



**WHITECHURCH DRINKING WATER SYSTEM APPENDIX**

The following Section represents DWQMS information specific to the individual systems.

Element 6 - System Description

Element 8 – Risk Assessment Outcomes

Appendix B 2 – Risk Assessment Table

Appendix I 1 – Sampling, Testing, and Monitoring Table

Please see the appropriate section for details on the individual systems for the Township of Huron-Kinloss

File: C:\DWQMS\Huron-Kinloss- WHITECHURCH WELL SUPPLY SYSTEM APPENDIX

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Rev. 1	Mar. 4, 2011	Rev name to DWS	DC Scott –QMS Rep.	Laurie Cox - Veolia Project Manager

Note: To be reviewed annually or when a QMS change occurs.



## 6. Drinking Water System

### Whitechurch Drinking Water System:

#### System Description

##### 6.1 General

6.1.1 The Whitechurch water system is characterized as a “secure ground water” system and is classified as a small municipally owned water system. The system consists of two wells with a rated capacity of 260 m<sup>3</sup>/day, with chlorination treatment. The entire system is located in Whitechurch in the Township of Huron-Kinloss. The distribution system serves the community of Whitechurch with a population of approximately 90 residents, with approximately 35 customer services.

6.1.2 The Whitechurch Water System is a non-classified, small municipal system owned by the Township of Huron-Kinloss and operated by Veolia Water Canada. The system provides potable water to the residents and businesses of Whitechurch, and also delivers drinking water to a small number of properties that are outside the Township of Huron-Kinloss boundary.

6.1.3 Production well # 2 (TW1-03) is a 152 mm diameter, 54.9 m deep drilled groundwater production well located approximately 10 m west of the pumphouse at 9A Whitechurch Street. Well # 2 was drilled in 2003. The well pump and associated piping in well # 2 were brought on-line in March 2008.

6.1.4 Production well # 1 (TW2-03) is a 152 mm diameter, 73.2 m deep drilled groundwater production well located approximately 15 m south of TW1-03 9A. Well # 1 was drilled in 2003. The well pump and associated piping in well #1 was installed in August 2007.

6.1.5 Raw water from both wells is pumped into the pumphouse for treatment via submersible pumps. The two separate raw water lines entering the pumphouse are both equipped with a magnetic flow meter.

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6.1.6 The Whitechurch Water System is equipped with a supervisory control and data acquisition system (SCADA) allowing for remote control, monitoring and record keeping of the system. This provides the operator with the current operating status of the supply and treatment equipment throughout the system at any given time.

6.1.7 A 15 kW diesel generator and fuel system has been installed outside adjacent to the pumphouse in a sound attenuated, weather-proof enclosure. There is a fence around the generator to prevent unwarranted entry.

**6.2 Description of Water Source**

6.2.1 TW1-03 (well # 2) and TW2-03 (well # 1) and are not under the influence of surface water. The wells penetrate limestone aquifers. Because of the depth and structure of the aquifers, the water temperature is relatively constant, turbidity is low, and the water is relatively hard. The raw water is also relatively high in fluoride, but the lead content of the raw water is well below the half-MAC (Maximum Allowable Concentration). Water samples collected from both wells show barium concentrations slightly exceed the ODWQS of 1 mg/L. The Certificate of Approval for the system requires the owner to ensure treated water samples are collected on a quarterly basis and that the barium test results be forwarded annually to the local health unit. Those who are supplied water from the Whitechurch Water System are made aware of the various concentrations in their drinking water by numerous means of communication through the Township of Huron-Kinloss.

6.2.2 The characterization of the raw water supply source is listed in the Well Field Evaluation report prepared by Ian D. Wilson Associates Limited in conjunction with the new well drilling in 2003.

**6.3 Disinfection System**

6.3.1 The Whitechurch pumphouse ensures that raw water is disinfected and undergoes iron sequestering. Sodium hypochlorite (12%), the chemical used in the disinfection process, disinfects the raw water, and serves primarily as a measure to prevent microbiological growth within the raw water pipeline and distribution system. The system has a chlorine contact watermain to provide chlorine contact time between sodium hypochlorite and the

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raw water ensuring the deactivation of pathogens should they be present in the drinking water supply.

- 6.3.2 The disinfection system includes two chemical feed pumps (one duty, one standby) and a chemical storage tank, complete with secondary containment. Chlorine contact time is achieved via a contact watermain. Chlorine residuals are continuously monitored by on-line instrumentation to verify the pumphouses are supplying safe drinking water to the system.
- 6.3.3 In the well house the chemical is added prior to the water entering the chlorine contact chambers at dosages high enough to achieve both primary and secondary disinfection objectives. The free chlorine residual was monitored at the point of entry to the distribution system with a target residual of > 1.00 mg/l and < 1.30 mg/l.

**6.4 Iron Sequestering**

- 6.4.1 The Whitechurch system has iron levels higher than what is considered aesthetically acceptable. The system includes two chemical feed pumps (one duty, one standby), with automatic switchover and alarms, and a chemical storage tank, complete with secondary containment. Chlorinated water is immediately treated with sodium silicate for iron sequestering prior to the chlorine contact main. Sequestering prevents staining of plumbing fixtures and discoloration of the water, but can leave a slight metallic taste.

