

### MINISTRY OF THE ENVIRONMENT

### CORPORATION OF THE NATION MUNICIPALITY VILLAGE OF ST-ISIDORE

Supply and Water Treatment System
Consolidated Certificate of Approval no. 2052-54FRY9
MOE Reference No. 8402-4XNGRM
Fulfillment of Upgrading Requirements – Section 5 of the
Certificate of Approval

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Village of St-Isidore - Water Treatment Plant

Consolidated Certificate of Approval no. 2052-54FRY9

Upgrading requirements for disinfection system / Condition 5.1 Hydrogeological study at

Wells no. 1, 2, 3 and 4

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### 1.0 Introduction

The purpose of the present report is to respond to conditions 5.1a) and 5.1b) of consolidated certificate of approval no. 2052-54FRY9 dated January 31<sup>st</sup>, 2002. A copy of this certificate is included in the report under Appendix I. Condition 5.1a) asks the Municipality to undertake a hydrological study that will verify whether or not the groundwater source at wells 1, 2, 3 and 4 are under the direct influence of surface water.

Whereas, condition 5.1b) suggests an alternative to condition 5.1a) that an engineer's report be submitted proposing the implementation of a chemically-assisted filtration or approved equal treatment process at the existing water treatment plant facility.

We shall demonstrate to the Ministry of the Environment Director, hereafter abrieviated to the Director, that condition 5.1a) is currently under progress and how the present water treatment process can be improved with simple modifications to the existing disinfection system regardless of whether or not the ground water source is under the direct influence of surface water. This shall eliminate the need for a costly chemically-assisted filtration process. This improvement of continuous disinfection will meet the disinfection requirements of the certificate of approval.

The above statement is based on our review of past and present water analysis records of the raw and treated water with respect to the present water treatment process.

### 2.0 Disinfection Requirements for Ground Water Source

The documents governing the requirements for disinfection systems for ground water sources are :

- . Section 5 of O.Reg. 506/01 (formerly O. Reg. 459/00), Ontario Drinking Water Protection Regulation, refer to Appendix II.
- Procedure B13-3 Chlorination of potable water supplies in Ontario, Section 2.1 refer to Appendix III.

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Note that section 5 (1) of O.Reg. 506/01 specifies that the minimum level of treatment for water from an underground source is disinfection using chlorine or other agents. The procedure B13-3 is a supporting document for O.Reg. 506/01, providing guidance for the use of chlorine for disinfection. Section 2.1b of the procedure, attached in Appendix III, specifies the conditions where disinfection requirements could be achieved with simple chlorination, without filtration, for an underground source under direct influence of surface water.

### These conditions are:

- A If the characteristics of the water source are suitable to avoid filtration.
- B if there is adequate watershed control to avoid filtration.
- C with respect to the above, the minimum level of treatment using a chlorine disinfection system can achieve 3 log reduction of giardia lamblia cysts and 4 log reduction of viruses.

The minimum level of treatment proposed will meet the disinfection requirements as determined by the Ministry of the Environment and governed by O.Reg. 506/01.

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### 3.0 Characteristics of the Water Source

### 3.1 Chemical/Physical Parameters

We have gathered and compiled the chemical/physical parameters of past and present raw water sample records taken from well no. 1 to 5 inclusively. Please refer to tables 1, 3 and 4 of Appendix IV.

Table 1 - Chemical/physical health-related parameters;

The results indicate that most of the parameters are non-detectable. The only parameters that could require filtration are turbidity and the potential for trihalomethane formation.

Table 3 - Radionuclides;

The results indicate that all wells meet the provincial standards.

Table 4 - Non-health related parameters;

The results here again indicate that the present water treatment process controls colour, hydrogen sulfide, iron and manganese which are within the provicial standards.

With respect to **turbidity**, the present water treatment process at the St-Isidore plant, which includes forced aeration, chemical oxydation and greensand filtration, reduces the turbidity to 0.2 NTU on average and was measured as low as 0.14 NTU on December 13<sup>th</sup>, 2001. The maximum acceptable limit for turbidity is 1.0 NTU.

Therefore, chemically-assisted filtration, using a coagulant, will not significantly improve the water quality, since turbidity and colour are already very low and within provincial standards.

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Futhermore, a coagulant is more effective on surface water, where colour could be as high as 60 TCU and turbidity can be as high as 16 NTU. The coagulant process would also result in massive sludge production that would eventually overload the present greensand filter residue disposal system.

With respect to potential formation of trihalomethane (THM's), the results reported last year indicate a concentration of 0.0505 mg/L on average. This concentration is lower than the maximum acceptable concentration of 0.100 mg/L on an annual basis. However, the THM concentration was above the standard in November 2001 because of a momentarily higher than normal dosage of chlorine. The THM's could be reduced by using potassium permanganate as the prime oxydant instead of chlorine which is presently used. Since potassium permanganate is an oxydant chemical stronger than chlorine (i.e. sodium hypochloride), this change will result with a lower chlorine dosage for final disinfection, which will consequently reduce the potential formation of trihalomethanes in the treated water.

### 3.2 Microbiological Parameters of raw water, except Clostridium Perfringens

The results of microbiological parameters of raw water samples which were analysed from 1999 to 2001 are summarized in the tables included in Appendix V, as well as a copy of the result sheets for wells no. 1 2, 3 and 4 for the period between September 28<sup>th</sup> and November 1<sup>st</sup>, 1999.

The original copy of the laboratory analytical result sheets for the period covering the years 2000 and 2001 was submitted to the Director under a separate report dated December 3<sup>rd</sup>, 2001.

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Results indicate that wells no. 1, 2 and 3 have a very low level of contamination from fecal coliform and total coliform over a long period of time, except during the months of September and October 1999 where higher concentrations were reported. It appears that during this period, heavy rainfall was the cause of higher concentrations of coliform present in the aquifer. Since October 1999, no contamination of this nature has occurred as confirmed by the results.

From previous studies conducted on the St-Isidore wells, it was determined in 1997 that well no. 4 was contaminated with E-Coli bacteria from surface water. The well has since been shut down permanently.

Needless to say that wells no. 1, 2, 3 and 4 are under the direct influence of surface water.

### 3.3 Clostridium perfringens counts

Appendix VI includes copies of laboratory analytical result sheets for the period between April 1997 and December 2001 for Clostridium perfringens (Giardia cyst indicator). The sampling of the raw water was done at the junction point where wells no. 1, 2, 3 and 4 interconnect. Note that results for well no. 5 raw water are available only for the period between June to December 2001.

The results indicate no positive Clostridium perfringens count, even during the fall of 1999 where an episode of bacteria contamination was reported at wells no. 1, 2 and 3.

We can conclude that Giardia cysts are not present in the St-Isidore undergound water source, even though this source seems to be under the direct influence of surface water.

### 4.0 Watershed Control

The Nation Municipality is participating with other municipal authorities of Eastern Ontario in a well head protection area study managed by the Raisin Region Conservation Authority. The terms of reference of this study as well as the name of the contact person is included under Appendix VIII.

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This study will, in part, undertake a detailed review of the five St-Isidore wells discussed previously and will make recommendations as to measures that need to be applied to prevent biological and chemical contamination of underground water sources which are under the direct influence of surface water. The study will establish a delineation of the wellhead protection areas assisted with the ground water source in accordance with the « Protocal for Delineation of Wellhead Protection Areas for Municipal Groundwater Supply Wells under Direct Influence of Surface Water ». It will also provide a description of the proposed wellhead protection measures satisfactory to the Director and will therefore address condition 5.1a).

### 5.0 Status of Chemically-assisted Filtration

The consultant considers that the Giardia cyst and viruses inactivation requirements can be achieved by simple disinfection at the St-Isidore water treatment plant, since:

Raw water characteristics do not justify the use of chemicallyassisted filtration, since turbidity, colour and organic matter within raw water are already low enough and properly treated with the present aeration and greensand filtration process.

The municipality will provide adequate watershed protection, following the conclusions of a hydrogeological study to be undertaken this spring.

Therefore, the disinfection process should be reviewed in order to achieve the Giardia and viruses removal requirements by using the proper chlorine dosage. Protection measures for the wells, when made available at a later date, will be submitted to the Director. Village of St-Isidore – Water Treatment Plant Consolidated Certificate of Approval no. 2052-54FRY9 Upgrading requirements for disinfection system / Condition 5.1 Hydrogeological study at Wells no. 1, 2, 3 and 4

### 6.0 Review of Disinfection Process

### 6.1 Parameters Affecting Disinfection Process

The temperature and pH of the raw water are the two major physical parameters which affect the disinfection process. These parameters are utilized in procedure B13-3 to determine the inactivation rate for Giardia cysts and viruses. In general, when a high temperature and low pH are present, the more efficient the disinfection process becomes. The typical values of temperature and pH measured at the St-Isidore water treatment plant are as follows:

Parameter			vater at ls no.		Combined Treated	Raw Water at
	1	2	3	4	Water	Well no. 5
PH-1998	8.1	8.71	8.09	7.58		7.70
pH Fall 2000	8.17	8.66	8.19	8.03	7.8	8.19

Parameter	Combined Treated Water	Raw Water at Well no. 5
Temperature		
Minimum (°C)	6.9	8
Average (°C)	9.5	10
Maximum (°C)	12.1	12

The above values indicate that the disinfection process at the St-Isidore plant would have to be capable of providing a higher contact time and/or chlorine residual and/or pH adjustment during the winter compared to summer in order to achieve a relatively constant disinfection efficiency rate throughout the year.

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### 6.2 Disinfection process with present raw water characteristics

The following table illustrates extreme conditions of log inactivation for Giardia cysts and viruses by final disinfection during winter and summer periods, assuming no pH adjustment and inactivation of viruses with the injection of simple chlorine.

### Verification of CT Disinfection for Giardia Cyst before First Consumer without pH ajustment

PARAMETER		Wells no. 1, 2,	3 and 4
Raw water temperature (°C)	6.9	10	12.1
pH (after aeration)	8.0	7.8	7.5
Free chlorine residual at first			
consumer (mg Cl/L)	2.2	1.7	7.5
Clearwell (two compartments)			
Minimum volume (m³)	64	64	64
T <sub>10</sub> / T ratio	0.5	0.5	0.5
Maximum flowrate (L/s)	8.7	8.7	8.7
T (min.)	61.3	61.3	61.3
Connecting Main			
Flowrate (L/s)	8.83*	8.83*	8.83*
Diameter (mm)	150	150	150
Distance to first consumer (m)	1250	1250	1250
T <sub>10</sub> / T ratio	1.0	1.0	1.0
T (min.)	41.7	41.7	41.7
Total T (min.)	103	103	103
Total CT prior to first consumer	226	175	124
(mg Cl/L*min)			
Corresponding log inactivation for	3.1	3.2	3.1
Giardia cyst by final disinfection**			

\*Note: The maximum flow through the connecting main is occurring when two

(2) high lift pumps are in operation.

\*\*Note: Minimum requirement for groundwater supply under the influence of

surface water = 3.0 log inactivation of Giardia cysts.

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### Verification of Log Inactivation of Viruses

PARAMETER	Wells no. 1, 2, 3 and 4						
Temperature (°C)	6.9	10	12.1				
pН	8.0	7.8	7.5				
Free chlorine residual at first consumer(mg Cl/L)	2.2	1.7	1.2				
Time (min.)	103	103	103				
CT (mg Cl/L*min)	227	175	124				
Log inactivation	>10	>10	>10				

### \*Note: Minimum inactivation requirement for viruses = 2.0

The free chlorine residual at the first consumer varies widely between 1.2 mg Cl/L in summer to 2.2 mg Cl/L in winter. By comparison, the average free chlorine residual was 1.25 mg Cl/L in 2000 and 1.59 mg Cl/L in 2001.

It is important to note that the present disinfection process can achieve the log inactiviation requirements of Giardia cysts and viruses by increasing the free chlorine residual at the first consumer to 2.2 mg CI/L all year long.

### 6.3 Control of Potential THM formation

To minimize the formation of disinfection by-products such as THM's, potassium permanganate will have to be used as primary oxydant instead of sodium hypochlorite. The results of this modification are the following:

- lower dosage of chlorine at final disinfection
- lower chemical count
- lower potential trihalomethane formation rate

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### 7.0 Proposed Modifications to the Water Disinfection Process

The plant operator should be capable of providing and maintaining a free chlorine residual at the first consumer of 2.2 mg Cl/L by adjusting the concentration of sodium hypochlorite at the final disinfection stage. This change does not require a modification to the certificate of approval.

Futhermore, potassium permanganate should be used as the primary oxydant. A potassium permanganate feed system should be provided in accordance to the certificate of approval. Please refer to page 2 in Appendix I.

### 8.1 Summary and Conclusion

The St-Isidore water treatment plant's consolidated certificate of approval no. 2052-54FRY9 dated January 31<sup>st</sup>, 2002, stated that the Nation Municipality shall undertake a hydrogeological study at wells no. 1 to 4, in order to determine whether these wells are under the direct influence of surface water. Should this be the case, then the Ministry would recommend to implement chemically-assisted filtration or an equivalent treatment. Two conditions have to be fullfilled at the satisfaction of the MOE to avoid chemically-assisted filtration:

- that the water source is of adequate quality
- that there is adequate watershed control

After review of microbiological data, the consultant concludes that these wells are under the influence of surface water. Total and Fecal coliforms have been detected in September and October 1999. No Giardia cysts have ever been detected. The consultant recommends that the Municipality use potassium permanganate as primary oxydant and adjust the concentration of sodium hypochlorite at the final disinfection stage. This is based on the following reasons:

- -Since the raw water has low turbidity and colour, the consultant is in the opinion that a chemically-assisted filtration process will not significantly improve the water quality.
- -Watershed control will be provided by the Municipality following the recommendations of a hydrogeological study undertaken this spring. Specific protection measures will be submitted to the Director when available.

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The consultant recommends to achieve Giardia Cyst inactivation with simple chlorine disinfection, by maintaining a chlorine residual of 2.2 mg Cl/L at the first consumer.

As well, potassium permanganate should be used as the prime oxydant instead of sodium hypochlorite. This modification can take place immediately since the feed equipment is already part of the certificate of approval. This change will maintain the potential trihalomethane formation concentration below the provincial standard within the water distribution system.

These measures can be applied immediately and at minimal cost to the Municipality.

Prepared by:

LECOMPTE ENGINEERING LTD.

Jean Hébert, P.Eng.

April 29, 2002

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Parameter	Combined Treated Water	Raw Water at Well no. 5
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Average (°C)	9.5	10
Maximum (°C)	12.1	12

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consumer (mg Cl/L)	2.2	1.7	7.5
Clearwell (two compartments)			
Minimum volume (m³)	64	64	64
T10 / T ratio	0.5	0.5	0.5
Maximum flowrate (L/s)	8.7	8.7	8.7
T (min.)	61.3	61.3	61.3
Connecting Main			
Flowrate (L/s)	8.83*	8.83*	8.83*
Diameter (mm)	150	150	150
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Giardia cyst by final disinfection**			

\*Note:

The maximum flow through the connecting main is occurring when two

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Minimum requirement for groundwater supply under the influence of

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### Verification of Log Inactivation of Viruses

PARAMETER	Wells no	. 1, 2, 3 and	14
Temperature (°C)	6.9	10	12.1
pH	8.0	7.8	7.5
Free chlorine residual at first consumer(mg Cl/L)	2.2	1.7	1.2
Time (min.)	103	103	103
CT (mg Cl/L*min)	227	175	124
Log inactivation	>10	>10	>10

### \*Note: Minimum inactivation requirement for viruses = 2.0

The free chlorine residual at the first consumer varies widely between 1.2 mg Cl/L in summer to 2.2 mg Cl/L in winter. By comparison, the average free chlorine residual was 1.25 mg Cl/L in 2000 and 1.59 mg Cl/L in 2001.

It is important to note that the present disinfection process can achieve the log inactiviation requirements of Giardia cysts and viruses by increasing the free chlorine residual at the first consumer to 2.2 mg CI/L all year long.

### 6.3 Control of Potential THM formation

To minimize the formation of disinfection by-products such as THM's, potassium permanganate will have to be used as primary oxydant instead of sodium hypochlorite. The results of this modification are the following:

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The plant operator should be capable of providing and maintaining a free chlorine residual at the first consumer of 2.2 mg Cl/L by adjusting the concentration of sodium hypochlorite at the final disinfection stage. This change does not require a modification to the certificate of approval.

Futhermore, potassium permanganate should be used as the primary oxydant. A potassium permanganate feed system should be provided in accordance to the certificate of approval. Please refer to page 2 in Appendix I.

### 8.1 Summary and Conclusion

The St-Isidore water treatment plant's consolidated certificate of approval no. 2052-54FRY9 dated January 31<sup>st</sup>, 2002, stated that the Nation Municipality shall undertake a hydrogeological study at wells no. 1 to 4, in order to determine whether these wells are under the direct influence of surface water. Should this be the case, then the Ministry would recommend to implement chemically-assisted filtration or an equivalent treatment. Two conditions have to be fullfilled at the satisfaction of the MOE to avoid chemically-assisted filtration:

- that the water source is of adequate quality
- that there is adequate watershed control

After review of microbiological data, the consultant concludes that these wells are under the influence of surface water. Total and Fecal coliforms have been detected in September and October 1999. No Giardia cysts have ever been detected. The consultant recommends that the Municipality use potassium permanganate as primary oxydant and adjust the concentration of sodium hypochlorite at the final disinfection stage. This is based on the following reasons:

- -Since the raw water has low turbidity and colour, the consultant is in the opinion that a chemically-assisted filtration process will not significantly improve the water quality.
- -Watershed control will be provided by the Municipality following the recommendations of a hydrogeological study undertaken this spring. Specific protection measures will be submitted to the Director when available.

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The consultant recommends to achieve Giardia Cyst inactivation with simple chlorine disinfection, by maintaining a chlorine residual of 2.2 mg Cl/L at the first consumer.

As well, potassium permanganate should be used as the prime oxydant instead of sodium hypochlorite. This modification can take place immediately since the feed equipment is already part of the certificate of approval. This change will maintain the potential trihalomethane formation concentration below the provincial standard within the water distribution system.

These measures can be applied immediately and at minimal cost to the Municipality.

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Jean Hébert, P.Eng.

April 29, 2002

APPENDIX I



**Ministry** of the **Environment l'Environnement** 

**Ministère** de

CERTIFICATE OF APPROVAL MUNICIPAL AND PRIVATE WATER WORKS **NUMBER 2052-54FRY9** 

The Corporation of the Municipality of The Nation

Rural Route. 3 Casselman, Ontario,

**KOA 1MO** 

Site Location: St-Isidore Water Treatment Plant

Lot 22, Concession XI

The Nation Municipality, United Counties of Prescott and Russell

You have applied in accordance with Section 52 of the Ontario Water Resources Act for approval of:

Groundwater supply system serving the Village of St-Isidore, part of the Municipality of the Nation, consisting of five (5) wells at a rated capacity of 907 m<sup>3</sup>/d and consisting of the following:

### <u> Well No.1:</u>

A 150 mm diameter, 17.4 m deep drilled groundwater production well, located on along Caledonia Concession Road No.2 (Mainville Road), Lot 20, Concession X (NAD 27: Zone 18, UTM Co-ordinates Easting - 509055.00 m and Northing - 5023980.00 m) consisting of a submersible pump with a rated capacity of 4.2 L/s at 38 m total dynamic head (TDH), 50 mm diameter discharge piping into the water treatment plant, magnetic flowmeter, emergency discharge line, well monitoring system, SCADA system, service building, underground piping and site work.

### Well No.2:

A 200 mm diameter, 22.3 m deep drilled groundwater production well, located on along Caledonia Concession Road No.2 (Mainville Road), Lot 19, Concession XI (NAD 27: Zone 18, UTM Co-ordinates Easting - 509540.00 m and Northing - 5023920.00 m) consisting of a submersible pump with a rated capacity of 3.1 L/s at 53 m TDH, 50 mm diameter discharge piping into the water treatment plant, magnetic flowmeter, emergency discharge line, well monitoring system, SCADA system, service building, underground piping and site work.

### Well No.3:

A 200 mm diameter, 19.2 m deep drilled groundwater production well, located on along Caledonia Concession Road No.2 (Mainville Road), Lot 17, Concession XI (NAD 27: Zone 18, UTM Co-ordinates Easting - 510190.00 m and Northing - 5023900.00 m) consisting of a submersible pump with a rated capacity of 1.3 L/s at 26 m TDH, 50 mm diameter discharge piping into the water treatment plant, magnetic flowmeter, emergency discharge line, well monitoring system, SCADA system, service building, underground piping and site work.

