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REPORT ON

GROUNDWATER MONITORING PROGRAM FOR SIXTH AND SEVENTH YEAR OF OPERATION WELL SITE NO. 7 VILLAGE OF WINCHESTER WATER SUPPLY SYSTEM EXPANSION PROJECT

Submitted to:

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EXECUTIVE SUMMARY

This document has been prepared to summarize the results of the groundwater monitoring program associated with the sixth and seventh years of operation of the Village of Winchester Well Site No. 7. One of the conditions of approval for the water supply expansion, as set out in the Environmental Study Report, is a groundwater monitoring program in the area of the Morewood esker. This involves water level monitoring and aquifer water quality monitoring. This is in addition to the ongoing monitoring of the water supply system quality that is carried out by the Ontario Clean Water Agency as part of the water works approval.

The following executive summary highlights key points only; for complete information and findings, as well as the limitations provided in Section 5.0, it is necessary for the reader to examine the complete report.

The objectives of this monitoring program were to monitor groundwater level variations, flow characteristics, and groundwater quality conditions on site and in the vicinity of Well Site No. 7 during the sixth and seventh years of operation, and to compare these to previous trends observed during the pre-operational groundwater monitoring program and during the first five years of operation.

Based on the groundwater level data obtained during the sixth and seventh years of operation, the interpreted general direction of groundwater flow remains consistent with pre-operational flow directions, with periodic slight variations in the immediate vicinity and to the north of the pumping wells.

In general, the ongoing land uses and the pumping operations at the Village of Winchester Well Site No. 7 do not appear to have adversely affected groundwater quality to date in the vicinity of the well site.

The most noteworthy observation related to groundwater quality based on the results of the monitoring programs for the sixth and seventh years of operation is a continuing trend in elevated nitrate concentrations reported at monitor 96-21 since September 2001. Although nitrate has typically been present at relatively low levels at monitor 96-20, this monitor also had more elevated nitrate concentrations in April 2002 than previously reported. Monitor 96-20 is located between monitor 96-21 and the well site, in an area with variable flow directions.

The aforementioned observations require that particular attention be paid to nitrate concentrations at groundwater monitors 96-20 and 96-21 during future monitoring programs. In addition, it is recommended that reconnaissance of the area in the immediate vicinity of these groundwater monitors be carried out, possibly at different times during the year, to document any potential source(s) of nitrate.

The previously proposed annual monitoring program for on-going operations is provided. No changes to this monitoring program are proposed at this time with the exception of the removal of monitors 94-6 and WESA-16 from the list of monitoring locations included in the water level monitoring component of the program and the addition of nitrogen cycle parameters to the suite of parameters to be analyzed on samples collected from monitors 96-20 and 96-21 during the events of year 8. It is recommended that monitor 94-6 be decommissioned in accordance with Ontario Regulation 903.

It is considered appropriate to continue to follow the formal reporting frequency of once every two years. Following this schedule, the next formal report would be prepared in 2006, following the ninth year of operations. Monitoring should still be carried out on an annual basis with a review of data and analytical results as they become available. Any significant changes or observations should be reported immediately. It is recommended that a brief summary letter be prepared following completion of the annual monitoring program for the eighth year of operations in order to fulfil the annual reporting requirement set out in the Environmental Study Report and to highlight any significant or appropriate modifications to the monitoring program for the coming year.

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1.0 INTRODUCTION

This document has been prepared to summarize the results of the groundwater monitoring programs associated with the sixth and seventh years of operation of the Village of Winchester Well Site No. 7. The scope of the monitoring program was described in Section 4.0 of Golder Associates (2002). Well Site No. 7 was put into operation on March 21, 1997. This report presents the results of monitoring activities conducted between May, 2002 and April, 2004.

One of the conditions of approval for the water supply expansion, as set out in the Environmental Study Report, is a groundwater monitoring program in the area of the Morewood esker. This involves water level monitoring and aquifer water quality monitoring. This is in addition to the ongoing monitoring of the water supply system quality that is carried out by the Ontario Clean Water Agency (OCWA) as part of the water works approval.

