

2012 Annual Report

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|---------------------------------|---|
| Drinking-Water System Number: | 210002263 |
| Drinking-Water System Name: | Vars Well System |
| Drinking-Water System Owner: | City of Ottawa |
| Drinking-Water System Category: | Large Municipal Residential |
| Period being reported: | January 1st – December 31st 2012 |

Complete if your Category is Large Municipal Residential or Small Municipal Residential

Does your Drinking-Water System serve more than 10,000 people? **No**

Is your annual report available to the public at no charge on a web site on the Internet? **Yes**

Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.

**Britannia Water Purification Plant
2731 Cassels St., Ottawa Ontario
K2B 1A8
Telephone: 613-828-2727**

Complete for all other Categories.

Number of Designated Facilities served:

N/A

Did you provide a copy of your annual report to all Designated Facilities you serve?

N/A

Number of Interested Authorities you report to:

N/A

Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?

N/A

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

N/A

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

N/A

Indicate how you notified system users that your annual report is available, and is free of charge.

- Public access/notice via the web
 Public access/notice via Government Office
 Public access/notice via a newspaper
 Public access/notice via Public Request
 Public access/notice via a Public Library
 Public access/notice via other method _____

Describe your Drinking-Water System

The Vars water system draws from either of two wells located approximately 15 meters apart at the treatment facility. Both wellheads are about 0.5 meter above ground surface and there is minimal potential for contamination from surface water. The source water is high in organic carbon, colour, iron and manganese.

A series of treatment steps successively remove undesirable substances such as iron, manganese, organic carbon, colour, bacteria, and viruses from the water. The treatment process in Vars consists of the following steps:

- greensand filtration – (using potassium permanganate to oxidize iron and manganese)
- granular activated carbon filtration (for organic carbon removal)
- primary disinfection (free chlorine – applied as sodium hypochlorite)
- storage (disinfection contact time & hydraulic storage)

This treatment process results in water that is clear and safe to drink.

Treated water is then pumped through the distribution network to reach water customers in Vars. All treatment, pumping, and storage systems are controlled by a dedicated SCADA computer system and monitored by certified water treatment operators 24 hours per day. On-line analyzers are used to measure chlorine residual and turbidity of the treated water. In addition, a certified operator visits the well system twice per week to collect water samples and conduct on-site water quality tests.

List all water treatment chemicals used over this reporting period

Sodium Hypochlorite (liquid – 6%)
Potassium Permanganate (KMnO₄ saturated solution)

Were any significant expenses incurred to?

- [√] Install required equipment
- [√] Repair required equipment
- [√] Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred

1. Granular Activated Carbon (GAC) replacement: Removed and replaced the filter media that is used in the filtration step in the treatment process (approximate cost \$25,000)
2. Sludge Disposal – From green-sand filter backwash effluent, a sludge containing iron, manganese, and organic carbon accumulates in the holding cell. This liquid waste needs to be trucked for disposal—approximate cost of \$30,000

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Table 1 Adverse Water Quality events for the Vars Well System

| Incident Date | Test Parameter and Location | Result | Unit of Measure | Corrective Action | Date of Resolution |
|---------------------------------|--|---|----------------------|-----------------------|--------------------|
| 3-Apr-12 AWQI# 105535 | Total Coliform bacteria >0 Vars Public School | Positive | Presence/ Absence | Flush and resample | 4-Apr-12 |
| 9-Jul-12 AWQI# 106968 | Sodium > 20 mg/L Vars well system treated & Distribution | Treated= 24.6 Distribution =24.4 | mg/L | 5 yr reporting | 9-Jul-12 |

Table 2 Microbiological testing done under Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

| | Number of Samples | Range of E.Coli Or Fecal Results (min - max) | Range of Total Coliform Results (min - max) | Number of HPC Samples | Range of HPC Results (min - max) |
|--------------|-------------------|--|---|-----------------------|----------------------------------|
| Raw | 208 | 0 | 0 | 206 | <10 - 40 |
| Treated | 106 | 0 | 0 | 104 | <10 - 40 |
| Distribution | 204 | 0 | 0 - Positive | 200 | <10 - 70 |