### Well No.4:

A 200 mm diameter, 29.9 m deep drilled groundwater production well (not in use), located on along Caledonia Concession Road No.2 (Mainville Road), Lot 22, Concession XI (NAD 27: Zone 18, UTM Co-ordinates Easting – 508470.00 m and Northing – 5023950.00 m) consisting of a submersible pump with a rated capacity of 1.9 L/s at 59 m TDH, 50 mm diameter discharge piping into the water treatment plant, magnetic flowmeter, emergency discharge line, well monitoring system, SCADA system, service building, underground piping and site work.

### ■ Water Treatment Plant:

- A water treatment plant to treat water from Wells No. 1 to 4 located on Lot 22, Concession XI, in the Municipality of the Nation (NAD 27: Zone 18, UTM Co-ordinates Easting 508450.00 m, Northing 5023950.00 m) with a rated capacity of 8.7 L/s (752 m<sup>3</sup>/d) consisting of 189 m<sup>2</sup> enclosure building housing the following:
- An aeration tower, 1372 mm in diameter, 3289 mm high having a maximum treatment capacity of 12.7L/s. The aeration tower is complete with an air blower (1250 CFM 35.4 m³/h air flowrate, 46 mm static pressure, 1HP, 230v/1ph/60Hz) discharging air 4.7 m above the ground level.
- A potassium permanganate feed system which includes two (2) feed pumps with automatic switchover, each having a capacity of 0.63 L/h and one (1) 200 L capacity solution tank with an injection point between the aeration tower and the contact chamber.
- A contact chamber that is 2.8 m X 1.83 m X 0.89 m and 4.57 m<sup>3</sup>, complete with 150 mm diameter overflow, baffles, bypass pipe to clearwell, control float and ultrasonic transducer.
- Two (2) transfer pumps, each having a maximum capacity of 13.14 L/s (47.3 m³/h) at a TDH of 7.6 m, complete with a 1.5 kW (2HP) 230v/3ph/60Hz variable speed motor. The flowrate is adjusted to maintain a constant water level at the contact chamber.
- Two (2) greensand filters, 1830 mm diameter, each divided into two equal size compartments having 203 mm of anthracite (0.30 to 0.35 mm effective size, uniformity coefficient < 1.7), 610 mm of greensand (0.30 to 0.35 effective size, uniformity coefficient < 1.6) having a design filtration rate of 5.95 m/h and equipped with automatic electrically actuated valves.
- One submersible backwash pump that has a capacity of 13.6 L/s (215 USGPM) at a total dynamic head of 8.5 m (28 feet), 2.23 kW (3HP) 230/1ph/60Hz, 3600 RPM, capable of a backwash rate of 37.3 m/h, complete with discharge piping and valving facilities.

### Backwash water disposal system:

- One 7,200 L balancing tank, complete with two submersible transfer pumps both having a capacity of 2.77 L/s (44 USGPM) at 10 m TDH, 230v/1ph/60Hz, 0.3 HP.
- One 7,200 L septic tank (for backwash disposal).
- An above-ground infiltration bed made of four 19 m long perforated 100 mm diameter pipes.

- (iv) A summary of records made under Condition 2.1 related to flow rate exceedances, and a summary of analytical results of sampling required by the certificate, including raw water and in-process parameters as specified in the operations manual in accordance with Condition 3.10; and
- (v) A summary listing treatment chemicals used, including average dosage rates with special reference to any abnormal usages.
- (d) The Compliance Report shall be signed by a person designated by the Council of the municipality that owns the works.
- (e) Within three months of completion of the Compliance Report, the Owner shall confirm by a resolution of council that the Compliance Report has been presented to council.
- (f) The Owner shall ensure that copies of the Compliance Report are available for inspection by any member of the public during normal business hours without charge and at the same location as that required by s.11 of O.Reg. 459/00 for reports under that regulation. Each 4<sup>th</sup> quarter report required under section 12 of that regulation shall include information about when the Compliance Report is required to be completed, an outline of the requirements for its contents, and the location where the completed report can be inspected.

### 5. UPGRADING REQUIREMENTS

5.1 (a) The Owner shall ensure that a hydrogeological study is undertaken for Wells No. 1, 2, 3, and 4 to establish whether or not the groundwater source is under the direct influence of surface water, and that an appropriate report is submitted to the Director.

The study shall be undertaken and the necessary report prepared in accordance with "Terms of Reference for Hydrogeological Study to Examine Groundwater Sources Potentially under Direct Influence of Surface Water" available from the Ministry. Two (2) copies of the hydrogeological study report shall be submitted to the Director by April 30, 2002.

Where the undertaken hydrogeological study concludes that there is a direct influence of surface waters and further concludes that, despite the influence, a requirement for filtration may not be warranted, and the Owner does not wish to provide filtration, the Owner shall prepare and submit to the Director, along with the application for approval of the physical improvements required by Condition 5.2, a delineation of the wellhead protection areas associated with the groundwater source, prepared in accordance with the "Protocol for Delineation of Wellhead Protection Areas for Municipal Groundwater Supply Wells under Direct Influence of Surface Water" available from the Ministry, and a description of the proposed wellhead protection measures satisfactory to the Director.

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- (b) As an alternative to submitting the report required by clause 5.1(a) above, the Owner may choose to submit a proposal to provide full treatment consisting of chemically assisted filtration and continuous disinfection or an equivalent treatment process. Such proposal shall be submitted to the Director by April 30, 2002.
- 5.2 Subject to Condition 5.3 below, by **December 31, 2002**, the Owner shall implement the following physical improvements to the works, in keeping with recommendations of the Engineers' Report and related correspondence:
  - (a) All works and measures necessary to meet requirements of the "Procedure B13-3 Chlorination of Potable Water Supplies in Ontario".
  - (b) All works and measures necessary to ensure the effective treatment and integrity of the works, including but not limited to:
    - (i) Provide a second sodium hypochlorite solution tank for the water treatment system.
    - (ii) Provide well protection with steel bollards and extend well casing to a minimum 300 mm above existing grade to Well No. 5.
- 5.3 The Owner shall not construct or allow the construction of any portion of the works necessary to comply with the requirements of Condition 5.2 above for which an approval under the Ontario Water Resources Act or the Environmental Protection Act is required unless a complete application for approval of such portion of the works, including detailed design drawings, specifications and a design brief containing detailed design calculations, has been submitted to and approved by the Director.
- 5.4 The Owner shall ensure that a complete application for approval under Section 52 of the Ontario Water Resources Act, and if necessary, under Section 9 of the Environmental Protection Act, is submitted to the Director for each item listed in Condition 5.2 above for which an approval is required at a date which will allow the Owner to obtain approval for the required physical upgrades to the works, and implement the upgrades on or before the compliance date stipulated in Condition 5.2 above.
- 5.5 The Owner shall submit to the Director complete raw water characterization data, specifically 2,3,4,6-tetrachlorophenol, and trichloroethylene, as required by the Terms of Reference for Engineers' Reports for Water Works, dated January 2001, as soon as it is available and not later than the date of submission of application for approval for physical improvements identified in Condition 5.2
- 5.6 The Owner shall ensure that the design of the proposed physical improvements is based on the complete raw water characterization data.

**APPENDIX II** 

Document updated: December 19, 2001

Ontario Regulation 505/01, Drinking Water Protection – Smaller Water Works Serving Designated Facilities, is complementary to O. Reg. 459/00. It is appropriate to amend the title of the latter to avoid possible confusion and accentuate the complementary relationship.

reg2001.0539.e 2-DB

ONTARIO REGULATION 506/01 made under the ONTARIO WATER RESOURCES ACT

Amending O. Reg. 459/00 (Drinking Water Protection)

Note: Ontario Regulation 459/00 has not previously been amended.

1. The title to Ontario Regulation 459/00 is revoked and the following substituted:

Drinking Water Protection - Larger Water Works

(5) The Director may issue a Notice of Interim Approval for analysis for the microbiological parameters listed in Table A of Schedule 2 to a laboratory that,

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- (a) is a member in good standing of the Canadian Association for Environmental Analytical Laboratories;
- (b) has passed the Canadian Association for Environmental Analytical Laboratories Proficiency Testing studies for the microbiological parameters listed in Table A of Schedule 2; and
- (c) has completed the Canadian Association for Environmental Analytical Laboratories Initial or Abbreviated On-Site Assessment addressing the methods specific to those microbiological parameters.
- (6) Until October 31, 2000, every laboratory for which a Notice of Interim Approval has been issued under subsection (5) and not revoked shall be deemed to be an accredited laboratory for the microbiological parameters listed in Table A of Schedule 2.

### **APPLICATION**

- 3. (1) This Regulation applies to every water treatment or distribution system that includes a water works for which an approval would be required if the water works were established on or after August 8, 2000.
- (2) Despite subsection (1), this Regulation does not apply to a water treatment or distribution system that obtains all of its water from another water treatment or distribution system to which this Regulation does apply, unless,
  - (a) the system that obtains the water is owned or operated by a municipality or by the Ontario Clean Water Agency;
  - (b) the system that obtains the water supplies water to a municipality or the Ontario Chain Water Agency; or
  - (c) the system that obtains the water rechlorinates or otherwise treats the water.
- (3) Despite subsection (1), this Regulation does not apply to a water treatment or distribution system that supplies 50,000 litres of water or less on at least 88 days in every 90-day period, unless the system serves more than five private residences.
- (4) Despite subsection (1), this Regulation does not apply to a water treatment or distribution system that is not capable of supplying water at a rate greater than 250,000 litres per day, unless the system serves more than five private residences.

### APPROVALS

- 4. (1) A person who applies for an approval shall do so in accordance with the Ontario Drinking Water Standards.
- (2) In considering an application for an approval, the Director shall have regard to the Ontario Drinking Water Standards.

### MINIMUM LEVEL OF TREATMENT

- 5. (1) The owner of a water treatment or distribution system that obtains water from a ground water source shall ensure provision of a minimum level of treatment consisting of disinfection.
- (2) The owner of a water treatment or distribution system that obtains water from a surface water source shall ensure provision of a minimum level of treatment consisting of chemically assisted filtration and disinfection or other treatment capable, in the Director's opinion, of producing water of equal or better quality.

- (3) The owner of a water treatment or distribution system shall ensure that no water enters a water distribution system or plumbing unless it has been treated with chlorination or another treatment that, in the Director's opinion, is as effective as chlorination to achieve disinfection that persists into the distribution system or plumbing.
- (4) Subsections (1), (2) and (3) apply despite any provision in an approval granted before August 1, 2000.
- (5) If a water treatment or distribution system commenced operation before August 1, 2000 and, immediately before August 1, 2000, was not in compliance with subsection (1), (2) or (3), the owner.
  - (a) is not required to comply with that subsection until December 31, 2002; and
  - (b) shall, on or before October 31, 2000, deliver to the Director a written notice describing the action proposed in order to achieve compliance and setting out a timetable for the action.
- 6. (1) Subsections 5 (1) and (3) do not apply if an approval granted on or after August 1, 2000 provides that disinfection and chlorination are not required.
- (2) An approval may provide that disinfection and chlorination are not required only if,
  - (a) the water is obtained exclusively from ground water sources: and
  - (b) the application for the approval includes,
    - (i) if the owner of the water treatment and distribution system is a municipality, a copy of a resolution of the municipal council approving the application,
    - the written consent of the medical officer of health for the health unit in which the water reatment and distribution system is located.
    - (iii) results of all water sampling and analysis required by subsection 7 (1) during the 24 months before the application is made.
    - (iv) a report prepared by a hydrogeologist, assessing the aquifer, the well, the well head protection and the impact of existing and anticipated land uses,
    - (v) confirmation that reasonable notice was given of a public meeting to inform users and prospective users of water from the water treatment and distribution system of the application and to obtain their comments on it,
    - (vi) a summary of the comments made at the public meeting mentioned in subclause (v) and the owner's responses to them, and
    - (vii) confirmation that, for every well in the water treatment and distribution system, standby disinfection equipment and a supply of appropriate chemicals will be readily available for immediate use in case disinfection is required.

### SAMPLING AND ANALYSIS

- 7. (1) The owner of a water treatment or distribution system shall ensure that water sampling and analysis is carried out in accordance
  - (a) Schedule 2 (Sampling and Analysis Requirements); and
  - (b) any additional requirements of an approval or an order or direction under the Act.

APPENDIX III

### PROCEDURE B13-3 CHLORINATION OF POTABLE WATER SUPPLIES IN ONTARIO

### 1.0 RATIONALE

Procedure B13-3 is a supporting document for the Ontario Drinking Water Protection Regulation.

Procedure B13-3 supersedes the MOE Bulletin 65-W-4 "Chlorination of Potable Water Supplies" 1987.

Disinfection, the destruction or inactivation of pathogenic organisms, is the most important step in any water treatment process. New microbiological challenges and increased knowledge of disinfection by-products makes it essential that the design of new waterworks, the upgrading of, or extension to, existing waterworks and the maintenance of existing facilities reflect current knowledge, technologies and practices.

### 1.1 GOALS

Disinfection in Ontario is primarily accomplished through chlorination. This Procedure provides guidance for the use of chlorine for disinfection. The goals are:

- minimize the risk to human health attributable to disease causing microorganisms that may be present in the drinking water supply;
- achieve and maintain adequate disinfection of a ground or surface water supply at the water treatment plant,
   while minimizing disinfection by-product concentrations in the treated water; and
- outline the requirements to achieve adequate disinfection of water distribution systems.

### 2.0 CHLORINATION REQUIREMENTS FOR WATER WORKS

### 2.1 GROUNDWATER SUPPLIES

- a. A minimum chlorine residual, measured as free chlorine, after 15 minutes contact time determined as T<sub>10</sub><sup>1</sup> at maximum flow and before the first consumer of 0.2 mg/L shall be maintained in all disinfected water entering the distribution system.
- b. Where a groundwater source is determined to be under the direct influence of surface water; and where the source water quality conditions are suitable to avoid filtration as determined by the Ministry; and where there is adequate watershed control to avoid filtration as determined by the Ministry; the system treatment requirements of greater than 3 log reduction of giardia lamblia cysts and greater than 4 log reduction of viruses may be achieved by disinfection only, in accordance with Section 3 of this document.
- c. A maximum chlorine residual, measured as free chlorine should be less than 4.0 mg/L, or as combined chlorine should be less than 3.0 mg/L at all times, at any location, in the water distribution system.
- d. A minimum free chlorine residual in a water distribution system should be 0.2 mg/L. Minimum combined chlorine residuals, if appropriate, shall be 1.0 mg/L at distant points in the distribution system.

- e. Automatic chlorine residual recorders should be provided where the chlorine dem and varies appreciably over a short period of time. The installation of an alarm system should be provided to ensure continuous disinfection at all waterworks.
- f. Monitor chlorine residuals according to the Ontario Drinking Water Standards and/or site specific Certificate of Approval requirements using monitoring equipment capable of measuring chlorine residuals with an accuracy of +/-0.1 mg/L.
- g. Disinfect all new watermains and water mains taken out of service for inspection, repair or other activities that may lead to contamination before they are placed in service according to the provisions of the AWWA C651-

- e. Automatic chlorine residual recorders should be provided where the chlorine demand varies appreciably over a short period of time. The installation of an alarm system should be provided to ensure continuous disinfection at all waterworks.
- f. Monitor chlorine residuals according to the Ontario Drinking Water Standards and/or site specific Certificate of Approval requirements using monitoring equipment capable of measuring chlorine residuals with an accuracy of +/-0.1 mg/L.
- g. Disinfect all new watermains and water mains taken out of service for inspection, repair or other activities that may lead to contamination before they are placed in service according to the provisions of the AWWA C651-92 Standard for Disinfecting Water Mains, AWWA C652-92 for storage facilities, C653-87 for Water Treatment Plants and C654-87 for Wells or a proven equivalent procedure.

### 2.2 SURFACE WATER SUPPLIES

- a. Achieve, through a combination of filtration and continuous disinfection, a minimum 3-log removal/inactivation of giardia cysts and a 4-log removal/inactivation of viruses at all times at or before the first consumers' connection in accordance with Section 3 of this do cument. Higher removal/inactivation credits may be required for source waters where increased levels of raw water contamination may occur.
- b. A minimum free chlorine residual in a water distribution system should be 0.2 mg/L. Minimum combined chlorine residuals, if appropriate, should be 1.0 mg/L at distant points in the distribution system.
- c. A maximum chlorine residual, measured as free chlorine should be less than 4.0 mg/L, or as combined chlorine should be less than 3.0 mg/L at all times at any location in the water distribution system.
- d. The installation of continuous residual analyzers equipped with a high and low residual alarm system should be provided to ensure continuous disinfection at all waterworks, particularly at remotely operated or minimally supervised facilities. Automatic chlorine residual recorders should be provided where the chlorine demand varies appreciably over a short period of time.
- e. Monitor chlorine residuals according to the Ontario Drinking Water Standards and/or site specific Certificate of Approval requirements using metering equipment capable of measuring chlorine residuals with an accuracy of +/-0.1 mg/L.
- f. Disinfect all new watermains and water mains taken out of service for inspection, repair or other activities that may lead to contamination before they are placed in service according to the provisions of the AWWA C651-92 Standard for Disinfecting Water Mains, AWWA C652-92 for storage facilities, C653-87 for Water Treatment Plants and C654-87 for Wells or a proven equivalent procedure.

### 3.0 "CT" DISINFECTION CONCEPT

This section outlines the CT disinfection concept, developed by the United States Environmental Protection Agency (Federal Register, 40 CFR, Parts 141 and 142, June 29, 1989). The CT concept uses the combination of disinfection residual concentration (mg/L) and the effective disinfection contact time (in minutes) to measure the effective pathogen reduction achieved in a water works.

a. The required log reductions of pathogens are achieved by a combination of filtration and disinfection removal/inactivation credits.

Disinfection shall contribute a minimum of 0.5 log giardia cyst inactivation or 2 log virus inactivation to the total credits.

APPENDIX IV

## THE NATION MUNICIPALITY – VIllage of St-Isidore

# Table 1 – Chemical / Physical Health-related Parameters

### Raw Water Characteristics

Date: December 13<sup>th</sup>, 2001

PARAMETERS	MAC	IMAC	AO	Detection		Well	Well		Well
	(mg/L)	(mg/L)	(mg/L)	Limit		No. 2	No. 3		No. 5
Alachlor		0.005		0.001	l	9	N Q		QN
Aldicarb	0.009			0.005		9	Q.		R
Aldrin + Diedrin	0.0007			0.0001	QN	QN	ND	ND	ND
Arsenic		0.025		0.001		QN	QN		ᄝ
Atrazine + N-dealkylated				0.003		S	9		2
Metabolites		0.005		0.002		QN	QN		Q
Azinphos-methyl	0.020								
Barium	1.0			0.005	0.775	0.150	0.525	0.52	0.165
Bendiocarb	0.04			0.005	Q Q	Q	Q	QN	ᄝ
Benzene	0.005			0.0005	Q	Q.	Q	ND	ND
Benzo (a) pyrene	0.00001			0.00001	QN	S	Q	ND	QN
Boron		5.0		0.01	0.15	0.46	0.21	0.10	0.14
Bromoxynil		0.005		0.0005	Q	Q.	9	ND	ND
Cadmium	0.005			0.0001	QN	Q.	Q.	QN	QN
Carbaryl	60.0			0.005	Q Q	QN	Q.	QN Q	9
Carbofuran	0.09			0.010	QN	QN	QN	Q.	Q