The objectives of the groundwater monitoring programs for the sixth and seventh years of operation were:

- to monitor groundwater level variations and flow characteristics on-site and in the vicinity of Well Site No. 7, and to compare these to previous trends observed during the pre-operational groundwater monitoring program (Golder Associates, 1996) and during the first five years of operation (Golder Associates, 1998, 1999, 2000, 2001, 2002);

- to compare groundwater quality conditions on-site and in the vicinity of Well Site No. 7 to baseline groundwater quality established in the pre-operational groundwater monitoring program (Golder Associates, 1996) and to groundwater quality data collected during the first five years of operation (Golder Assoicates, 1998, 1999, 2000, 2001).

The Village of Winchester Well Site No. 7 is located on Lot 15, Concession IX in the geographic Township of Winchester, Ontario (see Key Plan, Figure 1), now the Township of North Dundas. A site plan and overview of the study area, including the locations of all groundwater monitors included in the groundwater monitoring programs for the sixth and seventh years of operation and the locations of the production wells (i.e., wells 7A, 7B and 7C), are shown on Figure 2.

2.0 PROCEDURES

A summary of the groundwater monitoring programs for the sixth and seventh years of operation is provided in Table 1 including the monitoring and sampling dates and locations, and the chemical and physical parameters that were measured in the field and in the laboratory.

All groundwater level measurements and groundwater sampling was carried out by South Nation Conservation (SNC) up until, and including, the December 2002 water level monitoring session. SNC expressed a desire in early 2003 to discontinue their role in water level monitoring and water quality sampling in conjunction with this project. As such, OCWA assumed water level and water quality sampling responsibilities, commencing with the water level monitoring and sampling sessions in March/April, 2003. It is expected that OCWA will continue in this role, as required, for the foreseeable future.

2.1 Groundwater Level Monitoring

Groundwater level measurements were recorded in accordance with the proposed monitoring program for on-going operations provided in Table 4 of Golder Associates (2002), with the exception that the "July" monitoring session was carried out in August during 2002 and the "March" monitoring session was carried out in April during 2003. The timing of these monitoring sessions was considered appropriate as they represented "dry" and "wet" periods of the year, respectively, as intended.

Groundwater monitors 94-9A and 94-9B could not be located by SNC during the September 2002 or December 2002 monitoring sessions. Frozen conditions during the December 2002 monitoring session also prevented water level measurements at groundwater monitors 94-11 and 94-12. Groundwater monitor 94-10 was reported to be "full" during the March 2003 monitoring session and therefore an accurate measurement of the static water level could not be recorded. Groundwater monitor 94-6 was reported to be damaged during the September 2002 monitoring session and remained as such for the balance of the sixth and seventh years of operation. Starting in December 2002, groundwater monitor WESA-16 was reported to be instrumented for the Provincial Groundwater Monitoring Network (PGWMN) program and therefore water levels were not measured manually in this monitor.

2.2 Groundwater Quality Monitoring

Groundwater quality monitoring sessions were conducted in September 2002, April and September 2003 and April 2004, as indicated in Table 1. This was in accordance with the proposed program on-going operations (Table 4 of Golder Associates, 2002), with the exception that the proposed "March" sampling sessions were carried out in April. This timing was considered to be acceptable as it represented the "wet" period of the year, as intended.

The groundwater monitors included in the monitoring sessions were 94-5, 94-11, 96-19, 96-20, 96-21 and 96-22.

The groundwater monitors were developed through the removal of at least three standing volumes of water using dedicated sampling devices consisting of a length of flexible low density polyethylene (LDPE) tubing and a Model D-25 foot valve manufactured by Waterra Pumps Ltd. of Toronto, Ontario. Groundwater samples were collected from each monitor immediately after well development.

The temperature, pH and conductivity of the groundwater samples collected during each sampling session were measured in the field at the time of sample collection. The pH and conductivity meters were calibrated prior to use. All samples were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to the private analytical laboratory.

The groundwater samples were collected, prepared and preserved in the field as follows:

- one plastic bottle, unfiltered and unpreserved for analysis of chloride, nitrate, sodium and potassium;
- one plastic bottle, unfiltered and preserved to pH<2 with sulphuric acid for analysis of total phosphorus;
- one amber glass vial with Teflon septum, unfiltered and unpreserved with no headspace for analysis of BTEX (Benzene, Toluene, Ethylbenzene, Xylenes); and,
- one amber glass bottle with foil lined cap, unfiltered and unpreserved for analysis of atrazine.