**6.5 System Flows**

- 6.5.1 The Whitechurch water system has 1 permit to take water # 1286-6M7PPP which allows 260 cubic metres per day from the combined wells.
- 6.5.2 The Whitechurch treatment system has a maximum flow as specified in C of A # 3835-6XTKGA of 260 cubic meters per day .
- 6.5.3 The limiting factor regarding flow is chlorine contact time in the chlorine contact mains. In order to meet the regulatory CT requirements (CT value > 3.0) increased flows beyond 3.28 litres per second must have an adequate free chlorine residual to counter the decreased retention time in the chlorine contact main. The maximum allowed flow must correspond with a free chlorine residual of a minimum 0.32 mg/l.

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**6.6 Distribution System**

- 6.6.1 The Whitechurch Water System has approximately 35 water connections, and provides potable water to a population of approximately 90. The system provides potable water to the residents and businesses of Whitechurch, and also delivers drinking water to a small number of properties that are outside the Township of Huron-Kinloss boundary.
- 6.6.2 The distribution system is a combination of PVC and polyethylene piping.
- 6.6.3 There are no hydrants or isolation valves associated with the distribution system and lacks the capacity to provide fire flows.
- 6.6.4 There is no elevated storage to maintain pressure and the system pressure is maintained using pressure tanks and the well pump.
- 6.6.5 Distribution piping is all 50 mm poly ethylene.
- 6.6.6 The system pressure is between 45 to 65 psi.
- 6.6.7 The Whitechurch Water System has two designated sample stations that are blow-offs that are located near the dead ends of watermains.

**6.7 Sample Analysis**

- 6.7.1 Provincial regulations dictate the sampling and monitoring requirements for the system. Water quality is tested throughout the treatment process and distribution system. Where required by regulation, samples are submitted to an accredited laboratory for analyses.

**6.8 Process Flow Schematic and Diagram:**

(see below)