Carbon tetrachloride	PARAMETERS	MAC	IMAC	AO	Detection	Well	Well	Well	Well	Well
Chloramine		(mg/L)	(mg/L)	(mg/L)	Limit	No. 1	No. 2	No. 3	No. 4	No. 5
Chlordane	Carbon tetrachloride	0.005			0.0002	ND	ND	ND	ND	ND
Chloripyrifos	Chloramine	3.0			0.1	ND	ND	ND	ND	ND
Chromium	Chlordane	0.007			0.0005	ND	ND	ND	ND	ND
Cyanazine Cyanide         0.2         0.01         0.001         ND	Chloripyrifos	0.09			0.005	ND	ND	ND	ND	ND
Diazinon	Chromium	0.5			0.01	ND	ND	ND	ND	ND
Diazinon	Cyanazine		0.01		0.001	ND	ND	ND	ND	ND
Dicamba	Cyanide	0.2			0.005	ND	ND	ND	ND	ND
1,2-Dichlorobenzene					0.002	ND	ND	ND	ND	ND
1,4-Dichlorobenzene         0.005         0.001         0.0002         ND	Dicamba	0.12			0.010	ND	ND	ND	ND	ND
Dichlorodiphenyltrichloroethane(DDT)   0.03   0.001   ND   ND   ND   ND   ND   ND   ND   N	1,2-Dichlorobenzene	0.2		0.003	0.0001	ND	ND	ND	ND	ND
1,1-Dichloroethylene (vinylidene chloride)         0.014         0.0001         ND         ND	1,4-Dichlorobenzene	0.005		0.001	0.0002	ND	ND	ND	ND	ND
chloride)         0.005         0.0001         ND		0.03			0.001	ND	ND	ND	ND	ND
1,2-Dichloroethane         0.005         0.0001         ND		0.014			0.0001	ND	ND	ND	ND	ND
Dichloromethane   2,4-Dichlorophenol   0.9   0.002   ND   ND   ND   ND   ND   ND   ND   N										
2,4-Dichlorophenol         0.9         0.002         ND         ND<	1,2-Dichloroethane		0.005		0.0001	ND	ND	ND	ND	ND
2,4-Dichlorophenoxy acetic acid(2,4-D)         0.1         0.010         ND         ND<	Dichloromethane	0.05			0.0001	ND	ND	ND	ND	ND
Diclofop-methyl         0.009         0.009         0.0005         ND	2,4-Dichlorophenol	0.9			0.002	ND	ND	ND	ND	ND
Dimethoate         0.02         0.002         ND	2,4-Dichlorophenoxy acetic acid(2,4-D)		0.1		0.010	ND	ND	ND	ND	ND
DINOSEB         0.01         0.001         ND	Diclofop-methyl	0.009			0.0005	ND	ND	ND	ND	ND
Dioxins and Furans         15 pg/L Diquat         0.1 pg/L 0.15         ND N			0.02		0.002	ND	ND	ND	ND	ND
Diquat         0.15         0.005         ND         0.5           Fluoride         1.5         0.1         ND         0.6         0.3         0.4         0.5	DINOSEB	0.01			0.001	ND	ND	ND	ND	ND
Diquat         0.15         0.005         ND         ND         ND         ND         ND           Diuron         0.15         0.010         ND         0.4         0.5	Dioxins and Furans	15 pg/L			0.1 pg/L	ND	0.6pg/L	0.3pg/L	0.4pg/L	0.5pg/L
Fluoride 1.5 0.1 ND 0.6 0.3 0.4 0.5	Diquat	0.15			0.005	ND		ND	ND	ND
	Diuron	0.15			0.010	ND	ND	ND	ND	ND
Glyphosate 0.28 0.025 ND ND ND ND ND	Fluoride	1.5			0.1	ND	0.6	0.3	0.4	0.5
O.20   ND   ND   ND   ND   ND	Glyphosate		0.28		0.025	ND	ND	ND	ND	ND

PARAMETERS	MAC	IMAC	AO	Detection	Well	Well	Well	Well	Well
	(mg/L)	(mg/L)	(mg/L)	Limit	No. 1	No. 2	No. 3	No. 4	No. 5
Heptachlor + Heptachlor epoxide	0.003	3	, , ,	0.0004	ND	ND	ND	ND	ND
Lead	0.01			0.0002	ND	ND	ND	ND	ND
Lindane (TOTAL)	0.004			0.0004	ND	ND	ND	ND	ND
Malathion	0.19			0.01	ND	ND	ND	ND	ND
Mercury	0.001			0.0001	ND	ND	ND	ND	ND
Methoxychlor	0.9			0.01	ND	ND	ND	ND	ND
Metolachlor		0.05		0.005	ND	ND	ND	ND	ND
Metribuzin	0.08			0.005	ND	ND	ND	ND	ND
Monochlorobenzene	0.08			0.0002	ND	ND	ND	ND	ND
Nitrate (N)	10.0			0.1	ND	ND	ND	ND	ND
Nitrite (N)	1.0		ļ	0.1	ND	ND	ND	ND	ND
Nitrate + Nitrite (N)	10.0			0.1	ND	ND	ND	ND	ND
Nitrilotriacelic Acid (NTA)	0.4			0.05	ND	ND	ND	ND	ND
Nitrosodimethylamine (NDMA)		9 pG/L		0.4 pG/L	ND	ND	ND	ND	ND
Paraquat		0.01		0.001	ND	ND	ND	ND	ND
Parathion	0.05			0.005	ND	ND	ND	ND	ND
Pentachlorophenol	0.06		0.03	0.0002	ND	ND	ND	ND	ND
Phorate		0.002		0.0005	ND	ND	ND	ND	ND
Picloram		0.19		0.01	ND	ND	ND	ND	ND
Polychlorinated		0.003		0.0002	ND	ND	ND	ND	ND
Biphenil (PCB)		0.001		0.0002	ND	ND	ND	ND	ND
Prometryne									
Selenium	0.01		1	0.001	ND	ND	ND	ND	ND
Simazine		0.01		0.001	ND	ND	ND	ND	ND
Temephos		0.28		0.020	ND	ND	ND	ND	ND
Terbufos		0.001		0.001	ND	ND	ND	ND	ND
Tetrachloroethylene	0.03			0.0002	ND	ND	ND	ND	ND
2,3,4,6-Tetrachiorophenol	0.10			0.002	ND	ND	ND	ND	ND

PARAMETERS	MAC (mg/L)	IMAC (mg/L)	AO (mg/L)	Detection Limit	Well No. 1	Well No. 2	Well No. 3	Well No. 4	Well No. 5
2,4,5-Trichlorophenoxyacetic Acid									
(2,4,5-T)	0.28			0.02	ND	ND	ND	ND	ND
Trichloroethylene	0.05			0.0001	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	0.005			0.0002	ND	ND	ND	ND	ND
Triallate	0.100			0.02	ND	ND	ND	ND	ND
Trifluralin		0.045		0.002	ND	ND	ND	ND	ND
Trihalomethanes	0.100			0.001	ND	ND	ND	ND	ND
Turbidity *	1 NTU		5 NTU	0.1	1.8	0.3	1.1	4.8	3.2
Uranium	0.1			0.001	0.001	0.006	ND	0.002	ND
Vinyl choride	0.002			0.0003	ND	ND	ND	ND	ND

### Shortforms:

MAC	Maximum Acceptable Concentration	NTU	Nephalometric Turbidity Unit
IMAO	Interim Maximum Acceptable Concentration	mg/L	Milligram per litre
AO	Aesthetic Objective	pg/L	picograms per litre
		ND	non detected; actual concentration is the
			method or instrument detection limit

Date of sampling: All wells sampled on December 13th, 2001, except well no. 4 (January 29th, 2002).

Compiled by:

LECOMPTÉ ENGINEERING LTD.

Jean Hébert, P.Eng.

April 17, 2002

5918-23.ta1

<sup>\*</sup>Trihalomethanes at treated water (refer to Appendix IX).
\*Turbidity at treated water on December 13<sup>th</sup>, 2001; at water treatment plant = 0.2 NTU; at well no. 5 = 0.14 NTU

# THE NATION MUNICIPALITY – Village of St-Isidore Table 3 – Raw Water Characteristics Date: January 29<sup>th</sup>, 2002

PARAMETERS	MAC (Bq/L)	Detection Limit	Well No. 1	Well No. 2	Well No. 3	Well No. 4	Well No. 5
I – Gross Alpha Emission							
Radium-226	0.6	0.1	ND	ND	ND	ND	ND
II – Gross Beta Emission	0.0	0.1	0.3	0.2	0.4	0.2	0.3
Cesium-137							
Iodine –131	10						
Strontium-90	6 5						
III – Tritium	7,000	1,000	ND	ND	ND	ND	ND

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Jean Hébert, P.Eng.

April 4, 2002

5918-23.ta3

#### THE NATION MUNICIPALITY – Village of St-Isidore

# Table 4 – Chemical / Physical Non-Health Related Parameters Raw Water Characteristics

Dates: December 18<sup>th</sup>, 2000 / November 6<sup>th</sup>, 2001 / January 29<sup>th</sup>, 2002

PARAMETERS	Objective (mg/L – unless otherwise specified)	Type of Objective	Detection Limit	Well No. 1	Well No. 2	Well No. 3	Well No. 4	Well No. 5
Alkalinity (as CaCO <sub>3</sub> )*	30-500	OG	1	297	334	250	279	279
Aluminium*	0.1	OG	0.01	0.01	ND	0.02	0.01	ND
Chloride	250	AO	0.5	103	53.3	112	40.1	88.9
Colour	5 TCU	AO	1	6	3	ND	5	ND
Copper	1.0	AO	0.01	ND	ND	ND	ND	ND
Total Organic Carbon	5.0	AO	0.3	2.6	1.7	0.7	2.8	0.8
Ethylbenzene	0.0024	AO	0.0005	<u>ND</u>	ND	ND	ND	<u>ND</u> 273
Hardness (as CaCO <sub>3</sub> )	80-100	OG	1	209	<u>ND</u> 31	286	312	273
Iron	0.3	AO	0.02	0.09	0.06	0.38	0.89	0.14
Manganese	0.05	AO	0.01	0.02	ND	ND	0.08	0.02
Methane	3 L/m³	OG	0.02	<u>ND</u>	ND	ND	ND	<u>ND</u>
Odour	Inoffensive	AO	0.2	-	Rotten egg	Inoffensive	2	Inoffensive
Organic Nitrogen	0.15	AO	0.01	0.07	0.13	0.08	0.21	0.09
PH	6.5-8.5 (no units)	AO	0.1	8.17	8.66	8.19	8.03	8.19
Sodium	200	AO	1	154	191	73.7	38.6	77.8
Sulphate*	500	AO	1	109	9	12	70	22
Sulphide	0.05	AO	0.01	0.02	0.95	0.08	0.06	0.01
Taste	Inoffensive	AO	_	Bad	Inoffensive	Inoffensive	Inoffensive	Inoffensive

PARAMETERS	Objective (mg/L – unless otherwise specified)	Type of Objective	Detection Limit	Well No. 1	Well No. 2	Well No. 3	Well No. 4	Well No. 5
Temperature	15°C	AO	0.5°C	-	-	_	_	-
Toluene	0.024	AO	0.0005	ND	<u>ND</u>	ND	ND	ND
Total Dissolved Solids	500	AO	1	456	422	362	414	442
Xylenes	0.3	AO	0.002	ND	ND	ND	ND	ND
Zinc*	5.0	AO	0.01	ND	$\overline{ND}$	ND	ND	ND
Conductivity	-		1	951	1360	2080	ND	1900

Results that are <u>underlined</u> are dated December 18<sup>th</sup>, 2000.

Results in regular font are dated November 6<sup>th</sup>, 2001.

Results in *italic* font are dated January 29<sup>th</sup>, 2002.

Compiled by:

LECOMPTÉ ENGINEERING LTD.

Jean Hébert, P.Eng.

April 4, 2002

Data supplied by the Ontario Clean Water Agency (St-Isidore WTP)

Laboratory: Caduceon Enterprises Inc., Ottawa, Ontario

5918-23.ta4

Division of Caduceon Enterprises Inc.

Client:

Ontario Clean Water Agency P.O.Box 70, 209 Limoges Rd. Limoges, ON

KOA 2MO

Attention: J.P. Gelinas



Samula Identification

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Report: Project:

Date Sampled:
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Date Printed:

Matrix:

210009014

WTP- St. Isidore December 13, 2001 December 14, 2001

March 08, 2002

Parameter	Unit	MDL	Sample Identification		
			Raw Water Well #3	Raw Water Well #5	
Fluoride	mg/L	0.1	0.3	0.3	
Nitrite- Nitrogen	mg/L	0.1	<0.1	<0.1	
Nitrate- Nitrogen	mg/L	0.1	<0.1	<0.1	
Turbidity	NTU	0.1	0.3	3.2	
Mercury	mg/L	0.0001	<0.0001	<0.0001	
Cadmium	mg/L	0.0001	<0.0001	<0.0001	
Lead	mg/L	0.0002	<0.0002	<0.0002	
Arsenic	mg/L	0.001	<0.001	<0.001	
Selenium	mg/L	0.001	<0.001	<0.001	
Total Cyanide	ng/L	0.005	<0.005	<0.005	
Total Uranium	mg/L	0.001	<0.001	<0.001	
Boron	mg/L	0.01	0.21	0.14	
Barium	mg/L	0.005	0.525	0.165	
Chromium	mg/L	0.01	<0.01	<0.01	
Benzo(a)pyrene	µg/L	0.01	<0.01	<0.01	
2,3,4,6-Tetrachlorophenol	μg/L	2	<2	<2	
2,4,5-T	µg/L	20	<20	<20	
2,4,6-Trichlorophenol	µg/L	0.2	<0.2	<0.2	
2,4-D	µg/L	10	<10	<10	
2,4-Dichlorophenol	µg/L	2	<2	<2	
Alachlor	µg/L	1	<1	<1	
Aldicarb	μg/L	5	<5	<5	
Aldrin	µg/L	0.1	<0.1	<0.1	



Division of Caduceon Enterprises Inc.

Client:

**Ontario Clean Water Agency** P.O.Box 70, 209 Limoges Rd.

Limoges, ON **KOA 2M0** 

# Certificate of Analysis

Report:

Project:

Date Sampled: Date Received:

Date Printed:

210009014

WTP- St. Isidore December 13, 2001

December 14, 2001 March 08, 2002

Attention: J.P. Gelinas		<del></del>		Matrix:	Drinking Water
Parameter	Unit	MDL	Sample Identifi	cation	
			Raw Water Well #3	Raw Water Well #5	
Atrazine	µg/L	3	<3	<3	
Bendiocarb	µg/L	5	<5	<5	
Bromoxynil	µg/L	0.5	<0.5	<0.5	
Carbaryl	µg/L	5	<5	<5	
Carbofuran	µg/L	10	<10	<10	
Chlordane	µg/L	0.5	<0.5	<0.5	
Chlorpyrifos (Dursban)	µg/L	5	<5	<5	
Cyanazine (Bladex)	µg/L	1	<1	<1	
DDT	µg/L	1	<1	<1	
Diazinon	µg/L	2	<2	<2	
Dicamba	µg/L	10	<10	<10	
Diclofop-methyl	μg/L	0.5	<0.5	<0.5	
Dieldrin	µg/L	0.1	<0.1	<0.1	
Dimethoate	µg/L	2	<2	<2	
Dinoseb	µg/L	1	<1	<1	
Diuron	µg/L	10	<10	<10	
Guthion (Azinphos-methyl)	µg/L	2	<2	<2	
Heptachlor	μg/L	0.2	<0.2	<0.2	
Heptachlor epoxide	µg/L	0.2	<0.2	<0.2	
Lindane	µg/L	0.4	<0.4	<0.4	
Malathion	pg/L	10	<10	<10	
Methoxychlor	µg/L	10	<10	<10	
Metolachlor	µg/L	5	<5	<5	

Division of Caduceon Enterprises Inc.

Client:

Ontario Clean Water Agency P.O.Box 70, 209 Limoges Rd.

Limoges, ON K0A 2M0

Attention:

J.P. Gelinas

#### **Certificate of Analysis**

Report:

Project:

Date Sampled: Date Received:

Date Printed:

Matrix:

210009014

WTP- St. Isidore

December 13, 2001 December 14, 2001

March 08, 2002

Attention: <b>J.P. Gelinas</b>				Matrix:	Drinking Water
Parameter	Unit	MDL	Sample Identif	cation	
			Raw Water Well #3	Raw Water Well #5	
Metribuzin (Sencor)	µg/L	5	<5	<5	
Parathion	µg/L	5	<5	<5	
Pentachlorophenol	µg/L	0.2	<0.2	<0.2	
Phorate	µg/L	0.5	<0.5	<0.5	
Picloram	µg/L	10	<10	<10	
Prometryn	µg/L	0.2	<0.2	<0.2	
Simazine	pg/L	1	<1	<1	
Temephos	µg/L	20	<20	<20	
Terbufos	µg/L	1	<1	<1	
Total PCB	hd/r	0.2	<0.2	<0.2	
Triallate	µg/L	20	<20	<20	
Trifluralin	hd/r	2	<2	<2	
Glyphosate	µg/L	25	<25	<25	
1,1-Dichloroethylene	mg/L	0.0001	<0.0001	<0.0001	
1,2-Dichlorobenzene	mg/L	0.0001	<0.0001	<0.0001	
1,2-Dichloroethane	mg/L	0.0001	<0.0001	<0.0001	
1,4-Dichlorobenzene	mg/L	0.0002	<0.0002	<0.0002	
Benzene	mg/L	0.0005	<0.0005	<0.0005	
Bromodichloromethane	ng/L	0.0001	<0.0001	<0.0001	
Bromoform	mg/L	0.0001	<0.0001	<0.0001	
Carbon Tetrachloride	mg/L	0.0002	<0.0002	<0.0002	
Chlorobenzene	mg/L	0.0002	<0.0002	<0.0002	
Chloroform	mg/L	0.0003	<0.0003	<0.0003	

Division of Caduceon Enterprises Inc.

Client:

Ontario Clean Water Agency P.O.Box 70, 209 Limoges Rd. Limoges, ON

KOA 2M0

Attention:

J.P. Gelinas

#### **Certificate of Analysis**

Report:

Project:
Date Sampled:

Date Received: Date Printed:

Matrix:

210009014

WTP- St. Isidore December 13, 2001

December 14, 2001

March 08, 2002

Attention: J.P. Gelinas				wairix.	Diffiking vvater
Parameter	Unit	MDL	Sample Identif	ication	
			Raw Water Well #3	Raw Water Well #5	
Dibromochloromethane	mg/L	0.0001	<0.0001	<0.0001	
Methylene Chloride	mg/L	0.003	<0.003	<0.003	
Tetrachloroethylene	mg/L	0.0002	<0.0002	<0.0002	
Total Trihalomethanes	mg/L	0.001	<0.001	<0.001	
Trichloroethylene	mg/L	0.0001	<0.0001	<0.0001	
Vinyl Chloride	mg/L	0.0003	<0.0003	<0.0003	
Diquat	μg/L	5	<5	<5	
Paraquat	hd\r	1	<1	<1	
1234678-HpCDD (Dioxins)	ppq	1	<1	<1	
1234678-HpCDF (Furans)	ppq	1	<1	<1	
1234789-HpCDF (Furans)	ppq	1	<1	<1	
123478-HxCDD (Dioxins)	ppq	1	<1	<1	
123478-HxCDF (Furans)	ppq	1	<1	<1	
123678-HxCDD (Dioxins)	ppq	1	<1	<1	
123678-HxCDF (Furans)	ppq	1	<1	<1	
123789-HxCDD (Dioxins)	ppq	1	<1	<1	
123789-HxCDF (Furans)	ppq	1	<1	<1	
12378-PeCDD (Dioxins)	ppq	1	<1	<1	
12378-PeCDF (Furans)	ppq	1	<1	<1	
234678-ExCDF (Furans)	ppq	1	<1	<1	
23478-PeCDF (Furans)	ppq	1	<1	<1	
2378-TCDD (Dioxins)	bŏď	1	<1	<1	
2376-FCDF (Furans)	ppq	1	<1	<1	

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Division of Caduceon Enterprises Inc.

Client:

Ontario Clean Water Agency P.O.Box 70, 209 Limoges Rd.

Limoges, ON **K0A 2M0** 

Attention:

J.P. Gelinas

Report:

Project:

Date Sampled: Date Received:

Date Printed:

210009014

WTP- St. Isidore December 13, 2001

December 14, 2001

March 08, 2002

Matrix:

Parameter	Unit	MDL	Sample Identifi	ication	
			Raw Water Well #3	Raw Water Well #5	
OCDD (Dioxins)	ppq	2		<2	
OCDD (Dioxins)	ppq	3	<3		
OCDF (Furans)	ppq	1	<1	<1	
Total HpCDDs (Dioxins)	Pqq	1	<1	<1	
Total HpCDFs (Furans)	pqq	1	<1	<1	
Total HxCDDs (Dioxins)	ppq	1	<1	<1	
Total HxCDFs (Furans)	ppq	1	<1	<1	
Total PeCDDs (Dioxins)	ppq	1	<1	<1	
Total PeCDFs (Furans)	ppq	1	<1	<1	
Total TCDDs (Dioxins)	ppq	1	<1	<1	
Total TCDFs (Furans)	pqq	1	<1	<1	
Toxic Equivalent (TEQ)	ppq		•	0	
NTA	mg/L	0.05	<0.05	<0.05	
N-Nitrosodimethylamine	µg/L	0.0004	<0.0004	<0.0004	

Division of Caduceon Enterprises Inc.