Accutest Laboratories Ltd. in Nepean, Ontario performed all laboratory chemical and physical analyses on the groundwater samples.

3.0 DISCUSSION

3.1 Pumping Data

The Ontario Clean Water Agency (OCWA) forwarded monthly pumping data for 2002 and 2003 to Golder Associates. The Annual Record of Water Taking form containing this monthly pumping data is included in Appendix C. For comparison, the Annual Record of Water Taking forms for 2000 and 2001 are also included in Appendix C.

The total volume of water pumped from the wells at Well Site No. 7 during 2002 was very similar to the average pumped in 2000 and 2001, with an overall drop in the total volume of water pumped by about 3% compared to the 2000/01 average. Most of this decrease was accounted for during the latter half of 2002 (i.e., June to December) where the monthly volume of water pumped was generally lower than the corresponding monthly averages in 2000/01 (i.e., 1% higher to 14% lower). In January to May, 2002, the monthly volume of water pumped was generally slightly higher (4% to 11%) than the corresponding 2000/01 monthly averages.

The total volume of water pumped from the wells at Well Site No. 7 during 2003 was about 10% higher than the total volume of water pumped during 2002 (and about 7% higher than the average pumped in 2000 and 2001. On a monthly basis, the greatest increase from 2002 to 2003 occurred during the month of September (i.e., about 47% and 28% higher in 2003 than in 2002 and 2000/01, respectively). From September through December 2003, the monthly volume of water pumped from the wells at Well Site No. 7 was generally higher than in 2000 through 2002. During the first half of 2003, the monthly pumped volumes were generally similar to that recorded in 2000 through 2002 with the exception of a lower volume pumped during the month of May, 2003 (i.e., about 18% and 15% lower in 2003 than in 2002 and 2000/01, respectively).

3.2 Groundwater Levels

The groundwater levels measured during the groundwater monitoring programs for the sixth and seventh years of operation are provided in Table 3. The groundwater elevations in Table 3 were calculated using the elevation data presented in Table 2. These groundwater elevations along with historical groundwater levels measured during the pre-operational monitoring program and the seven years of operation are represented graphically on Figures 3 through 6.

Precipitation data have not been reviewed by Golder Associates. Therefore discussion in this report regarding groundwater elevations recorded during the sixth and seventh years of operation in comparison to the first five years of operation and pre-operating groundwater elevations is strictly factual. Any suggestions for causes of changes in groundwater elevations over time due to weather fluctuations are hypothetical and for evaluation there would need to be a comparison to precipitation data in addition to the pumping data in order to more thoroughly examine the possible reasons for any changes over time related to weather.

Figure 3 shows groundwater level fluctuations on, and in the immediate vicinity of, the Village of Winchester well site (Well Site No. 7). The screens of these groundwater monitors are located in the core of the Morewood esker in unconfined fine sand and sand and gravel deposits. The trend depicted in Figure 3 shows seasonal variation with groundwater levels typically highest in the spring months and lowest in the fall/winter months.

The lowest groundwater levels recorded at the monitors in the immediate vicinity of Well Site No. 7 during the sixth and seventh years of operation occurred during the September monitoring sessions and were about 0.7 to 1.1 meters lower than the lowest water levels recorded during the pre-operational monitoring program. The September 2002 water levels at monitors 94-5 and 95-14 were slightly lower than the September 2003 water levels at these monitors.

Figure 4 shows groundwater level fluctuations in other groundwater monitors located in the core of the Morewood esker to the south of Well Site No. 7 (with the exception of 94-7, which was on the road allowance directly north of the well site). The screens of these monitors are all in unconfined sand and gravel. Groundwater monitor 94-6 was damaged after July 2002, groundwater monitor 94-7 was destroyed after November 1996, and groundwater monitor WESA-16 was instrumented as part of the Provincial Groundwater Monitoring Network (PGWMN) as of December 2002. As such, groundwater levels could not be measured at these wells subsequent to these dates. The trend depicted in Figure 4 is similar to that in Figure 3 with the lowest groundwater levels typically occurring in the fall/winter months.