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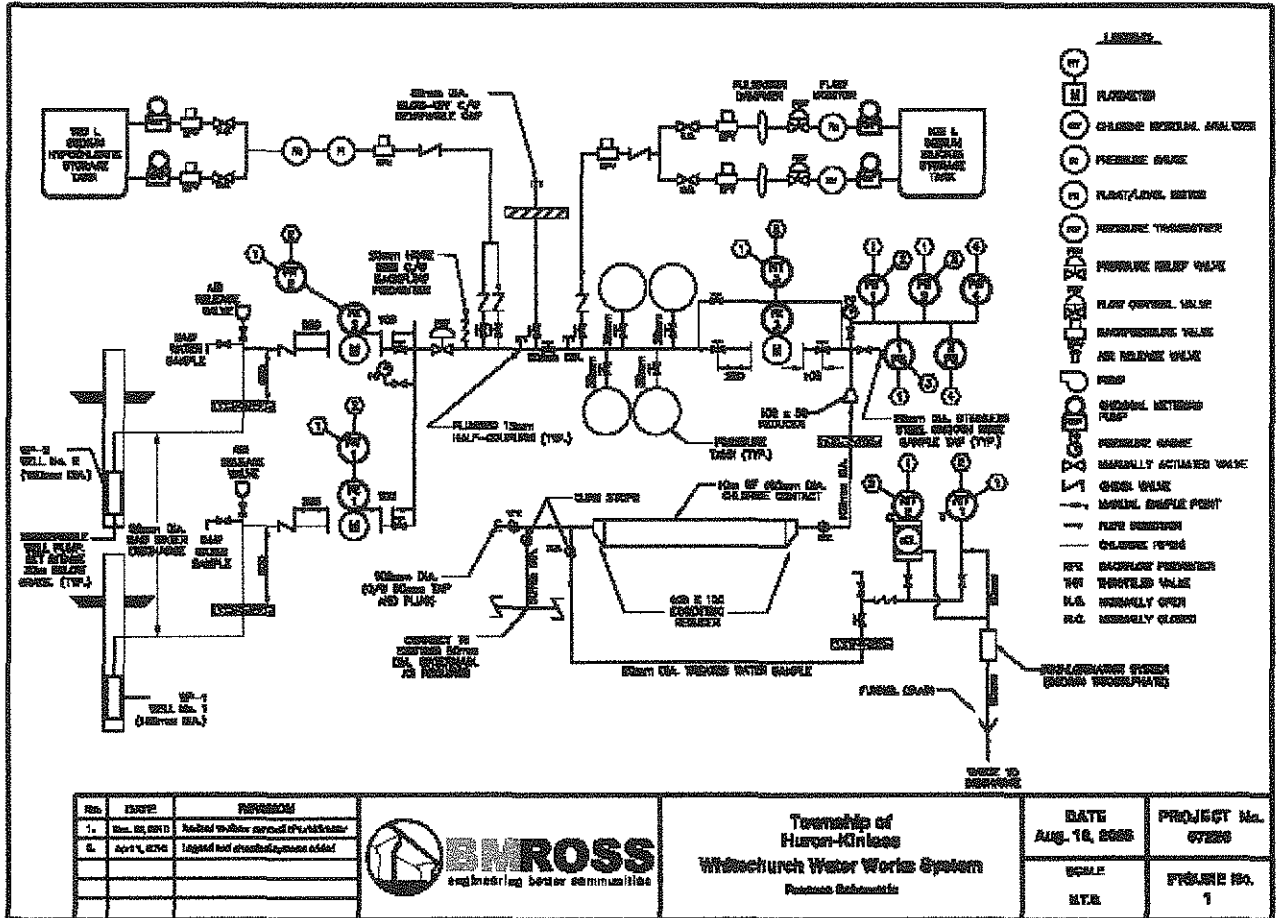
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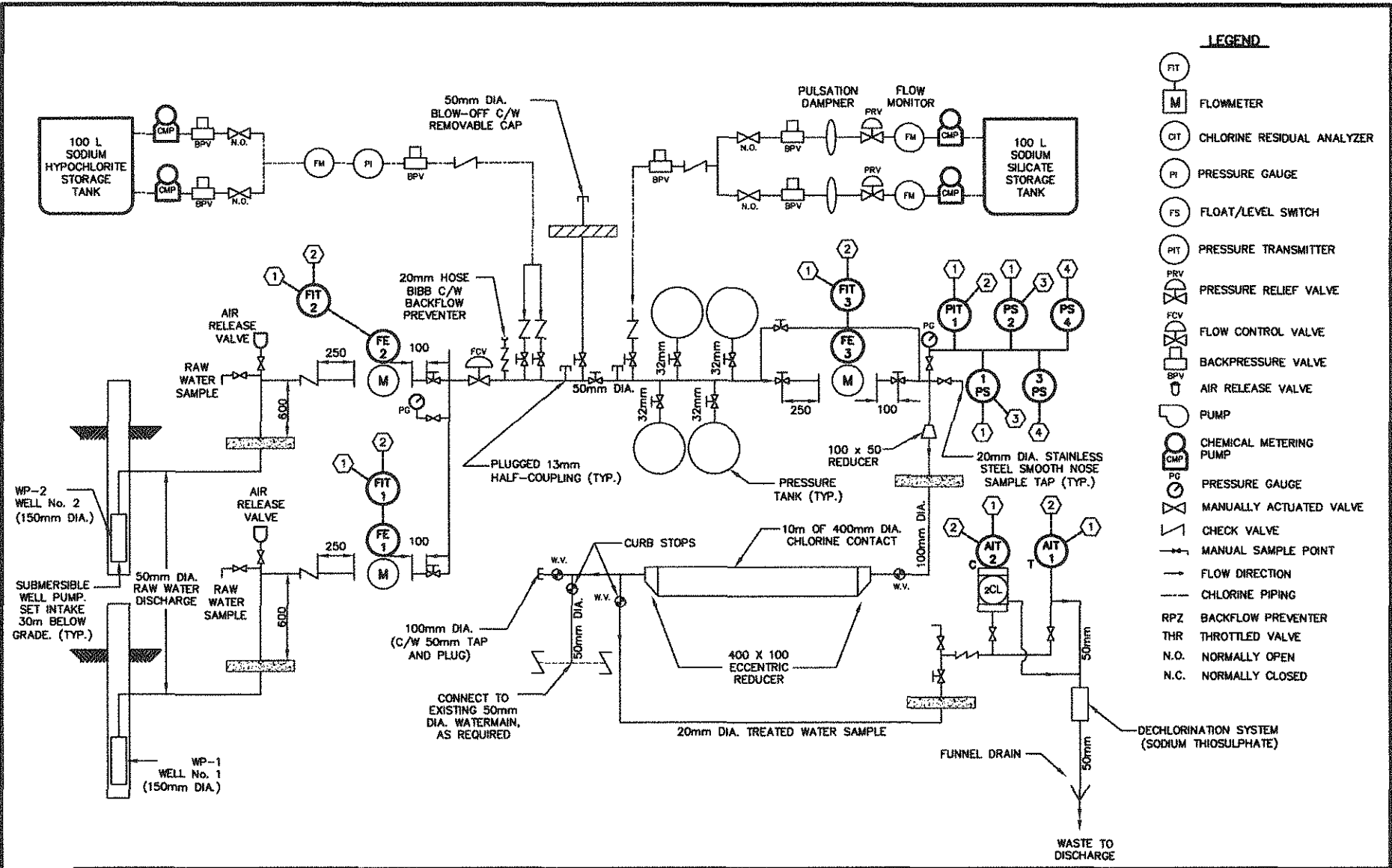
6.8.1 Whitechurch Process Flow Schematic