Client:

**Ontario Clean Water Agency** P.O.Box 70, 209 Limoges Rd. Limoges, ON

KOA 2MO Attention:

J.P. Gelinas

## **Certificate of Analysis**

Report:

Matrix:

Project:

Date Sampled: Date Received:

Date Printed:

210009025

WW# 220003573 December 13, 2001 December 14, 2001

March 08, 2002

Attention. J.P. Gennas			
Parameter	Unit	MDL	Sample Identification
			TRT Water - WTP
Fluoride	mg/L	0.1	0.3
Nitrite- Nitrogen	mg/L	0.1	<0.1
Nitrate- Nitrogen	mg/L	0.1	<0.1
Turbidity	ntu	0.1	0.2
Mercury	mg/L	0.0001	<0.0001
Cadmium	mg/L	0.0001	<0.0001
Lead	mg/L	0.0002	<0.0002
Arsenic	mg/L	0.001	<0.001
Selenium	mg/L	0.001	<0.001
Total Cyanide	mg/L	0.005	<0.005
Total Uranium	mg/L	0.001	0.003
Boron	mg/L	0.01	0.30
Barium	mg/L	0.005	0.490
Chromium	mg/L	0.01	<0.01
2,3,4,6-Tetrachlorophenol	µg/L	0.5	<0.5
2,4,5-T	µg/L	1	<1
2,4,6-Trichlorophenol	µg/L	0.5	<0.5
2, <b>4</b> -D	µg/L	1	<1
2,4-Dichlorophenol	μg/L	0.5	<0.5
Alachlor	µg/L	0.5	<0.5
Aldicarb	μg/L	5	<5
Aldrin	µg/L	0.02	<0.02
Atrazine	µg/L	0.5	<0.5

Division of Caduceon Enterprises Inc.

Client:

**Ontario Clean Water Agency** 

P.O.Box 70, 209 Limoges Rd.

Limoges, ON KOA 2MO

Attention: J.P. Gelinas

## **Certificate of Analysis**

Report:

210009025

Project:

Date Sampled:

Date Received:

Date Printed:

December 13, 2001 December 14, 2001 March 08, 2002

WW# 220003573

Matrix:

Attention: J.P. Gelinas				Man IV.	Dilliking Trace	
Parameter	Unit	MDL	Sample Identification			
		-	TRT Water - WTP			
Bendiocarb	µg/L	2	<2			
Bromoxyni.l	µg/L	0.5	<0.5			
Carbaryl	µg/L	5	<5			
Carbofuran	µg/L	5	<5			
Chlordane	µg/L	0.7	<0.7			
Chlorpyrifos (Dursban)	µg/L	1	<1			
Cyanazine (Bladex)	µg/L	1	<1			
DDT	μg/L	3	<3			
Diazinon	µg/L	1	<1			
Dicamba	µg/L	1	<1			
Diclofop-methyl	µg/L	0.9	<0.9			
Dieldrin	µg/L	0.05	<0.05			
Dimethoate	µg/L	3	<2.5			
Dinoseb	μg/L	1	<1			
Diuron	µg/L	10	<10			
Guthion (Azinphos-methyl)	µg/L	2	<2			
Heptachlor	μg/L	0.1	<0.1			
Heptachlor epoxide	µg/L	0.2	<0.2			
Lindane	µg/L	0.4	<0.4			
Malathion	µg/L	5	<5			
Methoxychlor	µg/L	90	<90			
Metolachlor	ug/L	0.5	<0.5			
Metribuzin (Sencor)	μ <b>g</b> /L	5	<5			

**Certificate of Analysis** 

Division of Caduceon Enterprises Inc.

**Ontario Clean Water Agency** P.O.Box 70, 209 Limoges Rd. Limoges, ON KOA 2MO

Report: Project: Date Sampled: Date Received: Date Printed:

210009025 WW# 220003573 December 13, 2001 December 14, 2001 March 08, 2002

Attention: J.P. Gelinas				Matrix:	Drinking Water
Parameter	Unit	MDL	Sample Identification		
			TRT Water - WTP		
Parathion	µg/L	1	<1		
Pentachlorophenol	µg/L	0.5	<0.5		
Phorate	µg/L	0.5	<0.5		
Picloram	µg/L	5	<5		
Prometryn	µg/L	0.3	<0.25		
Simazine	μg/L	1	<1		
Temephos	µg/L	10	<10		
Terbufos	µg/L	0.7	<0.7		
Total PCB	hd/r	0.3	<0.3		
Triallate	μg/L	1	<1		
Trifluralin	µg/L	1	<1		
Glyphosate	pg/L	10	<10		
1,1-Dichloroethylene	mg/L	0.0001	<0.0001		
1,2-Dichlorobenzene	mg/L	0.0001	<0.0001		
1,2-Dichloroethane	mg/L	0.0001	<0.0001		
1,4-Dichlorobenzene	mg/L	0.0002	<0.0002		
Benzene	mg/L	0.0005	<0,0005		
Bromodichloromethane	mg/L	0.0001	0.0425		
Bromoform	mg/L	0.0001	0.0115		
Carbon Tetrachloride	mg/L	0.0002	<0.0002		
Chlorobenzene	mg/L	0.0002	<0.0002		
Chloroform	mg/L	0.0003	0.0400		
Dibromochloromethane	mg/L	0.0001	0.0476		

**Certificate of Analysis** 

Division of Caduceon Enterprises Inc.

Client:

**Ontario Clean Water Agency** P.O.Box 70, 209 Limoges Rd.

Limoges, ON KOA 2MO

Report:

Project:

Date Sampled: Date Received:

Date Printed:

December 14, 2001 March 08, 2002

RA atris

Drinking Mater

210009025

WW# 220003573

December 13, 2001

Attention: J.P. Gelinas				Matrix:	Drinking Water
Parameter	Unit	MDL	Sample Identification		
			TRT Water - WTP		
Methylene Chloride	mg/L	0.003	<0.003		
Tetrachloroethylene	mg/L	0.0002	<0.0002		
Total Trihalomethanes	mg/L	0.001	0.142		
Trichloroethylene	mg/L	0.0001	<c.0001< td=""><td></td><td></td></c.0001<>		
Vinyl Chloride	mg/L	0.0003	<0.0003		
Diquat	µg/L	7	<7		
Paraquat	µg/L	1	<1		
1234678-HpCDD (Dioxins)	ppq	1	<1		
1234678-HpCDF (Furans)	ppq	1	<1		
1234789-HpCDF (Furans)	ppq	1	<1		
123478-HxCDD (Dioxins)	ppq	1	<1		
123478-HxCDF (Furans)	ppq	1	<1		
123678-HxCDD (Dioxins)	ppq	1	<1		
123678-HxCDF (Furans)	ppq	1	<1		
123789-HxCDD (Dioxins)	ppq	1	<1		
123789-HxCDF (Furans)	ppq	1	<1		
12378-PeCDD (Dioxins)	pqq	1	<1		
12378-PeCDF (Furans)	ppq	1	<1		
234678-HxCDF (Furans)	ppq	1	<1		
23478-PeCDF (Furans)	pqq	1	<1		
2378-TCDD (Dioxins)	ppq	1	<1		
2378-TCDF (Furans)	ppq	1	<1		
OCDD (Dioxins)	ppq	2	<2		

**Certificate of Analysis** 

Division of Caduceon Enterprises Inc.

Client:

**Ontario Clean Water Agency** P.O.Box 70, 209 Limoges Rd. Limoges, ON

**KOA 2MO** 

Report:

210009025

Project:

WW# 220003573

Date Sampled:

December 13, 2001 December 14, 2001

Date Received: Date Printed:

March 08, 2002

Attention: J.P. Gelinas				Matrix:	Drinking Water
Parameter	Unit	MDL	Sample Identification		
			TRT Water - WTP		
OCDF (Furans)	ppq	1	<1		
Total HpCDDs (Dioxins)	ppq	1	<1		
Total HpCDFs (Furans)	pqq	1	<1		
Total HxCDDs (Dioxins)	pqq	1	<1		
Total HxCDFs (Furans)	ppq	1	<1		
Total PeCDDs (Dioxins)	pqq	1	<1		
Total PeCDFs (Furans)	ppq	1	<1		
Total TCDDs (Dioxins)	ppq	1	<1		
Total TCDFs (Furans)	ppq	1	<1		
Toxic Equivalent (TEQ)	ppq		0		
NTA .	mg/L	0.05	<0.05		
N-Nitrosodimethylamine	μg/L	0.0009	<0.0009		

Division of Caduceon Enterprises Inc.

Client:

**Ontario Clean Water Agency** P.O.Box 70, 209 Limoges Rd.

Limoges, ON **KOA 2MO** 

Attention:

J.P. Gelinas

#### **Certificate of Analysis**

Report:

Project: Date Sampled:

Date Received:

Date Printed:

Matrix:

210009026

St. Isidore -22000357

December 13, 2001

December 14, 2001

March 08, 2002

Parameter	Unit	MDL	Sample Identifi	cation
	•		Raw Water , Well #1	Raw Water , Well #2
Fluoride	mg/L	0.1	<0.1	0.6
Nitrite- Nitrogen	mg/L	0.1	<0.1	<0.1
Nitrate- Nitrogen	mg/L	0.1	<0.1	<0.1
Turbidity	NTU	0.1	1.8	0.3
Mercury	mg/L	0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.0001	<0.0001	<0.0001
Lead	mg/L	0.0002	<0.0002	<0.0002
Arsenic	mg/L	0.001	<0.001	0.001
Selenium	mg/L	0.001	<0.001	<0.001
Total Cyanide	mg/L	0.005	<0.005	<0.005
Total Uranium	mg/L	0.001	0.001	0.006
Boron	mg/L	0.01	0.15	0.46
Barium	mg/L	0.005	0.775	0.150
Chromium	mg/L	0.01	<0.01	<0.01
Benzo (a) pyrene	µg/L	0.01	<0.01	<0.01
2,3,4,6-Tetrachlorophenol	µg/L	2	<2	<2
2,4,5-T	pg/L	20	<20	<20
2,4,6-Trichlorophenol	μg/L	0.2	<0.2	<0.2
2,4-D	µg/L	10	<10	<10
2,4-Dichlorophenol	μg/L	2	<2	<2
Alachlor	µg/L	1	<1	<1
Aldicarb	μg/L	5	<5	<5
Aldrin	µg/L	0.1	<0.1	<0.1

Division of Caduceon Enterprises Inc.

Client:

**Ontario Clean Water Agency** P.O.Box 70, 209 Limoges Rd.

Limoges, ON **KOA 2M0** 

#### **Certificate of Analysis**

Report:

Project:

Date Sampled:

Date Received: Date Printed:

210009026

St.Isidore -22000357

December 13, 2001 December 14, 2001

March 08, 2002

Attention: J.P. Gelinas				Matrix:	Drinking Water
Parameter	Unit	MDL	Sample Identific	cation	
			Raw Water , Well #1	Raw Water, Well #2	
Atrazine	μg/L	3	<3	<3	
Bendiocarb	μg/L	5	<5	<5	
Bromoxynil	μg/L	0.5	<0.5	<0.5	
Carbaryl	μg/L	5	<5	<5	
Carbofuran	µg/L	10	<10	<10	
Chlordane	μg/L	0.5	<0.5	<0.5	
Chlorpyrifos (Dursban)	µg/L	5	<5	<5	
Cyanazine (Bladex)	μg/L	1	<1	<1	
DDT	µg/L	1	<1	<1	
Diazinon	µg/L	2	<2	<2	
Dicamba	µg/L	10	<10	<10	
Diclofop-methyl	µg/L	0.5	<0.5	<0.5	
Dieldrin	μg/L	0.1	<0.1	<0.1	
Dimethoate	µg/L	2	<2	<2	
Dinoseb	µg/L	1	<1	<1	
Diuron	μg/L	10	<10	<10	
Guthion (Azinphos-methyl)	µg/L	2	<2	<2	
Heptachlor	μg/L	0.2	<0.2	<0.2	
Heptachlor epoxide	μg/L	0.2	<0.2	<0.2	
Lindane	μg/L	0.4	<0.4	<0.4	
Malathion	μ <b>g</b> /L	10	<10	<10	
Methoxychlor	μg/L	10	<10	<10	
Metolachlor	μg/L	5	<5	<5	

Division of Caduceon Enterprises Inc.

Client:

**Ontario Clean Water Agency** 

P.O.Box 70, 209 Limoges Rd.

Limoges, ON **K0A 2M0** 

Attention: J.P. Gelinas

# **Certificate of Analysis**

Report:

Project:

Date Sampled:

Matrix:

Date Received:

Date Printed:

210009026

St. Isidore -22000357

December 13, 2001

December 14, 2001

March 08, 2002

Parameter	Unit	MDL	Sample Identific	cation
			Raw Water , Well #1	Raw Water , Well #2
Metribuzin (Sencor)	µg/L	5	<5	<5
Parathion	μg/L	5	<5	<5
Pentachlorophenol	µg/L	0.2	<0.2	<0.2
Phorate	µg/L	0.5	<0.5	<0.5
Picloram	µg/L	10	<10	<10
Prometryn	µg/L	0.2	<0.2	<0.2
Simazine	µg/L	1	<1	<1
Temephos	hd/r	20	<20	<20
Terbufos	µg/L	1	<1	<1
Total PCB	µg/L	0.2	<0.2	<0.2
Triallate	µg/L	20	<20	<20
Trifluralin	µg/L	2	<2	<2
Glyphosate	µg/L	25	<25	<25
1,1-Dichloroethylene	mg/L	0.0001	<0.0001	<0.0001
1,2-Dichlorobenzene	mg/L	0.0001	<0.0001	<0.0001
1,2-Dichloroethane	mg/L	0.0001	<0.0001	<0.0001
1,4-Dichlorobenzene	mg/L	0.0002	<0.0002	<0.0002
Benzene	mg/L	0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/L	0.0001	<0.0001	<0.0001
Bromoform	mg/L	0.0001	<0.0001	<0.0001
Carbon Tetrachloride	mg/L	0.0002	<0.0002	<0.0002
Chlorobenzene	mg/L	0.0002	<0.0002	<0.0002
Chloroform	mg/L	0.0003	<0.0003	<0.0003

Division of Caduceon Enterprises Inc.

Client:

**Ontario Clean Water Agency** P.O.Box 70, 209 Limoges Rd.

Limoges, ON K0A 2M0

Attention:

J.P. Gelinas

#### **Certificate of Analysis**

Report:

Project:

Date Sampled: Date Received:

Date Printed:

Matrix:

210009026

St.Isidore -22000357

December 13, 2001 December 14, 2001

March 08, 2002

Parameter	Unit	MDL	Sample Identif	ication	
			Raw Water , Well #1	Raw Water , Well #2	
Dibromochloromethane	mg/L	0.0001	<0.0001	<0.0001	
Methylene Chloride	mg/L	0.003	<0.003	<0.003	
Tetrachloroethylene	mg/L	0.0002	<0.0002	<0.0002	
Total Trihalomethanes	mg/L	0.001	<0.001	<0.001	
Trichloroethylene	mg/L	0.0001	<0.0001	<0.0001	
Vinyl Chloride	mg/L	0.0003	<0.0003	<0.0003	
Diquat	μg/L	5	<5	<5	
Paraquat	μg/L	1	<1.	<1	
1234678-HpCDD (Dioxins)	PPq	1	<1	<1	
12340/8-mpCDF (Furans)	ppq	1	<1	<1	
1234789-HpCDF (Furans)	ppq	1	<1	<1	
123478-HxCDD (Dioxins)	ppq	1	<1	<1	
123478-HxCDF (Furans)	pqq	1	<1	<1	
123678-HxCDD (Dioxins)	ppq	1	<1	<1	
123678-HxCDF (Furans)	ppq	1	<1	<1	
123789-HxCDD (Dioxins)	ppq	1	<1	<1	
123789-HxCDF (Furans)	ppq	1	<1	<1	
12378-PeCDD (Dioxins)	ppq	1	<1	<1	
12378-PeCDF (Furans)	ppq	1	<1	<1	
234678-HxCDF (Furans)	ppq	1	<1	<1	
23478-PeCDF (Furans)	ppq	1	<1	<1	
2378-TCDD (Dioxins)	pqq	1	<1	<1	
2378-TCDF (Furans)	ppq	1	<1	<1	

Division of Caduceon Enterprises Inc.

**Ontario Clean Water Agency** 

P.O.Box 70, 209 Limoges Rd.

Limoges, ON **KOA 2M0** 

Attention: J.P. Gelinas **Certificate of Analysis** 

Report:

Project:

Date Sampled: Date Received:

Date Printed:

Matrix:

210009026

St. Isidore -22000357

December 13, 2001

December 14, 2001

March 08, 2002

**Drinking Water** 

Parameter	Unit	MDL	Sample Identifi	cation	
			Raw Water , Well #1	Raw Water , Well #2	
OCDD (Dioxins)	pqq	2	<2	<2	
OCDF (Furans)	pqq	1	<1	<1	
Total HpCDDs (Dioxins)	ppq	1	<1	<1	
Total HpCDFs (Furans)	pqq	1	<1	<1	
Total HxCDDs (Dioxins)	ppq	1	<1	<1	
Total HxCDFs (Furans)	ppq	1	<1	<1	
Total PeCDDs (Dioxins)	ppq	1	<1	<1	
Total PeCDFs (Furans)	pqq	1	<1	<1	
Total TCDDs (Dioxins)	pqq	1	<1	<1	
Total TCDFs (Furans)	pqq	1	<1	<1	
Toxic Equivalent (TEQ)	ppq		0	o	
NTA	mg/L	0.05	<0.05	<0.05	
N-Nitrosodimethylamine	pg/L	0.0004	<0.0004	<0.0004	

This is a corerction certificate and superceds all previous reports of this number. Benzo(a) pyrene Detection limit was corrected.

Mar

**Caduceon Environmental Laboratories** 

Division of Caduceon Enterprises Inc.

Client:

Ontario Clean Water Agency

P.O.Box 70, 209 Limoges Rd. Limoges, ON

K0A 2M0

Attention: J.P. Gelinas

Report:

**220000834** St. Isidore WTP

Project:

Date Sampled:

Date Received:
Date Printed:

January 29, 2002 January 29, 2002 March 08, 2002

Matrix:

Parameter	Unit	MDL	Sample	ldentification				
·		Raw Water - Well #1	Raw Water - Well #2	Raw Water - Well #3	Raw Water - Well #4	Raw Water - Well #5		
Chloride	mg/L	0.5				40.1		
fluoride	mg/L	0.1				0.4		
Nitrite- Nitrogen	mg/L	0.1				<0.1	•	
Nitrate- Nitrogen	mg/L	0.1				<0.1		
Sulphate	mg/L	1	109	9	12	70	22	
Hardness as CaCO3	mg/L	1				312		
Total Dissolved Solids	mg/L	1	456	422	362	414	442	
Turbidity	NTU	0.1				4.8		
Odour						2		
Taste						N/A		
Alkalinity as CaCO3	mg/L	1	297	334	250	279	283	
Mercury	mg/L	0.0001				<0.0001		
Organic Nitrogen	mg/L	0.05				0.21		
Cadmium	mg/L	0.0001				<0.0001		
Lead	mg/L	0.0002				<0.0002		

Division of Caduceon Enterprises Inc.

Client:

**Ontario Clean Water Agency** 

P.O.Box 70, 209 Limoges Rd.

Limoges, ON K0A 2M0

Attention:

J.P. Gelinas

**Certificate of Analysis** 

Report:

220000834

Project:

Date Sampled:

Date Received:

**Date Printed:** 

Matrix:

St.Isidore WTP

January 29, 2002

January 29, 2002

March 08, 2002 **Drinking Water** 

Parameter	Unit	MDL	Sample	<b>Identif</b> ication	······································			 
			Raw Waier - Well #1	Raw Water - Well #2	Raw Water - Well #3	Raw Water - Well #4	Raw Water - Well #5	
Arsenic	mg/L	0.001				<0.001		
Selenium	mg/L	0.001				<0.001		
Total Cyanide	mg/L	0.005				<0.005		
Total Uranium	mg/L	0.001				0.002		
Aluminum	mg/L	0.01	0.01	<0.01	0.02	0.01	<0.01	
Boron	mg/L	0.01				0.10		
Barium	mg/L	0.005				0.520		
Chromium	mg/L	0.01				<0.01		
Copper	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Iron	mg/L	0.02				0.89		
Manganese	mg/L	0.01				0.08		
Sodium	mg/L	0.2				38.6		
Zinc	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
рн	units	0.10				8.03		
Benzo(a) pyrene	µg/L	0.01				<0.01		

**e**21

Client:

Ontario Clean Water Agency P.O.Box 70, 209 Limoges Rd.

Limoges, ON

**KOA 2M0** 

Attention:

J.P. Gelinas

**Certificate of Analysis** 

Report:

220000834

Project:

Date Sampled: Date Received:

Date Printed:

Matrix:

St.Isidore WTP

January 29, 2002 January 29, 2002

March 08, 2002

Parameter	Unit	MDL	Sample	Identification				<u> </u>	
			Raw Water - Well #1	Raw Water - Well #2	Raw Water - Well #3	Raw Water - Well #4	Raw Water - Well #5		
2,3,4,6-Tetrachloropher	iolµg/L	0.5				<0.5			
2,4,5-T	μg/L	1				<1			
2,4,6-Trichlorophenol	hd\r	0.5				<0.5		•	
2,4-D	µg/L	1				<1			•
2,4-Dichlorophenol	μg/L	0.5				<0.5			
Alachlor	μg/L	0.5				<0.5			
Aldicarb	μg/L	5				<5			
Aldrin	µg/L	0.02				<0.02			
Atrazine	µg/L	0.5				<0.5			
Bendlocarb	μg/L	2				<2			
Bromoxynil	µg/L	0.5				<0.5			
Carbaryl	µg/L	5				<5			
Carbofuran	μ <b>g</b> /L	5				<5			
Chlordane	μg/L	0.7				<0.7			
Chlorpyrifos (Dursban)	μg/L	1				<1			

Division of Caduceon Enterprises Inc.

