



**Township of Manitouwadge  
Water Distribution System  
Contingency Plan  
And  
Emergency Guidelines**

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**TOWNSHIP OF MANITOUWADGE  
PUBLIC WORKS DEPARTMENT  
Contingency Plan/Emergency Guidelines  
Table of Contents**

<b>Topic</b>	<b>Page #</b>
<b>Introduction</b>	<b>1</b>
<b>Adverse Drinking Water quality Corrective actions</b>	<b>1 – 2</b>
<b>Spill Contingency Plan</b>	<b>3 – 7</b>
<b>Operators Unable to perform Duties for Extended Period of Time</b>	<b>8-9</b>
<b>Loss of Pressure in the Distributions System</b>	<b>9-10</b>
<b>Equipment Failure</b>	<b>10-11</b>
<b>Water Main Breaks</b>	<b>11-12</b>
<b>Fire</b>	<b>13</b>
<b>Contact List</b>	<b>Appendix a</b>
<b>300 KW Genset form</b>	<b>Appendix b</b>
<b>400 KW Genset form</b>	<b>Appendix c</b>
<b>Public Works Equipment List</b>	<b>Appendix d</b>
<b>Boild Water Advisory Notice Forms (example)</b>	<b>Appendix e</b>
<b>Boild Water Advisory Notice form – Medical Officer of Health</b>	<b>Appendix f</b>
<b>Notice of Water shut off</b>	<b>Appendix g</b>
<b>50 Day Time of Travel Capture Zones</b>	<b>Appendix h</b>
<b>Aquifer Boundary</b>	<b>Appendix i</b>

# Township of Manitouwadge Public Works Department Contingency Plan/Emergency Guidelines

## INTRODUCTION

The purpose of this contingency plan and emergency guideline is to assist in the case potential emergencies that could affect the Manitouwadge Distribution/Treatment system. Copies of this plan are located at each pumping station, 1 Shawinigan Place, Public Works Supervisor's office, Municipal Office, The Manitouwadge Emergency Control Room and Control Emergency Group located in the Council Chambers.

This plan is created as a checklist which can be utilized in case of emergencies, Spills, Contamination of water source systems, power failure, and equipment failures. This guide includes a contact list, authority notifications, and procedures on how to handle adverse water samples, power failure procedures, and recommended practices during an emergency.

One thing to remember, every emergency has its own set of problems which may occur sometimes and cannot be predicted. During every emergency feel free to utilize every resource to assist in the defusing of the situation. Manitouwadge has good Emergency Service Resources; do not be afraid to call upon them for assistance.

This plan can be subject to change if systems are changed in the facilities and the Plan will be reviewed on an annual basis.

### Adverse Drinking Water Quality Corrective Actions

The Drinking Water Protection Regulation requires Water Works Owners/Operators and Laboratories to immediately notify the Local Medical Officer of Health (MOH) and Ministry of the Environment (MOE) if:

- A parameter exceeds its Maximum Acceptable Concentration (MAC) or Interim Maximum Acceptable Concentrations (IMAC) or there is an indicator of Adverse Water Quality. These are found under Corrective Actions/Contamination of Water Source Section of O'Reg 170/03 Schedule 18.
- The Water Works Owner must also provide confirmation that appropriate corrective action is being taken. Corrective Actions include the following:
  1. Re-sampling at the upstream, downstream and at the location of the exceedence.
  2. increasing the chlorine dosage
  3. flushing water mains to insure fresh chlorinated water is established in the area of concern

Please follow any directions given by the MOH and the MOE.

**Township of Manitouwadge  
Public Works Department  
Contingency Plan/Emergency Guidelines**

The ALS Laboratory Group in Thunder Bay, Ontario will notify the Owner/Operator of any indicators of Adverse Water Quality.

**Steps to follow when an Adverse Sample is implemented:**

1. Notification must be given to ALS by speaking with a person at the laboratory. Telephone numbers are on the contact list.
2. Notification must be given to the MOH officer by speaking with a person at the Medical Officer of Health office. If the office is closed you ***must*** speak with a person at the On-call system of the Thunder Bay District Health Unit. Telephone numbers are located on the contact list.
3. Notification must be given to the MOE by speaking with a person at the Ministry's Spills Action Center. Telephone numbers are on the contact list.
4. Notify the Chief Administrative Officer of the situation, keep the conversation short, and leave the telephone line open for the TBDHU and the MOE.
5. It is ***mandatory*** to follow up your verbal confirmation by written confirmation to the MOH, the MOE, OSAC, and ALS Laboratories.
6. A Notice of Adverse Test Result and other Problems and Notice of Issue Resolution at Drinking Water System as well the events and actions taken of the situations and faxed to the MOH and the MOE, quoting the following within 24 hours: Times, Dates, Record of persons whom you spoke with at the different offices and particulars.

**The most important action to take, if in doubt, is to call the above Ministries to clarify any concerns you may have.**

## **Township of Manitouwadge Public Works Department Contingency Plan/Emergency Guidelines**

Changes have been made to the spill containment area, it is no longer part of the fire department. Omer Collin has assured that the spill containments will be set up at the main pumphouse, the sewage liftstation, and the Public works Garage. Also spill containment supplies could be obtained from the Gold Mines at the corner in an emergency.

Spills of contaminants of any kind can be potential disaster to our environment, but not only our environment, also to the Manitouwadge Aquifer Water Source.

Spills of fuel, chemicals, etc. of any amount should be contained and cleaned up and reported to the Ministry of the Environment Spills Action Center (OSAC).

In the case of spills of materials which could possibly contaminate our Aquifer in Manitouwadge the following steps should be followed:

1. In case of accidental spill of any size notification to the supervisor and initiate the contingency plan for spill containment and clean up.
2. If at all possible identify and quantify spill and initiate containment team to prevent further contamination and minimize adverse affect to the environment.
3. Once contaminant is identified and determined safe to enter the spill zone begin containment with use of all available equipment. (i.e. Loaders, hoes, dump trucks etc.)
4. As a Water Operator you can give incident commander information on measures to contain the spill and information on the water Aquifer and time lines at which the contaminant may reach our well heads.
5. Call and Notify MOE (OSAC) and MOH regarding the spill. Take detailed notes of the conversation (i.e. Persons Name, Date, time, known volumes. If volume is not known do not guess!!)
6. Follow any orders that may be given by the MOE and MOH.
7. Start clean up, take notes regarding clean up, what measures were taken to contain and clean up the spill. Record times, dates, volumes ect.

**One main concern with spills to the Environment is containment and clean up.**

**As stated above, the duties of the Operator is to provide assistance to EMS and keep good records such as the following:**

- a) Time, Date, location**
- b) What has spilled**
- c) Quantity of the spill**
- d) Who you contacted**
- e) What actions are being taken to contain and clean up**
- f) Sampling, if required, as directed by the MOE and MOH**

## **Township of Manitowadge Public Works Department Contingency Plan/Emergency Guidelines**

In the event of a power failure affecting our Distribution System Operations, Manitowadge Public Works Department has a power failure procedure in place.

Two locations of concern within our system operation is 1 Shawinigan Place Pump House where our Raw Well #1 & #2, UV Reactor, Service pumps, Reservoir, Chlorination System and Laboratory is situated.

The second location of concern is Well # 3 & #4 and #5 pump station located off Ohsweken Road, adjacent to the Townships beach area.

In the event of a power failure these two locations have back up generator systems which are set to start up automatically once a power failure is detected.

At the sewage liftstation a new 300KW Generator is situated there to only supply power to one raw well pump and supply power to the Sewage Lift Station one sewage pump. Even though this generator can supply power under combine load, it is good practice to remove one load to ease the load. This can be accomplished by switching the lead well pump to # 2, if not this is not possible then lock out well # 4 and use only well pump #3 as your lead.

The second location, the Main Pump House at 1 Shawinigan Place is powered by a 400 KW Generator. It too will start when a power failure is detected. This will power the entire building systems.

**Once power is lost and the generators are up and running these steps should be followed:**

- a) Operators at both locations if possible to monitor generators. Fill out the generator operator's sheets to keep record of operations.
- b) Notify Hydro One for update of the situation.
- c) If told power failure may be long, make arrangements for fuel to be supplied by supplier.
- d) Mechanic can be called for standby, if needed. Public Works Mechanic or Tormont Cat.

Operator at the Main Pump house location duties include:

- a) Monitor 400 KW generator and record required information on generator sheets, (see appendix b)
- b) Monitor online systems
- c) Monitor pumps which include Raw wells, Service pumps and chlorination pumps
- d) Conduct lab tests i.e. pH, Turbidity, Total and Free Chlorine residuals and colour
- e) Keep a good log of events for the power failure

### **TROUBLE SHOOTING**

Steps for trouble shooting are listed below:

- a) Generator failure to start automatically 400 KW. Refer to the Operator's manual locate in the office area of the Water Pump House at 1 Shawinigan Place.
- b) Secondly, Try to reset
- c) Start Manually
- d) Call Electrician and Mechanical Department
- e) Generator Failure 300 KW at the sewage liftstation, Try to reset
- f) Check transfer switches at sewage liftstation MCC room
- g) Start manually
- h) Call Electrician and Mechanical Department

### **BACK UP EQUIPMENT**

#### **Public Works Building:**

- a) 4600 Yamaha Generator
- b) 2200 Honda Generator

#### **Fire Department:**

- a) 6500 Generator
- b) Rescue Truck has on board power system
- c) 22KVA Portable Genset



For additional supplies refer to contact list.

**Township of Manitouwadge  
Public Works Department  
Contingency Plan/Emergency Guidelines**

**PROBLEM**

When operators are out of commission due to illness, or injury, or for some unseen reason, could cause a problem in the operation of the water and wastewater facilities.

Currently the Township of Manitouwadge has one Chief Operator fully licensed in Water Treatment, Water Distribution, Wastewater Treatment, and Wastewater collections. The Township of Manitouwadge employs as second person who also is currently fully licensed which allows him to work on his own without any supervision.

**SOLUTION**

In the case that this problem occurs, Manitouwadge Public Works Supervisor will call in the Ontario Clean Water Agency to provide emergency assistance by supplying trained operators.

The phone numbers for this are provided in the contact list.

Also, notification would be made to the MOE and the MOH to keep these agencies informed and these agencies may provide assistance also. The telephone numbers are in the contact list.

**Contingency Plan Operators Unable to Perform  
Duties for Extended Period of Time**

**Problem**

If operators are out of commission due to illness, or injury, or for some unseen reason which could cause a problem in the operation of the Water and Wastewater Facility.

Currently we have one Chief Operator and a second operator who are both fully licensed in Water treatment, Wastewater Treatment, Water distribution and Wastewater Collections.

**Solution**

In the case that this problem occurs, Manitouwadge Public Works Supervisor will call in OCWA to provide emergency assistance by supplying trained operators to fill in temporarily. Telephone numbers for this are provided in the contact list.

Also, notification would be made to the MOE and the MOH to keep these agencies informed and these agencies may provide assistance also. The telephone numbers are in the contact list.

### **Loss of System Pressure in the Distribution System**

#### **Solution**

1. Evaluate the situation for personal safety hazards and follow all necessary safety procedures
2. Formulate a plan
3. verify that a problem indeed exists
4. Verification of problem, determine the source of failure and schedule repairs
5. Consult the MOH as to whether or not a boil water advisory or order should be put in place restoring system pressure, notify SAC and MOE
6. Take measures for corrective actions that has been agreed to with the MOH
7. Notify Operational staff and crews as well as the Fire Department of the situation
8. Before returning to service that affective parts of the system have been adequately disinfected in accordance with Ministry Procedures for Disinfection of Drinking Water in Ontario
9. Collect samples from Distribution System for analysis
10. Once distribution system is restored and sample results come back clean and the MOH and MOE have confirmed this then the boil water advisory can be lifted.
11. Document all actions in a log book and incident report. Keep good field notes.

### **Equipment Failure Manitouwadge Water Distribution System**

Manitouwadge Public Works Department and Water Works Department have a great deal of Equipment. An equipment list is attached as Appendix D.

In the case of fatal equipment failure each case has its own set of problems which must be addressed.

#### **Generator Failure 300 KW and 400 KW Systems – The following procedures apply.**

1. Report failure to supervisor immediately
2. Check fuel supply
3. Try resets to system, refer to operators
4. Check transfer switches to ensure they are in proper positions
5. Check all automatic resets
6. If failure to start, try manual starting
7. Call Mechanical Department as per telephone numbers in contact list
8. Call electrical Department as per telephone numbers in contact list

9. Keep Supervisor informed
10. Keep a close eye on system pressure and other systems, keep detailed notes
11. If a system pressure drops to low you may have to start low pressure Contingency Plan
12. If power failure persists, notify SAC, MOH and the MOE
13. Follow all directions given by these agencies and keep notes
14. Possible sampling, disinfection or flushing may be ordered

### **Chlorination Pump Failure**

**Chlorination Pump Failure, insure the following steps are followed:**

1. Restart back up pump
2. Note Chlorine residuals – Lab Tests
3. Report incident so OSAC, MOE and MOH
4. If system free residuals stay above 0.05 mg/L throughout the Distribution System, note this and information to report to the agencies you contact
5. Follow all directions give by the agencies you contact
6. Notify your supervisor of the incident
7. Complete incident reports as required.

### **Service Pump Failure**

The Manitowadge Water distribution System Service Pumps supply water to our community and are essential to our operation to maintain pressure and volume.

Currently we have six service pumps located at the main pumping station at 1 Shawinigan Place.

These six pumps are hooked up to our Spectrum Operator Interface which provides a duty cycle for these pumps. This system will detect pump shut downs and star up a replacement pump to maintain the system pressure and volume which is required.

**When a pump is determined out of service the following is done:**

1. Lock out pump and pump power
2. Change duty cycle on PLC, move pump to last called
3. Call an electrician to inspect
4. If found not to be an electrical problem, make arrangements to get pump repaired by contacting the supervisor
5. List of contacts in appendix

- Note: If pressure is lost due to service pump failure, notify authorities and carry out procedures given, i.e. Flushing, disinfection and sampling.

#### **Solution**

1. Evaluate the situation for personal safety hazards and follow all necessary safety procedures
2. Formulate a plan
3. verify that a problem indeed exists
4. Verification of problem, determine the source of failure and schedule repairs
5. Consult MOH as to whether or not a boil water advisory or order should be put into place restoring system pressure, notify OSAC and the MOE
6. Take measures for corrective actions that has been agreed to with MOH
7. Notify Operational staff and crews, and fire department of the situation
8. Before returning to service that affective parts of the system have been adequately disinfected in accordance with the "Ministry Procedures for Disinfection of Drinking water in Ontario"
9. Collect samples from distribution system for analysis
10. Document all actions in log book and incident report. Keep detailed field notes.

#### **Water Main Breaks**

Ensure that you emergency procedures in your Contingency binder have been followed, i.e. all contacts made and notice to affected areas provided.

When leak in minor and water in the main always has a positive pressure, no disinfection is required after repair is complete. It is good practice to disinfect all parts and repair clamps which are required to use to repair the break.

However, with a more serious break, the main must be disinfected before being put back into service.

**When completing a repair to a water main the following procedures shall be undertaken:**

1. Check service pump operation
2. May have to shut down a service pump to minimize damage to affected area, keeping an eye on the distribution system pressures

3. Isolate break area following safety procedures
4. Close roads if necessary
5. Notify affected consumers
6. Excavate area as per safe procedures
7. Repair break
8. The interior of the pipe and fittings used to repair must be disinfected with proper solution
9. Flushing shall be started as soon as repair is completed and shall be continued until discoloured water is eliminated. (Practise good flushing procedures preventing ground damage)

When practical in addition to the procedures previously described, the section of main in which the break is located shall be isolated, all service connections shutoff and sections flushed and chlorinated as described in the AWWA Standard C651-05 for water main disinfection.

10. After chlorination flushing shall be resumed and continued until discoloured water is eliminated and chlorine concentrations are no higher than the rest of the system.
11. Sampling after a large break has been repaired is good practice.
12. Contact affected customers to flush their own lines by running water.

- **Supplies needed for main breaks can be located in the Manitowadge Public works storage areas. If needed special supplies or equipment refer to contact list**

**Township of Manitowadge  
Public Works Department  
Contingency Plan/Emergency Guidelines**

**FIRE**

Manitouwadge Water Distributions System plan for FIRE is simple and to the point.

The following steps shall be taken:

1. Detecting the fire, note the location and what is burning, Call 911 Manitowadge fire.
2. Evacuate the building and area
3. If possible without causing injury to yourself or to others you may attempt to extinguish the fire by approved methods
4. Be careful on how you extinguish due to the fact that the water works buildings house many electrical systems and chemicals which only certain products will extinguish these types of fires.
5. Once Manitowadge fire departments is on the scene, provide any information required to the officer in charge.
6. Once fire department is on scene they are in charge.
7. Follow all directions given by the fire department
8. If systems are affected by the fire, follow procedures in the contingency plan to notify authorities.
9. Keep detailed notes for reports
10. Important telephone numbers are listed on provided contact list.