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**LEGEND**

- FIT FLOWMETER
- M FLOWMETER
- CR CHLORINE RESIDUAL ANALYZER
- PI PRESSURE GAUGE
- FS FLOAT/LEVEL SWITCH
- PIT PRESSURE TRANSMITTER
- PRV PRESSURE RELIEF VALVE
- FCV FLOW CONTROL VALVE
- BPV BACKPRESSURE VALVE
- ARV AIR RELEASE VALVE
- P PUMP
- CMP CHEMICAL METERING PUMP
- PG PRESSURE GAUGE
- MAV MANUALLY ACTUATED VALVE
- CV CHECK VALVE
- MS MANUAL SAMPLE POINT
- FD FLOW DIRECTION
- CP CHLORINE PIPING
- RPZ BACKFLOW PREVENTER
- THR THROTTLED VALVE
- N.O. NORMALLY OPEN
- N.C. NORMALLY CLOSED

No.	DATE	REVISION
1.	Mar. 30, 2010	Revised to show removal of turbidimeter
2.	April 1, 2010	Legend and chemical systems added



**Township of Huron-Kinloss**  
**Whitechurch Water Works System**  
 Process Schematic

DATE Aug. 18, 2006	PROJECT No. 07226
SCALE N.T.S.	FIGURE No. 1



## 8. Risk Assessment Outcomes

### Risk Assessment Outcomes - Summary and Analysis

#### Huron-Kinloss – Whitechurch Water Treatment System

Basis: Risk Assessment Table and Team Meeting June 11, 2008

#### 1- First Engineer's Report

No outstanding items

#### 2- Rank Hazardous Events and Identify CCP's

From the Risk Assessment Table ranking of the potential result of the hazard, the Risk Priority Numbers (RPN) ranged from 4 to 11 (out of a total max of 15).

An RPN Threshold Value of 6 was chosen from review of the Risk Table because the Critical Control Point minimum number is 6, with exceptions as shown of 4 and 5 considered in some cases. It should be noted that although all hazards were assigned RPNs, only Critical Control Points and hazards with control measures available have Standard Operating Procedures or Contingency Plan response procedures.

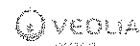
Potential hazards and events always considered critically hazardous to water quality are high turbidity, inadequate primary and secondary disinfection, and loss of or low system pressure. These have been taken into account in this assessment.

RPN numbers less than 6 will be further assessed on an on-going basis as annual Risk Assessment reviews take place, and additional Monitoring or Control Measures may be considered at that time. Also not all high ranking hazards have Critical Control Limits or Control Measures, and will be considered in Contingency Plans or future reviews as required.

File: C:\DWQMS\Huron-Kinloss\H-K-Whitechurch- 8 – Risk Assessment Outcomes

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**Risk Assessment Table Summary**

NOTE: A total 24 hazards were identified in the Risk Assessment Table – Appendix B2

CCP's (see additional details in Table below)

	<u>RPN</u>	<u>CONTROL</u>
Chemical feed system failure	6	SOP
Contamination of the chamber with improperly disinfected water	6	CP
Inadequate chlorine residual in distribution system	10	SOP
Loss of system pressure	5	CP

Not Considered CCP's (< 6 RPN)

	<u>RPN</u>	<u>CONTROL</u>
Well casing failure / Well head damage	5	SOP
Well pump failure	4	SOP
Low well levels	5	SOP
Chlorine Contact Chamber-out of service for mtce / repair	4	SOP
Commission of new mains	5	SOP
Non-functioning pressure sustaining and press. red. valves	4	SOP

Not all high ranking hazards have Critical Control Limits or Control Measures. A summary of results from the risk assessment is shown below.

Additional Potential Hazards or Hazardous Events Identified in the Risk Assessment ( >= 6 RPN)

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(Although assessed with RPNs equal to or greater than the threshold value these are not considered CCP's, or assessed as required to have formal Operator response plans because no control measures are available.)

Not Considered CCP's ( >= 6 RPN)

	<u>RPN</u>	<u>CONTROL</u>
Non CCPs >= 6		
Chemical spill	8	CP
Agricultural run-off	9	CP
Changes in aquifer water quality	7	SOP
Sodium silicate addition system problems	6	SOP
High flows	6	SOP
Degradation of liquid chlorine	7	SOP
Watermain break	9	SOP
Non-functioning isolation valves and hydrants	8	SOP
Failure to receive critical supply of parts or chemical	10	SOP
Power failure	6	SOP
Remote Transmitting Unit / Remote Processing Unit Failure	9	SOP
Communications / Telemetry lines failure	9	SOP
Primary power failure	6	SOP
Vandalism, introduction of contaminant	11	CP

The Operating Authority intends to document and implement Standard Operating Procedures (SOP's) for many of these potential hazards regardless of the RPN number. These are noted in the Risk Assessment Table.

A summary of Process Steps established from the Risk Assessment Table, as Critical Control Points (CCPs) with Critical Control Limits (CCLs) is shown in the Table below:

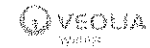
**3- Establishing Procedures for Deviations from Critical Control Limits**

Each CCP must have one or more documented response procedure to respond if a critical control limit is exceeded. These procedures are documented in the Operating Authority's Operations Manual or Contingency Plan (Emergency Response Plan – ERP).