The water level reported at the WESA-16 monitor during the spring of 2002 was lower than water levels that have typically been observed during the spring at this monitor. Consequently, the groundwater levels reported at WESA-16 in August and September, 2002 were about 1 metre lower than typical low levels found in previous years. The groundwater levels at monitor 94-6 in May and August 2002 were slightly higher than the levels observed in the summer of the fifth year of operation, and approximately 0.5 to 1.7 meters higher than the levels that have typically been recorded at this monitor during the summer months in the past. Typical groundwater levels were reported at monitor 94-11 during the sixth and seventh year of operation. Based on historical trends, it is considered that the groundwater levels in monitor 94-11 continue to reflect influence from the pumping activities on Well Site No. 7 on the order of about 0.6 to 0.8 meters of drawdown.

Figure 5 depicts groundwater level variations in various other geological formations in the vicinity of the Morewood esker. Monitors 94-8A and 94-9A are located in a confined (overlain by clay) silty sand deposit to the west of the core of the esker, while 94-8B and 94-9B are in the overlying silty clay layer in the same area. Monitor 94-10 is located in a confined glacial till unit to the east of the core of the Morewood esker. Monitor 94-12 is located northwest of Well Site No. 7 in a sand and gravel portion of the Morewood esker that is overlain by a thin silty clay layer.

Similar trends to Figure 3 are again seen in Figure 5, with a lower piezometric surface in 94-9A, 94-9B and 94-12 than in the other groundwater monitors included in the groundwater level monitoring program. Riser pipe extensions were added to groundwater monitors 94-8A and 94-8B in June of 1999. Prior to this these monitors have been frequently artesian (water level above the top of the monitoring well riser pipe). Therefore comparison of groundwater levels in monitors 94-8A and 94-8B during wetter times of the year has not previously been possible.

The groundwater levels reported for all of the monitors included in Figure 5 during May 2002 were lower than water levels that have typically been observed during the spring months. These water levels generally returned to typical levels, however, throughout the remainder of 2002 and in 2003. The water level measured in groundwater monitor 94-10 in September 2002 was greater than 3 metres lower than previously reported at this location. The groundwater level returned to typical levels in the monitoring sessions following the September 2002 event. Therefore, in the absence of significantly lower groundwater levels at monitoring locations in close proximity to the well site (e.g., as illustrated in Figure 3), it is concluded that the September 2002 groundwater level in 94-10 was either affected by activities other than pumping activities on Well Site No. 7 or that the September 2002 measurement at this well was erroneous.

The groundwater levels in the monitors included in Figure 5 may represent a minor degree of influence from the pumping activities on the Village of Winchester Well Site No. 7, however it is considered that these monitors are more greatly influenced by seasonal variations than by the pumping activities.

Figure 6 represents the groundwater levels in the 96-Series groundwater monitors. Monitors 96-20, 96-21 and 96-22 are located in the Morewood esker to the north of Well Site No. 7, in unconfined fine sand, and sand and gravel. Monitor 96-19 is located within the esker to the south of the well site, in confined fine sand.

The trends in Figure 6 are similar to the trends in Figure 3 with groundwater levels highest in the spring months and lowest in the late summer/early fall to late fall/early winter. The uncharacteristically lower spring groundwater levels that were observed in May of 2002 at several of the other groundwater monitors were not observed at the 96-Series groundwater monitors. Similar to groundwater monitor 94-10 (see Figure 5 and discussion above), the water levels reported at monitors 96-20, 96-21 and 96-22 in September 2002 were lower than previously reported at these locations. The water level reported at monitor 96-22 in August 2002 was also lower than previously reported. In addition, the water level reported at monitor 96-19 in April 2004 was lower than previous water levels at this monitor. Again, in the absence of lower groundwater levels at monitoring locations in closer proximity to the well site (e.g., as illustrated in Figure 3), it is concluded that the September (and August at 96-22) 2002 groundwater levels in 96-20, 96-21 and 96-22 and the April 2004 groundwater level in 96-19 were either affected by activities other than pumping activities on Well Site No. 7 or that these measurements were erroneous.