Client:

**Ontario Clean Water Agency** 

P.O.Box 70, 209 Limoges Rd.

Limoges, ON **K0A 2M0** 

Attention:

J.P. Gelinas

Report:

Project: Date Sampled:

Date Received:

Date Printed:

Matrix:

220000834

St.Isidore WTP

January 29, 2002 January 29, 2002

March 08, 2002

Parameter	Unit	MDL	Sample	ldentification_		<del> </del>		
			Raw Water - Well #1	Raw Water - Well #2	Raw Water - Well #3	Raw Water - Well #4	Raw Water - Well #5	
Cyanazine (Bladex)	µg/L	1				<1		
TQQ	µg/L	3				<3		
Diazinon	µg/L	1				<1		
D1camba	μ <b>g/L</b>	1				<1		
Diclofop-methyl	µg/L	0.9				<0.9		
Dieldrin	μ <b>g/L</b>	0.05				<0.05		
Dimethoate	μ <b>g/</b> L	3				<2.5		
Dinoseb	μ <b>g</b> /L	1				<1		
Diuron	µg/L	10				<10		
Guthion (Azinphos-met)	ŋl)μg/L	2				<2		
Heptachlor	μ <b>g</b> /L	0.1				<0.1		
Heptachlor epoxide	µg/L	0.2				<0.2		
Lindane	μg/L	0.4				<0.4		
Malathion	μg/L	5				<5		
Methoxychlor	μg/L	90				<90		

Division of Caduceon Enterprises Inc.

Client:

Ontario Clean Water Agency

P.O.Box 70, 209 Limoges Rd. Limoges, ON

**KOA 2MO** 

Attention:

J.P. Gelinas

## **Certificate of Analysis**

Report:

Project:

Date Sampled:

Date Received:

Date Printed:

Matrix:

220000834

St.Isidore WTP

January 29, 2002

January 29, 2002

March 08, 2002

Parameter	Unit	MDL	Sample	Identification				
			Raw Water - Well #1	Raw Water - Well #2	Raw Water - Well #3	Raw Water - Well #4	Raw Water - Well #5	
Metolachlor	μg/L	0.5				<0.5		
Metribuzin (Sencor)	μg/L	5				<5		
Parathion	µg/L	1				<1		
Pentachlorophenol	μg/L	0.5				<0.5		
Phorate	μg/L	0.5				<0.5		
Picloram	μg/Ł	5				<5		
Prometryn	μg/L	0.3				<0.25		
Simazine	µg/L	1				<1		
Temephos	µg/L	10				<10		
Terbufos	μg/L	0.7				<0.7		
Total PCB	µg/L	0.3				<0.3		
Triallate	µg/L	1				<1		
Trifluralin	µg/L	1				<1		
Glyphosate	µg/L	10				<10		
1,1-Dichloroethylene	mg/L	0.0001				<0.0001		

Division of Caduceon Enterprises Inc.

Client:

Ontario Clean Water Agency

P.O.Box 70, 209 Limoges Rd.

Limoges, ON KOA 2M0

Attention:

J.P. Gelinas

**Certificate of Analysis** 

Report:

Project:

Date Sampled: Date Received:

Date Printed:

Matrix:

220000834

St.Isidore WTP

January 29, 2002 January 29, 2002

March 08, 2002

Parameter	Unit	MDL	Sample	Identification				
			Raw Water - Well #1	Raw Water - Well #2	Raw Water - Well #3	Raw Water - Well #4	Raw Water - Well #5	
1,2-Dichlorobenzene	mg/L	0.0001				<0.0001		
1,2-Dichloroethane	mg/L	0.0001				<0.0001		
1,4-Dichlorobenzene	mg/L	0.0002				<0.0002		
Benzene	mg/L	0.0005				<0.0005		
Bromodichloromethane	mg/L	0.0001				<0.0001		
Bromoform	mg/L	0.0001				<0.0001		
Carbon Tetrachloride	mg/L	0.0002				<0.0002		
Chlorobenzene	mg/L	0.0002				<0.0002		
Chloroform	mg/L	0.0003				<0.0003		
Dibromochloromethane	mg/L	0.0001				<0.0001		
Ethylbenzene	mg/L	0.0005				<0.0005		
m/p-Xylene	mg/L	0.002				<0.002		
Methylene Chloride	mg/L	0.003				<0.003		
o-Xylene	mg/L	0.002				<0.002		
Tetrachloroethylene	mg/L	0.0002				<0.0002		

Division of Caduceon Enterprises Inc.

Client:

Ontario Clean Water Agency

P.O.Box 70, 209 Limoges Rd.

Limoges, ON K0A 2M0

Attention:

J.P. Gelinas

**Certificate of Analysis** 

Report:

Project:

Date Sampled: Date Received:

Date Printed:

Matrix:

220000834

St.Isidore WTP

January 29, 2002 January 29, 2002

March 08, 2002

Parameter	Unit	MDL	Sample	dentification			
			Raw Water - Well #1	Raw Water - Well #2	Raw Water - Well #3	Raw Water - Well #4	Raw Water - Well #5
Toluene	mg/L	0.0005				<0.00)5	
Total Trihalomethanes	mg/L	0.001				<0.001	
Trichloroethylene	mg/L	0.0001				<0.0001	
Vinyl Chloride	mg/L	0.0003				<0.0003	
Diquat	μg/L	5				<5	
Paraquat	hd\r	1				<1	
1234678-HpCDD (Dioxins)	ppq	1				<1	
1234678-HpCDF (Furans)	ppq	1				<1	
1234769-HpCDF (Furans)	ppq	1				<1	•
123478-ExCDD (Dioxins)	ppq	1				<1	
123478-HxCDF (Furans)	ppq	1				<1	
123678-HxCDD (Dioxins)	ppq	1				<1	
123678-HxCDF (Furans)	ppq	1				<1	
123789-HxCDD (Dioxins)	ppq	1				<1	
123789-HxCDF (Furans)	ppq	1				<1	
				Caduceon Environm	And A set a series of		

Division of Caduceon Enterprises Inc.

Client:

**Ontario Clean Water Agency** P.O.Box 70, 209 Limoges Rd.

Limoges, ON **KOA 2M0** 

Attention:

J.P. Gelinas

**Certificate of Analysis** 

Report:

Project:

Date Sampled: Date Received:

**Date Printed:** 

Matrix:

220000834

St.Isidore WTP January 29, 2002

January 29, 2002

March 08, 2002 **Drinking Water** 

Parameter	Unit	MDL	Sample Ide	entification			
			Raw Water - Well #1	Raw Water - Well #2	Raw Water - Well #3	Raw Water - Well #4	Raw Water - Well #5
12378-PeCDD (Dioxins)	ppq	1				<1	
12378-PeCDF (Furans)	ppq	1				<1	
234678-HxCDF (Furans)	ppqq	1				<1	
23478-PeCDF (Furans)	ppq	1				<1	
2378-TCDD (Dioxins)	ppq	1				<1	
2378-TCDF (Furans)	ppq	1				<1	
OCDD (Dioxins)	ppq	1				<1	
OCDF (Furans)	ppq	1				<1	
Total HpCDDs (Dioxins)	ppq	1				<1	
Total HpCDFs (Furans)	pqq	1				<1	
Total HxCDDs (Dioxins)	ppq	1				<1	
Total HxCDFs (Furans)	ppq	1				<1	
Total PeCDDs (Dioxins)	ppq	1				<1	
Total PeCDFs (Furans)	ppq	1				<1	
Total TCDDs (Dioxins)	ppq	1				<1	

Division of Caduceon Enterprises Inc.

Client:

Ontario Clean Water Agency

P.O.Box 70, 209 Limoges Rd.

Limoges, ON K0A 2M0

Attention:

J.P. Gelinas

**Certificate of Analysis** 

Report:

220000834

Project:

St.Isidore WTP January 29, 2002

Date Sampled: Date Received:

January 29, 2002

Date Printed:

March 08, 2002

Matrix:

**Drinking Water** 

Parameter	Unit	MDL	Sample	Identification				·	
		·	Raw Water - Well #1	Raw Water - Well #2	Raw Water - Well #3	Raw Water - Well #4	Raw Water - Well #6		
rotal TCDFs (Furans)	ppq	1				<1			
Toxic Equivalent (TEQ)	ppq					o			
Mothane	L/m3	0.2				<0.2			
Gross Alpha	Bq/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Gross Beta	Bq/L	0.1	0.3	0,2	0.4	0.2	0.3		
Tritium	Bq/L	1,000	<1000	<1000	<1000	<1000	<1000		
NTA	mg/L	0.05				<0.05			
N-Nitrosodimethylamine	μg/L	0.002				<0.002			
Dissolved Organic Carbon	mg/L	0.2				2.8			
Hydrogen Sulphide (H2S)	mg/L	0.01	0.02	0.95	0.08	0.06	0.01		
Colour	TCU	1				5			

N/A - Not available on Raw Water. This is a corerction certificate and superceds all previous reports of this number. Benzo(a) pyrene Detection limit was corrected.

Michael Zichell, General Manager

Unit

MDL

Client:

Ontario Clean Water Agency P.O.Box 70, 209 Limoges Rd. Limoges, ON

KOA 2MO

Attention: Parameter J.P. Gelinas

Certificate of Analysis

Report

210007925

Project:
Date Sampled:

Stitsidare WTP 1 revember 5, 2001

Date Printed:

November 7, 2001

Matrix:

Drinking Water

			Raw Water Web #1	Raw Water Well #2	Raw Water Well #3	Raw Viator Well #8	TRT H28 W.T.P
Chloride	<b>=</b> g/L	0.5	103 -	53.3 ~	112 -	88.8	92.9
Fluoride	mg/€	0.1	0.5 ~	Q.B	0.3 ~	0.3-	9 7-
Mitrite- Mitrogen	mg/L	0 1	<0.1 <sup>-</sup>	<0.1 ~	co.1 ~	<0.1~	<0.1 ~
Nitrate- Mitrugen	mg/1.	0.1	<0.1 -	<0.1 _	<0.1~	<0.1 ~	0.1 -
Bardness as CaCO3	mg/L	1	209 —	31 -	226	273 —	139 -
Turbidity	NLA.	0.1	0.4 ~	0.6=	1.0	0.7-	0.3 ~
Total Kjøldihl Witxogen	mg/L	0.05	0.88	0.60 -	<b>0.</b>	1.10-	0.25-
Total Ammonia Mitroyen	mg/L	0.01	U . 81	0.53	9.72	1.19	0.18
Iron	m3/L	0.02	0.09 ~	0.06-	0.38 -	0.14	co.oz-
Manganese	<b>m3/L</b>	0.01	0.02 -	<0.01	0.01 -	0.02	<0.01 —
Sodium	<b>₽</b> 3/L	D. 2	154 ~	191-	73.7 —	77.0 —	155 —
рВ	units	0.10	8.17 -	B. 65 -	8.19 -	9.19	8.45-
Dissolved Organic Carbon	mg/L	v. <b>2</b>	2.4	14-	0.6-	0.6-	1.4~
Total Organic Cambon	₽g/L	0.3	2.6 -	1.7-	0.7	0.8 —	1.6~
Colour	TO	1	6 ~	3 -	α- ι	<1	1

Sample Identification

Caduceon Enterprises Inc. Environmental Laboratory 2378 Hoffy Lane, Ottawe, Onterio, K1V 7P1, Canada T.d. (813)528-0123, Fac (613)526-1244

Page 1 of 2

Dave Peolor, Lab Supervisor

26 01 02:07p

# Certificate of Analysis

Project Report

210007925

Date Sampled:

Date Received:

November 19, 2001 November 6, 2001 November 7, 2001 St-Isidore WTP Drinking Water

Date Printed:

Maturia:

Sample Identification

절

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Parameter Attention: KOA 2NO

J.P. Gelinas

TRT HZB W.T.P Raw Water Well #5

19061

Raw Wales Well #3 Raw Water Well #7

Raw Vielter Wed #1

2000

1360 -

818

Mino/on 1

Conductivity

9.51

Hayard Ziebell, General Misroger

Caduceon Enterprises the Ernisonmental Laboratory
2378 Hoby Lane, Oxfores, Oxforio, KTV 701, Cenada
Tal (613)526-0123, Par (613)528-1244

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PAGE

Ontario Clean Water Agency P.O.Box 70, 209 Limages Rd.

Limoges, ON

Caduceon Enterprises Inc.

Environmental Laboratory

OCMA LIMOGE

1-013-443-5011

91:91 Z00Z/Z0/80



# Certificate of **Analysis**

Client:

**Ontario Clean Water Agency** P.O. Box 70, 209 Limoges Rd. Limoges, Ontario K0A 2M0

Report:

200008402

Project:

St. Isidore WTP

Date sampled: Date submitted:

December 18, 2000

Date printed:

December 19, 2000 January 26, 2001

Attention: Daniel Lafleche

drinking water

page 2 of 4				Matrix:	drin	king water	
Parameter	Units	Det. Limit	Raw Water Well #1	Raw Water Well #2	Raw Water Well #3	Treated Water Well #5	Treated Water WTP
Metolachior	µg/L	0.5	nd	nd	nd	nd	nd
Metribuzin(Sencor)	μg/L	5	nd	nd	nd	nd	nd
Parathion	μg/L	1	nd	nd	nd	nd	nd
Pentachlorophenol	μg/L	0.5	nd	nd	nd	nd	nd
Phorate	μg/L	1	nd	nd	nd	nd	nd
Picioram	μg/L	5	nd	nd	nd	nd	nd
Prometryn	μg/L	0.5	nd	nd	nd	nd	nd
Simazine	μg/L	2	nd	nd	nd	nd	nd
Temephos	μg/L	200	nd	nd	nd	nd	nd
Terbufos	μg/L	0.5	nd	nd	nd	nd	nd
Triallate	μg/L	1	nd	nd	nd	nd	nd
Triflurallin	μg/L	1	nd	nd	nd	nd	nd
Total PCB	μg/L	2.5	nd	nd	nd	nd	nd
Glyphosate	μg/L	10	nd	nd	nd	nd	nd
Paraquat	μg/L	8	nd	nd	nd	nd	nd
Diquat	μg/L	20	nd	nd	nd	nd	nd
NDMA	μ <b>g/</b> L	0.0009	0.0009	0.001	0.001	0.002	0.004
NTA	mg/L	0.05	<0.05	<0.05	<0.05	< 0.05	<0.05
Benzo(a)pyrene	μg/L	0.01	nd	nd	nd	na	nd
Methane	L/m3	0.02	nd	nd	nd	nd	nd
							· · · · · · · · · · · · · · · · · · ·
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\*nd=Not detected



# Certificate of **Analysis**

Client:

**Ontario Clean Water Agency** P.O. Box 70, 209 Limoges Rd. Limoges, Ontario K0A 2M0

Attention: Daniel Lafleche

,Report:

200008402

Project:

St. Isidore WTP

Date sampled:

December 18, 2000

Date submitted:

December 19, 2000

Date printed: January 26, 2001

Page 3 of 4				Matrix:	drinking	water	
Parameter	Units	Det. Limit	Raw Water Well #1	Raw Water Well #2	Raw Water Well #3	Treated Water Well #5	Treated Water WTP
benzene	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
bromodichloromethane	mg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.0012
bromoform	mg/L	0.0008	<0.0008	<0.0008	<0.0008	<0.0008	≪0.0008
carbon tetrachloride	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
chlorobenzene	mg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
chloratorm	mg/L	0.0006	<0.0006	<0.0006	<0.0006	<0.0006	0.0018
dibromochloromethane	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,2-dichlorobenzene	mg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
1,4-dichlorobenzene	mg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
1,2-dichloroethane	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-dichloroethylene	mg/L.	0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006
ethylbenzene	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
methylene chloride	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	<0.004
tetrachloroethylene	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
toluene	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trichloroethylene	mg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
vinyi chloride	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m/p-xylene	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
o-xylene	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
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Seprotech Laboratories 2378 Holly Lane, Ottawa, Ontario, KIV 7P1, Canada Tel: (613)523-1641, Fax: (613)731-0851

Dave	Peeler.	Lab	Suc	ervisa

APPENDIX V

# THE NATION MUNICIPALITY VILLAGE OF ST-ISIDORE

# Raw Water & Treated Water Microbiological Characteristics

Number of samples with positive results YEAR: 1999

Of Samples	Results	Unsafe Results	Fecal Coli.	Total	HPC	HPC
			>=i	Coli. >=1	(SPC) 1-499	(SPC) >=500
		Raw V	Water			
16	N/A	N/A	6	7	31	10
46	N/A	N/A	4	5	28	10
46	N/A	N/A	4	4	30	11
47	N/A	N/A	0	0	34	
		Treated	i Water			
52	52	0	0	0	29	2
49	49	0	0	0	20	0
150	150		0	0	50	3
	46 46 47 52	46 N/A 46 N/A 47 N/A 52 52 49 49	16 N/A N/A 46 N/A N/A 46 N/A N/A 47 N/A N/A  Treated 52 52 0 49 49 0	16 N/A N/A 6  46 N/A N/A 4  46 N/A N/A 4  47 N/A N/A 0  Treated Water  52 52 0 0  49 49 0 0	16 N/A N/A 6 7  46 N/A N/A 4 5  46 N/A N/A 4 4  47 N/A N/A 0 0  Treated Water  52 52 0 0 0 0  49 49 0 0 0	16         N/A         N/A         6         7         31           46         N/A         N/A         4         5         28           46         N/A         N/A         4         4         30           47         N/A         N/A         0         0         34           Treated Water           52         52         0         0         0         29           49         49         0         0         0         20

Comments: No unsafe conditions are met at treated water.

Compiled by:

LECOMPTE ENGINEERING LTD.

Jean Hébert, P.Eng. December 3, 2001

#### THE NATION MUNICIPALITY VILLAGE OF ST-ISIDORE

#### Raw Water & Treated Water **Microbiological Characteristics**

#### Number of samples with positive results YEAR: 2000

Source	Number	Safe	- Poor or	. 1		amples having	
Of Sample	Of Samples		Unsafe Results	Fecal Coli.	Total Coli. >=1	HPC (SPC) 1-499	HPC (SPC) >=500
			Raw V	Vater			
Well no. 1	55	N/A	N/A	0	11	43	5
Well no. 2	55	N/A	N/A	1	8	43	4
Well no. 3	55	N/A	N/A	2	8	41	3
Well no. 5	55	N/A	N/A	0	1	46	<u>j</u>
			Treated	Water			
WTP	55	55	0	0	0	17	0
Well no. 5	55	55	0	0	0	14	0
WPS and Water							
Tower	179	179	0	0	0	91	9

Comments: No unsafe conditions are met at treated water.

Compiled by: LECOMPTE ENGINEERING LTD.

Jean Hébert, P.Eng. December 3, 2001

# THE NATION MUNICIPALITY VILLAGE OF ST-ISIDORE

# Raw Water & Treated Water Microbiological Characteristics

# Number of samples with positive results YEAR: 2001

Source	Number			Number of S	amples having	g	
Of Sample	Of Samples	Results Unsafe Results	Fecal Coli. >=1	Total Coli. >=1	HPC (SPC) 1-499	HPC (SPC) >=500	
			Raw V	Vater			
Well no. 1	28	N/A	N/A	1	4	21	1
Well no. 2	28	N/A	N/A	0	3	6	2
Well no. 3	28	N/A	N/A	0	1	19 -	3
Well no. 5	28	N/A	N/A	0	0	5	
			Treated	Water			
WTP	28	28	0	0	0	2	0
Well no. 5	28	28	0	0	0	1	0
WPS and Water							
Tower	80	80	0	0	0	34	<u>)</u>

Comments: No unsafe conditions are met at treated water.

Compiled by:

LECOMPTE ENGINEERING LTD.

Jean Hébert, P.Eng. December 3, 2001

#### APPENDIX VI

#### Table 2 – Microbiological Characteristics Raw Water From January 2000 to November 2001

#### (also included into Appendix XIII - Records of Microbiological Testings)

	Number	Number of Samples having						
	Of Samples	Fecal Coli.	Total Coli.	1	HPC (SPC)			
		>=1	>=1	1-499	>=500			
Year 2000					· ,			
Well no.1	55	0	11	43	5			
Well no.2	55	1	8	43	4			
Well no.3	55	2	8	41	3			
Well no.5	55	0	1	46	0			
Year 2001								
Well no.1	28	1	4	21	1			
Well no.2	28	0	3	6	2			
Well not?	28	0	1	19	3			
Weli no.5	28	0	0	5	1			

Well no. 4 was shut down in 1997 because of a high bacteria count and high iron and manganese concentrations.