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**SUMMARY OF CCP'S FROM RISK ASSESSMENT TABLE:**

Process Step	Description of Hazard	Result of Hazard	Monit. & Cont Meas.	Control Proc.	L	S	D	#	CCP ?	CCL	Contin.Plan
Primary Disinfection	Chemical feed system failure	-loss of disinfection -possible loss of water	-on-line monitoring and controls with auto pump lock-out -Operator response -automatic back-up feed system	-Operator response -maintain spare parts on site -refer to SOP -routine preventative maintenance	2	3	1	6	YES		-Prepare procedure -Boil Water Procedure -0.2 mg/L free chlorine -chlorine alarm sounds and well pump locks out -operator response
Chlorine Contact Chamber	Contamination of the chamber with improperly disinfected water	-improperly disinfected water entering the distribution system	-online chlorine analyzers -alarms -operator observation	-Operator response -refer to procedure	3	2	1	6	YES	-less than 0.2 mg/L free chlorine	Need procedure Part of Emergency Response Procedure
Secondary Disinfection	inadequate chlorine residual in distribution system	-potential biological contamination	-on-line monitoring and controls of primary disinfection -chlorine residual at point of entry to distribution system -daily residual from distribution system	-Operator response -increase chemical dosage -routine flushing of dead-ends -refer to Operations Manual SOP	5	2	3	10	YES	-less than 0.2 mg/L free chlorine in distribution	Review / Amend Procedure Part of Emergency Response Procedure -As provided by Nancy
Distribution	Loss of system pressure	-potential chemical or biological contamination -backflow from private plumbing	-monitoring of system pressure	-consumer complaint -precautionary boil water notice -refer to SOP	2	2	1	5	YES	Table provided by Nancy for pressure limits	Part of Emergency Response Procedure -as provided by Nancy

Note: Primary Disinfection and Distribution have been added as minimum Critical Control Points, although not originally assessed as such.

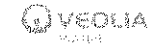
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Township of Huron-Kinloss



Veolia Water Canada

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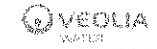
**APPENDIX B 2: RISK ASSESSMENT TABLE ( from Team Meeting June 11, 2008 ) Wells #1 & #2**

Process Step	Description of Hazard	Potential Result of Hazard	Available Monitoring and Control Measures	Control Procedure	Likelihood	Severity	Detectability	Risk Priority Number - RPN	CCP ?	Critical Control Limits	Contingency Plan
Raw Water / Well	Well casing failure / Well head damage	-Loss of raw water -potential biological / chemical contamination	-finished water on-line turbidity testing -weekly samples for microbiological testing -monthly monitoring and raw water turbidity testing -redundancy back-up well	-shut down the affected well -refer to SOP	2	2	1	5	N	None	Need procedure SOP

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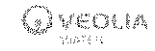
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Process Step	Description of Hazard	Result of Hazard	Monit. & Cont Meas.	Control Proc.	L	S	D	#	CCP ?	CCL	Contin.Plan
Raw Water / Well	Well pump failure	-loss of raw water	-alarm system -redundancy back-up well	-Operator response -shut down the affected well -refer to SOP	2	1	1	4	N	None	Need Plan -develop SOP
Raw Water / Well	Chemical spill	-potential chemical contamination of aquifer	-monitoring weekly microbiological, -monthly turbidity -36 month chemical testing -Operator observation -Customer complaint -well head protection plan	-refer to contingency plan -Operator response	1	5	2	8	N	None	Part of Emergency Response Plan

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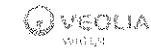
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Process Step	Description of Hazard	Result of Hazard	Monit. & Cont Meas.	Control Proc.	L	S	D	#	CCP ?	CCL	Contin.Plan
Raw Water / Well	Agricultural run-off	-potential biological / chemical contamination of aquifer	-monitoring - weekly microbiological, -monthly turbidity -quarterly chemical testing -36 month chemical testing -Operator observation -Customer complaint -well head protection plan	-Operator response -refer to SOP	2	3	4	9	N	None	-Water Quality Monitoring -Prepare procedure Part of Emergency Response Procedure
Raw Water / Well	Low well levels	-loss of water	-monitoring well levels weekly -trending	-Operator response -refer to SOP	1	2	2	5	N	None	Prepare procedure - SOP

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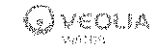
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Process Step	Description of Hazard	Result of Hazard	Monit. & Cont Meas.	Control Proc.	L	S	D	#	CCP ?	CCL	Contin.Plan
<b>Additional Treated Water Quality Exceedences</b>	Changes in aquifer water quality	-potential chemical contamination -restrictions on water use	-monitoring -advise health unit as required	Refer to SOP	1	2	4	7	N	None	SOP for adverse
<b>Primary Disinfection</b>	Chemical feed system failure	-loss of disinfection -possible loss of water	-on-line monitoring and controls with auto pump lock-out -Operator response -automatic back-up feed system	-Operator response -maintain spare parts on site -refer to SOP -routine preventative maintenance	2	3	1	6	YES		-Prepare procedure -Boil Water Procedure -0.2 mg/L free chlorine -chlorine alarm sounds and well pump locks out -operator response
<b>Iron Sequestering</b>	Sodium silicate addition system problems	Insufficient or excess sodium silicate addition provides potential chemical hazard	-Operator inspection -consumer complaints	-Operator response	1	2	2	5	N	None	Procedure required