Excluding the September 2002 groundwater level data and considering the groundwater levels reported in August 2002, deviations in groundwater levels in the 96-Series groundwater monitors between the lowest pre-operation groundwater levels and the lowest water levels reported during the sixth year of operation range from about 1.7 metres lower at monitor 96-22 to about 0.4 metres lower at monitor 96-21. It is noted that the water level at 96-22 (i.e., the furthest 96-Series groundwater monitor from the well site) reported in August 2002 may be erroneous, as discussed above.

Deviations in groundwater levels in the 96-Series groundwater monitors between the lowest pre-operation groundwater levels and the lowest water levels reported during the seventh year of operation range (excluding the April 2004 water level measured at monitor 96-19) range from about 1.0 meters lower in September 2003 at monitor 96-20 (closest to the well site) to about 0.4 meters lower in September 2003 at monitor 96-22 (furthest from the well site).

These deviations are similar to the ranges that have typically been observed at these monitors during previous years of operation. The groundwater levels during the sixth and seventh year of operation at the 96-Series monitors continue to suggest some influence from the pumping activities at Well No. 7. The degree of influence from pumping on the 96-Series groundwater monitors generally appears to be inversely proportional to the distance from the well site, as would be expected.

3.3 Flow Directions

Based on the groundwater elevation data available prior to the start of operation of Village of Winchester Well Site No. 7 on March 21, 1997, the general direction of natural (pre-operation) groundwater flow within the Morewood esker is to the north, following the long axis of the esker, as illustrated in Figure 2. As would be expected in permeable coarse grained deposits, the horizontal hydraulic gradient is quite low and was previously reported to be around $1x10^{-4}$ (Golder Associates, 1996).

A component of groundwater flow in a southerly direction was previously reported (Golder Associates, 1996) in the south portion of the esker, forming a groundwater divide approximately 500 metres north of County Road 3. It has been considered that this condition is likely a result of the topographic high spot that is present in this area (Golder Associates, 1996). Based on the groundwater level data available from monitor WESA-16, the presence of this groundwater divide does not appear to be altered by the pumping activities at Well Site No. 7. The interpreted position of this groundwater divide could also be influenced by activities at the sand and gravel pit in this vicinity. Based on the groundwater level data reported at monitor 94-11 during the sixth and seventh years of operation, the interpreted position of the groundwater divide is estimated to be somewhere between groundwater monitors 94-6 and 94-11, to the north of the adjacent sand and gravel pit (see Figure 2). This is consistent with the interpretation following completion of the monitoring program for the fifth year of operations, however it is considered that the position of the groundwater divide may be somewhat transient and vary in position.

In Golder Associates (1998) a decrease in the magnitude of the hydraulic gradient since the start of operation was described in the Morewood esker to the immediate north of the well site. This trend continued during the sixth and seventh years of operation, as evidenced by groundwater elevations recorded in monitors 96-20, 96-21 and 96-22. Periodic southerly components of groundwater flow in this area are interpreted based on groundwater elevation measurements recorded since the start of operation. To the north of monitor 96-22, groundwater flow appears to be toward the north, similar to pre-operation conditions.

Based on the groundwater level data obtained during the sixth and seventh years of operation, the interpreted general direction of groundwater flow remains consistent with pre-operational flow directions, with periodic slight variations in the immediate vicinity and to the north of the pumping wells. The interpreted direction of groundwater flow, based on groundwater elevation measurements obtained on September 16, 2003, is shown on Figure 2.

3.4 Groundwater Quality

The results of all field and laboratory chemical and physical analyses conducted during the groundwater monitoring programs for the sixth and seventh years of operation, along with the relevant Ontario Drinking Water Quality Standards (ODWQS) (Ministry of the Environment, 2003) are provided in Appendix A. Historical results are also provided in Appendix A for the groundwater monitors included in the groundwater monitoring programs for the sixth and seventh years of operation. The Report of Analyses sheets from Accutest Laboratories Ltd. for all analyses conducted as part of the groundwater monitoring program for the sixth and seventh years of operation are included in Appendix B.