Table 3 Operational testing for treated water done under Schedule 7, 8 or 9 of Regulation 170/03 during this reporting period.

| | Number of Grab Samples | Results (min - max) |
|---|-------------------------------|---|
| Turbidity | 106 + continuous | 0.38 – 0.96 NTU |
| Chlorine | 107 + continuous | 0.94 – 1.70 mg/L |
| Fluoride (If the DWS provides fluoridation) | 10 | 0.14 – 0.21 mg/L (naturally occurring in well water) |

Table 4 Summary of additional testing and sampling carried out in accordance with requirement of approval, order or other legal instruments.

| Date of legal instrument issued | Parameter | Date Sampled | Result | Unit of Measure |
|--|------------------|---------------------|---------------|------------------------|
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Table 5 Summary of Inorganic parameters tested in treated water during this reporting period or the most recent sample results.

| Parameter | Sample Date* | Result Value | Unit of Measure | Exceedance** |
|------------------|---------------------|---------------------|------------------------|---------------------|
| Antimony | Jan – Dec 2012 | ND | mg/L | No |
| Arsenic | Jan – Dec 2012 | ND | mg/L | No |
| Barium | Jan – Dec 2012 | 0.2927 | mg/L | No |
| Boron | Jan – Dec 2012 | 0.0572 | mg/L | No |
| Cadmium | Jan – Dec 2012 | ND | mg/L | No |
| Chromium | Jan – Dec 2012 | 0.0002 | mg/L | No |
| Lead | Jan – Dec 2012 | 0.0009 | mg/L | No |
| Mercury | Jan – Dec 2012 | ND | mg/L | No |
| Selenium | Jan – Dec 2012 | ND | mg/L | No |
| Sodium | Jan – Dec 2012 | 25.7 | mg/L | Yes - Advisory*** |
| Uranium | Jan – Dec 2012 | ND | mg/L | No |
| Fluoride | Jan – Dec 2012 | 0.16 | mg/L | No |
| Nitrate | Jan – Dec 2012 | ND | mg/L | No |
| Nitrite | Jan – Dec 2012 | ND | mg/L | No |

ND denotes non-detectable results

NOTE*: Inorganic parameters are tested monthly. The values in the table represent annual average values.

NOTE**: The determination of exceedances are based on all results in the data set.

NOTE***: Sodium concentration is above the advisory limit of 20.0 mg/L for treated water. Notification of the sodium exceedance was made to the MOE and Public Health Department on July 09, 2012 for this water system (notification is required every 60 months).

Table 6 Summary of lead testing under Schedule 15.1 during this reporting period.

| Location Type | Number of Samples | Range of Lead Results (min#) – (max #) | Number of Exceedances |
|---------------|-------------------|--|-----------------------|
| Distribution | 3 | 0.05 - 1.10 ppb | 0 |

Table 7 Summary of Organic parameters in treated water sampled during this reporting period or the most recent sample results.

| Parameter | Sample Date | Result Value | Unit of Measure | Exceedance* |
|---|--------------|--------------|-----------------|-------------|
| Alachlor | Mar 27, 2012 | ND | mg/L | No |
| Aldicarb | Mar 27, 2012 | ND | mg/L | No |
| Aldrin + Dieldrin | Mar 27, 2012 | ND | mg/L | No |
| Atrazine + N-dealkylated metabolites | Mar 27, 2012 | ND | mg/L | No |
| Azinphos-methyl | Mar 27, 2012 | ND | mg/L | No |
| Bendiocarb | Mar 27, 2012 | ND | mg/L | No |
| Benzene | Mar 27, 2012 | ND | mg/L | No |
| Benzo(a)pyrene | Mar 27, 2012 | ND | mg/L | No |
| Bromoxynil | Mar 27, 2012 | ND | mg/L | No |
| Carbaryl | Mar 27, 2012 | ND | mg/L | No |
| Carbofuran | Mar 27, 2012 | ND | mg/L | No |
| Carbon Tetrachloride | Mar 27, 2012 | ND | mg/L | No |
| Chlordane (Total) | Mar 27, 2012 | ND | mg/L | No |
| Chlorpyrifos | Mar 27, 2012 | ND | mg/L | No |
| Cyanazine | Mar 27, 2012 | ND | mg/L | No |
| Diazinon | Mar 27, 2012 | ND | mg/L | No |
| Dicamba | Mar 27, 2012 | ND | mg/L | No |
| 1,2-Dichlorobenzene | Mar 27, 2012 | ND | mg/L | No |
| 1,4-Dichlorobenzene | Mar 27, 2012 | ND | mg/L | No |
| Dichlorodiphenyltrichloroethane (DDT) + metabolites | Mar 27, 2012 | ND | mg/L | No |
| 1,2-Dichloroethane | Mar 27, 2012 | ND | mg/L | No |
| 1,1-Dichloroethylene | Mar 27, 2012 | ND | mg/L | No |