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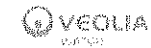
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Process Step	Description of Hazard	Result of Hazard	Monit. & Cont Meas.	Control Proc.	L	S	D	#	CCP ?	CCL	Contin.Plan
Primary Disinfection	High flows	-insufficient chlorine contact time -possible loss of water	-on-line monitoring and controls -Operator inspection, response, and repair -calculation of CT	-Operator response -control access to hydrants	2	2	1	5	N		-SOP procedure required -0.2 mg/L. free chlorine resid. -chlorine alarm sounds and well pump locks out -operator response
Primary Disinfection	Degradation of liquid chlorine	-improper disinfection	-on-line monitoring and controls -Operator response -refer to SOP	-Operator response -refer to test method -spare chlorine kept on site -increase chemical dosage	2	4	1	7	N		-refer to test method procedure -less than 8% -SOP req'd
Chlorine Contact Chamber	Out of service for maintenance / repair	-inadequate contact time for primary disinfection	-increase dosage rate -redundant- alternate water source (tanker)	-limit flows -increase chlorine residual at point of entry	1	2	1	4	N	None	<i>PROCEDURE TO BE DEVELOPED</i>

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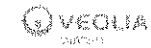
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<b>Chlorine Contact Chamber</b>	Contamination of the chamber with improperly disinfected water	-improperly disinfected water entering the distribution system	-online chlorine analyzers -alarms -operator observation	-Operator response -refer to procedure	3	2	1	6	YES	-less than 0.2 mg/L free chlorine	Need procedure Part of Emergency Response Procedure
<b>Secondary Disinfection</b>	inadequate chlorine residual in distribution system	-potential biological contamination	-on-line monitoring and controls of primary disinfection -chlorine residual at point of entry to distribution system -daily residual from distribution system	-Operator response -increase chemical dosage -routine flushing of dead-ends -refer to Operations Manual SOP	5	2	3	10	YES	-less than 0.2 mg/L free chlorine in distribution	Review / Amend Procedure Part of Emergency Response Procedure -As provided by Nancy

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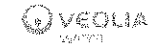
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Process Step	Description of Hazard	Result of Hazard	Monit. & Cont Meas.	Control Proc.	L	S	D	#	CCP ?	CCL	Contin.Plan
Distribution	Watermain break	-loss of system pressure - potential biological contamination of distributed water -property damage	-alarm -Operator response / observation -consumer complaint	-Operator response -refer to SOP (Operations Manual)	4	2	3	9	N	None	Review / Amend procedure -need SOP
Distribution	Commission of new mains	-potential contamination	-daily sampling and monitoring -Operator response -system maintenance and repair	-Disinfection procedure -refer to SOP	3	1	1	5	N	None	Procedures in place -amend / review SOP
Distribution	Loss of system pressure	-potential chemical or biological contamination -backflow from private plumbing	-monitoring of system pressure	-consumer complaint -precautionary boil water notice -refer to SOP	2	2	1	5	Yes	Table provided by Nancy for pressure limits	Part of Emergency Response Procedure -as provided by Nancy

File: C:\DWQMS\Huron-Kinloss\H-K-Whitechurch- APPENDIX B 2 – Risk Assessment Table

Rev. Level:	Date:	Change:	By:	Approved By:
Initial Release	Apr. 20, 2009	Release	DC Scott –QMS Rep.	Laurie Cox - Veolia PM / ORO

Note: To be reviewed annually or when a QMS change occurs.



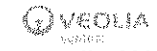
DWQMS Operational Plan  
WHITECHURCH

Process Step	Description of Hazard	Result of Hazard	Monit. & Cont Meas.	Control Proc.	L	S	D	#	CCP ?	CCL	Contin.Plan
Distribution	Non-functioning isolation valves and hydrants	-unable to isolate -no access to fire protection -loss of water	-annual exercise -annual inspection -regular maintenance	-Operator response -refer to SOP	4	1	3	8	N	None	Amend procedure
Distribution	Non-functioning pressure sustaining valves and pressure reducing valves	-loss of water pressure -high pressure breaks -no access to fire protection	-alarms -consumer complaints	-operator response -interconnection valve with Kincardine	1	2	1	4	N	None	Refer to Kinc. Procedure SOP Req'd
Suppliers	Failure to receive critical supply of parts or chemical	-unable to treat water adequately -failure of equipment	-written communication and agreements with suppliers -NSF and CofA requirement on site -redundancy of equipment	-Operator response -alternate source -critical spare parts available	4	3	3	10	N	None	<i>PROCEDURE REQ'D FOR LISTING SPARE PARTS AND CRITICAL QUANTITIES OF CHEMICALS</i>

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DWQMS Operational Plan  
WHITECHURCH