Discussion relating to compliance with the ODWQS relates specifically to non-health related objectives (i.e. aesthetic parameters) and health related parameters for which a Maximum Acceptable Concentration (MAC) or Interim Maximum Acceptable Concentration (IMAC) have been established. The following provides a summary of the apparent trends in groundwater quality over time with particular attention to any discrepancies or changes in groundwater quality between the pre-operational monitoring program and the monitoring programs for the sixth and seventh years of operation:

- Groundwater quality in all of the groundwater monitors included in the monitoring programs for the sixth and seventh years of operation was generally consistent over time and met the ODWQS for all parameters monitored with the exception of nitrate at monitor 96-21 in September 2002 (11.40 mg/L), April 2003 (14.70 mg/L) and September 2003 (10.50 mg/L), which slightly exceeded the ODWQS (10.0 mg/L).

- Atrazine and BTEX (benzene, toluene, ethylbenzene, xylenes) were not detected at any of the monitoring locations included in the monitoring programs for the sixth and seventh years of operation.

- Total phosphorus levels have been variable over time at all of the groundwater monitors included in the sampling program.

- Nitrate was not detected in any of the groundwater samples collected from monitors 94-5, 96-19 or 96-22 during the sixth and seventh years of operation.

- Nitrate was not detected in the groundwater samples collected from monitor 94-11 in April 2003 or April 2004 but was detected at relatively low concentrations (1.50 and 0.20 mg/L respectively) in the samples collected in September 2002 and September 2003. Nitrate has typically been detected in groundwater samples collected from monitor 94-11 since September 1997 at concentrations between 0.11 mg/L and 3.03 mg/L.

- Nitrate concentrations, which have been variable over time at groundwater monitor 96-20 (historically < 3.11 mg/L), were the highest reported to date at this location during the September 2002 monitoring session (6.03 mg/L).

- There has been a notable increase in nitrate concentrations at groundwater monitor 96-21 since September 2001. Prior to September 2001, nitrate was consistently detected in samples from this monitor at concentrations between 0.31 and 1.30 mg/L; Since September 2001, the nitrate concentrations at 96-21 have been reported at levels ranging from 4.44 mg/L (April 2004) to 14.7 mg/L (April 2003).

- The gradual trend in increasing chloride concentrations at groundwater monitor 96-20 that has previously been reported did not continue during the sixth and seventh operational years, however the chloride concentrations at this groundwater monitor are slightly higher than at the other groundwater monitoring locations.

In general, the ongoing land uses and the pumping operations at the Village of Winchester Well Site No. 7 do not appear to have adversely affected groundwater quality to date in the vicinity of the well site.

The most noteworthy observation related to groundwater quality based on the results of the monitoring programs for the sixth and seventh years of operation is a continuing trend in elevated nitrate concentrations reported at monitor 96-21 since September 2001. Although nitrate has typically been present at relatively low levels at monitor 96-20, this monitor also had more elevated nitrate concentrations in April 2002 than previously reported. Monitor 96-20 is located between monitor 96-21 and the well site, in an area with variable flow directions (see Section 3.3).

The aforementioned observations require that particular attention be paid to nitrate concentrations at groundwater monitors 96-20 and 96-21 during future monitoring programs. Further to these observations, Golder Associates reviewed nitrate concentrations that have been reported in samples collected by OCWA on a regular basis from well site No. 7 (sampled from a point downstream of the confluence of the three wells and after treatment). Reported nitrate concentrations were reviewed for samples collected between August 2001 and July 2004. The reported nitrate concentrations were very consistent at concentrations ranging from 0.22 mg/L to 0.97 mg/L with no apparent trend in increasing concentrations over this time frame. Recommendations related to the recently observed higher nitrate concentrations at monitors 96-20 and 96-21 are discussed in Section 4.0 of this report. In consideration of the nitrate data reviewed for the pumping wells and considering that the nitrate concentrations reported at monitor 96-20 have not exceeded the ODWQS for nitrate, it is considered that no further immediate action is warranted in addition to the recommendations in Section 4.0.

4.0 ANNUAL MONITORING PROGRAM ON-GOING OPERATIONS

The previously proposed annual monitoring program for on-going operations is included in Table 4. No changes to this monitoring program are proposed at this time with the exception of the removal of monitors 94-6 and WESA-16 from this list of monitoring locations included in the water level monitoring component of the program. As indicated in Section 2.1, groundwater monitor 94-6 has been damaged and is in need of repair if it is to be used in future monitoring sessions. Due to the relatively close proximity of monitor 94-11 to monitor 94-6, and considering the well-established database for water levels in this area, it is considered that monitor 94-6 is redundant. Therefore, it is recommended that monitor 94-6 be decommissioned in accordance with Ontario Regulation 903. WESA-16 has been instrumental in the Provincial Groundwater Monitoring Network Program and, as such, water levels are recorded in this monitor on an on-going basis. These water levels would be available for review, if required.