Township of Manitowadge  
Public Works Department  
Contingency Plan and Emergency Guidelines

Contact List

Appendix A

Contact		Telephone, Fax #'s and Email	Information and Supplies
Local Medical Officer of Health	AH	807-623-7451	Authority Notification
	P	888-294-6630	
	F	807-623-2369	
Ministry of Environment	P	807-875-7772	Authority Notification
	F	807-476-3160	
	P	800-268-6060	
Spill Action Center	P	800-268-6060	Authority Notification - Spills
Stephen Hunsberger, MOE Water Inspector	P	807-475-1513	Water Treatment/Distribution Issues/Sewage Collection and Treatment
	F	807-475-1161	
	E	<a href="mailto:Stephen.Hunsberger@ene.gov.on.ca">Stephen.Hunsberger@ene.gov.on.ca</a>	
ALS Laboratory Group	P	800-668-9878	Laboratory Analytical for Manitowadge
	F	807-623-7598	
Fire	P	911	Emergency Services
OPP	P	911	Emergency Services
Ambulance	P	911	Emergency Services
Alliance Chemical	P	807-472-2080	Roberto Bucci: 12% Sodium Hypochlorite
	F	866-204-4685	
	E	<a href="mailto:rb.allichem@tbaytel.net">rb.allichem@tbaytel.net</a>	
Batchilder Plumbing	P	807-826-4440	Local Plumber
Bell Locates	P	611	Bell Telephone Lines
Cal Gas	P	888-269-4380	Propane Supplier
Hydro Locate	P	888-664-9376	Hydro lines
Shaw Locate	P	807-826-3921	Shaw Cable lines



**Township of Manitouwadge  
Public Works Department  
List of Essential Services & Suppliers**

<b>Contact List</b>			
<b>Contact</b>		<b>Telephone, Fax #'s and Email</b>	<b>Information and Supplies</b>
<b>Local Medical Officer of Health</b>	<b>P</b>	888-294-6630	Authority Notification
	<b>A.H</b>	1-807-623-7451	
	<b>F</b>	807-623-2369	
<b>Ministry of Environment</b>	<b>P</b>	807-875-7772	Authority Notification
	<b>F</b>	807-476-3160	
	<b>P</b>	800-268-6060	
<b>Spill Action Center</b>	<b>P</b>	800-268-6060	Authority Notification - Spills
<b>Sherry Hakala, MOE Sewage Inspector</b>	<b>P</b>	807-475-1724	Sewage Collection/Treatment Issues
	<b>F</b>	807-475-1754	
	<b>E</b>	<a href="mailto:Sherry.Hakala@ene.gov.on.ca">Sherry.Hakala@ene.gov.on.ca</a>	
<b>Stephen Hunsberger, MOE Water Inspector</b>	<b>P</b>	807-475-1513	Water Treatment/Distribution Issues
	<b>F</b>	807-475-1161	
	<b>E</b>	<a href="mailto:Stephen.Hunsberger@ene.gov.on.ca">Stephen.Hunsberger@ene.gov.on.ca</a>	
<b>ALS Laboratory Group</b>	<b>P</b>	800-668-9878	Laboratory Analytical for Manitouwadge
	<b>F</b>	807-623-7598	
<b>Fire</b>	<b>P</b>	911	Emergency Services
<b>OPP</b>	<b>P</b>	911	Emergency Services
<b>Ambulance</b>	<b>P</b>	911	Emergency Services
<b>Alliance Chemical</b>	<b>P</b>	807-472-2080	Roberto Bucci: 12% Sodium Hypochlorite
	<b>F</b>	866-204-4685	
	<b>E</b>	<a href="mailto:rb.allchem@tbaytel.net">rb.allchem@tbaytel.net</a>	
<b>Clear Tech</b>	<b>P</b>	800-387-7503	Water Equipment Supplier, chemicals
	<b>F</b>	905-612-0575	
<b>Dallaire Welding</b>	<b>P</b>	807-826-4495	Welding
<b>Endress and Hauser</b>	<b>P</b>	905-681-9292	Computer system, Flow meter verification
<b>Greyhound Bus</b>	<b>P</b>	807-229-3433	Deliveries
<b>Hospital</b>	<b>P</b>	807-826-3251	
<b>J &amp; J Rentals</b>	<b>P</b>	807-826-1444	Equipment Rentals
<b>JML Engineering</b>	<b>P</b>	807-345-1131	Consulting Engineers
	<b>F</b>	807-345-1229	
<b>KGS Group</b>	<b>P</b>	204-896-1209	Consulting Engineers
	<b>F</b>	204-896-0754	

<b>Manitoulin Transport</b>	<b>P</b>	<b>807-229-0551</b>	<b>Deliveries</b>
<b>Home Hardware</b>	<b>P</b>	<b>807-826-3233</b>	<b>Equipment Rentals, plumbing supplies etc.</b>
<b>McKnight Plumbing</b>	<b>P</b>	<b>807-229-1693</b>	<b>Plumber</b>
<b>Nelson Environmental</b>	<b>P</b>	<b>204-949-7500</b>	<b>Consulting Engineers</b>
	<b>F</b>	<b>204-237-0660</b>	
<b>OCWA</b>	<b>P</b>	<b>800-667-6292</b>	
<b>Phils Pumping</b>	<b>P</b>	<b>807-229-2606</b>	<b>Sewage Pumping</b>
<b>Potters Plumbing</b>	<b>P</b>	<b>888-213-2220</b>	<b>Sewage Pumping</b>
	<b>F</b>	<b>807-939-2558</b>	
<b>Powell Cat</b>	<b>P</b>	<b>807-475-7535</b>	<b>Generator Mechanic</b>
<b>Synergy Controls Corp.</b>	<b>P</b>	<b>705-674-2875</b>	<b>Electronic Meters and Computers</b>
	<b>F</b>	<b>807-683-3870</b>	
	<b>C</b>	<b>807-627-5569</b>	
<b>Tornomont Cat Mechanical</b>	<b>P</b>	<b>807-475-7535</b>	
<b>Trans West</b>	<b>P</b>	<b>807-623-0909</b>	<b>Sewage Q meter calibration, Hach supplier</b>
<b>Vezeau Haulage</b>	<b>P</b>	<b>807-826-1369</b>	<b>Sewage Pumping</b>
<b>David Bell Mine</b>	<b>P</b>	<b>807-238-1041</b>	
<b>Williams Mine</b>	<b>P</b>	<b>807-238-1100</b>	
<b>Batchilder Plumbing</b>	<b>P</b>	<b>807-826-4440</b>	<b>Local Plumber</b>
<b>Bell Locates</b>	<b>P</b>	<b>611</b>	<b>Bell Telephone Lines</b>
<b>Cal Gas</b>	<b>P</b>	<b>888-269-4380</b>	<b>Propane Supplier</b>
<b>Hydro Locate</b>	<b>P</b>	<b>888-664-9376</b>	<b>Hydro lines</b>
<b>Western Supplies</b>	<b>P</b>	<b>807-345-6543</b>	
	<b>F</b>	<b>807-345-0090</b>	
	<b>C</b>	<b>807-628-6291</b>	
<b>Shaw Locate</b>	<b>P</b>	<b>807-826-3921</b>	<b>Shaw Cable lines</b>
<b>P=phone</b>		<b>A.H=after hours</b>	<b>C=Cell Phone</b>
<b>F=fax</b>		<b>E=Email</b>	

**300 KW Genset Located at Sewage Lift Station.**

Date: \_\_\_\_\_

Time																			
Volts																			
Amps																			
Frequency (Hz)																			
Engine Temp (oF)																			
oil pressure (PSI)																			
Tachometer (RPM)																			
Cooling Water																			

**Hour Meter**

Finish: \_\_\_\_\_

Start: \_\_\_\_\_

Duration: \_\_\_\_\_

Main Power Restored \_\_\_\_\_

Main Power On \_\_\_\_\_

Emergency Power off \_\_\_\_\_

Duration \_\_\_\_\_

**Load**

Sewer Pump1: \_\_\_\_\_

Sewer Pump2: \_\_\_\_\_

Sewer Pump3: \_\_\_\_\_

Exhaust Fan \_\_\_\_\_

Louvers \_\_\_\_\_

Well Pump #3: \_\_\_\_\_

Well Pump #4: \_\_\_\_\_

Well Pump #5: \_\_\_\_\_

VFD #3: \_\_\_\_\_

VFD #4: \_\_\_\_\_

VFD #5: \_\_\_\_\_

Yes: \_\_\_\_\_ No: \_\_\_\_\_

Open: \_\_\_\_\_ Close: \_\_\_\_\_

Signature: \_\_\_\_\_

# 400 KW Genset Located at Main Pump House

Genset Pannel											
Time											
Volts											
Amps											
Engine Pannel											
Frequency (Hz)											
Engine Temp (oF)											
Oil Temp											
Oil pressure (PSI)											
Tachometer (RPM)											
Transfer Switch Pannel											
Volts											
Amps											
Frequency (Hz)											

Date: \_\_\_\_\_

Hour Meter

Finish: \_\_\_\_\_  
 Start: \_\_\_\_\_  
 Duration: \_\_\_\_\_

Load

Exhaust Fan \_\_\_\_\_  
 Louvers \_\_\_\_\_

Main Power Restored \_\_\_\_\_  
 Main Power On \_\_\_\_\_  
 Emergency Power off \_\_\_\_\_  
 Duration \_\_\_\_\_

Well Pump #1: \_\_\_\_\_  
 Well Pump #2: \_\_\_\_\_  
 VFD #1: \_\_\_\_\_  
 VFD #2: \_\_\_\_\_

Yes: \_\_\_\_\_ No: \_\_\_\_\_  
 Open: \_\_\_\_\_ Close: \_\_\_\_\_

#1 \_\_\_\_\_ #2 \_\_\_\_\_ #3 \_\_\_\_\_ #4 \_\_\_\_\_ #5 \_\_\_\_\_  
 Service Pump \_\_\_\_\_  
 VFD \_\_\_\_\_  
 Aerator \_\_\_\_\_

Signature: \_\_\_\_\_

**PUBLIC WORKS EQUIPMENT**

**Appendix D**

Heavy Equip.	Equip.#	GL #	Description	DIESEL	DIESEL	GAS
				Clear	Dyed	
X	314401	61265 310115	Volvo Loader		X	
	314402	61265 310146	1999 Thompson Steamer			
	314408	61265 310121	Broom			
X	314409	61265 310122	Komatsu Loader		X	
X	314410	61265 310123	1991 Champion Grader		X	
	314411	61265 310124	Cement Mixer			X
	314415	61265 310126	Leroi Compressor		X	
	314417	61265 310128	1995 GMC Van	X		
	314421	61265 310129	Lincoln Ranger 8 Welder			X
	314424	61265 310132	1996 Half Ton Ford "A"			X
	314426	61265 310134	1996 Half Ton Ford "B"			X
	314430	61265 310137	Plate Tamper			X
	314433	61265 310144	1999 Vibratory Roller		X	
X	314434	61265 310145	99 Int'l Sand/Snow Plow T	X		
X	314435	61265 310140	Daewoo Dozer		X	
X	314436	61265 310141	1998 Trackless MTV		X	
	314437	61265 310142	1999 1/2 Ton Chev. "A"			X
	314447	61265 310147	1991 Dodge Van			X
	314489	61265 310199	All Vehicles			
X	314492	61265 310139	John Deere Loader/Backhoe		X	
X	354402	61265 350161	1998 J.D. 544H Loader		X	
	354403	61265 350162	Tenco Snowblower		X	
	354404	61265 350163	Airport Sander Unit			X
	354405	61265 350164	1994 3/4 Ton GMC			X
X	354406	61265 350165	Int'l. 6 Ton Single Axle	X		
	434401	61265 430140	200 KW Genset			
	434402	61265 430141	400 KW Genset			
X	4446	61265 440171	1999 Garbage Packer	X		



**PUBLIC NOTICE  
Boil Water Advisory  
Effective :  
Midnight, July 27, 2003**

The Public Works Department along with Eraldo Scocchia from Lucon Construction will be repairing the Township's water reservoirs and sluice gates at the main water pumphouse. To accomplish this the water reservoirs and clear well cells have to be completely drained.

**Public Works will be shutting off the water to the community effective Midnight on July 27, 2003 until 7:00 am on July 28<sup>th</sup>, 2003.**

Once the water has been restored the quality of water cannot be guaranteed.

**This boil water advisory will remain in effect until the Thunder Bay District Health Unit and the Ministry of the Environment are satisfied that the Township of Manitouwadge's drinking water system is capable of providing a safe water supply.**

**THERE IS NOTHING WRONG WITH OUR WATER.**

This measure is being taken to safeguard the health of our consumers.

Please be informed that the free chlorine residual will be raised above normal levels.  
If you are chlorine sensitive, please take note.

**During the shutdown on July 27, 2003 at Midnight until 7:00 AM remember:**

- (1) Shut off your main water valve to prevent back siphoning of your water to the distribution system.**
- (2) Shut off the power to your hot water tank and drain your hot water tank to waste.**
- (3) Upon restoration of your water supply, run your cold water to waste for at least ten (10) minutes.**
- (4) Remember to boil your water for drinking/cooking purposes until you are notified not to.**

We regret any inconvenience that this may cause.

**Herb Cordeiro,  
Public Works Superintendent  
Township of Manitouwadge  
Telephone Numbers:  
Office: 826-2712, After Hours(cell): 229-6057**

July 23, 2003

Mr. Herb Cordeiro  
Public Works Superintendent  
Township of Manitowadge  
Manitowadge, ON POT 2CO

Fax: #(807) 826-4592

Residents and Persons Consuming  
Drinking Water from the Township of Manitowadge  
Water Distribution System

**BOIL WATER ADVISORY NOTICE**  
**(EFFECTIVE 12:00 MIDNIGHT , JULY 27, 2003)**  
**UNTIL FURTHER NOTICE**

Please be advised that the Township of Manitowadge Public Works Department has informed the Thunder Bay District Health Unit of maintenance which will be conducted on the municipality's water system. During this time the quality of water cannot be guaranteed

Until the safety of the water can be assured, all water used for human consumption should be brought to a rapid rolling boil for one minute.

This Boil Water Advisory will remain in effect until the T.B.D.H.U. and the Ministry of Environment are satisfied that the Township of Manitowadge's drinking water system is capable of providing a safe water supply.



Dr. D. Williams, M.D., FRCPC  
Medical Officer of Health  
Phone: (807) 625-5965 or 1-888-294-6630

DW/ms

2002 Boil Water Advisories/Advisory-Township of Manitowadge July 23-03

**“Sample Copy”**

**Appendix G**

CORPORATION OF THE TOWNSHIP OF MANITOUWADGE

PUBLIC WORKS DEPARTMENT

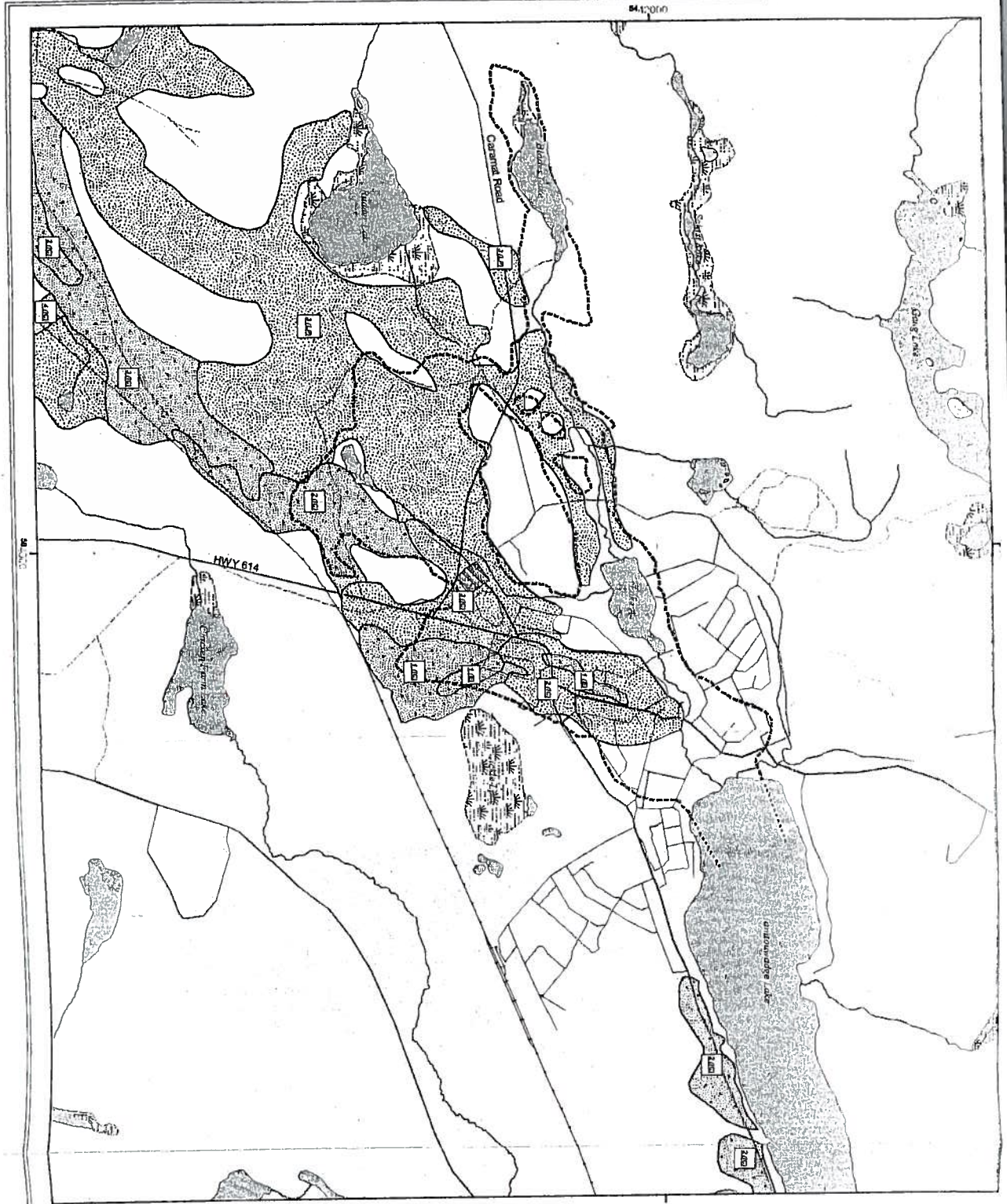
**NOTICE OF WATER SHUT-OFF**

Please be advised that the water service on your street will be shut off tomorrow morning, for an indefinite period, in order that we may make necessary repairs to the water lines. **PLEASE TURN OFF THE POWER TO YOUR HOT WATER TANK TO AVOID BURNING OUT THE ELEMENTS.**

Thank you for your co-operation and understanding.

Herb Cordeiro  
Public Works Superintendent





**Legend**

- Rivers
- Railway
- ▨ Waste Disposal Site
- Islands
- Lakes
- ▨ Wetland Area, Permanent
- ▨ Aquifer Boundary
- ▨ Sand and Gravel Resources
- ▨ Sand
- ▨ Gravel

Label Codes on Resources indicate Thickness

- 1 - Greater than 6 meters
- 2 - 3 to 6 meters
- 3 - 5-10 meters
- 4 - Less than 5 meters

Deposit Origin

- E - Esker
- LC - Lacustrine Plain
- IC - Ice Contact

Example: 1 (IC)  
 Ice Contact deposit 3 to 5 meters thick.