| Parameter | Sample Date | Result Value | Unit of Measure | Exceedance* |
|--|-----------------|--------------|-----------------|-------------|
| Dichloromethane | Mar 27, 2012 | ND | mg/L | No |
| 2-4 Dichlorophenol | Mar 27, 2012 | ND | mg/L | No |
| 2,4-Dichlorophenoxy acetic acid (2,4-D) | Mar 27, 2012 | ND | mg/L | No |
| Diclofop-methyl | Mar 27, 2012 | ND | mg/L | No |
| Dimethoate | Mar 27, 2012 | ND | mg/L | No |
| Dinoseb | Mar 27, 2012 | ND | mg/L | No |
| Diquat | Mar 27, 2012 | ND | mg/L | No |
| Diuron | Mar 27, 2012 | ND | mg/L | No |
| Glyphosate | Mar 27, 2012 | ND | mg/L | No |
| Heptachlor + Heptachlor Epoxide | Mar 27, 2012 | ND | mg/L | No |
| Lindane (Total) | Mar 27, 2012 | ND | mg/L | No |
| Malathion | Mar 27, 2012 | ND | mg/L | No |
| Methoxychlor | Mar 27, 2012 | ND | mg/L | No |
| Metolachlor | Mar 27, 2012 | ND | mg/L | No |
| Metribuzin | Mar 27, 2012 | ND | mg/L | No |
| Monochlorobenzene | Mar 27, 2012 | ND | mg/L | No |
| Paraquat | Mar 27, 2012 | ND | mg/L | No |
| Parathion | Mar 27, 2012 | ND | mg/L | No |
| Pentachlorophenol | Mar 27, 2012 | ND | mg/L | No |
| Phorate | Mar 27, 2012 | ND | mg/L | No |
| Picloram | Mar 27, 2012 | ND | mg/L | No |
| Polychlorinated Biphenyls(PCB) | Mar 27, 2012 | ND | mg/L | No |
| Prometryne | Mar 27, 2012 | ND | mg/L | No |
| Simazine | Mar 27, 2012 | ND | mg/L | No |
| Trihalomethanes** | Jan – Dec, 2012 | 0.023 | mg/L | No |
| Temephos | Mar 27, 2012 | ND | mg/L | No |
| Terbufos | Mar 27, 2012 | ND | mg/L | No |
| Tetrachloroethylene | Mar 27, 2012 | ND | mg/L | No |
| 2,3,4,6-Tetrachlorophenol | Mar 27, 2012 | ND | mg/L | No |
| Triallate | Mar 27, 2012 | ND | mg/L | No |
| Trichloroethylene | Mar 27, 2012 | ND | mg/L | No |
| 2,4,6-Trichlorophenol | Mar 27, 2012 | ND | mg/L | No |
| 2,4,5-Trichlorophenoxy acetic acid (2,4,5-T) | Mar 27, 2012 | ND | mg/L | No |
| Trifluralin | Mar 27, 2012 | ND | mg/L | No |
| Vinyl Chloride | Mar 27, 2012 | ND | mg/L | No |

ND denotes non-detectable results

NOTE*: The determination of exceedances are based on all results in the data set.

NOTE**: The reported THM result is an annual average of the maximum value observed in each quarter.

Table 8 Inorganic or Organic parameters that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

| Parameter | Result Value | Unit of Measure | Date of Sample |
|-----------|--------------|-----------------|----------------|
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