Results at this well are as follows:

Parameter	Unit	Sept 1997	April 1997
Total Coliform	c/100 mL	1600	22
E. Coli or Fecal Coliform	c/100 mL	128	4

Compiled by:

LECOMPTE ENGINEERING LTD.

Jean Hébert, P.Eng. December 3, 2001



# Certificate of Analysis

Client:
Ontario Clean Water Agency
832 Drouin St.
Casselman, Ontario
KOA 1M0

Report: Program: 992719123 St-Isidore WTP

Date sampled: Date received: September 27, 1999 September 28, 1999

Date printed:

September 30, 1999

Attention: J.P. Gelinas

Attention, S.F. Gennas		М	atrix:	drinking water	
Sample Identification	Free Chlorine	Total Chlorine	fecal coliforms	total coliforms	standard plate count
Units	mg/L	mg/L	/100mL	/100mL	/mL
Det, Limit			1	2	2
Raw Water Well #1			7	18	>3000
Raw Water Well #2			6	14	>3000
Raw Water Well #3			7	30	>3000
Raw Water Well #5			absent	absent	268
WTP Treated Water A	0.65	1.6	absent	absent	30
Dist. Fire Hydrant #3 ch. Campeau	0.60	1.1	absent	absent	>600
Dist. Fire Hydrant #6 Ranger St.	0.70	1.2	absent	absent	
Dist. Fire Hydrant #4 Jacques St.	0.60	1.3	absent	absent	>600
WTP Treated Water B	0.70	1.6	absent	absent	20
Dist. Treated at Weil #5	0.80	1.4	absent	absent	absent
					·

Seprotech Laboratories 2378 Holly Lane, Ottawa, Ontario, K1V 7P1, Canada Tel: (613)523-1641, Fax: (613)731-0851



# Certificate of **Analysis**

Client:

**Ontario Clean Water Agency** 

832 Drouin St.

Casselman, Ontario

**KOA 1MO** 

Report:

992789302

Program:

St-Isidore WTP

Date sampled: Date received: October 03, 1999

Date printed:

October 05, 1999

October 08, 1999

Attention: J.P. Gelinas

Matrix.

drinking water

		M:	atrix:	drinking water	
Sample Identification	Free Chlorine	Total Chlorine	fecal coliforms	total coliforms	standard plate count
Units	mg/L	mg/L	/100mL	/100mL	/mL
Det. Limit			-1	2	2
Raw Water Well #1			20	44	244
Raw Water Well #2			22	46	158
Raw Water Well #3			15	34	176
Raw Water Well #5			absent	absent	944
WTP Treated Water	0.52	0.77	absent	absent	absent
Dist. Fire Hydrant #6 Ranger St.	0.48	0.60	absent	absent	14
Dist. Fire Hydrant #3 ch. Campeau	0.50	0.70	absent	absen:	
Dist. Treated at Well #5	1.0	1.4	absent	absent	absent
				,	

Seprotech Laboratories 2378 Holly Lane, Ottawa, Ontario, K1V 7P1, Canada Tel: (613)523-1641, Fax: (613)731-0851



# Certificate of Analysis

Client:
Ontario Clean Water Agency
832 Drouin St.
Casselman, Ontario
K0A 1M0

Report:

992869541

Program: Date sampled: St-Isidore WTP

Date received:

October 12, 1999 October 13, 1999

Date printed:

October 18, 1999

Attention: J.P. Gelinas

Matrix: drinking water

_				
Free Chlorine	Total Chlorine	fecal coliforms	total coliforms	standard plate count
mg/L	mg/L	/100mL	/100mL	/mL
		1	2	2
		6	42	>2000
		15	48	600
		10	18	360
		absent	absent	4
0.61	0.73	absent	absent	8
0.20	0.37	absent	absent	300
0.21	0.39	absent	absent	
0.70	1.5	absent	absent	absent
			·	
				<u> </u>
				<u> </u>
	0.61 0.20	O.61 0.73 0.20 0.37 0.21 0.39	Chlorine         Chlorine           mg/L         /100mL           1         1           6         15           10         absent           0.61         0.73         absent           0.20         0.37         absent           0.21         0.39         absent	Chlorine         Chlorine           mg/L         /100mL           1         2           6         42           15         48           10         18           absent         absent           0.61         0.73         absent           0.20         0.37         absent           0.21         0.39         absent           0.70         1.5         absent           absent         absent

Seprotech Laboratories 2378 Holly Lane, Ottawa, Ontario, K1V 7P1, Canada Tel: (613)523-1641, Fax: (613)731-0851



# Certificate of **Analysis**

Client: **Ontario Clean Water Agency** 832 Drouin St. Casselman, Ontario KOA 1MO

Report: Program: Date sampled:

992929723 St-Isidore WTP October 18, 1999

Date received: Date printed:

-:

October 19, 1999 October 29, 1999

	T		atrix:	drinking water	-4444444444444-
Sample Identification	Free Chlorine	Total Chlorine	fecal coliforms	total coliforms	standard plate count
Units	mg/L	mg/L	/100mL	/100mL	/mL
Det. Limit			1	2	2
Raw Water Well #1			4	10	>600
Raw Water Well #2			4	14	>600
Raw Water Well #3			10	24	>600
Raw Water Well #5			absent	absent	336
WTP Treated Water	0.10	0.20	absent	absent	112
Dist. Fire Hydrant #4 Jacques St.	0.25	0.40	absent	absent	absent
Dist. Fire Hydrant #3 ch. Campeau	0.85	1.0	absent	absent	1 Leitt
Dist. Treated at Well #5	1.6	2.0	absent	absent	absent
		<u> </u>			

Seprotech Laboratories 2378 Holly Lane, Ottawa, Ontario, K1V 7P1, Canada Tel: (613)523-1641, Fax: (613)731-0851



# Certificate of Analysis

Client:
Ontario Clean Water Agency
832 Drouin St.
Casselman, Ontario
KOA 1M0

Report: Program: 992999908 St-Isidore WTP

Date sampled: Date received: October 25, 1999

Date printed:

October 26, 1999 October 29, 1999

Attention: J.P. Gelinas

Matrix: drinking water

Sample Identification Free Chlorine Chlorine In Itotal Chlorine Chlorine Chlorine In Itotal Coliforms Itotal Chlorine In	andard plate count /mL 2
Det. Limit         1         2           Raw Water Well #1         7         24	
Raw Water Well #1 7 24	2
Raw Water Well #2 absent absent	
Raw Water Well #3 absent absent	
Raw Water Weil #5 absent absent	
WTP Treated Water 0.32 0.44 absent absent	absent
Dist. Fire Hydrant #7 Place Mad. 0.71 0.90 absent absent	-
Dist. Fire Hydrant #4 Jacques St. 1.0 1.5 absent absent	
Dist. Water Tower 0.65 1.1 absent absent	
Dist. Treated at Weil #5 2.0 2.5 absent absent	
	· · · · · · · · · · · · · · · · · · ·

Seprotech Laboratories 2378 Holly Lane, Ottawa, Ontario, K1V 7P1, Canada Tel: (613)523-1641, Fax: (613)731-0851



# Certificate of Analysis

Client:
Ontario Clean Water Agency
832 Drouin St.
Casselman, Ontario
KOA 1M0

Report: Program: Date sampled: 993070135 St-Isidore WTP

Date received:
Date printed:

November 01, 1999 November 02, 1999 November 08, 1999

Attention: J.P. Gelinas

Matrix: drinking water

		NA	aurx:	annking water	
Sample !dentification	Free Chlorine	Total Chlorine	fecal coliforms	total coliforms	standard plate count
Units	mg/L	mg/L	/100mL	/100mL	/mL
Det. Limit			1	2	2
Raw Water Well #1		·	7	14	>5000
Raw Water Well #2			absent	24	>600
Raw Water Well #3			absent	absent	>600
Raw Water Well #5			absent	absent	248
WTP Treated Water	1.2	1.4	absent	absent	absent
Dist. Fire Hydrant #6 Ranger St.	· <sup>٩3</sup> 0.72	l, <sub>3</sub> , 0.99	absent	absent	absent
Dist. Fire Hydrant #3 ch. Campeau	0.60	0.92	absent	absent	absent
Dist. Treated at Well #5	1.4	2.0	absent	absent	absent

Seprotech Laboratories 2378 Holly Lane, Ottawa, Ontario, K1V 7P1, Canada Tel: (613)523-1641, Fax: (613)731-0851

**APPENDIX VI** 

## APPENDIX VI

# The Nation Municipality Village of St-Isidore

## Raw Water and Treated Water Clostridium Perfringens Counts Number of samples at each Source

Source of Sample Combined	1997	1998	1999	2000	2001
Wells no. 1,			·		
2 and 3	9	10	12	2	7
Treated					
Water at					
WTP	9	10	12	2	7
Treated					
Water at					
Well no. 5	0	0	0	0	7

Number of samples with positive results at all locations = 0

Compiled by:

LECOMPTE ENGINEERING LTD.

Jean Hébert, P.Eng/

Can Hillert

April 17, 2002

5918-app.VI

1020 Hargrieve Road London, Ontario NGE 1P5

200 M

Toli Free: 1-800-680-9771

				Chlorine and Amount	NA	987						Comments		100mc						1
			1-540 Y.	nent								Clostridium Persistration Pers	27	\frac{1}{2}						
GENCY			FIX. 764-5404	e and Environn								Aeromonas /100 mL								
ONTARO CLEAN WATER AGENCY	WIP	Ortario	784-5678	Nature of Sample and Environment		.~						Heterotrophic Plate Count 11 mL								
ONTABIO C	CASSELMAN WIP	Cassefman, Order	KOA 1MO		0.	1						Pseudomonas aeruginosa 1100 mL								
Report To:	Address:		Fax:	and Time	DORE WITH							Fecal Streptococci /100 mL								
				Locations and	ratisi-	•						Escherichia coli 1100 mL								
ايرا	K		] }	Sampling Point Locations	15 a	2 N 0 11	<sub>2</sub> 2					Background /100 mL								
ST-IST DURE	AROUND LUNTYK	BORIC 97	APR 2 2 1997	U,	RAW H							Total Coliforms /100 mL			•					
	(ARONA)	C		Sender's Number	1# IST-12 # 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ST-155#3						Sender's Number			:					
Phinicipality:	The second second	Baldoms mot	teate Amalyzed	Lab	A STATE OF S			ЭИС	MAIKO	<b>7</b> 6 EV	- -	Lab Number	T89 6	19 X	)3 E <b>7</b>	:07	JHT	16/f	2/10	

200 D

1020 Hargrieve Road London, Ontario N6E 1P5

Toll Free: 1-000-680-9771

Telephone: (519) 681-0571

l-ax:

(519) 681-7150

181	Municipalit	VI ST-TO	IDORE.			Report To:	ANTARK	CLEAN WATER	AGENCY		
SI 1S1	Source:	_	WITER			Address:	CASSELM	AN WTP			
	Date Samp						B32 Droui Casselman	. Ontario			
WT7	Date Analyz		0.6.1997			Fax:	koa 1mo	764-5678	FA4 613-	764-5424	
CASSELMAN	Lab Number	Sender's Number	s	ampling Point	Locations and	d Time		Nature of Sampi	e and Environ	ment	Chlorine and Amount
† † † ,	es. (Un	21-122 #	TAW W	ative St	-TSI DOR	e w.T.P					NA
		ST-ISI.#Q		DWATER	ST: IS	ing h	578.	- Marie and			121
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71 MC							ـــــــ څخې خدست د د ساېد د پارونۍ د د ښې پوت				
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067/	Lab Number	Sender's Number	Total Coliforms /100 mL	Background /100 mL	Escherichia cofi /100 mL	Fecal Streptococci /100 mL	Pseudomonas aeruginosa /100 mL	Heterotrophic Plate Count 11 mL	Aeromonas /100 mL	BCJöstridjum Perfringens 1100 mL	Comments
700	r.3393									0	
are v	23374				,					0 * 0	er
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∩ <b>u</b> T											
10/00											
on / en											

1020 Hargrieve Road London, Ontario N6E 1P5

Toll Free: 1-800-680-9771

Municipali	ty: St-Is	IDORE.			Report To:	CNTARIO	CLEAN WATER	AGENCY		1
Source:	_GROIN[	STRW (	<b>.</b>		Address:	CASSELM	AN WTP			
	pled: JUN 02 1					832 Droui Casselmar	onterio			
Date Analy	zed JUN 03	1997			Fax:	toa 1MO	764-5678	FAA 613-	764-5424	
Lab Number	Sender's Number		ampling Point				Nature of Samp	le and Énviron	ment	Chlorine and Amoun
1.5355	21-125 #	TAW W	OTTO R ST	-TST 00	e w.T.P					NA
5356	ST-ISI#2	TRANTA	a staw o	J-IS	ing u	).T.P.				. 34 F
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				[;:::						
					7/2					
					JUN 5 1					·
				الما	Jon d'a					
	·									
Lab Number	Sender's Number	Total · Coliforms /100 mL	Background /100 mL	Escherichia coli /100 mL	Fecal Streptococci /100 mL	Pseudomonas aeruginosa /100 mL	Heterotrophic Plate Count 11 mL	Aeromonas /100 mL	Clostridium perfring <b>ens</b> "1100 mil	Comments
64535	5								12	
2535	6				· · · · · · · · · · · · · · · · · · ·				0 *	per
										800 mL
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Chlorine and Amou	Juami	下的 613 - 19e and Environ	Mature of Samp	CASSELM B32 Drawl Baneaea2 OMr A03	emit t	ACO IZT-	rnio9 pniiqme	s whit	Sender's Number Number	19 dmuly

1020 Hargneve Road London, Ontario NGE 1P5

Telephone: (519) 681-0571 Fax: (519) 681-7150

Toll Free: 1-400-680-9771

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<b>ಬೊತ್ತಾಗಾ</b> ಂನಿ	Clostndlum pedringens Jm 001	sanomoreA Jm 0011	Heterotrophic Plate Count Im I I	zsonomobues9 esonigunaa Jm 00M	Fecal Sueptococci 1100 mL	Eschenchia coli 1100 mL	Hop mr Hop mr	taoi Emiotilo Coliform Jm 00t1	Sender's Number	Lab
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		AUGUA I	OTAM MATER	MUITIN	Report To:			TDORE .	<u> </u>	Qilisqisina()

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12232 12232

Number

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Municipality:

Source:

Number

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cipality	" ST-19	IDORE.			Report To:	CHRATINO	CLEAN WATER	AGENCY		
ce:	_				Address:	CASSELM	AN WTP		*	
	1101 11 10 10	997		<del> </del>		Casselmas	. Ontario			
			OCT 07	1997	Fax:	koa 1MO	764-5678	FA4 613-	764-5424	
ab aber	Sender's Number	S	ampling Point	Locations and	1 Time	ment	Chlorine and Amount			
31	<u>ड्रा-गश्च #  </u>	TAW W	OTRR ST	-TST DOR	E W.T.P					NA
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									100	
b iber	Sender's Number	Total Colforms /100 mL	Background /100 mL	Escherichia coli /100 mL	Fecal Streptococci /100 mL	Pseudomonas aeruginosa /100 mL	Heterotrophic Plate Count /1 mL	Aeromonas /100 mL	Clostridium perfringens /100 mL	Comments
81.									0	
82		·		,					O per	1000ML
		•								
	Sample Analyze  Analyze  Sample  Analyze  Sample  Samp	Sampled: GROING  Analyzed:    Sender's   Number	Sampled: DCI 0 6 1997  Analyzed:  Sender's Number S  ST-151 # 1 TAW W  ST-151 # 2 TRBATE  Sher Number Collforms  /100 mL	Sampled: OCT 07  Analyzed: OCT 07  Aber Number Sampling Point  Analyzed: TAW WOTR ST  Analy	Sampled: DCT 0 7 1997  Analyzed: OCT 0 7 1997  Abber Sender's Sampling Point Locations and Number ST-155 #1 TRU WOTH R ST-151 DOR  BY ST-155 #1 TRU WOTH R ST-151 DOR  BY ST-151 # 2 TRUBTION WATER ST-151  By Sender's Number Colliforms /100 mL /100 mL /100 mL  SA. Sender's Number /100 mL	Sampled: DCT 0 6 1987  Analyzed: OCT 0 7 1997 Fax:  Abber Sender's Sampling Point Locations and Time  31 ST-155 #1 TAW WOTR ST-TST DORE W.T.P  82 ST-151 # 2 TRBRTRD WATR ST-TST DORE W.T.P  Bber Sender's Collorms /100 mL Streptococcl /100 mL  83. ST-151 # 3 Total /100 mL  Streptococcl /100 mL  83. Streptococcl /100 mL	Sampled: DI 06 1997  Sampled: DI 06 1997  Analyzed:  OCT 07 1997  Fax:  KOA 1MO  Abor Sender's Number  Sampling Point Locations and Time  ST-151 #1  TRU WOTH ST-TST DIRE W.T.P.  ST-151 #2  TRUTTED WATER ST-TST DIRE W.T.P.  ST-151 #2  TRUTTED WATER ST-TST DIRE W.T.P.  BY ST-151 #2  TRUTTED WATER ST-TST DIRE W.T.P.  ST-151 #2  TRUTTED WATER ST-TST DIRE W.T.P.  BY ST-151 #2  Total Colliorins Number Colliorins Number Colliorins 1/100 mL  Sizeptococci Pseudomonas aeruginosa 1/100 mL	Sampled: OCT 0 7 1997 Fax: Casselman WIP Sampled: OCT 0 7 1997 Fax: LOA 1MO 764-5678  De Sender's Number Sampling Point Locations and Time Nature of Samp  ST-151 # 2 TRBATRO WATER ST-TSLDER W.T.P.  Size St-151 # 2 TRBATRO WATER ST-TSLDER W.T.P.  Bize St-151 # 2 TRBATRO WATER ST-TSLDER W.T.P.  Sender's Number Collions Background Escherichie Steptococci 1100 mL 1100	Sampled: OCT 07 1997 Fax: CASSEMAN WTP B12 Troub Sheet  Analyzed: OCT 07 1997 Fax: KDA 1MO 764-5678 FA 6/3 -  Analyzed: Sender's Number Sampling Point Locations and Time Nature of Sample and Environ  31 ST-153 #1 TIAW WOTR R ST-TSTDRE W.T.P.  822 ST-151 #2 TRBATBO WATR ST-TSTDRE W.T.P.  B23 ST-151 #2 TRBATBO WATR ST-TSTDRE W.T.P.  B34 ST-151 #2 TRBATBO WATR ST-TSTDRE W.T.P.  B45 Sender's Colliforms /100 mL /100	Sampled: ST 16 1897  Sampled: ST 16 1897  Cassehman WTP  832 Drock Street  Cassehman Ortale  Cassehman

11/08/97

GAP EnviroMicrobial Services Inc.