**Sources:**  
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**Additional sources:** Canadian Geologic Survey of Canada, Canadian Department of Natural Resources, KGS Group and the Township of Manitowadge

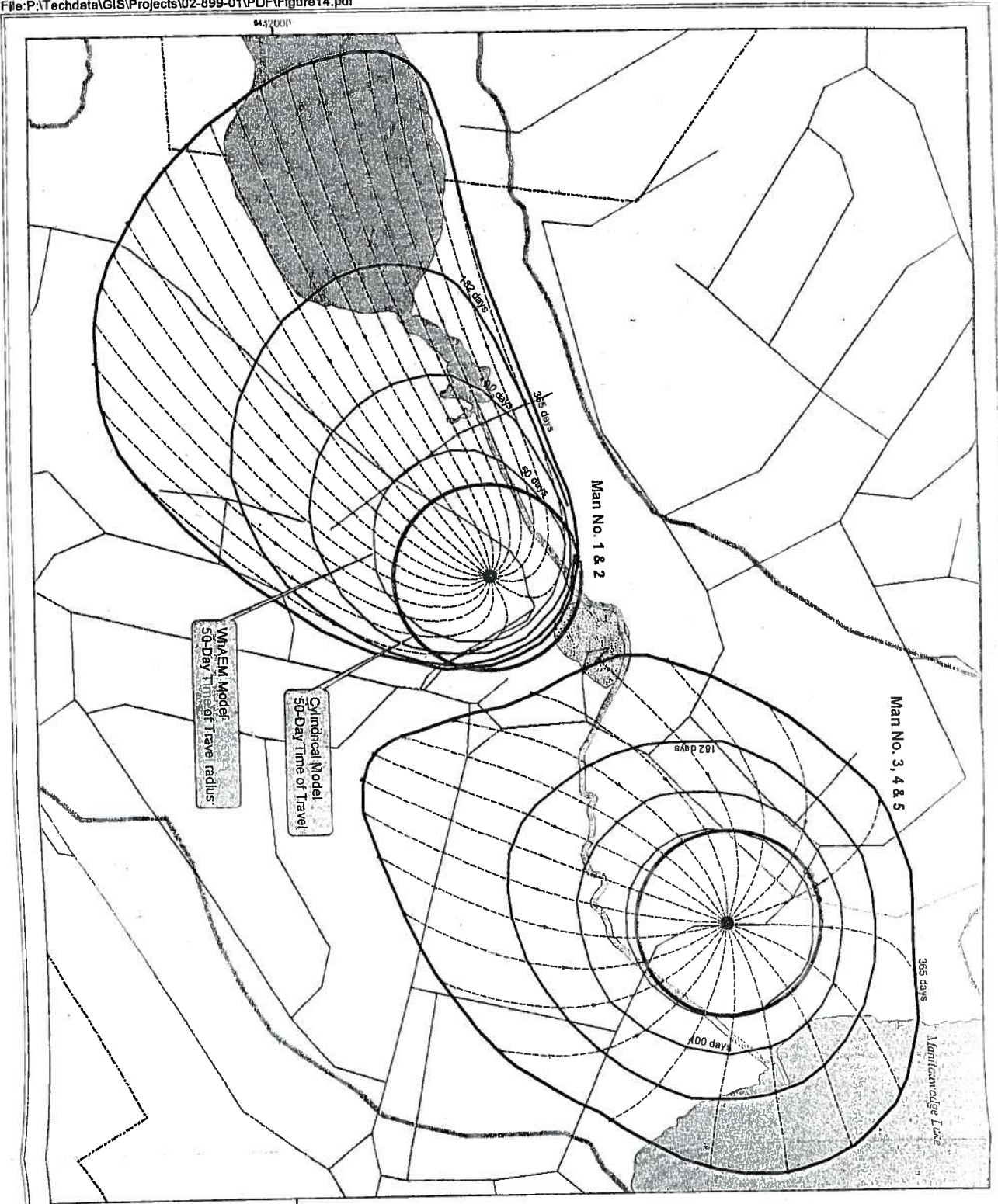
Scale set for 11 x 17 paper size.  
 1:20,000

0 120 240 480 720 960  
 Meters

All labels are metric and in meters unless otherwise specified.  
 Township of Manitowadge, North American Datum 1983 (NAD83)  
 Projection: UTM  
 Zone: 18N  
 Datum: NAD83  
 Spheroid: GRS80  
 Datum Shift: 0  
 Units: Meter  
 Contour Interval: 5

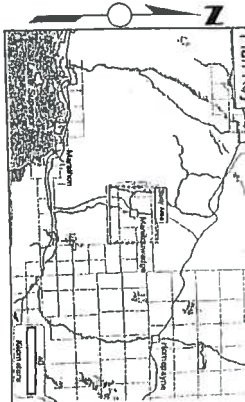
**KGS GROUP**  
**TOWNSHIP OF MANITOWADGE**  
 HYDROGEOLOGICAL STUDY - GROUNDWATER  
 UNDER DIRECT INFLUENCE OF SURFACE WATER  
 REGIONAL SAND AND GRAVEL  
 RESOURCES

SEPTEMBER 2002    FIGURE 8    REV. 0



WhaEM Model - 50-Day Time of Travel radius

Cylindrical Model - 50-Day Time of Travel

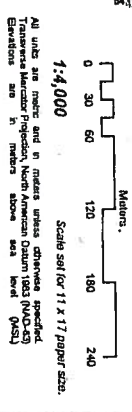


**Legend**

- Town Wells
- Town Limits
- ▨ Pit and Quarry
- ▨ Water Bodies
- ▨ Lake A Creek
- ▨ Aquifer Boundary
- ▨ WhaEM Model - Time of Travel (days)
  - 50
  - 100
  - 182
  - 365
- ▨ Groundwater Flow Path
- ▨ Cylindrical Model
- ▨ 50 Day Time of Travel

Note:  
 Well 2 Pumping 21 L/sec at 0.0005 gradient  
 Well 5 Pumping 22 L/sec at 0.0005 gradient

Sources:  
 Portions of data presented are owned by the Province of Ontario and are produced under the license agreement with the Province of Ontario.  
 © 2001 Queen's Printer  
 Additional sources: Canadian Geographic Survey of Canada,  
 Canadian Department of Natural Resources, KGS Group and the  
 Township of Mantouwadge



All units are metric and in metric unless otherwise specified.  
 Transverse Mercator Projection, North American Datum 1983 (NAD83)  
 Elevations are in meters above sea level (ASL)


**KGS**  
 TOWNSHIP OF MANTOUWADGE

**GROUP**  
 HYDROGEOLOGICAL STUDY - GROUNDWATER  
 UNDER DIRECT INFLUENCE OF SURFACE WATER

50 DAY TIME OF TRAVEL CAPTURE ZONE

SEPTEMBER 2002    FIGURE 14    REV. 0

28/01/2010

*Reviewed*  
*29/05/14* 

**TOWNSHIP OF MANITOUWADGE  
PUBLIC WORKS DEPARTMENT  
Table of Contents**

<b>Topic</b>	<b>Tab #</b>
<b>List of Essential Services, suppliers, and Inventory</b>	<b>1</b>
<b>Instrumentation and Monitoring</b>	<b>2</b>
<b>Sampling Procedures and Lab Requirements</b>	<b>3</b>
<b>Water Main Breaks and Repairs</b>	<b>4</b>
<b>Water Meter Readings and Shut offs</b>	<b>5</b>
<b>Documentation and Record Control</b>	<b>6</b>
<b>Pump Control System</b>	<b>7</b>
<b>Hydrant Check List</b>	<b>8</b>
<b>Water Valve Exercise Program</b>	<b>9</b>
<b>Unilateral/Unidirectional Flushing Program</b>	<b>10</b>

Manitouwadge Public Works  
Department

List of Essential Services  
Suppliers  
Inventory

**Township of Manitowadge  
Public Works Department  
List of Essential Services & Suppliers**

Contact List		
Contact	Telephone, Fax #'s and Email	Information and Supplies
<b>Local Medical Officer of Health</b>	P	888-294-6630
	A.H	1-807-623-7451
	F	807-623-2369
<b>Ministry of Environment</b>	P	807-875-7772
	F	807-476-3160
	P	800-268-6060
<b>Spill Action Center</b>	P	800-268-6060
<b>Sherry Hakala, MOE Sewage Inspector</b>	P	807-475-1724
	F	807-475-1754
	E	Sherry.Hakala@ene.gov.on.ca
<b>Stephen Hunsberger, MOE Water Inspector</b>	P	807-475-1513
	F	807-475-1161
	E	Stephen.Hunsberger@ene.gov.on.ca
<b>ALS Laboratory Group</b>	P	800-668-9878
	F	807-623-7598
<b>Fire</b>	P	911
<b>OPP</b>	P	911
<b>Ambulance</b>	P	911
<b>Alliance Chemical</b>	P	807-472-2080
	F	866-204-4685
	E	rb.allchem@bpaytel.net
<b>Clear Tech</b>	P	800-387-7503
	F	905-612-0575
<b>Dallaire Welding</b>	P	807-826-4495
<b>Endress and Hauser</b>	P	905-681-9292
<b>Greyhound Bus</b>	P	807-229-3433
<b>Hospital</b>	P	807-826-3251
<b>J &amp; J Rentals</b>	P	807-826-1444
<b>JML Engineering</b>	P	807-345-1131
	F	807-345-1229
<b>KGS Group</b>	P	204-896-1209
	F	204-896-0754

<b>Manitoulin Transport</b>	P	807-229-0551	Deliveries
<b>Home Hardware</b>	P	807-826-3233	Equipment Rentals, plumbing supplies etc.
<b>McKnight Plumbing</b>	P	807-229-1693	Plumber
<b>Nelson Environmental</b>	P	204-949-7500	Consulting Engineers
	F	204-237-0660	
<b>OCWA</b>	P	800-667-6292	
<b>Phils Pumping</b>	P	807-229-2606	Sewage Pumping
<b>Potters Plumbing</b>	P	888-213-2220	Sewage Pumping
	F	807-939-2558	
<b>Powell Cat</b>	P	807-475-7535	Generator Mechanic
<b>Synergy Controls Corp.</b>	P	705-674-2875	Electronic Meters and Computers
	F	807-683-3870	
	C	807-627-5569	
<b>Toronto Cat Mechanical</b>	P	807-475-7535	
<b>Trans West</b>	P	807-623-0909	Sewage Q meter calibration, Hach supplier
<b>Vezeau Haulage</b>	P	807-826-1369	Sewage Pumping
<b>David Bell Mine</b>	P	807-238-1041	
<b>Williams Mine</b>	P	807-238-1100	
<b>Batchilder Plumbing</b>	P	807-826-4440	Local Plumber
<b>Bell Locates</b>	P	611	Bell Telephone Lines
<b>Cal Gas</b>	P	888-269-4380	Propane Supplier
<b>Hydro Locate</b>	P	888-664-9376	Hydro lines
<b>Western Supplies</b>	P	807-345-6543	
	F	807-345-0090	
	C	807-628-6291	
<b>Shaw Locate</b>	P	807-826-3921	Shaw Cable lines
<b>P=phone</b>		<b>A.H=after hours</b>	<b>C=Cell Phone</b>
<b>F=fax</b>		<b>E=Email</b>	

Item	Total Quantity	PW Shelves	Water Trailer	Cold Storage	Pipe Storage	Recommendations
3/4 Main Stop	25	24	1			
3/4 Curb Stop	21	16	5			
3/4 T's	8	8	0			
3/4 Union	19	15	4			
1/2 Curb stop	6	5	1			
1/2 Union	2	0	2			
1/2 Main Stop	8	7	1			
1/2 - 3/4 Union	8	3	5			
1 "	None					
3/4 (Ford T's)	3	3	0			
2" Union	8	0	0			
2" Main Stop	3	0	0			
Valve Box with Rods	3		3	0		
Saddle 4"	4			4		
Saddle 6"	8		1	7		
Saddle 8"	5			5		
Saddle 10"	2			2		
Saddle 12"	1			1		
8" Water Pipe	32				32	
4" Water Pipe	14				14	
6" Water Pipe	0				0	Need To order
12" Water Pipe	0				0	
10" Water Pipe	0				2	
12 Sewer Pipe	2				1	
10" Sewer Pipe	1				44	
8" Sewer Pipe	44				0	Need to order
3" Sewer Pipe	0				0	Need To order
4" Sewer Pipe	0				36	
5" Sewer Pipe	36					Plastic To plastic
4" Sewer Connections	2		2			Clay to plastic
4" Sewer connections						Plastic To plastic
5" Sewer						
5" Clay to plastic			3	9		
6" to 6"	3			3		
8" Repair Clamp Water	1			1		
12" Repair Clamp	1			1		
6" Valve	1			1		
4" Valve	2			2		
10" Valve	2			2		Clay to Plastic
8" Sewer Connection	None		None			
3/4" Coper	1(Full Roll)		1	& Some smaller Pieces		
1/2" Copper	3			3		
10"Repair Clamps Water	4			4		
4" Repair Clamp Water	11			11		
6" Repair Clamps Water						

Well Pumps	Stock
Spare Submersible Pumps	Out for service
Genset	
Genset Block Heaters	2 on order
Oil Filters	
Analytical	
DPD Free Chlorine powder Pillows	1 Pkg/1000
DPD Total Chlorine powder Pillows	1 Pkg/1000
CL17 Chlorine Reagents	3 pkg
Sodium hypochlorite	10 Drums
pH (buffer solution) 4	1 pkg/50
pH (buffer solution) 7	1 pkg/50
pH (buffer Solution) 10	1 pkg/50
Phenol Red	1 50mL vial
Pipett dispenser	1 bag - 1000
Large Pipett Dispenser	1 bag - 30
Lense Wipes Glass ware cleaner	7 boxes
Reactor	
UV Lamps	6
Quarts Sleeves	1
Balasts	1
Desiccant	2
UVT vials	0
Wiper Motors	0
Intensity Sensors	0
Reference Sensor	1

Manitouwadge Public Works  
Department

S.O.P's

Instrumentation and Monitoring



**Manitouwadge Public Works  
SOP  
DR 2000**

Using the DR 2000 takes a bit of knowledge of laboratory testing procedures. Following proper laboratory procedures is mandatory and will allow for a greater accuracy and better representation of samples analysis. Steps for using the DR 2000 are listed below for each laboratory test conducted at this utility.

- Turn on Power
- Select Method number (according to analysis required i.e. Color, chlorine etc.)

### Color

- Running Samples for color Select method # 120
- Dial wave length to 455 nm
- Fill sample cell #1 (blank) with 25 mL DI water
- Fill sample Cell #2 with 25 mL of sample to be analyzed
- Wipe sample cells dry
- Insert blank into sample chamber in the DR 2000
- Press the zero button on the unit to get a back round zero
- Once sample has been zeroed the sample to be analyzed is inserted into the chamber and the read button is then pushed
- The digital display will indicate the reading acquired

\*Glass cleaning wipes are used to help with the condensation issues due to the temperature of the water.

\*Hach instrumentation is calibrated by a factory technician on an annual basis.

### Chlorine (Free)

- Select the method # 80 for both free and total chlorine residual
- Dial wave length to 530 nm
- Fill sample cell #1 with 25 ml of sample used for the analysis for the Blank
- Fill sample cell #2 with 25 ml of sample to be analyzed
- Wipe samples cells dry before inserting into DR 2000 Chamber
- If running free chlorine add a Free DPD chlorine powder pillow to sample and swirl
- A color reaction will occur and the sample will turn pink in color which indicates that there is a free chlorine residual in the sample collected
- The sample is then put into the sample chamber of the DR 2000, close the lid and press the read button
- The digital display will give you a read out which is the reading of the sample you analyzed for
- Once the read button is pressed and recorded it becomes a reading. Readings will be affected by dissolved air coming out of solution as well as condensation on the glass ware. If the reading seems to be suspect samples should be re-ran to insure a representative reading is verified.

### Chlorine (Total)

- Select the method # 80 for both free and total chlorine residual
- Dial wave length to 530 nm
- Fill sample cell #1 with 25 ml of sample used for the analysis for the Blank
- Fill sample cell #2 with 25 ml of sample to be analyzed
- Wipe samples cells dry before inserting into DR 2000 Chamber
- If running Total chlorine add a Total DPD chlorine powder pillow to sample and swirl
- Hit the Shift button and then the number 7 button.

- This will initiate a 3 minute timer which is required for the reaction to take place
- A color reaction will occur and the sample will turn pink in color which indicates that there is a Total chlorine residual in the sample collected (Sample will be darker in color than the Free chlorine residual)
- Swirl sample a few times during the 3 minute reaction time to remove any dissolved oxygen from the side of the glass ware.
- Once the timer has expired the sample is then put into the sample chamber of the DR 2000, close the lid and press the read button
- The digital display will give you a read out which is the reading of the sample you analyzed for
- This reading should always be higher than the free chlorine residual. If not than you should re-run the set of samples to insure that the values achieved are representative of each other.

**Manitouwadge Public Works  
SOP  
2100 P – Hand held Portable Turbidity Meter**

Using the 2100 P takes a bit of knowledge of laboratory testing procedures. Following proper laboratory procedures is mandatory and will allow for a greater accuracy and better representation of sample analysis. Steps for using the 2100 P are listed below for each laboratory test conducted at this utility.

- Turn on power
- Fill sample cell completely with sample to be analyzed
- Dry off sample cell
- Insert sample cell into 2100 P chamber and press the read button
- The reading shown on the digital display is representative of the sample collected
- Once per month the 2100 P gets checked with predetermined standards prepared by the manufacture to insure the meter is reading accurately
- If the readings are found to be inaccurate a calibration using these standards is conducted according to the Operations Manual for this unit.

\*On an annual basis a factory technician from Hach will come to the site and perform factory calibrations as required.

**Manitouwadge Public Works  
SOP  
Hand Held pH/D.O Meter -- HQ 40d**

If available on site pH probe is the preferred method of analyzing for pH due to the accuracy of the meter. This hand held meter allows you to read pH to two decimal places which is required for some sampling programs. To use the pH probe follow the step indicated below

- Turn on the power to the unit
- Remove the probe from the storage solution
- Rinse the probe thoroughly with DI water
- Insert the probe in to the sample and swirl or if available use a stir plate to achieve mixing
- On the hand held depress the sample button and select appropriate location
- On the hand held depress the operator selection and select the appropriate operator
- Depress the read button on the hand held unit
- The digital display will start to read
- There is a stabilization process that will take place in the top left corner of the display
- When reading is achieved the stabilization bar will disappear and you will see a lock
- This is the reading that will be recorded in the daily log sheets

\*This unit should be calibrated on a monthly basis or as needed (i.e. erroneous readings are being achieved). Calibration of the probe is completed using a three point calibration process (i.e. 4, 7 and 10 buffers). Once annually a factory technician from Hach will come to the site and perform factory calibrations as required.

**Manitouwadge Public Works  
SOP  
Hand Held pH Pocket Colorimeter**

If the pH hand held unit is unavailable or out of commission then the back up for this unit is the pH pocket colorimeter. This unit is small and uses color to determine the pH of the sample to be analyzed. To use this unit follow the steps that are listed below:

- Take sample cell #1 and fill to the 10 ml mark with DI water which is used as your blank
- Dry off sample cell before inserting into appropriate cell chamber
- Put the cover on and depress the Zero button
- Fill the second sample cell with 10 ml of sample to be analyzed
- Add 0.5 ml of phenol red color indicator solution and swirl
- Dry off sample cell before inserting into appropriate cell chamber
- Insert into chamber
- Put the cover on and depress the read button
- The digital display will give you a read out with the samples pH value
- This is the value that will be written and recorded on daily record sheets

\* Once annually a factory technician from Hach will come to the site and perform factory calibrations as required.

**Manitouwadge Public Works  
SOP  
On-Line Instrumentation**

On-Line instrumentation which monitors treated water from the reservoir to the distribution system runs 24 hours a day 7 days a week. These instruments need regular maintenance and cleanings approximately once per month to sustain a good working order. Also factory calibrations from a Hach representative are completed on an annual basis as required.

**CL17 (Chlorine Residual Analyzer)**

The first analyzer we will be looking at is the free chlorine residual analyzer (CL17). This instrument allows you to monitor and adjust the free chlorine into the reservoir and better yet allows you to control the chlorine residual in the distribution system. It is required that the chlorine residual in the distribution system not drop below 0.05 mg/l. During sampling if the residual is found to be in the range of 0.2 mg/l level with in the distribution system, flushing of the hydrants and adjustment of the chlorine dosage rates will follow. If the residual is below the 0.05 mg/l it is considered an adverse water quality and the MOE, MOH are to be notified and recommendations are to be followed accordingly. An adverse water quality form must be filled out and faxed to them ASAP indicating the adverse, time, date, and corrective actions to be performed. Also, once the situation has been corrected the MOE and MOH are to be notified and faxed the results of the corrective actions as well as proof that there is no longer an adverse water quality situation.

The chlorine residual analyzer receives its cleaning approximately once per month to maintain a good working order. Try to schedule this around the time that you are changing the reagents as they need to be changed every 30 days. Steps for maintenance should be followed and are listed below:

**Cleaning CL17**

- Enter the menu system on the display
- Select maintenance
- Select cleaning (display will flash wait)
- Once the display flashes "clean" you may start
- Get a small paper clip and straighten
- Remove plug to sample chamber
- Insert the paper clip and remove stir bar that is in chamber
- Fill the chamber with 19.2 N sulfuric acid (wear chemical gloves while handling) and let sit while completing the rest of the cleaning process
- Open up inlet reservoir and remove filter screen
- Clean the reservoir with a brush or a rag
- Insert a clean screen into the reservoir and close screen
- Remove all reagent tubing and replace (as needed) as well s replace all barbed hose fittings (as needed)
- Change reagents (CAT #25569-00, Free chlorine buffer solution and free chlorine color indicator solution)
- Open inlet lines and replace stir bar
- Insert plug back in to the top of the sample chamber
- Put the Unit back on line. It will take this unit a while to stabilize

**pH EC 310**

Once per month the on-line EC310 pH probe must be cleaned and calibrated. Steps for cleaning and calibrating are listed below:

- Shut off inlet valve
- Remove pH probe from sample chamber
- Clean probe with cotton swab and CLR to remove Iron and Manganese bacteria that has accumulated on the probe
- Rinse the probe with DI water
- Clean the sample chamber with CLR and a brush
- Rinse the chamber to waste

To calibrate the pH probe enter the menu setting on the digital display and find calibration. Complete an auto calibration using a three point calibration process. The 4, 7 and 10 buffers are used in this process. Step for calibration are listed below:

- Insert the probe into the 4 buffer solution and wait for stabilization
- Once stable hit the enter button on the display
- Remove the probe and rinse with DI water
- Insert the probe into the 7 buffer solution and wait for stabilization
- Once stable hit the enter button on the display
- Remove and rinse with DI water
- Insert the probe into the 10 buffer solution and wait for stabilization
- Once stable hit the enter button on the display
- Rinse the probe and re-insert into the sample chamber
- Put unit back on line

\* Once annually a Hach representative visits the site and completes a factory calibration as required.