Should any changes be made to the operation of Well Site No. 7, it is recommended that the frequency of monitoring be adjusted appropriately in order to observe any effects caused as a result of such changes. It is recommended that OCWA document any deficiencies or required maintenance on groundwater monitors included in the monitoring program on an on-going basis.

It is recommended that reconnaissance of the area in the immediate vicinity of groundwater monitors 96-20 and 96-21 be carried out to document any potential source(s) of nitrate in the area of these monitors during different times of the year. Furthermore, it is recommended that sampling from nitrogen cycle parameters be completed at these two locations for the events of year 8 commencing in September 2004. This has been added to the program summarized in Table 4. Further modifications may be suggested pending the results of these sampling events. Also, the results should be reviewed in combination with the nitrate levels measured in the production wells.

It is considered appropriate to continue to follow the formal reporting frequency of once every two years. Following this schedule, the next formal report would be prepared in 2006, following the ninth year of operations. Monitoring should still be carried out on an annual basis with a review of data and analytical results as they become available. Any significant changes or observations should be reported immediately. It is recommended that a brief summary letter be prepared following completion of the annual monitoring program for the eighth year of operations in order to fulfil the annual reporting requirement set out in the Environmental Study Report (Section 6.3.4.2). This letter should confirm completion of the monitoring program for the eighth operational year, indicate any difficulties (e.g., required groundwater monitor maintenance) or significant changes in groundwater levels or water quality, and any proposed modifications to the monitoring program for the coming year.

called Ag. Ordered extra bottles for nitrogen cycle

She will set a council resolution to decommission 94-6

5.0 LIMITATIONS AND USE OF REPORT

This annual report was prepared for the exclusive use of the Township of North Dundas. The report, which specifically includes all tables, figures and appendices, is based on data and information collected by Golder Associates and is based solely on the conditions of the property at the time of the work, supplemented by historical information and data obtained by Golder Associates as described in this report. Each of these annual reports must be read and understood collectively, and can only be relied upon in their totality.

Golder Associates has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the reports as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions at this site has been made using the results of physical measurements and chemical analyses of liquids from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed at the borehole locations. Subsurface conditions may vary from these sampled locations.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practising under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates should be requested to re-evaluate the conclusions of this report, and to provide amendments as required. The groundwater monitors installed during the course of this investigation or previous investigations by Golder Associates have been left in place. These groundwater monitors are the property of the Township of North Dundas and not Golder Associates.

GOLDER ASSOCIATES LTD.

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PASB:BJV:cr
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TABLE 1

SUMMARY OF GROUNDWATER MONITORING PROGRAM FOR ON-SITE AND OFF-SITE BOREHOLES SIXTH AND SEVENTH YEAR OF OPERATION

1.0 WATER LEVEL MONITORING COMPONENT

1.1 Monitoring Sessions

May 15, 2002
August 15, 2002
September 30, 2002
December 23, 2002
March 26, 2003
May 30, 2003
July 15, 2003
September 16, 2003
December 1, 2003
April 20, 2004

1.2 Monitoring Locations

Groundwater Monitors 94-1, 94-3, 94-4, 94-5, 94-6, 94-8A, 94-8B, 94-9A, 94-9B, 94-10, 94-11, 94-12, 95-13, 95-14
Monitor WESA-16
Monitors 96-19, 96-20, 96-21 and 96-22

2.0 WATER QUALITY MONITORING COMPONENT

2.1 Monitoring Sessions

September 30, 2002
April 1, 2003
September 16 2003
April 20, 2004

2.2 Monitoring Locations

Groundwater Monitors 94-5 and 94-11
Monitors 96-19, 96-20, 96-21 and 96-22

2.3 Field Measured Physical Parameters

Temperature
Conductivity
pH

2.4 Laboratory Measured Chemical Parameters

Chloride
Nitrate
Sodium
Potassium
Total Phosphorus
Benzene
Toluene
Ethylbenzene
Xylenes
Atrazine