Process Step	Description of Hazard	Result of Hazard	Monit. & Cont Meas.	Control Proc.	L	S	D	#	CCP ?	CCL	Contin.Plan
Control Systems	Power failure	-loss of SCADA -loss of pumps, water pressure, and supply	-UPS -back-up disks, memory stick -propane back-up generator with auto transfer switch at Municipal office	-Operator response -stand-by genset for SCADA PC	3	2	1	6	N	None	Develop procedure (gen set from Ripley)
Control Systems	Remote Transmitting Unit / Remote Processing Unit Failure	-loss of control of equipment -loss of communication and record keeping	-alarms -regular checks	-Operator response -spare components -refer to procedure	3	2	4	9	N	None	Need Procedure
Control Systems	Communications / Telemetry lines failure	-loss of operator monitoring and control	-alarms -regular checks	-operator response	5	2	2	9	N	None	Need SOP - purchase remote dialers -install phone lines
Entire System	Primary power failure	-loss of treated water supply	-back-up diesel generator with auto transfer (from Ripley) -UPS on SCADA PC -annual inspections	-Operator response -refer to SOP procedure	3	2	1	6	N	None	Review Procedure SOP

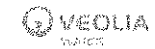
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Township of Huron-Kinloss



Veolia Water Canada

DWQMS Operational Plan  
WHITECHURCH

Process Step	Description of Hazard	Result of Hazard	Monit. & Cont Meas.	Control Proc.	L	S	D	#	CCP ?	CCL	Contin.Plan
Facility Security	-Vandalism, -introduction of contaminant	-damage to equipment -inability to produce treated water -potential contamination	-locks -daily checks -high visibility	-operator response -refer to procedure	1	5	5	11	N	None	Need Procedure -part of ERP
Emergency Preparedness											PROCEDURE REQ'D FOR EMERGENCY PROCEDURE FOR WATER SYSTEM- CONTACT #'S NAMES ETC.

Team Members: H-K – Tracey Howe, Hugh Nichol, Nicole Elliott  
Veolia – Laurie Cox, Nancy Mayhew, Wendy Gallant, Don Scott

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DWQMS Operational Plan  
WHITECHURCH

**APPENDIX I 1: SAMPLING, TESTING, AND MONITORING SUMMARY TABLE: (Ground Water System)**

PARAMETER						
Process step	Sampling or Monitoring Parameter and Frequency	Location	Quality Targets	Response	Challenging Conditions	Records
<u>Raw Water</u> -WELL LEVEL STATIC	MONTHLY level checks -static	Well #1 and #2	Flows & level: Operator responds to / reports significant changes in flows, levels or pressure	-Operator to note and respond to significant changes in readings or observations and note in Log Book	None known	Recorded in Log Book and log sheet
<u>Raw Water</u> -TURBIDITY	- MONTHLY grab sample testing from each well -turbidity	-collected at raw water tap	Turbidity: Observe trends, report significant change (of +/- .25 NTU)	-Operator to note and respond to significant changes in readings or observations and note in Log Book	-status of aquifer such as limestone flaking -well casing deterioration	Recorded in Log Book and log sheet
<u>Raw Water</u> MICRO-BIOLOGICAL	MONTHLY microbiological grab sample from each well  -E-coli -total coliform	-collected at raw water tap	-not detectable -not detectable	samples sent to outside lab for analysis and report	As above	-Operator records on Custody Sheets -results reported by outside lab to WTP

File: C:\DWQMS\Huron-Kinloss\H-K- Whitechurch - APPENDIX I 1 – Sampling, Testing, and Monitoring Summary Table

Rev. Level:	Date:	Change:	By:	Approved By:
Initial Release	Apr. 20, 2009	Release	DC Scott –QMS Rep.	Laurie Cox - Veolia PM / ORO
Rev. 1	Mar. 4, 2011	No Dist. Cl2 analyser, remove turbidity analyser	DC Scott –QMS Rep.	Laurie Cox - Veolia PM / ORO

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DWQMS Operational Plan  
WHITECHURCH

Process step	Sampling or Monitoring Parameter and Frequency	Location	Quality Targets	Response	Challenging Conditions	Records
<u>Treated Water</u> <b>CHLORINE RESIDUAL</b>  - Disinfection / Chlorination	- <u>ON-LINE / SCADA</u> Cl2 analyzer residual monitoring analysis  - <u>DAILY</u> grab sample Cl2 residual testing (free chlorine residuals)	point of entry treated tap	-Operational Goal is 0.90-1.10 mg/l	Operator to respond to significant changes in readings or observations and note in Log Book	-raw water quality changes	On-line SCADA record  Recorded in Log Book and log sheet
<u>Treated Water</u> <b>TURBIDITY</b>	Daily Operator checks	-point of entry to distribution system (treated tap)	-observe trends	Operator to respond to significant changes in readings or observations and note in Log Book	-raw water quality changes	On-line SCADA record  Recorded on log sheets only
<u>Treated Water</u> <b>NITRATE &amp; NITRITE</b>	<u>QUARTERLY</u> (every 3 mo)  -nitrate & nitrite testing	-point of entry (collected at treated water tap)	Per O.Reg 169/03  -MAC 10 mg/l (Operational Goal 5 mg/l) -MAC 1.0 mg/l (as nitrogen) (Operational goal 0.5 mg/l)	-samples sent to outside lab for analysis and report	Raw water quality	-Operator records on Custody Sheets -results reported by outside lab to WTP
<u>Treated Water</u> <b>INORGANICS</b>	<u>5 YEAR</u> intervals (every 60 mo)  Per schedule 23 of O.Reg. 170/03	-point of entry (collected at treated water tap)	As outlined in O.Reg 169/03 for parameters in sch. 23 of O.Reg. 170/03 (< 50% MAC Operational Goal)	-samples sent to outside lab for analysis and report	Raw water quality	-Operator records on Custody Sheets -results reported by outside lab