**1720D Turbidity Meter**

Once per month online instrumentation should be cleaned and calibrated. The 1720D turbidity meter runs 24 hours per day and 7 days per week and tends to accumulate Iron and Manganese bacteria in the sample chamber. Cleaning and calibrating once a month helps to maintain a good working order. Steps for cleaning and calibrating are illustrated below:

- Shut off the inlet water supply line
- Remove the top
- Drain and remove reservoir
- Insert reservoir into a large bucket with soapy water and let soak
- Clean the reservoir with a scour pad to remove any built up Fe and Mn bacteria
- Rinse thoroughly and reinstall on the wall mounts
- Clean the sensor with cotton swab and CLR to remove any of the built up Fe and Mn bacteria
- Rinse with DI water

Steps for the Calibration Process are illustrated below:

- Fill the calibration chamber with 1 liter of DI water
- Enter the menu system and find calibration and press enter
- Follow steps given by the instrument

- Place turbidity head into the calibration chamber filled with 1 liter of the DI water and let reading stabilize
- Once the reading has stabilized accept the reading
- Dispense 5 ml of 4000 NTU formazine standard into the 1 liter of the DI water located in the calibration chamber
- Swirl the chamber gently
- Place the unit back on the calibration chamber and let the reading stabilize. It should read approximately 20 NTU
- Accept the reading
- Insert the head of the meter back on to the sample chamber turn the water on to fill the reservoir
- Turn the display to read
- Monitor while readings stabilize this may take a few minutes to occur

SCHEDULE 6  
OPERATIONAL CHECKS, SAMPLING AND TESTING — GENERAL

**Application**

6-1. This Schedule applies to the following drinking water systems:

1. Large municipal residential systems.
2. Small municipal residential systems.
3. Large municipal non-residential systems.
4. Small municipal non-residential systems.
5. Non-municipal year-round residential systems.
6. Non-municipal seasonal residential systems.
7. Large non-municipal non-residential systems.
8. Small non-municipal non-residential systems.

**Frequency of sampling and equipment checks**

6-1.1 (1) If this Regulation or an approval or order, including an OWRA approval or OWRA order, requires at least one water sample to be taken every week and tested for a parameter, the owner of the drinking water system and the operating authority for the system shall ensure that at least one sample that is taken during a week for the purpose of being tested for that parameter is taken at least five days, and not more than 10 days, after a sample was taken for that purpose in the previous week.

**Note:** On December 14, 2009, subsection (1) is amended by striking out “an approval or order, including an OWRA approval or OWRA order” and substituting “an approval, municipal drinking water licence or order, including an OWRA approval or OWRA order”. See: O. Reg. 418/09, ss. 15 (1), 27.

(2) If this Regulation or an approval or order, including an OWRA approval or OWRA order, requires at least one water sample to be taken every two weeks and tested for a parameter, the owner of the drinking water system and the operating authority for the system shall ensure that at least one sample that is taken during a two-week period for the purpose of being tested for that parameter is taken at least 10 days, and not more than 20 days, after a sample was taken for that purpose in the previous two-week period.

**Note:** On December 14, 2009, subsection (2) is amended by striking out “an approval or order, including an OWRA approval or OWRA order” and substituting “an approval, municipal drinking water licence or order, including an OWRA approval or OWRA order”. See: O. Reg. 418/09, ss. 15 (2), 27.

(3) If this Regulation or an approval or order, including an OWRA approval or OWRA order, requires at least one water sample to be taken every month and tested for a parameter, the owner of the drinking water system and the operating authority for the system shall ensure that at least one sample that is

taken during a month for the purpose of being tested for that parameter is taken at least 20 days, and not more than 40 days, after a sample was taken for that purpose in the previous month.

**Note:** On December 14, 2009, subsection (3) is amended by striking out “an approval or order, including an OWRA approval or OWRA order” and substituting “an approval, municipal drinking water licence or order, including an OWRA approval or OWRA order”. See: O. Reg. 418/09, ss. 15 (3), 27.

(4) If this Regulation or an approval or order, including an OWRA approval or OWRA order, requires at least one water sample to be taken every three months and tested for a parameter, the owner of the drinking water system and the operating authority for the system shall ensure that at least one sample that is taken during a three-month period for the purpose of being tested for that parameter is taken at least 60 days, and not more than 120 days, after a sample was taken for that purpose in the previous three-month period.

**Note:** On December 14, 2009, subsection (4) is amended by striking out “an approval or order, including an OWRA approval or OWRA order” and substituting “an approval, municipal drinking water licence or order, including an OWRA approval or OWRA order”. See: O. Reg. 418/09, ss. 15 (4), 27.

(5) If this Regulation or an approval or order, including an OWRA approval or OWRA order, requires at least one water sample to be taken every 12 months and tested for a parameter, the owner of the drinking water system and the operating authority for the system shall ensure that at least one sample that is taken during a 12-month period for the purpose of being tested for that parameter is taken not more than 30 days before or after the first anniversary of the day a sample was taken for that purpose in the previous 12-month period.

**Note:** On December 14, 2009, subsection (5) is amended by striking out “an approval or order, including an OWRA approval or OWRA order” and substituting “an approval, municipal drinking water licence or order, including an OWRA approval or OWRA order”. See: O. Reg. 418/09, ss. 15 (5), 27.

(6) If this Regulation or an approval or order, including an OWRA approval or OWRA order, requires at least one water sample to be taken every 36 months and tested for a parameter, the owner of the drinking water system and the operating authority for the system shall ensure that at least one sample that is taken during a 36-month period for the purpose of being tested for that parameter is taken not more than 60 days before or after the third anniversary of the day a sample was taken for that purpose in the previous 36-month period.

**Note:** On December 14, 2009, subsection (6) is amended by striking out “an approval or order, including an OWRA approval or OWRA order” and substituting “an approval, municipal drinking water licence or order, including an OWRA approval or OWRA order”. See: O. Reg. 418/09, ss. 15 (6), 27.

(7) If this Regulation or an approval or order, including an OWRA approval or OWRA order, requires at least one water sample to be taken every 60 months and tested for a parameter, the owner of the drinking water system and the operating authority for the system shall ensure that at least one sample that is taken during a 60-month period for the purpose of being tested for that parameter is taken not more than 90 days before or after the fifth anniversary of the day a sample was taken for that purpose in the previous 60-month period.

**Note:** On December 14, 2009, subsection (7) is amended by striking out “an approval or order, including an OWRA approval or OWRA order” and substituting “an approval, municipal drinking water licence or order, including an OWRA approval or OWRA order”. See: O. Reg. 418/09, ss. 15 (7), 27.

(8) This section applies, with necessary modifications, if this Regulation or an approval or order, including an OWRA approval or OWRA order, requires equipment to be checked at intervals to which any of subsections (1) to (7) apply.



**Note: On December 14, 2009, subsection (8) is amended by striking out “an approval or order, including an OWRA approval or OWRA order” and substituting “an approval, drinking water works permit, municipal drinking water licence or order, including an OWRA approval or OWRA order”. See: O. Reg. 418/09, ss. 15 (8), 27.**

**Location of samples**

**6-2.** Unless otherwise specified, a person who is required to ensure that samples are taken under this Regulation, or under an approval or order, including an OWRA order, shall ensure that they are taken from the point at which water enters the drinking water systems’ distribution system or plumbing that is connected to the drinking water system.

**Note: On December 14, 2009, section 6-2 is amended by striking out “under an approval or order” and substituting “under an approval, municipal drinking water licence or order”. See: O. Reg. 418/09, ss. 15 (9), 27.**

**Microbiological samples and chlorine residual**

**6-3. (1)** If this Regulation or an approval or order, including an OWRA order, requires a water sample to be taken and tested for a microbiological parameter, the owner of the drinking water system and the operating authority for the system shall ensure that another sample is taken at the same time from the same location and is tested immediately for,

**Note: On December 14, 2009, subsection (1) is amended by striking out “an approval or order” in the portion before clause (a) and substituting “an approval, municipal drinking water licence or order”. See: O. Reg. 418/09, ss. 15 (10), 27.**

(a) free chlorine residual, if the system provides chlorination and does not provide chloramination;  
or

(b) combined chlorine residual, if the system provides chloramination.

(2) Subsection (1) does not apply to water samples taken from the drinking water system’s raw water or raw water supply.

(3) Subsection (1) does not apply to sampling and testing for a microbiological parameter that is conducted by microbiological in-line testing equipment.

**Form of sampling**

**6-4. (1)** A person who is required to ensure that samples are taken under this Regulation, or under an approval or order, including an OWRA order, shall ensure that they are taken in the form of grab samples, unless continuous monitoring equipment or microbiological in-line testing equipment is authorized or required.

**Note: On December 14, 2009, subsection (1) is amended by striking out “under an approval or order” and substituting “under an approval, municipal drinking water licence or order”. See: O. Reg. 418/09, ss. 15 (11), 27.**

(2) Continuous monitoring equipment may be used for sampling and testing that is required under this Regulation, or under an approval or order, for,

**Note: On December 14, 2009, subsection (2) is amended by striking out “under an approval or order” in the portion before clause (a) and substituting “under an approval, municipal drinking water licence or order”. See: O. Reg. 418/09, ss. 15 (12), 27.**

(a) turbidity;

(b) fluoride;

(c) free chlorine residual; and

(d) free chlorine residual and total chlorine residual measured for the purpose of determining combined chlorine residual.

(3) Microbiological in-line testing equipment may be used for sampling and testing for a microbiological parameter that is required under this Regulation, or under an approval or order, if the Director is of the opinion that the testing method used by the equipment and the person operating the equipment is equivalent to a testing method for the parameter that is accredited by an accreditation body for drinking water testing that is designated or established under the Act.

**Note: On December 14, 2009, subsection (3) is amended by striking out “under an approval or order” and substituting “under an approval, municipal drinking water licence or order”. See: O. Reg. 418/09, ss. 15 (13), 27.**

#### **Continuous monitoring**

**6-5. (1)** If a drinking water system uses continuous monitoring equipment for sampling and testing that is required under this Regulation, or under an approval or order, for a parameter set out in the Table to this section, the owner of the system and the operating authority for the system shall ensure that the following standards are met:

**Note: On December 14, 2009, subsection (1) is amended by striking out “under an approval or order” in the portion before paragraph 1 and substituting “under an approval, drinking water works permit, municipal drinking water licence or order”. See: O. Reg. 418/09, ss. 15 (14), 27.**

1. The continuous monitoring equipment must, except when no water is being directed to users of water sampled by the equipment,
  - i. test for the parameter with at least the minimum frequency specified in the Table for the parameter, and
  - ii. record the date, time, sampling location and result of every test for the parameter with at least the minimum frequency referred to in subparagraph i.
2. If the continuous monitoring equipment tests for a parameter more often than is required by subparagraph 1 i, the equipment may, instead of complying with subparagraph 1 ii,
  - i. record the minimum, maximum and mean results of tests for the parameter for every period that is equal to the length of time referred to in subparagraph 1 i, along with the sampling location, the date of the tests conducted during the period and the time at the end of the period, and
  - ii. record the result of every test that causes an alarm to sound under paragraph 1 of subsection (1.1), along with the sampling location and the date and time of the test.
3. Test results recorded under paragraph 1 or 2 must be examined, within 72 hours after the tests are conducted,
  - i. by a certified operator, in the case of,
    - A. a large municipal residential system,
    - B. a small municipal residential system,
    - C. a large municipal non-residential system,
    - D. a non-municipal year-round residential system, or
    - E. a large non-municipal non-residential system, or
  - ii. by a trained person, in the case of,
    - A. a non-municipal seasonal residential system,
    - B. a small municipal non-residential system, or
    - C. a small non-municipal non-residential system.

4. If test results are not examined under paragraph 3 at the location where the tests are conducted, the continuous monitoring equipment must transmit the results to the location where they are examined.
  5. The continuous monitoring equipment must be designed and operated in accordance with the standards described in subsection (1.1), or,
    - i. the continuous monitoring equipment must have a feature that ensures that no water is directed to users of water sampled by the equipment in the event that the equipment malfunctions or loses power or a test result for a parameter is above the maximum alarm standard or below the minimum alarm standard specified in the Table to this section for the parameter, and
    - ii. if the continuous monitoring equipment malfunctions or loses power or a test result for a parameter is above the maximum alarm standard or below the minimum alarm standard specified in the Table to this section for the parameter, a person who is qualified to examine test results under paragraph 3 takes appropriate action at the location where tests are conducted before water is again directed to users of water sampled by the equipment.
  - 6., 7. Revoked: O. Reg. 247/06, s. 17 (5).
  8. The continuous monitoring equipment must be checked and calibrated in accordance with the manufacturer's instructions.
  9. If the manufacturer's instructions do not indicate how often to check and calibrate the continuous monitoring equipment, the equipment must be checked and calibrated at least once a month while the drinking water system is in operation, in the case of,
    - i. a small municipal non-residential system,
    - ii. a non-municipal seasonal residential system, or
    - iii. a small non-municipal non-residential system.
  10. If the manufacturer's instructions do not indicate how often to check and calibrate the continuous monitoring equipment and paragraph 9 does not apply, the equipment must be checked and calibrated as often as necessary to ensure that test results are within the following margins of error:
    - i. In the case of free chlorine residual, 0.05 milligrams per litre, if the concentrations usually measured by the equipment are less than or equal to 1.0 milligrams per litre, and proportionally higher if the concentrations usually measured are greater than 1.0 milligrams per litre,
    - ii. In the case of free chlorine residual and total chlorine residual measured for the purpose of determining combined chlorine residual, 0.05 milligrams per litre, if the concentrations usually measured by the equipment are less than or equal to 1.0 milligrams per litre, and proportionally higher if the concentrations usually measured are greater than 1.0 milligrams per litre,
    - iii. 0.1 Nephelometric Turbidity Units (NTU), in the case of turbidity.
- (1.1) The standards referred to in paragraph 5 of subsection (1) are the following:
1. The continuous monitoring equipment must cause an alarm to sound immediately at the following locations if the equipment malfunctions or loses power or a test result for a parameter is above the maximum alarm standard or below the minimum alarm standard specified in the Table to this section for the parameter:
    - i. The location where the equipment conducts tests.
    - ii. A location where a person is present, if a person is not always present at the location where the equipment conducts tests.

- iii. Every designated facility served by the drinking water system, unless the system is a large municipal residential system or a small municipal residential system.
2. A person qualified to examine test results under paragraph 3 of subsection (1) must take appropriate action if the person is at the location where tests are conducted and,
- i. an alarm sounds under paragraph 1,
  - ii. a record of a test result indicates that an alarm should have sounded under paragraph 1,  
or
  - iii. there is good reason to believe that the continuous monitoring equipment has malfunctioned or lost power.
3. A person qualified to examine test results under paragraph 3 of subsection (1) must promptly be dispatched to the location where tests are conducted to take appropriate action if no person qualified to examine test results under paragraph 3 of subsection (1) is at that location and,
- i. an alarm sounds under paragraph 1, unless a person qualified to examine test results under paragraph 3 of subsection (1) determines that,
    - A. the alarm sounded because a test result for a parameter was above the maximum alarm standard or below the minimum alarm standard specified in the Table to this section for the parameter, and
    - B. within two minutes, a further test result indicated that the parameter was no longer above the maximum alarm standard or below the minimum alarm standard, as the case may be,
  - ii. a record of a test result indicates that an alarm should have sounded under paragraph 1,  
or
  - iii. there is good reason to believe that the continuous monitoring equipment has malfunctioned or lost power.
4. A person who is dispatched under paragraph 3 must arrive at the location where tests are conducted as soon as possible.
- (2) For the purposes of the Table to this section, the concentration of free chlorine residual or combined chlorine residual that is required to achieve primary disinfection for the drinking water system shall be determined in accordance with the Ministry's *Procedure for Disinfection of Drinking Water in Ontario*.

TABLE

Item	Parameter	Minimum Testing and Recording Frequency	Maximum Alarm Standard	Minimum Alarm Standard
1.	Free chlorine residual required to achieve primary disinfection	5 minutes	Not applicable	0.1 milligrams per litre less than the concentration of free chlorine residual that is required to achieve primary disinfection
2.	Free chlorine residual and total chlorine residual measured for the purpose of determining combined chlorine residual required to achieve primary disinfection	5 minutes	Not applicable	0.1 milligrams per litre less than the concentration of combined chlorine residual that is required to achieve primary disinfection
3.	Free chlorine residual in a distribution sample	1 hour	Not applicable	0.05 milligrams per litre

4.	Free chlorine residual and total chlorine residual measured for the purpose of determining combined chlorine residual in a distribution sample	1 hour	Not applicable	0.25 milligrams per litre
5.	Turbidity	15 minutes	1.0 Nephelometric Turbidity Units (NTU)	Not applicable

#### **Turbidity testing**

**6-6.** If a water sample is required to be taken and tested for turbidity, the owner of the drinking water system and the operating authority for the system shall ensure that the testing is conducted using a turbidity meter that measures turbidity in Nephelometric Turbidity Units (NTU).

#### **Chlorine residual testing**

**6-7.** (1) If a water sample is required to be taken and tested for free chlorine residual or combined chlorine residual, the owner of the drinking water system and the operating authority for the system shall ensure that the testing is conducted using,

- (a) an electronic direct readout colourimetric or amperometric chlorine analyzer; or
- (b) another device, if, based on an inspection of the device and on a review of relevant records and documentation, a professional engineer states in writing that it is equivalent to or better than an electronic direct readout colourimetric or amperometric chlorine analyzer, having regard to accuracy, reliability and ease of use.

**Note:** On December 14, 2009, clause (b) is amended by striking out “professional engineer” and substituting “licensed engineering practitioner”. See: O. Reg. 418/09, ss. 1 (5), 27.

- (2) Subsection (1) does not apply to testing that is conducted by continuous monitoring equipment.

#### **Sample handling**

**6-8.** If this Regulation or an approval or order, including an OWRA order, requires a water sample to be tested for a parameter by a laboratory, the owner of the drinking water system and the operating authority for the system shall ensure that, subject to the other provisions of this Regulation, the sample is taken and handled in accordance with the directions of the laboratory to which the sample will be delivered for testing, including directions with respect to,

**Note:** On December 14, 2009, section 6-8 is amended by striking out “an approval or order” in the portion before clause (a) and substituting “an approval, municipal drinking water licence or order”. See: O. Reg. 418/09, ss. 15 (15), 27.

- (a) collection procedures;
- (b) the use of specified kinds of containers or of containers that are provided by the laboratory;
- (c) the labelling of samples;
- (d) the completion and submission of forms that are provided by the laboratory;
- (e) methods of transporting samples, including temperature conditions that must be maintained during transportation; and
- (f) time periods for delivery of samples.

#### **Testing by laboratories**

- 6-9.** (1) Revoked: O. Reg. 249/03, s. 12 (5).
- (2) Revoked: O. Reg. 249/03, s. 12 (6).
- (3) Revoked: O. Reg. 249/03, s. 12 (8).