:Xs7 Telephone: (S19) 681-0571

1020 Hargrieve Road

THU 12:49 FAX אססטיר אינע \$0303. 0 0 \$0000g 7150 Clostridium pedringens JM 001i 1m11 Jm 0011 7400 ML 1400 mL Jm 00t1 Jm 0011 1400 mL Number Number Plate Count esoulBruee Comments Streptococci 1100 Coliforms Background AeromonaA Sender's qe7 Heterotrophic Pseudomobues · lassal Escherichia 1610T GAP ENVIROMIC AON 16619 33036 ST-121 + 3 118. 212. ESULTATE SETAL OFTAES # 221-72 ANA 25056 InuomA bas Number Number Mature of Sample and Environment Sampling Point Locations and Time Chlorine Sender's rsp 491 613-40F-510 1871 Fax: Date Analyzed: 8782-\$87 OM! AQJ Casasman, Ordanio Date Sampled: Baz Diona Subbl GRAIND WITTER CASSELMAN WTP :asaibbA CHERN WATER AGENCY ST-ISIDORE Report To: :yhleqibinubl 0217-183 (613) 1776-083-008-1 :sariq lloT London, Ontatio N6E 1P5

1020 Hargrieve Road London, Ontario NGE 1P5

Toll Free: 1-800-680-9771

WED 1	4:06	FA	X 51	9 681	715	0 		GAP	ENVI	ROMIC	 			 		<b>@</b>	001
			Chlorine and Amount	MA	166'						Comments		SCOML SCOML				
		764-5434	nent				3 1967				Ciostridium pertringens 1100 mt.	0	* 0		•		
AGENCY		F94 613-7	and Environn			XWL	E 030				Aeromonas 1100 mL						The state of the s
CASSELMAN WIP	Street Ontario	764-5678	Nature of Sample and Environment				Activities (19. de			,	Heterotrophic Ptate Count 11 mL						de la responsable de destrumption unaggebenden erde Mr. von de
CASSELMAN WTP	Casselman.	KOA 11MO	_		<u>ن</u> 1-						Pseudomonas aeruginosa /100 mL						
Report To: Address:		Fax:	Time	Cult.P.	MRR (W.T			Control and fairly defined with response to the second sec			Fecal Streptococci /100 mL						
			ocations and	ST-ISTMRE (N.	CF IN MAR						Escherichia cofi 1100 mL						
	1		Sampling Point Locations and		=						Background /100 mL						
ST-TSTDORE	1997	0.2 1997		Thus works	1	1					 Total Coliforms /100 mL						
7	Med: 0.50 0 1 1997	zed: DEC 0	Sender's Number	005702	005703						 Sender's Number						
( ) Sunicipality:	vate Sampled;	Date Analyzed:	Lab Number	05702	00220						Lab Number	0220	05203				•

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Way

Toll Free: 1-800-680-9771

Telephone: (519) 681-0571 Fax: (519) 681-7150

Fax:

Municipality	" ST-IS	IDORE.			Report Tc:	CNTARIO	CLEAN WATE	R AGENCY			
Source:	GRAINS	WIRR			Address:	CASSELM	an wip				
Date Sampl	36414	0 5 1998				832 Orouk Casselman	Onterio				
Date Analyz	ed: JAN	0 6 1998			Fax:	KOA 1MO	to A 1840 764-5678 FAI 613-764-				
Lab Number	Sender's Number	S	ampling Point	Locations and	ocations and Time Nature of Sample and Environment						<b>n</b> e
08214	Z1-121 #	TAW W	OTO R ST	-ISI DOR	-ISIDORE W.T.P.						
08215	ST-1SI#2	TROST	AFTAW C	STIS	STITURE WITP.						_
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Lab Number	Sender's Number	Total Coliforms /100 mL	Background /100 mL	Escherichia coli 1100 ml	Fecal Streptococci /100 mL	Pseudomonas aeruginosa !100 mL	Heterotrophic Plate Count /1 mL	Aeromonas /100 mL	Clostridium pertringens /100 mL	Comme	nts
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01/19/98

MON 11:51 FAX 519 881 7150

CAP ENVIRONT

--- CASSELMAN S.

1020 Hargrieve Road London, Ontario N6E 1P5

Toll Free: 1-800-680-9771

Municipality	"ST-IS	IDORE.			Report To:		CLEAN WATER	AGENCY			
Source:	GRAINE	WITER	<b></b>		Address:	CASSELM					
Date Sample		0 2 1990				832 Droui Casselman	832 Drouin Street Casselman, Ontario				
Date Analyz	ed: FEB O	3 <b>19</b> 98			Fax:	toa 1MO	764-5678	FA1 613-	764-5424		
Lab Number	Number Number Sampling Point Li  0324 ST-155 #1 TAW WOTER ST-				d Time		Nature of Samp	ole and Environi	ment	Chlorin and Amo	
0924					e with			NA			
10925	ST-ISI#2	TROATE			wes u					. 87	1
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Lab Number	Sender's Number	Total Coliforms /100 mL	Background /100 mL	Escherichia coli /100 mL	Fecal Streptococci	Pseudomonas aeruginosa /100 mL	Heterotrophic Plate Count / 1 mL	Aeromonas /100 mL	Clostridium perfringens /100 mL	Comme	nts
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1020 Hargrieve Road London, Ontario N6E 1P5

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				Chlorine and Amount	MA	1.1				·		Comments		COOM	
			194 613 - 764 - 5424	ment		Istal Cit						Clostndium perfringens 1100 mL	0	1 × P/6	
AGENCY			HB4 613-	le and Environ					MAR 1 2 1938			Aeromonas /100 mL			
ONTARIO CLEAN WATER AGENCY	AN WTP	Orderio	184-30/6	Nature of Sample and Environment					MAR			Heterotrophic Plate Count / 1 mL		-	
CNTABIO	CASSELMAN WTP	Cassemen Order	KOA 11MO									Pseudomonas aeruginosa 1100 mL			
Report To:	Address:		Fax:	and Time	HAW WOTHE ST-TSTODE WIT.P.	IX WAS WIP.						Fecal Streptococci /100 mL			
					-TST DOR	5						Escherichia cali 1100 mL			
	-	4	MAR 10 1998	Sampling Point Locations	OTAR ST	TREATED WATER						Background /100 mL			
ST-TST. DORE	CSRAIND WITER	7.4	[Z]	S		١					-	Total Coliforms /100 mL			
	(seam	iled:	zed:	Sender's Number	0.14239-155 #	014,540 ST-155#2	·					Sender's Number	<b>3</b>	0	:
chimicipality:	Source:	Date Sampled:	Date Analyzed:	Lab Number	02423	14:24(	<b>=</b> 2.52 ± 2.7 ×	معدد عرود				Lab Number	1	0147	

**Q** 001 ISI S CASSELMAN H DEN TOPRE 139/197 Clostridium perhingens In 00 In 74 47 7400 WT Jm 001/ 1400 ML וומם שך JM 0011 Number Number Jm 0011 seruginoss Colitorms Streptococci **2119MMOD** Plate Count goo **Аеготопая** Background Sender's dsJ Escherichia Heterotrophic Pseudomobues Fecal lato I ENVIRONIC C#327-72 124 124 1 181 ALL OFTABS 94 7150 मि क्रान्य में AN 681 and Amount Number Number Sampling Point Locations and Time 519 Mature of Sample and Environment. Chlorine Sender's Lab 8991 1 1 JUN - 01 19-30-40F-513 HA Fax: Date Analyzed: FAX 10A 1MO 764-5678 Casaelman, Ortanio Date Sampled: : 42 B32 Droum Sheet SEGIND WARE CASSELMAN WTP Source: :sssnbbA 60 ONTARIO CLEAN WATER ACENCY Manicipality: ST-TSTDORE Report To: London, Ontario NEE 1P5 0514-189 (615) Toll Free: 1-800-680-9771 08/13/98 Telephone: (519) 681-0571 1020 Hargrieve Road GAP EnviroMicrobial Services Inc. 

Telephone: (519) 681-0571 Fax: (519) 681-7150

17Te-083-008-1 :san71loT

1020 Hargrieve Road London, Ontario MEE 1P5

402000 \* 1000) A Q 10/2/10/20 1100 mL 1 I WE Jm 0011 7400 mL Jm cort Jm 0011 Number 1400 mL 1400 mL Number muibhizola enaganhad Unammo Plate Count **ezoalgun**ae Sueptococci 1100 Colitorms Aeromonas Background Senders rsp Pseudomobues9 Fecal Escherichia Helerotrophic **letoT** STED BROWER C#121-72 10/10/10 SETAU OBTABAL ATU BROOTET-TS SEEDEN WAIT 4 222-72 ANA InuomA bas Mumber Number Nature of Sample and Environment Sampling Point Locations and Time Sender's Chlorine therylona start 8783-487 OM! AQ\$ 255 01 1008 Casasinan, Ordano 15 :baldmas alad B32 Drouk Street CYPSETWYN MIP :2257bbA CAITARIO CLEAN WATER AGBICY Report To:

1020 Hargrieve Road

London, Ontario N6E 1P5

ST-ISIDORE

SPAIND WITER

OCT U 7 1998

Total

Coliforms

/100 mL

1281 2

Sender's

Number

57-252 #1

Sender's

Number

14/1/2014

00769|SF-1SL+2

GAP EnviroMicrobial Services Inc.

Toll Free: 1-800-680-9771

Report To:

Fecal

Streptococci

/100 mL

Address:

Fax:

ST-ISIONE W.T.P.

Sampling Point Locations and Time

TREATED WATER STISINGE WITP.

Escherichia

coli

/100 mL

Background

/100 mL

Telephone: (519) 681-0571

Clostridium perfringens

/100 mL

(519) 681-7150

Chloring

and Amount

NA

Comments

70200

Fax:

Nature of Sample and Environment

00T - 0 MB

Aeromonas

/100 mL

FAI 613-764-5424

ONTARIO CLEAN WATER AGENCY

Heterotrophic

Plate Count

11 mL

CASSELMAN WTP

R32 Droubt Street

Pseudomonas

aeruginosa

/100 mL

Casaelman, Ontario

KOA 1MO 784-5878

ST

Municipality:

Date Sampled:

Date Analyzed:

Source:

Lab

Number

10768

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MARKET STATE

Number

1020 Hargrieve Road London, Ontario N6E 1P5

Toll Free: 1-800-680-9771

Telephone: (519) 681-0571

Fax: (519) 681-7150

Municipalit	<u>y: St-T</u>	SIDORE			Report To:	ONTARIO	CLEAN WATE	R AGENCY			
Source:		D WITER			Address:	CASSELN	IAN WTP			4 *	
Date Samp		U 88				832 Drou	n Sueer n. Ontario				
Date Analy	zed: NOV	03 1998	····	·	Fax:	toa 1MC	764-5678	FA4 613-	764-5424		
Lab Number	Sender's Number		Sampling Point	t Locations and Time Nature of Sample and Environment							
193448	21-125 #	PAW W	IOTRR ST	T-TSI 006	ZE W.T.P					N/	h
0341	ST-1SI# Q	TRANT	SETAW O	J-IS	IDURB U	1.T.P.				2.4	11
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							NOV-1-0-190	99 7		ļ	
							**************************************	<b>30</b>		ļ	
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Lab Number	Sender's · Number	Total Coliforms /100 mL	Background /100 mL	Escherichia coli 1100 mL	Fecal Streptococci /100 mL	Pseudomonas aeruginosa /100 mL	Heterotrophic Plate Count / 1 mL	Aeromonas /100 mL	Clostridium perfringens 1100 mL	Com	ments
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103419	3			,	·				0*	per l	000a
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6.7.634				·							
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1020 Hargrieve Road London, Ontario N6E 1P5

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i Sunicipalit	" ST-19	SIDORE			Report To:	CHRATIO	CLEAN WATER	AGENCY		1			
Source:		MATER 1			Address:	CASSELM	IAN WTP	·		4.			
Date Sampl		N 99				832 Drou Casselma							
Date Analyz	ed: IAAL	s 1999			Fax:	ŁOA 1MO	764-5678	FA4 613-	764-5424				
Lab Number	Senders Number		Sampling Point	Locations an	d Time		Nature of Sample and Environment						
499002	ट्रा-वस्त <b>#</b>	FAW W	OTRR ST	T-TSI DOR	E W.T.P		:			N/	A		
109004	ST-1SI#2	TRATE			INRO U					2.7.	TOTAL.		
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Lab Number	Sender's Number	Total Coliforms /100 mL	Background /100 mL	Escherichia coli 1100 mL	Fecal Streptococci /100 mL	Pseudomonas aeruginosa /100 mL	Heterotrophic Plate Count /1 mL	Aeromonas /100 mL	Clostridium perfringens /100 mL	Com	ments		
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1020 Hargrieve Road London, Ontario N6E 1P5

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r midijalii	1: ST-T	STDORE			Report To:	ONTARIO	CLEAN WATER	AGENCY					
والموجوع ومعالات الأراب	C'S ROLLN	N THERE	<u> </u>		Address:	CASSELM B32 Drov							
Pate Samp	led: /E/3 1	- 7 9 3 0 2 1999				Casselma	n. Ontario						
		3 0 2 4098			Fax:	toa 1M0	764-567 <b>8</b>	FA4 613-	764-5424	Chlorine			
Lab Number	Sender's Number	1	ampling Point	Locations and	d Time		Nature of Sample and Environment						
12013	21-1:7 #	FAW W	OTRR ST	-ISIDOR	E W.T.P					N/A			
12014	ST-ISI#2	TRANTA	A BTAW O	ST-IS	ing u	).T.R.		and a green with the state of t	1				
								9 1999					
				· · · · · · · · · · · · · · · · · · ·									
					والمراجعة مري حطو جهورسيم وجوس بالمراجع والمراجعة								
Lab Number	Sender's Number	Total Collforms /100 mL	Background /100 mL	Escherichia coli /100 mL	Fecal Streptococci /100 mL	Pseudomonas aeruginosa /100 ml	Heterotrophic Plate Count / 1 mL	Aeromonas /100 mL	Clostridium periringens /100 mL	Comments			
12013					,				0				
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1776-083-008-1 :sen-1 (loT

1020 Hargrieve Road Loadon, Ontario M6E 1P5

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416					A.T.W. #			M WAIL	# 52-15 # - 42-15 # - 42-15 # - 43-15 # - 43-1	2010
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1020 Hargrieve Road London, Ontario NSE 1P5

Toll Free: 1-800-680-9771

Municipalit	ty: ST-T	SIDORE			Report To:	CNTARIO	CLEAN WATER	AGENCY		
Source:		1 WITER			Address:	CASSELM	IAN WIP	-		4.
Date Samp		12-29				832 Drou	n Street n. Ontario			
Date Analy		APR 1	3 1999		Fax:	LDA 1MO	784-5678	FA 613-	764-5424	
Lab Number	Sender's Number	s	Sampling Point	Locations an	d Time		Nature of Samp	le and Environ	ment	Chlorine and Amount
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(519) 681-7150 Telephone: (519) 681-0571

Toll Free: 1-800-680-9771

London, Ontario NEE 1P5 1020 Hargrieve Road

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AGENCY		FB3 613-	e and Environn								Aeromonas /100 mL							
ONTARO CLEAN WATER AGENCY	NN WIP	Ordario 764-5678	Nature of Sample and Environment								Heterotrophic Plate Count 11 mL							
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Report To:	Address:	Fax:	and Time	DORE WIT. P.	IN BROTT						Fecal Streptococci /100 mL							
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1020 Hargrieve Road London, Ontario N6E 1P5 GAP Énviroivierobial Services Inc.

1020 Hargrieve Road London, Ontario N6E 1P5

Toll Free: 1-800-680-9771

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Report To:	Address:		Fax:	f Time	DORE WIT.P.	JIM BROUST.						Fecal Streptococci	-	·	- 1				
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1020 Hargrieve Road London, Ontario NGE 1P5

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		n Australia	CASSELMAN WITP	CASSELA	Address:			SEALUD WERE	(5 Rain	Source:	-21
		D ACENON	CIEAN WATE	ANTIBO	Report To:			T-ISIDORE		Municipality:	ISI
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Municipality: Structure Road  London, Ontario NE 125  Source:  Caractan Water Address:  Source:  Caractan Water Address:  Caractan Structure Struc	S71 150		Chlorine and Amount						Comments		) Jul	2	8	
Municipally: ST-TXTDORE Loaden, Owker, NEE 1P5 Loaden, Owker, Nee 1P		heng-h94	ment					7.00	Clostridium perfringens 1100 m.L.	0	100			
Municipality: Strict Road   Cap EnviroMichals Services   London, Oniario NEE 195   Toll Free: 1400-680-9775     Municipality: Strict Dock	Teleph Fax;	AGENCY FB+ 613-	le and Environ						Aeromonas 1100 mL					
Municipality: Strict Road   Cap EnviroMichals Services   London, Oniario NEE 195   Toll Free: 1400-680-9775     Municipality: Strict Dock	Inc.	Street Street	Nature of Samp		modile 21				Heterotrophic Plate Count / 1 mL					
Municipality: ST-TSTDORE Solute: Sampled: Sept 0 8 1919  Date Sampled: Sept 0 8 1919  Date Analyzed: SEP 0 8 1919  Lab Sender's Sampling Point Location  Silver: Silver Sept 0 8 1919  Lab Sender's Sampling Point Location  Mumber Number Total Background Escheric  Mumber Number Coliforns Background Escheric  Manner Number Coliforns 100 mL 100 mL 100 mL	ial Services	CASTELM CASSELM B32 Drod Cassemer K0A 1MO		1. P.	A STATE OF THE PARTY OF THE PAR				Pseudomonas aeruginosa /100 mL					
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Municipality: Source: Date Sampled Date Analyzed Lab Number Sitting Si	rieve Road Intario NGE 1F	LDORE WITER	y men						Total Coliforms /100 mL					
- <b>-</b>	1020 Harg London, O	Sender:	7	\$7-15.					Sender's Number		<del></del>			
10/15/88 INE 11:04 EYX 218 881 1120 CYB ENAIRONIC +++ CYSZETYY-EX CI 1001	T 0 U (2)	Scurce: Date Sam Date Ana	Number 5,735.7			<u></u>	TV6							== ==

# 1020 Hargrieve Road London, Ontario N6E 1P5

GAP ÉnviroMicro al Services Inc.

Toll Free: 1-800-680-9771

Telephone: (519) 681-0571

Fax: (519) 681-7150

	i tunicipali	Sr-TS	IDORE	<b>A</b>		Report To:	ONTARIO	CLEAN WATER	AGENCY		
į	Hounce: Leuta Samp		WITER			Address:	CASSELM 832 Drou				
	Date Analy		00T 05	1000		Fax:	Casselma	784-5678	To (m	200 200	
	l ab	Sender's	OCT 0:				KOA IIIIO	104-5575	TH 613-	764-249A	
	Number	Number		Sampling Point	Locations an	d Time	,	Nature of Samp	le and Enviror	rment	Chlorine and Amount
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1 7150	Lab Number	Sender's Number	Total Coliforms /100 mL	Background /100 mL	Escherichia coli /100 mL	Fecal Streptococci /100 mL	Pseudomonas aeruginosa /100 mL	Heterotrophic Plate Count 11 mL	Aeromonas /100 mL	Clostridium perfringens /100 mL	Comments
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### GAP EnviroMicrobia Services Inc.

1020 Hargrieve Road London, Ontario N6E 1P5

Toll Free: 1-800-680-9771

Telephone: (519) 681-0571 Fax: (519) 681-7150

Report To: Municipality: T-ISIDORE CONTARIO CLEAN WATER AGENCY CASSELMAN WTP Address: Source: ROUND WITTER **B32 Drown Street** Date Sampled: Casselman, Ontario KOA 1MO 764-5678 FA7 613-764-5424 Date Analyzed: Fax: Chlorine Lab Sender's Nature of Sample and Environment Sampling Point Locations and Time and Amount Number Number NA TAW WOTER ST-IST DORE W.T.P. (10/600 ST-151 #1 TRANTAD WATER STISIONER WITP. Clostridium perfringens Escherichia Feca! Pseudomonas Heterotrophic Total Aeromonas Background Lab Senders Comments aeruginosa Plate Count coli Streptococci Coliforms /100 mL /100 mL Number Number /100 mL /100 mL /100 mL /100 mL 11 mL /100 mL CURRIE UUKABB

:49 FAX 519 681 7150 GAP ENVIRONIC

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### GAP ÉnviroMicrobial Services Inc.