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DWQMS Operational Plan  
WHITECHURCH

Process step	Sampling or Monitoring Parameter and Frequency	Location	Quality Targets	Response	Challenging Conditions	Records
<u>Treated Water</u> <b>ORGANICS</b>	5 YEAR intervals (every 60 mo)  Per schedule 24 of O.Reg. 170/03	-point of entry (collected at treated water tap)	As outlined in O.Reg 169/03 for parameters in sch. 24 of O.Reg. 170/03  (< 50% MAC Operational Goal)	-samples sent to outside lab for analysis and report	Raw water quality	-Operator records on Custody Sheets -results reported by outside lab to WTP
<u>Treated Water</u> <b>SODIUM</b>	5 YEAR intervals (every 60 mo)  (Per schedule 23 of O.Reg. 107/03)	-point of entry (collected at treated water tap)	<20 mg/l (if above- advise MOH)  See also Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines	-samples sent to outside lab for analysis and report	Raw water quality	-Operator records on Custody Sheets -results reported by outside lab
<u>Treated Water</u> <b>FLUORIDE CONTENT</b>	5 YEAR intervals (every 60 mo)	- point of entry (treated water sample tap)	Operational goal is < 1.5 mg/l  (if above – call MOH)	-samples tested by Operator, records results, and advises MOH if above 1.5 mg/l	Raw water quality	Recorded in Log Book
<u>Treated Water</u> <b>BARIUM CONTENT</b>	<u>QUARTERLY</u> (every 3 mo)  -barium testing	- point of entry (treated water sample tap)	Operational goal is < 1 mg/l (MAC)  (if above – call MOH)	-samples sent to outside lab for analysis and report	Raw water quality	-Operator records on Custody Sheets -results reported by outside lab

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DWQMS Operational Plan  
WHITECHURCH

Process step	Sampling or Monitoring Parameter and Frequency	Location	Quality Targets	Response	Challenging Conditions	Records
<b>Treated Water</b> <b>HARDNESS</b>	<u>ON REQUEST</u> grab sample collected	-collected at treated tap	N/A See Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines	Operator to report result to ORO / CO to respond to Request	N/A	Recorded in Log Book
<b>Distribution System</b> <b>CHLORINE RESIDUAL</b>	- <u>DAILY</u> grab sample Cl2 residual testing (free chlorine residuals)	-household or business tap	-Operational Goal is > 0.2 mg/l  (and <2.0 mg/l)	Operator to respond as required and note in Log Book	-raw water quality changes	On-line SCADA record  Recorded in Log Book
<b>Distribution System</b> <b>MICRO-BIOLOGICAL</b>	<u>BI-WEEKLY</u> sample collection (every 2 weeks)  microbiological sample for -E-coli -total coliform -Heterotrophic Plate Count (HPC) bacteria plate count (25% HPC- distr.)	Distribution system per Weekly Bacti Sample Routes and Locations  (per SOP Sampling Schedule)	Operational Goals:  -E-coli- not detectable -Coliform-not detectable  -HPC steady baseline, no sudden change  Operational Goal ( (< 10 – plate count (colonies per ml) < 10- HPC plate count (colonies per ml) )	samples sent to outside lab for analysis and report	Raw water quality	-Operator records on Custody Sheets -results reported by outside lab to WTP

File: C:\DWQMS\Huron-Kinloss\H-K-Whitechurch - APPENDIX 11 – Sampling, Testing, and Monitoring Summary Table

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DWQMS Operational Plan  
WHITECHURCH

Process step	Sampling or Monitoring Parameter and Frequency	Location	Quality Targets	Response	Challenging Conditions	Records
<u>Distribution System</u> <b>TRIHALOMETHANES</b>	<u>QUARTERLY</u> (every 3 mo)  trihalomethane testing	-distribution system (collected at rotating distant points in the system)	MAC - 0.10 mg/l  (Ref. O.Reg 169/03)	-samples sent to outside lab for analysis and report	Raw water quality	-Operator records on Custody Sheets -results reported by outside lab
<u>Distribution System</u> <b>LEAD</b>  (see SOP also for lead Sampling Schedule )	<u>SEMI-ANNUALLY</u> (every 6 mo)  -lead testing	-distribution system- private plumbing, non-private plumbing, and distribution system samples (collected per Operations Manual Schedule)	0.10 mg/l  Per O.Reg 169/03	-samples sent to outside lab for analysis and report		-Operator records on Custody Sheets -results reported by outside lab

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