(4) If a test of a water sample for a parameter is required by this Regulation, or by an approval or order, including an OWRA order, the owner of the drinking water system and the operating authority for the system shall ensure that written notice of the identity of the laboratory that will conduct the test is given to the Director before the sample is tested, unless,

- (a) the Director has previously been notified under this subsection that a water sample from the drinking water system was to be tested for that parameter by that laboratory; or
- (b) before this Regulation came into force, the Director was previously notified in accordance with Ontario Regulation 459/00 (Drinking Water Protection — Larger Water Works) or Ontario Regulation 505/01 (Drinking Water Protection — Smaller Water Works Serving Designated Facilities) that a water sample from the drinking water system was to be tested for that parameter by that laboratory.

(5) Revoked: O. Reg. 249/03, s. 12 (10).

(6) If a test of a water sample for a parameter is required by an approval or order, including an OWRA order, and the parameter is identified in the approval or order as a health-related parameter, the owner of the drinking water system and the operating authority for the system shall ensure that the laboratory that conducts the testing is informed, when the sample is sent to the laboratory, of the maximum concentration set out for the parameter in the approval or order.

**Note:** On December 14, 2009, subsection (6) is amended by striking out “an approval or order” and substituting “an approval, municipal drinking water licence or order”. See: O. Reg. 418/09, ss. 15 (16), 27.

(7)-(9) Revoked: O. Reg. 249/03, s. 12 (11).

#### Records

**6-10.** (1) The owner of a drinking water system and the operating authority for the system shall ensure that, for every sample required by this Regulation or by an approval or order, including an OWRA order, a record is made of the following information:

**Note:** On December 14, 2009, subsection (1) is amended by striking out “an approval or order” in the portion before paragraph 1 and substituting “an approval, municipal drinking water licence or order”. See: O. Reg. 418/09, ss. 15 (17), 27.

1. The date and time the sample was taken, the location where the sample was taken and the name of the person who took the sample.
2. If the sample is taken under section 7 of this Regulation or Schedule 7, 8 or 9, the date and time the sample was tested, the name of the person who conducted the test, and the results of the test.
3. If the sample is taken from a drinking water system’s distribution system under section 15.1-4 or 15.1-5 of Schedule 15.1, the addresses of all premises served by the plumbing from which samples were taken on the same day in accordance with subsection 15.1-6 (3).
4. If the sample is taken under section 15.1-7 of Schedule 15.1 and tested for pH,
  - i. the date and time of the test,
  - ii. the name of the person who conducted it, and
  - iii. the results of the test.

(2) Subsection (1) does not apply to a sample tested by continuous monitoring equipment or microbiological in-line testing equipment.

#### OWRA orders

**6-11.** If an OWRA order requires samples to be taken and tested for a parameter and a provision of Schedules 7 to 15.2 also requires samples to be taken and tested for the parameter, the provision of Schedules 7 to 15.2 prevails.

**OWRA approvals**

**6-12.** (1) If an OWRA approval requires more stringent sampling or testing than a provision of this Schedule or Schedules 7 to 15.2, the OWRA approval prevails.

(2) If an OWRA approval requires less stringent sampling or testing than a provision of this Schedule or Schedules 7 to 15.2, the provision of this Schedule or Schedules 7 to 15.2 prevails.

O. Reg. 170/03, Sched. 6; O. Reg. 249/03, s. 12; O. Reg. 269/03, s. 9; O. Reg. 253/05, s. 13; O. Reg. 247/06, s. 17; O. Reg. 399/07, s. 5; O. Reg. 326/08, s. 7.

**MANITOUWADGE PUBLIC WORKS DEPARMENT**  
**WATER TREATMENT AND DISTRIBUTION**

**HYPOCHLORITE D.T. TEST KIT**

**Procedure**

1. Insert a clean delivery tube into the 2.26 N Thiosulfate Titrant Solution cartridge.
2. Flush the delivery tube by turning the delivery knob to eject a few drops of titrant. Reset the counter to zero and wipe off the tip.
3. Fill the Erlenmeyer flask to about the 75-mL mark with deionized or tap water  
*Note: the level of residual chlorine found in tap water will not interfere in the test.*
4. Add the contents of one Potassium Iodide Powder Pillow to the flask and swirl to mix
5. Add the contents of one Acid Reagent Powder Pillow to the flask and swirl to mix.
6. Attach a clean tip to the 100- $\mu$ L pipettor.
7. Use the pipettor to dispense two volumes (200  $\mu$ L) of bleach sample below the solution level in the flask. *Note: Insure no bleach enters the body of the pipettor as it will dispense inaccurate volumes. If this occurs dispose of pipettor.*
8. Swirl to mix the solution will turn dark brown. *Note: Proceed immediately with Step 9.*
9. Place the delivery tube tip into the solution and swirl the flask while titrating with the thiosulfate titrant until the solution is light yellow.
10. Add one dropperful of starch indicator solution to the flask and swirl to mix. A dark blue or green color will develop.
11. Continue the titration until the solution becomes colorless. Record the number of digits required.



2:47:20 PM

Water Plant  
01/14/2010

12. Calculate:

$$\text{g/L chlorine} = \text{Digits Required} \times 0.5$$

*Note: Divide by 10 the g/L chlorine to obtain the % (by volume) chlorine ("trade percent").*

Please insure prior to storage all equipment is clean, dispose of any expired reagents and order any reagents that need replenishing

**MANITOUWADGE PUBLIC WORKS DEPARTMENT**  
**WATER TREATMENT AND DISTRIBUTION**

**Refilling Sodium Hypochlorite Tank Procedure**

1. Refilling of sodium hypochlorite occurs when the depth of liquid in tank reaches approximately 50 inches. Refilling of the sodium hypochlorite tank requires two people for safety reasons.
2. Face shield, chemical resistant gloves and smock are to be worn prior to handling of sodium hypochlorite.
3. Sodium hypochlorite drums are to be used in order of oldest to newest. (Sodium hypochlorite has a shelf life and this will ensure sodium hypochlorite will not expire).
4. Take depth of sodium hypochlorite prior to filling tank.
5. Open selected sodium hypochlorite drum and place chemical pump into drum. (Ensure chemical is in the upright position during operation).
6. Open ball valve located on discharge line of chemical pump.
7. Once the sodium hypochlorite tank has been emptied place chemical pump in water drum and flush discharge line until all sodium hypochlorite is removed from discharge line.
8. Close ball valve on discharge line and hang chemical pump in the designated location.
9. Record final liquid depth of sodium hypochlorite.

**Manitouwadge Public Works  
Department**

**S.O.P's**

**Sampling Procedures and Laboratory  
Requirements**

**Township of Manitowadge  
Public Works Department  
S.O.P's  
CHEMICAL SAMPLING AND TESTING**

Municipal: Large Residential  
Small Residential

Non-Municipal: Year-Round Residential

**Application**

**13-1. This Schedule applies to the following drinking water systems:**

1. Large municipal residential systems.
2. Small municipal residential systems.
3. Revoked: O. Reg. 247/06, s. 24 (1).
4. Non-municipal year-round residential systems.
5. Revoked: O. Reg. 247/06, s. 24 (2).

**Inorganics**

**13-2. (1) The owner of a large municipal residential system and the operating authority for the system shall ensure that,**

- (a) at least one water sample is taken every 12 months, if the system obtains water from a raw water supply that is surface water; or (ANNUAL SAMPLING REQUIREMENT)
- (b) at least one water sample is taken every 36 months, if the system obtains water from a raw water supply that is ground water.

(2) The owner of a large municipal residential system and the operating authority for the system shall ensure that each of the samples taken under subsection (1) is tested for every parameter set out in Schedule 23. (SEE BOTTOM 3<sup>RD</sup> LAST PAGE FOR PARAMETERS)

(3) The owner of a small municipal residential system or non-municipal year-round residential system and the operating authority for the system shall ensure that at least one water sample is taken every 60 months and tested for every parameter set out in Schedule 23.

**13-3. Revoked: O. Reg. 399/07, s. 6 (1).**

**Organics**

**13-4. (1) The owner of a large municipal residential system and the operating authority for the system shall ensure that,**

- (a) at least one water sample is taken every 12 months, if the system obtains water from a raw water supply that is surface water; or (ANNUAL SAMPLING REQUIREMENT)
- (b) at least one water sample is taken every 36 months, if the system obtains water from a raw water supply that is ground water.

(2) The owner of a large municipal residential system and the operating authority for the system shall ensure that each of the samples taken under subsection (1) is tested for every parameter set out in Schedule 24. (SEE 2<sup>ND</sup> LAST AND LAST PAGE FOR PARAMETERS)

(3) The owner of a small municipal residential system or non-municipal year-round residential system and the operating authority for the system shall ensure that at least one water sample is taken every 60 months and tested for every parameter set out in Schedule 24.

**Increased frequency under ss. 13-2 and 13-4**

**13-5.** (1) If a test result obtained under section 13-2 or 13-4 for a parameter exceeds half of the standard prescribed for the parameter in Schedule 2 to the Ontario Drinking Water Quality Standards, the frequency of sampling and testing for that parameter under that section shall be increased so that at least one water sample is taken and tested every three months.

(2) Subsection (1) ceases to apply to a parameter if,

- (a) in the case of a drinking water system that obtains water from a raw water supply that is surface water, for four consecutive three-month periods in which the system is in operation, none of the test results obtained under section 13-2 or 13-4 for the parameter exceed half of the standard prescribed for the parameter in Schedule 2 to the Ontario Drinking Water Quality Standards; or
- (b) in the case of a drinking water system that obtains water from a raw water supply that is ground water, for two consecutive three-month periods in which the system is in operation, none of the test results obtained under section 13-2 or 13-4 for the parameter exceed half of the standard prescribed for the parameter in Schedule 2 to the Ontario Drinking Water Quality Standards.

**Trihalomethanes**

**13-6.** (1) The owner of a drinking water system that provides chlorination or chloramination and the operating authority for the system shall ensure that at least one distribution sample is taken every three months, from a point in the drinking water system's distribution system, or plumbing that is connected to the drinking water system, that is likely to have an elevated potential for the formation of trihalomethanes. (QUARTERLY SAMPLING REQUIREMENT)

(2) The owner of the drinking water system and the operating authority for the system shall ensure that each of the samples taken under subsection (1) is tested for trihalomethanes.

**Nitrate and nitrite**

**13-7.** The owner of a drinking water system and the operating authority for the system shall ensure that at least one water sample is taken every three months and tested for nitrate and nitrite. (QUARTERLY SAMPLING REQUIREMENT)

**Sodium**

**13-8.** The owner of a drinking water system and the operating authority for the system shall ensure that at least one water sample is taken every 60 months and tested for sodium. (EVERY FIVE YEARS – 2010 FOR MANITOUWADGE)

**Fluoride**

**13-9.** If a drinking water system does not provide fluoridation, the owner of the system and the operating authority for the system shall ensure that a water sample is taken at least once every 60 months and tested for fluoride. (EVERY FIVE YEARS – 2010 FOR MANITOUWADGE)

**First tests**

**13-10.** Where this Schedule requires that water samples be taken and tested for a parameter with a frequency of a period of time fixed by this Schedule, the owner of the drinking water system and the operating authority for the system shall ensure that the first sample is taken and tested for that parameter,

(a) within that period of time after the latest of,

- (i) the date the last sample was taken and tested for that parameter under Ontario Regulation 459/00 (Drinking Water Protection — Larger Water Works) or Ontario Regulation 505/01 (Drinking Water Protection — Smaller Water Works Serving Designated Facilities), if one of those regulations applied to the drinking water system,

- (ii) the date the last sample was taken and tested for that parameter for the purpose of preparing a report under section 13 of Ontario Regulation 459/00, if that regulation applied to the drinking water system, and
  - (iii) the date the last sample was taken and tested for that parameter before this Regulation came into force for the purpose of complying with an OWRA approval or OWRA order or making an application for an OWRA approval, if a sample was taken and tested for that parameter for that purpose before this Regulation came into force; or
- (b) within that period of time or 12 months, whichever is shorter, after this Schedule begins to apply to the drinking water system, if clause (a) does not apply.

**60-day shutdowns, etc.**

**13-11.** Sampling and testing is not required under sections 13-5, 13-6 and 13-7 during a period of 60 or more consecutive days when,

- (a) the drinking water system is not in operation; or
- (b) the drinking water system supplies water only to private residences that are occupied by the owner of the system, members of the family of the owner of the system, employees or agents of the owner of the system, or members of the families of employees or agents of the owner of the system.

**Note:** On December 14, 2009, clause (b) is amended by striking out “the drinking water system supplies water only to private residences that are occupied by the owner of the system” and substituting “the drinking water system supplies water only to five or fewer private residences, and all private residences are occupied by the owner of the system”. See: O. Reg. 418/09, ss. 20, 27.

**13-12.** Revoked: O. Reg. 249/03, s. 18.

O. Reg. 170/03, Sched. 13; O. Reg. 249/03, s. 18; O. Reg. 269/03, s. 13; O. Reg. 247/06, s. 24; O. Reg. 399/07, s. 6.

SCHEDULE 14 Revoked: O. Reg. 247/06, s. 25.

SCHEDULE 23  
INORGANIC PARAMETERS

Item	Parameter
1.	Antimony
2.	Arsenic
3.	Barium
4.	Boron
5.	Cadmium
6.	Chromium
7.	Mercury
8.	Selenium
9.	Uranium

O. Reg. 170/03, Sched. 23.

SCHEDULE 24  
ORGANIC PARAMETERS

Item	Parameter
1.	Alachlor
2.	Aldicarb
3.	Aldrin + Dieldrin
4.	Atrazine + N-dealkylated metabolites
5.	Azinphos-methyl
6.	Bendiocarb
7.	Benzene
8.	Benzo(a)pyrene
9.	Bromoxynil
10.	Carbaryl
11.	Carbofuran
12.	Carbon Tetrachloride
13.	Chlordane (Total)
14.	Chlorpyrifos
15.	Cyanazine
16.	Diazinon
17.	Dicamba
18.	1,2-Dichlorobenzene
19.	1,4-Dichlorobenzene
20.	Dichlorodiphenyltrichloroethane (DDT) + metabolites
21.	1,2-dichloroethane
22.	1,1-Dichloroethylene (vinylidene chloride)
23.	Dichloromethane
24.	2,4-Dichlorophenol
25.	2,4-Dichlorophenoxy acetic acid (2,4-D)
26.	Diclofop-methyl
27.	Dimethoate
28.	Dinoseb
29.	Diquat
30.	Diuron
31.	Glyphosate
32.	Heptachlor + Heptachlor Epoxide
33.	Lindane (Total)
34.	Malathion
35.	Methoxychlor
36.	Metolachlor
37.	Metribuzin
38.	Monochlorobenzene
39.	Paraquat
40.	Parathion
41.	Pentachlorophenol
42.	Phorate
43.	Picloram

44.	Polychlorinated Biphenyls (PCB)
45.	Prometryne
46.	Simazine
47.	Temephos
48.	Terbufos
49.	Tetrachloroethylene (perchloroethylene)
50.	2,3,4,6-Tetrachlorophenol
51.	Triallate
52.	Trichloroethylene
53.	2,4,6-Trichlorophenol
54.	2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)
55.	Trifluralin
56.	Vinyl Chloride

O. Reg



# Township of Manitowadge Public Works Department S.O.P's Pb Sampling Procedure

Lead testing under O'Reg 170/03 is mandated based on population size. It states that the township of Manitowadge falls under the 500-3,299 population density and therefore is required under O'Reg 170/03 to sample twice per annum (spring and fall) at 20 residential locations, two non-residential locations and four distribution locations (hydrants). The following procedure must be followed in accordance with O'Reg 170/03.

1. Locations will need to be obtained to collect at residential locations. This happens by means of advertising and offering discounts on water bills.
2. Once a list is compiled of sampling locations scheduled planning on access to the houses is made by contacting the homeowner and finding what times work for you and them.
3. Once a schedule has been compiled, locating associated distribution sampling points for four locations is prepared. The distribution samples must be done in accordance with the corresponding house sample.
4. Following those two non-residential sample locations must be established.

Once the sample locations are selected and the schedule is prepared sampling can commence as follows:

#### **Building Sampling (Residential and Non residential) Procedures:**

1. Select sample point based on homeowner consumption if at all possible i.e. kitchen tap. Only cold water is sampled and all samples are taken from the same tap.
2. If there is a filter on the tap it must be removed or by passed in order to get a sample. If it is not possible a secondary source of sampling will be selected i.e. bathroom tap. Aerators are not removed for this sampling.
3. Turn on tap for 5 min and turn off.
4. Wait a period of 30 minutes (not more than 35 minutes); take a 1 liter sample of the first water that comes out of the tap. Sample flow is that of what normal usage would be. ***DO NOT*** rinse the bottle before sampling. Fill to the neck to meet the volume requirements of the regulation. Preserve the sample with one vial of preservative (5 mL 50% Nitric Acid) which is supplied by the accredited lab (ALS). Ensure that the bottle is labeled 1 or first. This sample is tested for lead.
5. A second 1 liter sample is then taken immediately after the first sample without turning off the tap or altering the flow. ***DO NOT*** rinse the bottle prior to sampling. Fill to the neck of the bottle to meet the volume requirements of the regulation. Preserve as in step #4. This sample is then tested for lead.
6. A third sample is taken or the sample can be analyzed in the field for pH immediately after the second sample. This pH should be to at least two significant digits.

#### **Distribution Sample Procedures**

1. Distribution samples must be taken at a point as close a reasonably possible to the plumbing samples collected. (@ four locations)
2. The distribution sample is to be taken on the ***same day*** that samples are taken from the plumbing for that section.
3. The distribution sampling point is flushed until the quality of the water is representative of the quality of the water that is in this respective part of the distributions system.

4. Three samples are collected. Sample one is collected and preserved then tested for lead, Sample two is tested for Total Alkalinity, and sample three is tested for pH or done in the field immediately after the sample is taken.

Once samples are completed they are submitted to an accredited laboratory for analysis in this case it is with ALS laboratories in Thunder Bay, Ontario. Once all results are received and tabulated a copy is given to each individual homeowner and business owner who participated in the sampling program. If exceedences are found the MOH and MOE are notified and recommendations are give by the MOH on any corrective actions to be taken either by the municipality, the homeowners or the business owners.