1020 Hargrieve Road
London, Ontario N6E 1P5

Toll Free: 1-800-680-9771

Telephone: (519) 681-0571 Fax: (519) 681-7150

Municipality: Report To: ST-TSIDORE ONTARIO CLEAN WATER AGENCY Source: Address: CASSELMAN WTP GRAIND WITER **B32 Drack Street** Date Sampled: Casselman. Ortario toa 1MO 764-5678 Date Analyzed: Far. FA7 613-764-5424 Sender's Chlorine Lab Sampling Point Locations and Time Nature of Sample and Environment Number Number and Amount 1815XO \$ -151 #1 NA ST-ISIDORE W.T.P. 101570 3-151#2 TRANTED WATER STISSING WITP. 2.0T. Clostridium pertringens Escherichia Total ' Fecal Pseudomonas Heterotrophic Sender's Background Lab Aeromonas Coliforms coli Streptococci aeruginosa Plate Count Comments Number Number /100 mL 11 mL College: 4-Der 1000m

## GAP ÉnviroMicro. Il Services Inc.

1020 Hargrieve Road London, Ontario N6E 1P5

Toll Free: 1-800-680-9771

Telephone: (519) 681-0571 Fax: (519) 681-7150

Municipalit	y: ST-IS	IDORE.			Report To:		CLEAN WATER	AGENCY		<del> </del>
Source:		WITER	.)		Address:	CASSELM 832 Droot				<del>                                     </del>
Date Sampl		7				Casselman		<u> </u>	7.16 7.10.1	<del>                                     </del>
Date Analyz		JAN US	LUUI		Fax:	LUA IMU	704-0070	M 613-	764-2434	
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Lab Number	Sender's Number	Total Coliforms /100 mL	Background /100 mL	Escherichia coli /100 mL	Fecal Streptococci /100 mL	Pseudomonas peruginosa I100 mL	Heterotrophic Plate Count / 1 mL	Aeromonas /100 mL	Clostridium peringens /100 mL	Comments
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중점: 25	PHONE (519) 681-0571  MINITER WALLIE'S MATTON DATE WELLEWIED  STATEDORE  COMMILIED BY  CARAMETER  DATE SAMPLED STENDERS A  UNITE ANALYTE	0.57-751.#0	LAGAL SENDERS # Cont	

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PAGE 82

ALDOS Exclusion 1750	INVOICE TO: CYMB	AUDINESS: P.O. BON 252	2015 tajole st. Jefalvne On	PHONE: (CL)		Check Tend 15.7 December 15.3	PA TC EC TC FS Text for the		43	X 3				ren me,	Harvenaphic COMMENTS	I NOT COMMIT			Rt 1000 m			Ostelsmod: Kee College   Kee C
GAP Engineen Sentent AND UNAL RESULTS GAP Engineen Sententia.	dacques freen	AUDITESS: P.O. Box 252	Lefaivre On	9-4631		Chante	Toward of the second			1083		The second secon	00 5416	ייין מייין מייין (שני)	Piktel Presidentanes Clearibles				Oar		APPMOVEDOY:	Standurc; Insuly 124- head (mysters Commission) (dec 1500d) C-Crowded Filer; 14-18 aborator Analysis, 140-1000-1406
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MUNICIPALITY NA. 41		SOUNCE: WAS EAST OF LIVE	1 10 - 613	TATE SAME FOR TO SOLVE	10.00.2	LAG # SENDERS U		-	7	G Child	*	5		TYB # SENDENS # BYT	CALC	C/BOIL . 1	2	307K23 3		LESOLTS CALCHE ATERIOR.	Signature:	PA - Press Africa, 10 - Fay Called OA" Erreckissees Than, G

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Fax: (516) 601-7188 S E P.O. Dun 252 2019 fajole St. Lefelvre On Ris Las [613] 679-4631 (613) 679-4735 Changination X COMMENTS × £ MYORUETO CKYM Monther Monther World Miles St. 10 | Mari And College St. 10 | Mandelling St. 10 | Man Z A1259 R 1 School Republic PER ME Mercent ADDRESS: ٤ PHONE in 10 m 17 (00 m FAX: (in the met) 2 profitent Character Odeste Rostosi Impli P.O. Box 252 2015 Lajote St. Lofatives on kgs 130 SAMPLE SURMISSION FORM AND RINAL RESULTS (613) 679-4735 TC91-649. [C19] AUGUESS: P.O. Box 252 Paretories acouptions. resolty - bacteria fer 106 milliates (mil) COMBINED GAP EnviroMicrebial Services Inc. APPROVED INTO Participal PHONE • FAK (sampling location, times, etc.) KALL WRITER LUGIL 1-2-3 SITE DESCRIPTION Ficetal Cydffering REW WATER WILL#5 REGITTED WITHER WITH. 11 11 11 DATE RECEIVED: JUL 11 2001 Ercherighte Ş ŧ DATE AMALYZED. Bed grand ST-Landara W.T.O RECEIVED BY STORICE: Teffi DATE SAMPLED JULY 10, 01 vitació libritus RESULTS CALCULATED BY: MUNICIPALITY: NACCION SEMOERS I SEMDERA N 5 Phone: (519) 601-457 CONT. このないいつ しるないと ついていいい のなべいの こうできるこう LABA 

SAMPLE SUBMISSION FORM AND FINAL RESULTS

FRI 10:11 FAX 519 661 /100 FASE 82 CCWA A FIGURE 95/15/2881 89:17 E12-679-4735 MON. 14:28 EVY PTR BRT : YBA 03/14/61 epter. Pagor hogy cromitently, Bullian, August, 2998 Fax: (518) 664-7158 S IIK P.O. Box 252 2015 Pajole St. (613) 679-4631 613) 679-4735 COMPARTIE × X lefalvre on 'A - Fracest Alasos, Oster Hon State three Mines St. C. - Milly Wilder St. - E. ash TC - Faced Continued: 73 - Level Strangered 550 - Free State DB 1.10 Z FINDERER SON COMM Laleds Than, Gardinater Than; A: Approximate Value; C:-Crowited Filter; LAst aboratory Accident; NRENG Recut ೭ ध A1337 Characteristic PER OIL 1000 cal ADDHLESS: ñ PHONE FAX: ž Characterist precial ingress 000 Officials: Resident Prefit P.O. Box 252 2015 Lajoie St. Icfaivre On KOB 130 679-4735 (613) 679-463k Jacques Broen The second section of the second section of the second sec Presidences results - Bacteria Fer 100 militars (mt.) proughterns COMPINED (613) GAP Environicrostal Services Inc. REPORT TO: Medicals. AUTHESS Ę PERONE FAX: (sampling lacation, time, etc.) sky water well 1-2-3 SITE DESCRIPTION Cofficients 1 # 1 W CATAL. 1007 DATERPCEIVERY ANG . 8 2001 DAP EARIOMENDED SCOOLER Sec. 1898 Hoge Ins Rd. 1844, I saden, Chambe, NAS 1845 Deferiefts out # Gestin With R DATIS ANALYZED: LIBTRR **Britgraund** RECEIVED BY: COMMENTS: 4 California . Tonel TATE SAMPLEO: 19-45 7200 WESULTS CALCULATED BY: St- Barclove W. **GENOERS A** SENDERS D MUNICIPALITY: 1. notuen Crew of 100 octal ~ 1 5 Phone: (51 B) 681- 0571

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Fax: (518) 681-7150

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Sample Submission form and final results

GAP EnviroMicrobial Services Inc.

Phone: (619) 661-0571

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89:17 E13-679-6735 85/15/2221 ACK TEIRS NYY PIN DET ITON

G nr P.O. Box 252 2015 1ajole St. 1613) 679-4631 (613) 679-4735 Excention (679-4735 8 Ӽ COMMENTS: × lefolvre On ž PA TC BC IC PS Lukess Than; Gright alor Than, ArApproximate Value; C=Crowied Filter, LAxi sboratory Accident; NR=Ne Reful INVOICETO: CX MA - Parodisplik Plak Comm ad latitude PER act One from ADDRESS: PHONE FAX: Cherritten perfeligens Clasing Residual Carrell P.O. Box 252 2015 Lajoie St (613) 679-4735 C (613) 679-4631 Jacques Breen Icfnivre On 100 130 Parentament. RESULTS - BACTERIA FER 100 MILITIRES (MA) Group for 036 COHBINED P. . Profesorational TC - Taylor Collegen EC - S. 1454, PC - Pared Collegen; PB - Greet Suppressed GTA - Prochesters APPECIATED BY REPORT TO: Pexel Steplansed AUNTRESS PHONE: FAX (sumpling becation, time, etc.) WATER WILL 1-2-3 SITE DESCRIPTION Fascul Cofficients Getting Wal # 5 TREATTER WITH nate sampled. Sych (0,2001 (Date analyzed): 3FF 11 390 DATE RECEIVED: SEP -1 1 2861 RECEIVED BY: O Doda Erchesichte och Dackground COMMENTS Coffforms Khas (Fran not Water ESULTS CALCULATED BY: MUNICIPALITY, NACHON **SEMDERS A** SCHOERS & ځې At who clark 51 obi#3 899600 **69960** St. 22.4 699601 C419718 | 899600 **LAB#** ž SAMME SOURCE

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# SAMPLE SUBMISSION FORM AND FINAL RESULTS

GAP EnviroMicrobial Services, 1020 Margieva Road. London, ON WEE 1P5

> Phone: (519) 681- 0571 Fax: (519) 681-7150

TOTAL STREET, TOTAL MARKET STREET	AL DATERFCEIVED: October 17, 2001		REPORT TO: Jacques Breen		INVOICE TO:	
54. Islodene WTP	RECEIVED BY: T. Dadge		ADDRESS: PO Box 252, 2015 Lajoie ADDRESS: Steet, Lefaivre, ON K0B 130	015 Lajoie 30	ADDRESS.	
GAP JOB NUMBER: A1541	COMMENTS					
			PITONE: 613-679-4631		PHONE:	
DATE SAMPLED: October 16, 2001	001 DATE ANALYZED: October 17, 2001		FAX: 613-679-4735		FAX:	
1.AB# SENDERS#	SITIS Sildemes)	SITE DESCRIPTION (sumpling location, time, etc.)	(c.)	Matrix	J	COMMENTS
10273	Raw Wate	Raw Water Well # 1,2,3 cumbined	Uined	water		
10274		Treated Well 5		wite		
10275	Tre	liented Water WTP				
	Z	ICROBIAL TEST	MICROBIAL TEST RESULTS per 100 mL			
LAB # SIENDERS #	Gestrickion perfringens			Mei	Medheal Listed	REPORTED AS
1 87,501	0			ט	CP MF	CFU/100 ml
c 8,5001	0 oer 1000 nvL			J	CP.MF	CF.UV1000 mL
	Day's 1000 in			C	CP-MF	CFU/1000 ML
			Ì			
RESULTS CALCULATED BY:	VITER 1972: 9. Unger, Client Services		APPROVED BY. (Gallisy Manager, S. Kajón or Trechairas Manager, M. Vanth.	Manager, S. Ky	du or Technical M	langer, M. VanDrite

MF = Membrare Filtusion; EC = E.COY, FC = Fancial Coliforms, CP = Chostrition perfringent; FS = Fincial sheptochoot; PSA = Psycophysion Section (Color) Sectio

GAP ENVIRONIC

519 681 7150

MON 11:07 FAX

11/12/01

(G) GAP EnviroMicrobial Services

### **FINAL RESULTS FORM**

GAP EnviroNicrobial Services

1920 Hargrieve Road, Unit 14 London, ON N6E 1P5

Tel: (519) 681-0571 Fax. (519) 681-7150

GAP JOB#:	A1610	DATE SAMPLED: 6-Nov-01		REPORT	TO:	Jacques Breen		INVOICE TO:				
PAGE#:	1 of 1	COLLECTED BY:		ADDRES	35:	PO Box 252, 2015 I	ajoie St.	ADDRESS:				
CLIENT/PROJE		DATE RECEIVED: 7-Nov-D1		Lefaivre,	ON KOB	1J0						
<b>.</b>		RECEIVED BY: T. Dodge	)	TEL:	613-679-	4631		TEL:				
Nalion St. Is	Iskiore WTP	DATE ANALYZED: 7-Nov-01		FAX:	613-679	4735		FAX:				
LAB#	SENDERS #	MATRIX		SAMPL	E DESC	IPTION		C	OMMENTS			
10706	1	witer	Ra	w Water	Well#1-2-	3 Combined						
10707	2	waler		Treale	d Water V	Not #5						
10708	3	water		Treat	ed Water	WTP						
						·						
		TEST RESULTS	These test results re	late only fo	the samp	les submitted and the	enalyses	requested.				
		Clastridium perfringens										
LAB#	SENDERS #	100 mL										
		UF										
10706	. 1	0										
10707	2	0 per 1000 mL										
10708	3	0 per 1000 mL		-					•			
							•		**			
Calculated by:	Shalley Unger	Position: Cil	ent Services	Approve	d by: M.	Van Dyke (Technic	at Mana	or S. Kalan (D	~ / ·			
Signature:	Deul	and the second s		Signatur	e: A	) ac	7		Date: NUU10/01			

L = Less Than; G = Greater Than; TNTC = To Numerous To Count, NR = No Result; LA = Leboratory Accidenty, A = Approximate Value; C = Cronded Filter

CFU = Colony Forming Unit; PFU = Plaque Forming Unit; MF = Mentionane Filtration; MPN = Host Probable Number; SP / Spread Plate

Accretized Memod Codes: Presence/Absence Test = PA 0001; Numerical Value Tests = TCMF-0001, ECMF-0001, FCMF-0001, HPCMF-0001, MS2-0001, LEG-0001

GAP ENVIRONIC

881

\$18

PAZ

FRI

### **FINAL RESULTS FORM**

GAP Envirol/licrobial Services 1020 Hargrieve Road, Unit 14

London, ON NOE 1P5

Tel: (519) 681-0671 Fax: (519) 681-7150

									,	rect i the fairle and the
GAP JOB#;	1699	DATE SAMPLED: 11-Dec-0	)1	REPORT	TO:	OCWA		INVOICE	TO:	OCWA
PAGE#:	1 of 1	COLLECTED BY:		ADDRES	S:	2015 Lajole St. PO	Box 252	ADDRES	SS:	2015 Lajole St. PO Box 25
LIENT/PROJE	CT NAME:	DATE RECEIVED: 12-Dec-0	)1	Lefaivre,	ON KOB	1 <i>3</i> 0		L <b>eini</b> vre,	ON KOB	130
Makes Ch. I	sidore WTP	RECEIVED BY: T. Dodge		TEL:	613-679	4431		TEL:	613-679	4631
Nation St. II	SKJOTO YY I P	DATE ANALYZED 12-Dec-0	11	FAX:	613-673	-4735		FAX:	613-679	-4735
LAB#	SENDERS#	HATRIX		SAMPL	E DESC	RIPTION			C	OMMENTS
11268	1	W619F	Ray	w Water V	Vell \$1, 2	, 3 Combined				
11267	2	water		Tre	ated Wel	1#5				
11268	3	water		Treat	ed Water	WIP				
		TEST RESULTS	These lest results re	lete only to	the same	les submitted and the	malyses	requested	! !	
		Clostridium perfringens								
1A8#	SENDERS#	100 mL								
		NF			<u> </u>					
11266	1	0								
11267	2	0 per 1000 mL								
11268	3	0 per 800 ml.								·
Calculated by:	Shelley Unger	Position: Cli	ent Services	Approve	dhy Mi.	Van Dyke (Technic	al Manag	(v) or 5.	Kajan (Q	uality Manager)
Signature: 😅	Del /		<b>a</b> :	Not	=-}			Date: 1)2514, 200		

L = Less Than ; G = Greater Than ; TNTC = To Numerous To Count ; HR = No Result ; LA = Laboratory Accident ; A = Approximate Value ; C = Crowded Filter CFU = Colony Forming Unit : PFU = Plaque Forming Unit : MF = Mcnibuane Filtration : MPN = Most Probable Number : SP = Spread Plate

Accredited Method Codes: Presence/Absence Tost = PA-0001; Numerical Value Tests = TCMF-0001, ECMF-0001, FCMF-0001, HPCMF-0001, MS2-0001, LEG-0001.

### **APPENDIX VII**

Well Head Protection Area Study

**Terms of Reference** 

### 2.0 Wellhead Protection Area Studies ...

At a local scale, one of the most important areas from a geographic perspective is the surface area and subsurface volume surrounding a water well or well-field that supplies a public water system. It is through this adjacent zone that contaminants are reasonably likely to move toward and reach the well supply. In particular, the production, storage, use, or release of biological and chemical contaminants can present potential risks to groundwater quality in these areas.

The following municipalities and City of Ottawa have confirmed their involvement in this Study. The following table indicates the number of active municipal wells located within each of the municipalities and City of Ottawa. Each of the active municipal wells must be included within the scope of the study. Each municipality and the City of Ottawa will be submitting a Wellhead Protection Zone Fact Sheet for each active municipal well. This will benefit the Consulting firm in gathering information and estimating potential costs. The Fact Sheet will be included within the REP

United Counties of Stormont Dundas and Glengarry  Township Village/Hamlet Number of Active Municipal Wells  North Glengarry Glen Robertson 1  North Stormont Crysler 2 Finch 2 Moose Creek 3										
Township	Village/Hamlet									
North Glengarry	Glen Robertson	1								
North Stormont	Crysler	2								
	Finch	2								
	Moose Creek	3								
South Stormont	Newington	2								
North Dundas	Chesterville	2								
	Winchester	5								

Unit	ted Counties of Prescott	and Russell
Township	Village/Hamlet	Number of Active Municipal Wells
Russell	Embrun/Marionville Russell	2 2
Nation	St. Isidore Limoges	5 2

	City of Ottawa	a
City	Village/Hamlet	Number of Active Municipal Wells
Ottawa	Vars	2

### **Submission of Request for Qualifications**

If sent by mail please provide 22 copies of your Qualification document, clearly identified as to the contents to:

į.

Raisin Region Conservation Authority Ms. Chantal Whitaker P.O. Box 429 6589 Boundary Rd. Cornwall, ON K6H 5T2

Fax: (613) 938-3221 Email: <u>info@rrca.on.ca</u>

Responses to the RFQ MUST be received at these locations NOT LATER THAN 12:00 NOON EASTERN TIME February 08, 2002.

Responses received after the due date and time will not be considered, but will be returned unopened, using the method by which it was received, to the proponent.

**APPENDIX VIII** 

Factors Influencing Formation of THM's

# Water Treatment Principles and Design



JAMES M. MONTGOMERY, CONSULTING ENGINEERS, INC.

A Wiley-Interscience Publication JOHN WILEY & SONS

New York

Chichester

**Brisbane** 

Toronto

Singapore

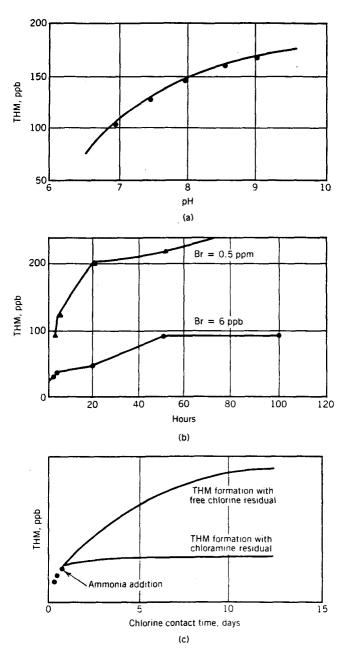


FIGURE 16-9. Factors influencing formation of THMs. (a) pH effect: (b) bromide effect; (c) ammonia effect.

substrates include aldehydes, ketones, carboxylic acids, phthalates, and, of course, carbon dioxide. The gas chromatogram depicted in Figure 16-10 shows the volatile organic by-products that resulted from treatment of a sample of water from the Colorado River with ozone. The most notable treatment products were a series of aliphatic aldehydes which contained from 4 to 10 carbon atoms. In this experi-

ment, the ozone was applied at elevated levels (20 mg/L) in order to ensure the formation of products at sufficient concentrations (1-10 ppb) for identification by gas chromatography/mass spectrometry. At dosages of ozone typically used for water treatment (3 mg/L), aldehyde concentrations may range from 0.01 to 1 ppb.

Similar by-products are formed from the reac-

APPENDIX IX



### Ontario Clean Water Agency **Performance Assessment Report - Ground Water Supply**

Page 1 of 1 1/15/2002 d\_par\_gw

Municipality: Project:

St-Isidore de Prescott

[6915] - St. Isidore de Prescott Water Treatment Plant

Project Number: 7153691936 Works Number: 220003573

Description: A Five Well Facility System

Year: Water Source:

2001 Groundwater

Design Avg Day Flow(m³): 907.0 Effluent Group Selected:

	<<< F	lows Treated	>>>	<<<	Effluent	Physical/Cher	nical Param	eters	>>> <	<<	Disinfection		>>>	< - Ba	act. (# of	Samples)	) ->
	Total Flow	Avg Day	Max Day	Avg Turb.	Avg Colour	THM	-	Avg Sodium	-	Avg Free Cl2 Resid.	Avg Total Cl2 Resid.	Min Free Cl2 Resid.		-			
Month	m,	m <sub>3</sub>	m³	(NTU)	(TCU)	(ug/L)	(ug/L)	(mg/L)	mg/L)	Treat (mg/L)		Dist. (mg/L)		Treat		Treat	Dist
AN	8,203	265	707	0.60	4.00					1.25	1.99		1.00	5	13		
EB	6,716	240	299	0.20	1.00	4.000	0.02	131.00	0.10	1.75	2.16		1.10	4	10		
MAR	6,879	222	227	0.11	1.50					2.04	2.49		1.70	4	12		
<b>NPR</b>	7,060	235	279	0.11	3.25					1.34	1.67		0.40	4	12		
YAN	7,047	227	284	0.15	1.30	55.000	0.02	123.00	0.20	1.55	1.86		0.50	5	15		
IUN	7,221	241	283	0.12	1.78					1.44	1.85		1.00	4	12		
JUL	7,690	248	293	0.13	2.00					1.16	2.05		0.50	5	15		
AUG	8,437	272	461	0.15	2.20	3.000	20.00	130.00	0.10	1.49	2.19		0.85	4	12		
SEP	7,036	235	253	0.12	2.00					1.76	2.32		0.50	4	13		
OCT	7,729	249	374	0.14	2.10					1.90	2.20		0.55	5	15		
VOV	7,045	235	255	0.11	2.11	140.000	-1.00	155.00	0.10				0.60	4	12		
DEC	7,118	230	255	0.14	2.29					1.85	2.23		0.55	4	12		
Total:	88,181													52	153	0	(
AVG:		242		0.17	2.13	50.500	4.76	134.75	0.13	1.59	2.09		0.77	4	13		
MAX:			707	0.60	4.00	140.000	20.00	155.00	0.20	2.04	2.49		1.70	5	15		
Criteria:				1.00	5.00	100.000											

LEGEND:

Effluent Group Selected:

NOTE: -1 Analysis result less than detectable limit