**Environmental Division**

**ALS FactSheet**  
**Lead Testing under O.Reg 243**

Disclaimer – This information is reproduced here for example only. Actions taken for this program should be made only after reference to O.Reg 243/07 available at <http://www.e-laws.gov.on.ca/navigation?file=home&lang=en>

**Sampling and Testing for Lead**

If your plumbing was installed	Schools and Private Schools		Day Nurseries	
	Any Plumbing installed before 1990	All Plumbing installed in 1990 or after	Any Plumbing installed before 1990	All Plumbing installed in 1990 or after
Then your sampling is	Once annually between June 15 to August 15	Once annually between June 15 to August 15	Once annually between May 1 to October 31	Not applicable

**Specific Sampling Instructions**

**(Plumbing) Sample:** Please note that a new bottle is now used for lead sampling

1. Sampling point is selected based on the likelihood that lead services pipes or lead solder are present AND is likely to be used for human consumption. The recommended sampling point is the kitchen tap (in the case of a day nursery) or a tap commonly used for consumption. The sample must be taken from a tap, **NOT from a fountain or staff room**. Only cold water is sampled and all samples are taken from the same tap. **The MINIMUM time between your standing sample and flushed sample is 35 minutes.**
2. Aerator is not removed. If a filter or treatment device is present on the tap, another tap can be chosen, or the device must be bypassed or removed.
3. Let water stand for 6 hours or more. If this is impractical allow the water to stand for longest time possible. The first sample must be taken immediately after this time period.
4. Take a 1 L sample that includes the first water that comes out of the tap. The sample flow should approximate the rate used when the tap is in normal use. The bottle is not rinsed prior to sampling. Fill to the neck to meet the volume requirements of the regulation. Add 1 (one) vial of preservative to the sample in the bottle, cap and mix. **Ensure that the bottle is labeled with a 1 or Standing.** This sample is the Standing sample and is tested for Lead.
5. Turn on tap for at least 5 minutes to flush the system. Following the flushing, turn off the tap and leave it unused for a period of 30 minutes (and not more than 35 minutes). If practical leave all plumbing unused. Immediately after the 30 to 35 minute time period (After flush) take a 1 L sample that includes the first water that comes out of the tap. The sample flow should approximate the rate used when the tap is in normal use. The bottle is not rinsed prior to sampling. Fill to the neck to meet the volume requirements of the regulation. Add 1 (one) vial of



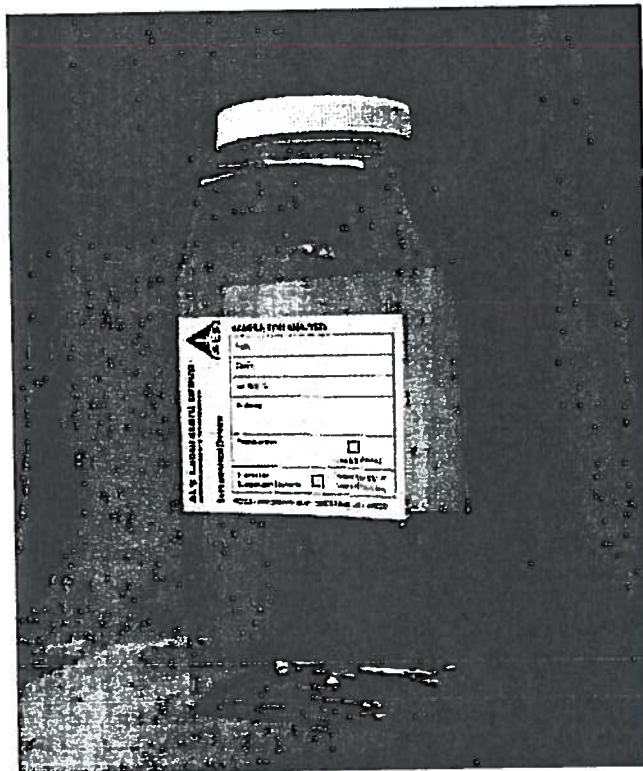
preservative to the sample in the bottle, cap and mix. **Ensure the bottle is labeled with a 2 or Flushed.** This sample is the Flushed sample and is tested for Lead.

**Bottle Labelling:** Ensure that the Date/Time, Client and Sample ID are filled in accordingly. The label on your bottle should match the information that is on your Chain of Custody.

**Submission Form:** The Chain of Custody included with your bottles is specifically for 243/07 lead samples and needs to be completed in full. Please use the correct chain of custody for your regulation and contact the lab if help is needed.

**Transporting Samples:** Samples must be kept cool prior to shipping, and ice packs should be used during shipping. Please insure samples are packed firmly and with enough packaging material that they will remain upright and cold during shipping.

**Sample Hold Time:** Samples to be tested for Lead only have along hold time (30 days), so although there is no rush to begin testing, it is a good idea to transport the samples as soon as practicable after sampling.



Fill to Line at Neck  
(bottom of Cap) for  
1 Litre



Preservative – 5 mL of 50%  
Nitric Acid (Light Blue Label)  
Add 1 (one) vial to the sample  
in the bottle, cap and mix

For further information or to arrange for testing please contact:

**ALS Laboratory Group**  
Christine Paradis, Lead Program CSS  
1081 Barton Street  
Thunder Bay, ON P7B 5N3  
Phone: 1-807-623-6463 Fax: 1-807-623-7598  
E-mail: christine.paradis@alsenviro.com



the regulation. Add 1 (one) vial of preservative to the sample in the bottle, cap and mix. Ensure that the bottle is labeled with a 2 or Second. This sample is tested for Lead.

6. A third sample is taken after the second sample. This sample is tested for pH in the field immediately after the sample is taken, using a pH meter that reads to at least two significant figures.

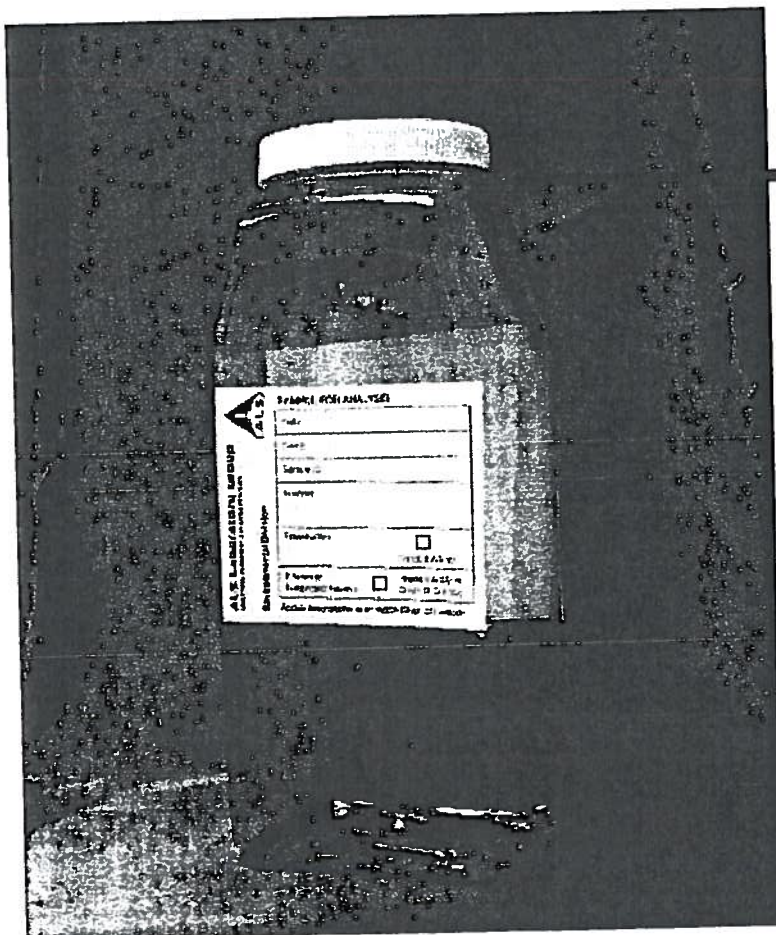
**ATTENTION!**

**Since the time of sampling for the plumbing lead samples coincide, please mark the bottles with "1" and "2" respectively, to clearly distinguish the "first" and "second" samples.**

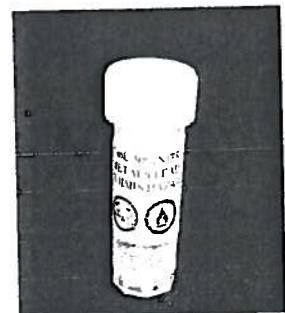
**Distribution Sample:**

1. The distribution sample must be taken at a point as close as reasonably possible to the plumbing sample(s).
2. The distribution sample is to be taken on the **same day** that samples are taken from plumbing for that section.
3. The distribution sampling point is flushed until the quality of water is representative of the quality of water in this respective part of the distribution system.
4. Three samples are taken. Sample one is tested for Lead (Add 1 (one) vial of preservative to the sample in the bottle, cap and mix), Sample Two is tested for Total Alkalinity, and Sample Three is tested for pH in the field immediately after the sample is taken.

Note: To facilitate the upload of samples, please place the Distribution sample and the associated Plumbing samples on the SAME Chain of Custody. Use one C/C per set.



Fill to Line at Neck  
(bottom of Cap) for  
1 Litre



Preservative – 5 mL of  
50% Nitric Acid (Light  
Blue Label)  
Add 1 (one) vial to the  
sample in the bottle, cap  
and mix



**ALS Fact Sheet**  
**Lead Testing under O.Reg 170**

Disclaimer – This information is reproduced here for example only. Actions taken for this program should be made only after reference to the revised O.Reg 170/03 available at <http://www.e-laws.gov.on.ca/navigation?file=home&lang=en>

**Standard Sampling – Number of Sampling Locations**

The regulation distinguishes between distribution system (provides drinking water to plumbing by direct connection) and plumbing (serves a population in a facility). Samples from each of Column 3, 4, 5 are required. Distribution points are sampling points not influenced by plumbing (typically hydrants).

Column 1 Item	Column 2 Population Served by DW System	Column 3 Number of Sampling Points in Plumbing that Serves Private Residences	Column 4 Number of Sampling Points in Plumbing that Does Not Serve Private Residences	Column 5 Number of Sampling Points in Distribution System
1	1-99	5	1	1
2	100-499	10	1	2
3	500-3,299	20	2	4
4	3,300-9,999	40	4	8
	10,000-49,999	60	6	12
	50,000-99,999	80	8	16
7	100,000+	100	10	20
Designated Facilities	Simple Case (Works serves 1 building)	Annually one sample taken from a location most likely to have higher lead levels (e.g. the oldest pipes).		
Designated Facilities	Complex Case (Works serves more than 1 building)	Please contact your local MOE Environmental Officer for the required lead sampling.		

**Specific Sampling Instructions**

**Building (Plumbing) Sample**

This is more complex than sampling under previous schedules and consists of the following steps:

1. Sampling point is selected based on the likelihood that lead services pipes or lead solder are present AND the water is likely to be used for human consumption. The recommended sampling point is the kitchen tap. Only cold water is sampled and all samples are taken from the same tap.
2. Aerator is not removed. If a filter or treatment device is present on the tap, another tap can be chosen, or the device must be bypassed or removed.
3. Turn on tap for 5 minutes and then turn off.
4. After a waiting period of 30 minutes (and not more than 35 minutes), take a 1 L sample, that includes the first water that comes out of the tap. The sample flow should approximate the rate used when the tap is in normal use. The bottle is not rinsed prior to sampling. Fill to the neck to meet the volume requirements of the regulation. Add 1 (one) vial of preservative to the sample in the bottle, cap and mix. Ensure that the bottle is labeled with a 1 or first. This sample is tested for Lead.
5. A second 1 L sample is taken immediately after the first sample without turning off the tap or altering the flow. The bottle is not rinsed prior to sampling. Fill to the neck to meet the volume requirements of

# Township of Manitowadge Public Works Department S.O.P's Bacteriological Sampling

Bacteriological sampling is required under O'Reg 170/03. Manitowadge being a large municipal residential system fall into this category. Sample location requirements are as follows

## Raw Water

Raw water refers to the source water for a water supply system and it is a requirement under O'Reg 170/03 to collect microbiological samples. This is a valuable sample to collect because any change in chemistry may affect the level of treatment to provide safe drinking water. All raw water samples must be collected prior to any treatment process. As Manitowadge is a Ground water source (GUDI) grab samples must be collected from each well location once per week. Manitowadge has installed sample taps located just prior to the well pump for easy access to raw water samples. The wells are to be run for a proximately ten minutes each before sampling.

## Treated Water

Treated water refers to water which has undergone one or more treatment processes (i.e. Manitowadge has UV Treatment and Chlorination). The sampling location must be before the point of entry in the distribution system, after minimum disinfection time and before the first consumer. Treated water should be run for approximately 2-10 min before sampling. Treated water samples must be analyzed for Free chlorine residual, recorded on the Chain of Custody sheets and submitted to the accredited laboratory.

## Distributions System Water

The distribution system refers to the entire network of storage tanks, reservoirs, and standpipes, pumping stations, pumps, valves metres and service pipes that deliver treated water leaving the drinking water system to consumers. Sampling of the distribution system is mandatory under the Drinking water systems regulation 170-03. The required number of samples is determined by the population served. Sampling points should be significantly far beyond the point of entry into the distribution system. The object is to measure the quality of water being supplied to the consumer. When ever possible samples should be taken at dedicated sampling stations within the distribution system! These stations will help eliminate the effects of residential plumbing. If residential samples are used then cold water taps are sampled ONLY and prior to water softeners or other home treatment processes, ideally a tap directly off the water main if at all possible. Distribution samples are to be run until water is consistently cold to the touch. Approximately, 15 – 15 min will achieve this consistency depending on the location to be sampled. Distribution system water samples must be analyzed for Free chlorine residual, recorded on the Chain of Custody sheets and submitted to the accredited laboratory.

## Sample Collection

Collection and handling of samples is crucial to obtaining representative data. Personnel should have appropriate training and knowledge of the sampling and handling techniques required to sample properly. Considerations when collecting bacteriological samples are aseptic procedures for the collection of samples, sampler may wear protective nitrile or latex gloves, and hand sanitizer for disinfection on bacteria on hands or a combination of both. Operators must take caution while sampling for bacteria as to not introduce and bacteria by way of breathing directly into the bottle, not touching the inside of the cap, not touching around the rim of the bottle and selecting a sufficient sample point to help reduce the chance

### **Sample Collection con't**

of cross contamination occurring. If it is thought that the sample/bottle was contaminated accidentally the sample should be discarded and another sample collected in a new sterile bottle. Sample bottles contain Sodium hypochlorite preservative there for the sample bottle is NOT to be rinsed. Also if the sample bottle sanitary seal is broken the sample bottle should be discarded and an alternate bacteria bottle be used. While sampling the sample bottle should be held at the base of the bottle and fill to the fill line or to the shoulder of the bottle. To prevent further bacteria growth the sample bottle should be refrigerated and transported to the laboratory on ice

### **Sample Labelling**

Complete labelling of samples ensures that the samples identity is maintained. This is very important for sample tracking and data interpretation and is mandatory for sample data reporting and adverse water quality notification requirements under the regulations. It is advisable that sample bottles be pre-labelled with a permanent marker that is able to withstand water. The following information should be on the bottle of the accompanying laboratory C.O.C sheet:

1. Indication that this is a regulated sample Drinking water sample
2. Sample type: Raw, Treated, or distribution
3. Sample Identifier
4. Legal name of the water system
5. Water works number (i.e. 220000219 for Manitowadge)
6. The date and time of sampling
7. Street address if it is a distribution sample
8. Preservative (s) used
9. Field measurements (i.e. chlorine residual, turbidity, pH)
10. The initials of the sampler

### **Frequency of Sampling**

Water operators for Manitowadge water treatment and distributions system are scheduled to collect samples every Monday. This will give a total # of samples for the Treated water per month as 4 – 5, the total # of raw samples per month are 20 – 25 and the total # of distribution sample to be 16 – 20 per month.

### **Sample Storage and Submission**

Samples should be refrigerated and shipped to the laboratory as soon as possible to meet the corresponding holding times for bacteria this holding time is 48 hours. Samples collected for bacteriological analysis should be kept on ice during shipping but not cold enough to freeze the sample. The sample COC sheet must be sent to the laboratory during shipping. If weekend samples are required special notification to the laboratory should be given.



SCHEDULE 10  
MICROBIOLOGICAL SAMPLING AND TESTING

Large Municipal Residential

**Application**

**10-1.** This Schedule applies to large municipal residential systems.

**Distribution samples**

**10-2.** (1) The owner of a drinking water system and the operating authority for the system shall ensure that,

- (a) if the system serves 100,000 people or less, at least eight distribution samples, plus one additional distribution sample for every 1,000 people served by the system, are taken every month, with at least one of the samples being taken in each week; and
- (b) if the system serves more than 100,000 people, at least 100 distribution samples, plus one additional distribution sample for every 10,000 people served by the system, are taken every month, with at least three of the samples being taken in each week.

(2) The owner of the drinking water system and the operating authority for the system shall ensure that each of the samples taken under subsection (1) is tested for,

- (a) *Escherichia coli*; and
- (b) total coliforms.

(3) The owner of the drinking water system and the operating authority for the system shall ensure that at least 25 per cent of the samples required to be taken under subsection (1) are tested for general bacteria population expressed as colony counts on a heterotrophic plate count.

**Treated samples**

**10-3.** The owner of a drinking water system and the operating authority for the system shall ensure that a water sample is taken at least once every week and tested for,

- (a) *Escherichia coli*;
- (b) total coliforms; and
- (c) general bacteria population expressed as colony counts on a heterotrophic plate count.

**Raw water samples**

**10-4.** (1) The owner of a drinking water system and the operating authority for the system shall ensure that a water sample is taken at least once every week from the drinking water system's raw water, before any treatment is applied to the water.

(2) If the drinking water system obtains water from a raw water supply that is ground water, the owner of the system and the operating authority for the system shall ensure that a sample is taken under subsection (1) from each well in the system.

**Note:** On December 14, 2009, subsection (2) is revoked and the following substituted:

(2) If the drinking water system obtains water from a raw water supply that is ground water, or is deemed under section 2 to obtain water from a raw water supply that is surface water, the owner of the system and the operating authority for the system shall ensure that a sample is taken under subsection (1) from each well in the system.

See: O. Reg. 418/09, ss. 18, 27.

(3) The owner of the drinking water system and the operating authority for the system shall ensure that each of the samples taken under subsection (1) is tested for,

- (a) *Escherichia coli*; and
- (b) total coliforms.

**10-5. Revoked: O. Reg. 247/06, s. 21 (6).**

**O. Reg. 170/03, Sched. 10; O. Reg. 247/06, s. 21.**

**Manitouwadge Public Works  
Department**

**S.O.P's**

**Water Main Breaks and Repairs**

**Township of Manitowadge  
Public Works Department  
Operations and Maintenance Manual**

**Water main Breaks and Repairs**

1. The first responder on site must secure area and is not to leave site unattended.
2. Determine the extent of the break and whether or not if emergency response is required or if repair can be completed at a later date.
3. Assemble your work crew and equipment required for repairs.
4. Once work crew has mobilized to work site determine whether or not the break area can be throttled back with main valves or if a completed shut down is required. Once all water main valves needed to isolate the leak are located they are to be shut down from the closest to the break to the valve furthest from the damaged area. The final valve to be shut should be left open 2 to 4 turns to maintain positive pressure within the affected area. This will vary from valve to valve. **Please note: That if possible always try to maintain a minimum positive pressure of 20 psi or 140 kpa within the system to avoid back siphoning from other service and contamination from entering the system. Be cautious of throttling back valves during peak usage times as your pressures may drop below 20 psi during low usage times. Valves are to be turned slow to reduce risk of water hammer and only by qualified personnel.**
5. Set up appropriate traffic control signs as per **Ontario Traffic Control Manual (Book 7)**. All appropriate personal protective equipment must be worn within the work area and ensure any bystanders do not enter work area.
6. Utilities must be located prior to any ground being broken. This can be through calling **Ontario One Call Ltd. 1-800-400-2255** **Please note: That not all utilities will be located through this service and addition phone calls to other service providers may be required.**

**7. LOCATOR FLAG COLORS**

White – Proposed Excavation

Pink – Temporary Survey Markings

Red – Electric Power Lines, Cables, Conduit and Lighting Cables

Orange – Communication, Alarm or Signal Lines, Cables or Conduit

Blue – Potable Water

Purple – Reclaimed Water, Irrigation and Slurry Lines

Green – Sewers and Drain Lines

8. Contact the Ministry of Labour to obtain a dig permit. If requesting a permit out of normal working hours leave a detailed message stating the **location, date and time, contact numbers (phone & fax) and work being completed**. The dig permit will be issued to you when there office opens. **Please note: That this permit must be on site at all times and so make multiple copies for vehicles on site.**
9. While waiting for locates determine all users that will be affected and notify them. If resident is not home leave the notice in a visible location and shut down service to house. Advise them to collect water for usage during the shut off period. If a complete shut down of the water main is required advise them to shut off hot water tanks to prevent any damage to them. **Please note: Do not give residence a specific time on which the service will be operational to avoid any conflicts.**
10. Once all utilities have been located, the dig permit is on site, and traffic control signs are in place work may commence. You can estimate water and sewer main depths through valve depths and opening manholes and measuring depth from surface. **Please note: Prior to opening manholes atmospheric conditions within chamber must be determined with the use of a gas detector.** Located curb stops to estimate where they tie into the main to avoid any addition damage to services.
11. Establish a proper trench. Trench wall must have a 3:1 slope with adequate means of egress. Spoil piles must remain 3 feet from excavation. If a shore box is required insure that end walls are inserted and backfill is place on exterior of walls to stabilize shore box. Once the break area has been exposed the excavation should be 1 foot below the bottom of the water main with a 2 foot deep sump hole at one end to allow for a pump to dewater the excavation.

### **CIRCUMFERENTIAL BREAKS**

12. If the break has occurred around the circumference of the pipe a repair clamp may be used. Prepare break area by descaling water main and disinfect repair area and repair clamp with 12% sodium hypochlorite solution. Measure out half the length of the repair clamp on both sides of the break area to ensure clamp is centered. Begin tightening clamp with the center bolt first then work your way out. **Please note: Do not twist repair clamp while installing it. This will affect the seating of the clamp. Follow manufactures installation instructions as the bolts have torque specifications. Do not etch pipe during measurements this will reduce life expectancy of pipe. (see image #3)**

### **LONGITUDINAL SPLIT**

13. If break has occurred along the length of the pipe the break area will have to be replaced. This will require a complete shut down of the water main. Determine the extent of the break and prepare areas to be cut by descaling water main.

**Please note: Do not use gas powered chop saw within the excavation as this could create hazardous atmospheric conditions. While using the pneumatic chop saw ensure face shield and hearing protection are worn. This saw is heavy and powerful so discontinue use if proper footing can not be obtained. Ensure that other people working in excavation are at a safe distance prior to cutting. Do not attempt to tap the end of breaks and clamp them. It is very difficult to determine the extent of the break and thus not an appropriate repair.** Ensure you have a sufficient length of pipe exposed on opposite sides of the break for the repair clamp installation.

Now you may begin to cut and remove the break area. Do not attempt to lift removed pipe by hand as they can be heavy. Have equipment remove broken section. Ensure that no contaminants enter the water main. Once pipe is out of the excavation it should be inspected to give you an understanding of the water main condition in that area and tagged with date and location for future reference. Measure the length of pipe to be replaced and attempt to make the fit as snug as possible. Pipe is to be cut on surface and not in excavation. Disinfect new pipe section with the use of a clean rag soaked in 12% sodium hypochlorite solution tied to a rope. Run the rope through the new pipe then pull cloth through making sure it comes into contact with the entire circumference of the new pipe. Now disinfect repair clamps and ends of the cut water main with a spray bottle containing 12% sodium hypochlorite solution.

Depending on the situation repair clamps may be placed on new section on surface as well. Proper pipe bedding is now put into place and compaction is completed. Lower pipe into excavation and put pipe into place. **Please note: Lower pipe into excavation with the use of a sling. Do not use a chain as this will affect life expectancy of pipe.** Complete measurements to ensure repair clamp is centered. Put repair clamps into place and disinfect all tools to be utilized with the repair. Tighten repair clamps starting with the center bolt first then work your way out. **Please note: Follow manufactures installation instructions as the bolts have torque specifications.**

## VALVE REPLACEMENT

14. The same procedure above applies for main valve replacement. Valves should be assemble on surface and disinfected appropriately. Please follow the manufactures instructions for installation as these valves need to be in the close position for installation. Ensure manufactures specifications are met for torque and collars on couplers (see image #4) are tightened evenly. An NSF 60/61 approved grease should be applied on rubber ring of coupler to insure proper seating.

## FLUSHING

15. Once the repairs have been made the repair area is ready for flushing. Locate appropriate hydrants for flushing. **Please note: Flushing must be completed in both directions.** When opening hydrant insure it is fully opened (they were not designed to be throttled) and place diffuser on hydrant. Ensure your dechlorination unit is in place prior to flushing. **Please note: Make appropriate calculations for the amount of dechlorination agent used as this has oxygen reducing properties. If it enters a body of water it will be detrimental to aquatic life.** Begin to open valve furthest away from the selected flushing hydrant. **Do this very slowly and only by a qualified water distribution operator.** The hydrant is to be flushed for a period of no less than 10 minutes with a minimum flushing velocity of 0.75 m/s. During this time inspect repair area to ensure no leaks are present. Once 10 minutes have lapsed (or if longer flushing times are deemed necessary) shut water main valve off slowly then close hydrant. Complete this step only flushing in the opposite direction. After flushing is completed chlorine residuals must be taken. A minimum chlorine residual of 0.2 mg/l must be obtained prior to putting the main back in service. **Please note: If you have any reason to believe contamination has occurred two bacti samples will be required both up and downstream.** Once flushing has been completed ensure hydrants have been closed the system can be put back into service (assuming a chlorine residual of 0.2mg/l has been met). If services are shallow insulation can be place over pipes to prevent freezing. This is also a good indicator of service depths for future excavations. Appropriate fill and compaction over the pipe is to be completed. If excavated material is to wet or coarse please do not reuse for backfill material as you will get poor compaction and coarse material will cause damage to watermains and copper service lines.

During this time affected residences can now be notified that service has been restored and any services that were shut down can now be opened. **Please note: Advise home owners to flush service lines for a period of 5 minutes to remove any air or brown water prior to usage.**

## TAPPING WATER MAINS

16. The same excavation procedures for water main repair apply for tapping watermains. We are only capable of dry tapping (**main shut down or pipe prepared on surface**) so a complete shut down of the water main is necessary as we do not have the equipment available for a wet tap (**main pressurized during tapping**)

## CAST IRON WATERMAIN TAPPING

17. Direct tapping method of cast iron is used (**tapping corporation stop directly into pipe**). Once you have the water main shut down and the portion to be tapped

exposed the first step is to descale the watermain. Determine the location for the corporation stops. Mark and disinfect (12% sodium hypochlorite solution) drill location. Copper service lines are placed on a 45 degree angle from the top of the pipe. Drill and tap the appropriate sized hole into the water main. **Please note: If tapping multiple corporation stops they must not be tapped on the same plane.** Prepare the corporation stop and tools for installation by disinfection with 12% sodium hypochlorite solution and the application of Teflon tap to threads. **Do not use pipe dope on corporation stop threads.** Carefully screw corporation stop into tapped pipe and tighten to a torque of 45 joules. **Do not over tighten as this will cause damage to the water main. If possible have 3 to 4 threads visible to prevent over tightening.**

### PVC WATERMAIN TAPPING

18. PVC watermain tapping can be direct tapped, but the use of a tapping saddle is the preferred method. Once you have the water main shut down and the portion to be tapped exposed determine the location for the corporation stop and mark location. The corporation stop will also be located 45 degrees from the top of the watermain (See image #. For PVC piping corporation stops must be a minimum of 2 feet of any joint and when installing multiple corporation stop they must be a minimum of 18 inches apart. Place tapping blanket over area to be drilled. **Please note: If any stress has been placed on PVC pipe there is a possibility of the pipe bursting during drilling. Please ensure the tapping blanket is in place prior to drilling and people not completing the tap are at a safe distance. If direct tapping into PVC water main insure that tap is not being complete in an area of the pipe where it has been exposed to UV ray. PVC pipe will turn white if exposed to UV rays for an extended period of time.**

Once the drilling of the hole with the appropriate sized drill bit has been completed prepare the saddle, watermain and tools by disinfecting it with 12% sodium hypochlorite solution. Do not place corporation stop on prior to installation of the saddle as you will need to line saddle up properly. **Please note: The use of saddles with U type bolts is not preferred as they can distort pipe during installation and improper seating of saddle could occur. Please use the flat band type of saddles (see image #2).** Once saddle is in place tighten saddles following manufactures instructions for torque specifications on bolts. Visually inspect saddle to ensure bolts have been tightened evenly.

Prepare the corporation stop and tools for installation by disinfection with 12% sodium hypochlorite solution and the application of Teflon tap to threads. **Do not use pipe dope on corporation stop threads.** Carefully screw corporation stop into saddle and do not over tighten. If possible have 3 to 4 threads visible to prevent over tightening.



Ensure that operation nut is in a location making turn on/off easy. Clean end of service line with sandpaper and spray end of copper service and corporation stop with 12% sodium hypochlorite solution. Place a gooseneck into the copper service (this allows for flexibility during ground movement) and insert service into corporation stop (see image 1). Insure service line has bottom out in corporation stop and tighten corporation stop nut keeping in mind not to over tighten. **Please note: Ensure compression ring in nut is inserted in the correct direction and ring has not been previously compressed as you will not get the nut to seat properly. Make sure no contaminants or debris has entered the service line. Debris will cause issues with water meters.**

The same procedures for watermain flushing apply when putting main back into service after corporation stop installation. Ensure no leaks are present in repair area when watermain is pressurized. Tighten accordingly if leaks have occurred. If services are shallow insulation can be placed over pipes to prevent freezing. This is also a good indicator of service depths for future excavations. If excavated material is too wet or coarse please do not reuse for backfill material as you will get poor compaction and coarse material will damage watermains and copper service lines.

### Service Line Repairs

19. The same excavation procedures apply for service line repairs as watermain repairs. If the water has surfaced you can determine which side of the curb stop the break has occurred by turning the curb stop in off position. If the water flow has stopped the break has occurred on the homeowner's side thus his responsibility for costs associated with the service repair. If the water flow continues with the curb stop in the off position then the break has occurred on the township side or the curb stop needs replacing. **Please note: If the break occurs on the homeowner's side you must insure the homeowner has agreed for work to be completed and signed the quotation for costs associated with the repair.** The next step involves determining which watermain valves will need to be closed to isolate the area where the work is to be completed. Choose a control valve closest to your work area. The control valve can be turned on during excavation to help determine the break area.

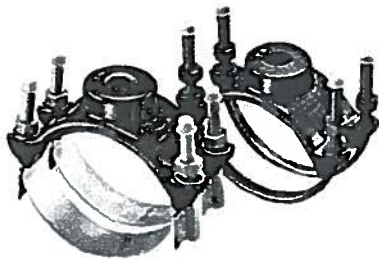
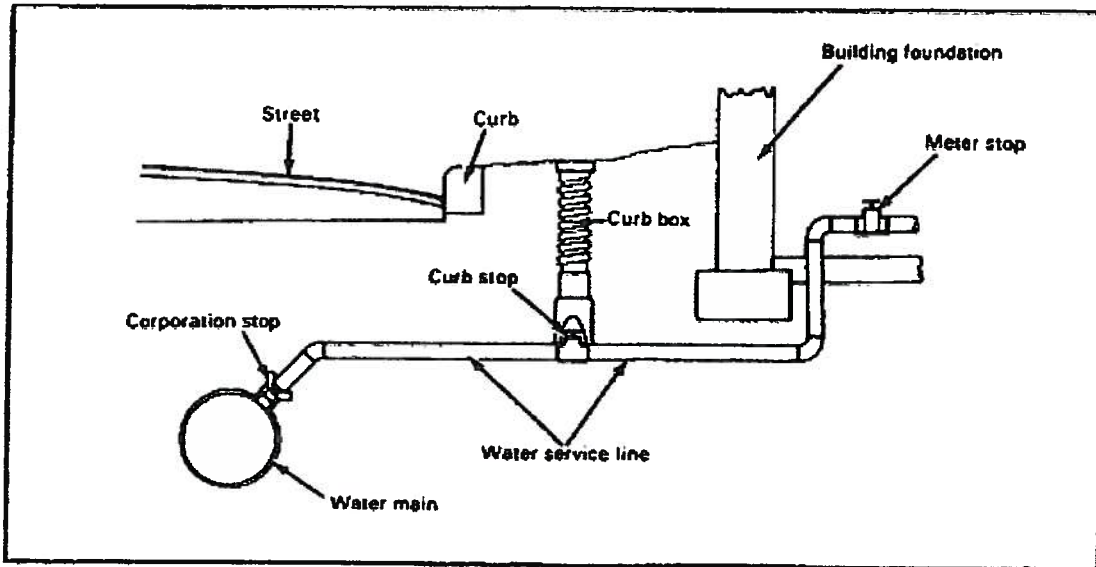
Once work area has been secured digging can commence. If possible start your excavation by following the curb box down to the curb stop to determine the depth of the service line. **Please note: The depth of the service line can also be estimated by placing the shut off key in the valve box. Extension rods used on curb stops are 4 feet in length. The length of the extension rod plus the depth in which the key went into the curb stop will give an estimate of the service line depth.** This will avoid further damage to the service line and sewer lateral. Once the curb stop has been exposed you can now follow the copper and expose the break area. It is also good practice to determine the location of the sewer lateral. In theory the sewer lateral should follow the water service line out

to the mains at a lower elevation, but there will be times where the sewer will be at a higher elevation than the sewer lateral. Once the break area has been located and the excavation secure the repair can commence. If it is a break in the copper line has occurred a section of the copper will need to be replaced. If possible replace copper right to the curb stop along with a new curb stop. Prior to cutting the length of copper out ensure all tools have been disinfected with 12% sodium hypochlorite solution. Once copper has been cut or curb stop removed inspect the copper to determine the condition of the copper. If the copper is in poor condition a repair may need to be completed to the main stop or a new service line into the house. Prior to repair insure all copper and fittings are disinfecting with 12% sodium hypochlorite solution and all copper is cleaned with emery cloth prior to inserting them into fittings to ensure proper seating. Stabilize curb stop with wood under the valve to minimize shifting of curb stop.

Once the repair is completed flushing procedures are to be completed. Pressurize service line before backfilling of the excavation is done to ensure a proper repair was completed. **Please note: Notify homeowner to flush service line for approximately 10 – 15 minutes prior to water usage.** Attempted to place curb box at grade for ease of locating in future. Excavation can now be filled and care be taken to leave homeowner's yard as tidy as possible.

20. Ensure during repairs good housekeeping is maintained, safe work procedures always follow and appropriate PPE is always worn to provide a safe work environment for all personnel on site.  
All tools are to be clean and returned to there designated areas to allow for quick mobilization for future emergencies. If any equipment has been deemed unsafe or broken please tag out equipment and inform the appropriate person for repair or replacement. This will ensure the proper tools are available to complete the job in a safe and efficient manner on subsequent water system repairs. If any consumables need to be restocked please advice the appropriate person as this can become costly and time consuming having to wait on supplies

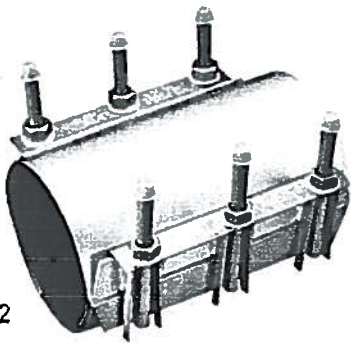
**Image #1.**



Double Strap Service Saddles

**Image #2.**

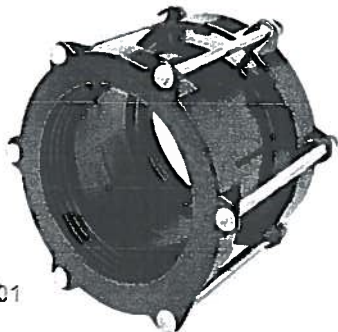
U bolt and flat band style saddles



**Image #3.**

Repair Clamp

SS2



**Image #4**

Coupler

XR501

**Manitouwadge Public Works  
Department**

**SOP**

**Water Meter Readings/Water Shut offs**

**Township of Manitowadge  
Manitouwadge Public Works  
SOP  
Water Meter Readings/Shut Offs**

On a quarterly basis water meter readings are to be taken. An operator acquires the handheld meter reading from the office. Once the operator has the handheld they log on to the unit and select the route required to achieve all the readings. Once the appropriate route is selected the operator must drive around the town to allow the handheld unit to communicate with the household meters. Once the operator has completed the route around town he then reviews all the missed readings on the list and revisits the house in order to see if the meter will pick it up a second time. If the meter still cannot communicate with the meter in the house then it will be revisited at a later date. Once the readings are complete the meter is then returned to the office and mounted on the docking station where it gets synchronized with the software and the data gets extrapolated. The office then develops work orders so that the houses that wouldn't read can be read either using a specific meter number on the hand held or by physically going into the house to take the meter reading manually.

Once all the meters are read the billing process begins which is handled by the accounting in the administration office. Bills get sent out to the homeowners then if the bill isn't paid by a certain date then a notice is sent out and if the bill still doesn't get paid by the homeowner on the due date of the bill then water shutoffs are the next step.

The administration gives the operator a detailed list of all the households who have not paid there bills and are to be shut off until further notice. The fee associated with the turn off is \$30 and an additional \$30 to turn the customer back on in the municipality of Manitowadge. Therefore, if a house is on the list to be turned off the homeowner will be required to pay the bill plus an additional \$60 before we are able to turn them back on.

If the customer is being irate with us during this procedure we are to notify our supervisor to come to the location of the shut off and try to reason with the homeowner. The last resort, if we are still unable to complete our job then we call the OPP for assistance.

Once the office receives payment for the water bills we are handed a list of locations to turn back on. Operators then go around to all locations and turn the water back on to every one on the list. This repeats every three months and seems to be the same locations every three months.

**Manitouwadge Public Works  
Department**

**SOP**

**Document Control**

Record-keeping re operation of subsystem

27. (1) The owner or operating authority of a subsystem shall ensure that logs or other record-keeping mechanisms are provided to record information concerning the operation of the subsystem. O. Reg. 128/04, s. 27 (1).

(2) Entries in the logs or other record-keeping mechanisms shall be made chronologically. O. Reg. 128/04, s. 27 (2).

(3) No person shall make an entry in a log or other record-keeping mechanism unless the person is an overall responsible operator, an operator-in-charge or is authorized to make an entry by the owner, the operating authority, the overall responsible operator or an operator-in-charge. O. Reg. 128/04, s. 27 (3).

(4) A person who makes an entry in a log or other record-keeping mechanism shall do so in a manner that permits the person to be unambiguously identified as the maker of the entry. O. Reg. 128/04, s. 27 (4).

(5) An operator-in-charge or a person authorized by an operator-in-charge shall record the following information in the logs or other record-keeping mechanisms in respect of each operating shift:

1. The date, the time of day the shift began and ended and the number or designation of the shift.

2. The names of all operators on duty during the shift.

3. Any departures from normal operating procedures that occurred during the shift and the time they occurred.

4. Any special instructions that were given during the shift to depart from normal operating procedures and the person who gave the instructions.

5. Any unusual or abnormal conditions that were observed in the subsystem during the shift, any action that was taken and any conclusions drawn from the observations.

6. Any equipment that was taken out of service or ceased to operate during the shift and any action taken to maintain or repair equipment during the shift. O. Reg. 128/04, s. 27 (5).

(6) The owner or operating authority shall ensure that logs and other record-keeping mechanisms are accessible at the subsystem,

(a) for at least five years after the last entry in it was made, in the case of a log or record-keeping mechanism that is kept in a book or document form or kept on a similarly fixed basis; or

(b) for at least five years after each entry in it was made, in the case of a log or record-keeping mechanism that is kept on a loose-leaf or electronic basis or kept on a similarly continuous basis. O. Reg. 128/04, s. 27 (6).

(7) The owner or operating authority shall submit to the Director copies or summaries of the records kept under this section when requested to do so by the Director. O. Reg. 128/04, s. 27 (7).

Operations and maintenance manuals

28. The owner or operating authority of a subsystem shall ensure that operators and maintenance personnel in the subsystem have ready access to the comprehensive operations and maintenance manuals that contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the subsystem. O. Reg. 128/04, s. 28.

**MANITOUWADGE PUBLIC WORKS DEPARTMENT**  
**WATER TREATMENT AND DISTRIBUTION**

**DOCUMENT & RECORD CONTROL**

**Daily Check Sheets**

Daily check sheets are to be completed during pumphouse, liftstation and blowerstation morning inspections. Flow, pump hours, analyzers and time of reading are to be recorded and legible. Daily check sheets include a check list of duties performed that day and any exceedences that have occurred from sampling events. Morning and afternoon analysis are also recorded on these sheets along with distribution analysis results, locations and times. Daily check sheets are then filled accordingly and retained at the pumphouse for a period of seven years.

**Daily Waterflow Records Sheet**

Data collected from the daily check sheets are to be entered here. These sheets are to be reviewed and signed by the ORO and submitted to the office daily. Actual and minimum and maximum daily flows are also included on these sheets. Copies are to be retained at the pumphouse and filed with MOE month end reports, actual flows, instrument readings and daily lab test sheets for a period of seven years.

**Instantaneous Daily Flows**

Minimum and maximum flow data collected from the daily check sheets are calculated and entered on these sheets. Calculated flows are to be then entered on the daily waterflow record sheet. Instantaneous daily flows are transferred and saved on computer and included in the MOE annual report. These sheets are filled with MOE month end reports, actual flows, instrument readings and daily lab test sheets for a period of seven years.

**Well Record & Compliance Sheet**

Flow meter and hour meter readings collected from the daily check sheets are entered on these sheets. Calculated flows and percentage of calculated to actual are to be completed on these sheets. Well record and compliance sheets are transferred and saved on computer and included in the MOE annual report. These sheets are filled with MOE month end reports, actual flows, instrument readings and daily lab test sheets for a period of seven years.



**Daily Flows & Compliance Sheets**

Well flows and raw and treated water readings collected from the daily check sheets are transferred here. It is then transferred to the water system sheet where 24 hours adjusted time is calculated. Volume of sodium hypochlorite consumed is also calculated on this sheet which is transferred to the well flows record sheet. The 24 hour adjusted time calculation is then transferred back to the daily flows and compliance sheets.

Data is then entered into an excel spread sheet and calculations generated from the spread sheet are transposed back to the daily flows and compliance sheet. The 24 hour adjusted flow calculation generated from the excel spread sheet is then transferred to the daily waterflow record sheet. This data is entered into the MOE annual report, saved on the computer. These sheets are filled with MOE month end reports, actual flows, instrument readings and daily lab test sheets for a period of seven years.

**Well Flow Records Sheet**

Calculated Sodium hypochlorite volume and weight calculated from the water system sheet are entered here along with 24 hours adjusted daily water and sewer flows. This data is then entered into a excel spread sheets which generate a water flow to sewage percentage. This calculation is transferred back to the well flows records sheet. These sheets are filled with MOE month end reports, actual flows, instrument readings and daily lab test sheets for a period of seven years.

**Online Instrumentation Sheets**

Data collected from the daily check sheets are to be entered here. This data is transfer to an excel spread sheet and the MOE month end reports. This data is saved on the computer and filled with MOE month end reports, actual flows, instrument readings and daily lab test sheets for a period of seven years.

**Daily Lab Testing Sheet**

Data collected from the daily check sheets are to be entered here. This data is transfer to an excel spread sheet and the MOE month end reports. This data is saved on the computer and filled with MOE month end reports, actual flows, instrument readings and daily lab test sheets for a period of seven years.

### **Monthly Distribution Sampling Sheets**

Data collected from the daily check sheets are to be entered here. This data is transfer to an excel spread sheet and the MOE month end reports. This data is saved on the computer and filled with MOE month end reports, actual flows, instrument readings and daily lab test sheets for a period of seven years.

### **Laboratory Analysis Results**

Laboratory results are obtained by ALS Laboratories through fax to the Township office. These results are then faxed to the pumphouse where the data is entered into excel spreadsheets and included in the MOE annual report. Electronic copies are also sent via email to the ORO and saved on the computer. Hard copies are filled accordingly and retained at the pumphouse for a period of seven years.

### **Daily Log Book**

Daily duties are enter into the log book. Entries must be detailed, dated and signed by operators. Daily log books are filled at the pumphouse for a period of seven years.

**Manitouwadge Public Works  
Department**

**SOP**

**Pump Control System**

## Manitouwadge Water Works Pump Control System

The following is an explanation of the Pump Control Procedure for Manitouwadge Water Works :

Many of the parameters described below are configurable via the "Spectrum" Operator Interface located on the Control Panel (Cell No.12). Those parameters that can be configured are denoted with the following symbol (*config.*).

### **HIGH LIFT SERVICE PUMPS**

There are six Service Pumps SP1 - SP6 and two Variable Frequency Drives VFD1 & VFD2. Service Pumps SP1 - SP4 may be selected for Variable Speed via VFD1 or VFD2. Service Pumps SP5 & SP6 may only run at Constant Speed.

### **Pump Setup**

Either VFD1 or VFD2 is designated as the Duty VFD (*config.*). In the event of a VFD failure that VFD is Locked Out & the remaining VFD will automatically be selected as the Duty VFD. After clearing VFD faults pressing the Reset Pushbutton will restore the normal sequence of operation.

The Service Pumps run according to the specified Duty Cycle (*config.*). If the Service Pump Duty Cycle is 1,2,3,4,5,6 then Service Pump SP1 is the Lead Pump and will run continuously on Variable Speed. The remaining pumps will start/stop on Constant Speed in the order 2,3,4,5,6.

In the event of a Lead Pump failure that pump is Locked Out & the next pump in the Duty Cycle that is SP1 - SP4 is assigned as the Lead Pump for continuous Variable Speed operation.

In the event of a Constant Speed pump failure it is Locked Out.

After clearing pump faults pressing the Reset P/B will restore the normal sequence of operation.

If a LO/LO Level Input is received from Clearwell No.1 probe then Service Pumps SP1, SP2 & SP5 will STOP. If a LO/LO Level Input is received from Clearwell No.2 probe then Service Pumps SP3, SP4 & SP6 will STOP.

### **VFD/Pump Failure**

#### ***VFD Failure :***

When the VFD is called to run and the VFD Running input to the PLC is not received for a 60 second period then the VFD will have failed. This time delay allows the VFD to make up

to 3 restart attempts.

### ***Pump Failure :***

When a pump is called to run and that pumps Discharge Pressure Switch input to the PLC is not received for a 30 second period then the pump has failed.

## **Pump Operation**

The System (discharge) Pressure is monitored and fed into the PLC as an analog input. The Lead Pump's speed is controlled via a PID loop to maintain the System Pressure at its' Set Point (*config.*). Additional pumps are started on Constant Speed as required.

### ***On Increasing Demand :***

The Lead Pump increase's its speed to maintain System Pressure until maximum speed is reached. As demand increases and the System Pressure drops to and remains 2.5 - 5 PSI (*config.*) below the Set Point for a period of 20 seconds a Constant Speed pump is called per the Duty Cycle and then start's following a 5 second time delay. The Lead Pump's speed is adjusted by the PID loop to compensate & maintain the System Pressure at its Set Point.

As demand increases further the Lead Pump again ramp's towards maximum speed and when the System Pressure drops to and remains 2.5 - 5 PSI below the Set Point for a period of 20 seconds the next Constant Speed pump is called per the Duty Cycle and then start's following a 5 second time delay. The PID loop continue's to control the speed of the Lead Pump to maintain System Pressure at the Set Point.

As demand increases further additional pumps are be started in a similar manner until all pumps are running.

### ***On Decreasing Demand :***

The Lead Pump decreases its speed to maintain System Pressure until minimum speed is reached. As demand decreases and the System Pressure rises to and remains 2.5 - 5 PSI (*config.*) above the Set Point for a period of 10 seconds then a Constant Speed Pump is stopped per the Duty Cycle. The Lead Pump's speed is adjusted by the PID loop to compensate & maintain the System Pressure at its Set Point.

As demand decreases further additional pumps are stopped in a similar manner until only the Lead Pump is running.

As demand continues to decrease the Lead Pump's speed is ramped down toward minimum speed to maintain the Setpoint.

Whilst the above time delay's given for pump start/stop are true for *normal* operation the timing may change in certain circumstances as follows :

- When the Lead Pump is called to run, the next pump is not called for 60 seconds

irrespective of the System Pressure.

- When a Constant Speed Pump is called to run, the next pump is not called for 30 seconds irrespective of the System Pressure.
- When a Constant Speed Pump is called to run, it must run for at least 30 seconds irrespective of the System Pressure.

## Pump Duty Cycle Changeover

Whenever there is a change in the Pump Duty Cycle the entire duty cycle is affected & consequently all pumps are be stopped momentarily. Following a time delay of 30 seconds the pumps will restart in a normal staged sequence according to the new duty cycle.

**Caution** - When all pumps are stopped the system pressure will decay rapidly - to avoid this follow the recommended procedure "Change Service Pump Duty Cycle" in the Operational Procedures section later in this document.

## WELL PUMPS

There are five Well Pumps WP1 - WP5.

### Pump Setup

The Well Pumps run according to the specified Duty Cycle (*config.*). In the event of a Well Pump failure that pump will be Locked Out. After clearing pump faults pressing the Reset Pushbutton will restore the normal sequence of operation.

#### **Pump Failure :**

When a pump is called to run and that pumps Discharge Pressure Switch input to the PLC is not received for a 30 second period then the pump has failed.

### Pump Operation

The Reservoir Levels for Cell No.1 and Cell No.2 are independently monitored and fed into the PLC as analog signals, one of which is selected the controlling Reservoir Level (*config.*).

When the Reservoir Level falls to the Start Level programmed for Duty 1 (*config.*) the pump assigned to Duty 1 will start & continue to run until the Reservoir Level rises to the Stop Level programmed for Duty 1 (*config.*).

The remaining pumps will start/stop in a similar manner as their programmed start/stop levels (*config.*) are reached according to the Pump Duty Cycle for Duty 2 to Duty 5 .

## Pump Duty Changeover

Whenever there is a change in the Pump Duty Cycle the entire duty cycle is affected & consequently all pumps are stopped momentarily. Following a time delay of 30 seconds the pumps will restart in a normal staged sequence according to the new duty cycle.

### OPERATIONAL PROCEDURES

#### 1) Change Service Pump Duty Cycle

On the Spectrum Operator Interface press the key marked "Main Menu" then:

- press "2" for duty selection
- enter access code 911 & then press "enter"
- press "2" for SP duty cycle

The screen will show the current SP # currently proposed for SP Duty 1:

EITHER- Enter the SP # you would like for SP Duty 1

OR - Press "Next" to accept current selection & move to the next screen - SP # proposed for SP Duty 2

Repeat this sequence for SP Duty 2 to 6

The screen will now show the proposed SP Duty

Proposed SP Duty
1 2 3 4 5 6
Accept? Y/N

If not acceptable press "N" - no changes will be made & you are returned to the previous menu where you may begin to re-enter your selections.

If the proposed duty cycle is to your liking **BEFORE** pressing "Y" you must start pumps manually as required to maintain system pressure during the duty changeover. It is recommended that the manual pumps should be the last pumps in the proposed SP duty cycle.

Once pumps are running manually press "Y" to accept the proposed SP duty cycle:

- Automatic pumps will stop and then restart in the new sequence following a time delay.
- As the pumps restart automatically, stop the manual pumps as required

- When all manual pumps are stopped, return their selectors to the "Auto" position & then press the "Reset" button on the main control panel.

## 2) Change System Pressure Setpoint

On Spectrum Operator Interface press the key marked "Main Menu" then:

- Press "3" for adjust setpoints
- Enter Access Code 911 & then press "Enter"
- Press "3" for system pressure

The screen will show the current system pressure setpoint:

EITHER- Type a new setpoint value & press "enter".

OR - Press "Main Menu" to leave the setpoint unchanged & return to the main menu.



**Manitouwadge Public Works  
Department**

**SOP**

**Hydrant Check List**

## HYDRANT CHECK LIST

### LEGEND

B	-	B10 CV&H
C	-	CENTURY CV&H
NC	-	NEW CENTURY CV&H
M	-	MUELLER NEW CENTURION
MCA	-	MCAVITY
D	-	DRAINS
W	-	DOES NOT DRAIN, OR DRAINS POORLY, OR DRAINS CAPPED MUST BE PUMPED

### TOTALS

INDUSTRIAL	-	16	B	-	46
COMMERCIAL	-	11	C	-	21
AREA #1	-	51	NC	-	43
AREA #2	-	34	M	-	14
AREA #3	-	27	MCA	-	15

### INSTRUCTIONS

1. Take necessary tools - hydrant wrench, dip stick, hydrant pump.
2. Check hydrants in order. Complete one area before proceeding to the next area.
3. Check hydrant for water. Pump as required. **If frozen thaw out prior to end of work day! This is important.**
4. Enter the date, your comments and initials in the appropriate columns.

**Appropriate comments:** W - Wet, D - Dry, Pumped, Greased (followed by the number of shots of grease). Replace hose nozzle gasket (follow by number). Replace steamer nozzle gasket. O.K. Loosen caps (Fall). Tighten caps (Spring). Frozen, Thawed.

AREA: INDUSTRIAL (Page 1 of 1)

LOCATION	HYDRANT TYPE	DATE DD/MM/YY	COMMENTS	INSPECTED BY
PUBLIC WORKS	NC			
CORNER SAULT AND PIC	M			
SUPERIOR PROPANE	M			
CORNER PIC AND BLACK	M			
GULF BULK PLANT	NC			
IMPERIAL BULK PLANT	NC			
HOME HARDWARE	NC			
REAR MARTEN AVENUE	B			
DRAINAGE DITCH	B			
ACROSS FROM GOLF COURSE	B			
REC CENTRE PARKING LOT	B			
BELL TELEPHONE	B			
BLACK ROAD (PRINGLES)	M			
CORNER SAULT AND BLACK	M			
BADGER PLACE PARKING LOT	MCA			
GIONET'S SAW MILL	C			



LOCATION	HYDRANT TYPE	DATE DD/MM/YY	COMMENTS	INSPECTED BY
5 MANITOU	B			
21 MANITOU	NC			
35 MANITOU	NC			
49 MANITOU	C			
61 MANITOU	B			
22 GRAHAM	M			
30 GRAHAM	C			
42 GRAHAM	C			
50 GRAHAM	NC			
58 GRAHAM	NC			
6 NICOL	C			
5 MONA	B			
19 MONA	B			
ESSA PLACE	B			
MINAKI PLACE	M			
13 ADJALA	B			
38 ADJALA	B			
48 ADJALA	B			
9 SHINGWAUK	B			
30 SHINGWAUK	B			
34 NEEBIG	B			
52 NEEBIG	B			
53 NEEBIG	B			
2 WENONAH	B			
16 WENONAH	B			
SHAWINIGAN PL	B			
6 OHSWEKEN	B			
20 OHSWEKEN	B			
38 OHSWEKEN	B			
7 AGAWA GARDENS	B			

AREA #2 (Page 1 of 2)

LOCATION	HYDRANT TYPE	DATE DD/MM/YY	COMMENTS	INSPECTED BY
OHSWEKEN ROAD #1	C			
OHSWEKEN ROAD #2	B			
OHSWEKEN ROAD #3	B			
11 HERON DRIVE	B			
27 HERON DRIVE	B			
KINGFISHER PLACE	B			
6 SANDPIPER	M			
16 SANDPIPER	NC			
28 SANDPIPER	B			
6 SWALLOW	B			
16 SWALLOW	B			
6 REDWING	B			
36 REDWING	C			
6 REDWING	C			
56 REDWING	NC			
1 FALCON	C			
14 FALCON	C			
5 WARBLER	B			
14 WARBLER	B			
30 WARBLER	B			
60 WARBLER	C			
72 WARBLER	C			
78 WARBLER	C			
94 WARBLER	C			
97 WARBLER	C			
102 WARBLER	MCA			
2 FLICKER	B			
18 FLICKER	B			
28 FLICKER	B			
42 FLICKER	MCA			
2 PARTRIDGE	C			







**Manitouwadge Public Works  
Department**

**SOP**

**Water Valve Exercise Program**

**Manitouwadge Public Works Department**  
**Water Treatment Subsystem**  
**And**  
**Water Distribution Subsystem**  
**Water Valve Exercise Program**

During the summer of 2009 a water valve exercising program was implemented by the operators of the WTP and WDS. Due to the aging infrastructure in the community of Manitouwadge and the frequency of water main repairs and water service repairs it was determined that it would be beneficial to implement this program.

Notification to consumers is important as this program is likely to be directly related to red water complaints. A notification letter will be delivered to the home 24 hours in advance of the program start dates. This should eliminate any complaints from consumers.

After completion of this program it will insure that valves will be accessible and in good working order when the time comes to use them. On an annual basis operators will select a zone to complete during that period. Operators will be going to the locations of valves and recording GPS readings, condition of the valve boxes (i.e. cracked, full of dirt etc.), condition of the valve, date completed and number of turn counts. Traffic control will be used were valves are out in the middle of intersections or if lanes of traffic have to be redirected to gain access.

After completion of a zone a report will be completed and submitted to the Superintendent with all deficiencies noted and a crew will be designated to go complete the repairs indicated. This will help insure that the valves in the distribution system will be readily available in case of an emergency water break.

This program will be beneficial in the sense that we will be able to budget for repairs of older valves or install new valves in the distribution system. It will allow our operators to have confidence in the distribution system and assure that shut downs will be safely conducted in a timely manner.

**Manitouwadge Public Works  
Department**

**SOP**

**Unilateral/Unidirectional Flushing  
Program**

**MANITOUWADGE PUBLIC WORKS DEPARTMENT**  
**WATER TREATMENT AND DISTRIBUTION**

**Unilateral Hydrant Flushing**

1. The purpose of unilateral hydrant flushing are as follows:
  - Verifies that hydrants are working properly.
  - Flushes sediment from water mains.
  - Checks for closed valves and weak flows in our water system.
  - Improves water quality.
  
2. All residents in the flushing area are to be notified no less than 24 hours prior to the commencement of the flushing program. The notification shall contain the information listed below.
  - There may be a temporary drop in water pressure.
  - Water may become rusty or cloudy which is not harmful. This will clear up in a few hours.
  - Avoid washing laundry during scheduled flushing times. Wait until cold water runs clear at the tap.
  - If pressure or volume seems low, first check there faucet screen for trapped particles. If the problem persists contact Public Works to inspect water meter.
  - Avoid running hot water until cold water tap is clear then run hot water tap to allow hot water tank to clear.
  
3. Prior to initiating the flushing program locate all water main valves that need to be closed to direct the flow accordingly. These valves are to be inspected to determine whether they are operational or not.
  
4. When the flushing program is ready to commence shut off all located valves.
  
5. Hydrants are to be flushed in succession from the open end of the loop to the closed end.
  
6. Take the time to inspect hydrants and hydrant shut off valve to ensure everything is operational. Grease hydrant accordingly and check oil levels in reservoir.
  
7. Diffuser is to be placed and dechlorination puck placed in chamber on hydrant prior to opening hydrant. **Please Note: Never operate a hydrant while standing directly in front of the hydrant ports to avoid injury from blow offs.**

10:06:23 AM  
Plant

Water

01/28/2010

8. Hydrants are not designed to be operated partially open. Open the hydrant slow to avoid water hammer and ensure valve is completely open.
9. Flush hydrant until water exiting hydrant becomes clear. Once water is clear close the hydrant valve completely then back valve off a quarter of a turn.
10. Continue this process until all hydrants in the zone have been completed.
11. Once all Hydrants have been flushed return all valves in the distributions system back to open.
12. Finish recording documentation on record sheets.
13. Continue this process until all hydrants have been flushed accordingly.