TABLE 2

ELEVATION DATA

Monitor	Ground Surface Elevation (metres)	Groundwater Measurement Datum							
		Top of Casing Elevation (metres)	Stickup (metres)	Revised Top of Casing Elevaton 6/22/99 (metres)	Revised Stickup 6/22/99 (metres)	Revised Top of Casing Elevaton 9/1/00 (metres)	Revised Stickup 9/1/00 (metres)	Revised Top of Casing Elevaton 7/20/01 (metres)	Revised Stickup 7/20/01 (metres)
94-1	76.26	77.31	1.05						
94-2	76.19	77.18	0.99						
94-3	76.24	77.25	1.01					77.59	1.35
94-4	77.52	78.60	1.08			78.49	0.97	78.94	1.42
94-5	76.23	77.16	0.93			77.12	0.89	77.26	1.03
94-6	82.79	83.55	0.76						
94-7	80.56	80.47	-0.09						
94-8A	74.65	74.63	-0.02	75.29	0.63			75.54	0.88
94-8B	74.65	74.64	-0.01	75.36	0.71				
94-9A	73.08	73.08	0.00						
94-9B	73.08	73.08	0.00						
94-10	76.59	76.77	0.18						
94-11	82.62	82.52	-0.10						
94-12	79.58	79.51	-0.07						
95-13	76.27	77.32	1.05					77.15	0.88
95-14	76.21	77.23	1.02					77.19	0.98
WESA16	78.50	78.50	0.00					79.52	1.02
96-19	76.51	77.69	1.18						
96-20	79.34	80.09	0.75						
96-21	81.61	82.56	0.95						
96-22	81.50	82.34	0.84						

Note: "-" indicates top of casing is below ground surface.

TABLE 3

WATER LEVEL DATA

Monitor	5/15/2002		8/15/2002		9/30/2002		12/23/2002	
	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)
94-1	1.59	74.67	1.63	74.63	1.64	74.62	1.60	74.66
94-2	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed
94-3	1.86	74.38	1.37	74.87	1.70	74.54	1.40	74.84
94-4	3.32	74.20	3.54	73.98	2.69	74.83	2.65	74.87
94-5	0.71	75.52	1.61	74.62	1.95	74.28	1.25	74.98
94-6	5.99	76.80	6.06	76.73	damaged	damaged	damaged	damaged
94-7	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed
94-8A	0.37	74.29	0.98	73.68	0.82	73.84	0.57	74.09
94-8B	0.77	73.88	1.17	73.48	0.74	73.91	0.48	74.17
94-9A	1.35	71.73	1.78	71.30	n/a	n/a	n/a	n/a
94-9B	1.65	71.43	1.89	71.19	n/a	n/a	n/a	n/a
94-10	1.36	75.23	1.52	75.07	5.02	71.57	0.61	75.98
94-11	6.69	75.93	7.62	75.00	7.30	75.32	n/a	n/a
94-12	7.13	72.45	7.65	71.93	7.67	71.91	n/a	n/a
95-13	nm	nm	nm	nm	nm	nm	nm	nm
95-14	2.07	74.14	1.58	74.63	2.04	74.17	1.55	74.66
WESA16	4.00	74.50	3.92	74.58	4.66	73.84	PGWMN	PGWMN
96-19	0.06	76.45	0.84	75.67	0.64	75.87	0.51	76.00
96-20	4.10	75.24	5.20	74.14	7.46	71.88	4.63	74.71
96-21	6.47	75.14	6.63	74.98	9.45	72.16	6.90	74.71
96-22	6.36	75.14	8.21	73.29	9.76	71.74	6.93	74.57

Notes:
All elevations are relative to Geodetic datum
BGS = "Below Ground Surface"
nm = not measured
n/a = Monitor was either inaccessible at time of monitoring, or could not be located.
PGWMN = well instrumented for Provincial Groundwater Monitoring Network

TABLE 3

WATER LEVEL DATA

Monitor	3/26/2003		5/30/2003		7/15/2003		9/16/2003	
	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)
94-1	1.68	74.58	1.32	74.94	1.36	74.90	1.81	74.45
94-2	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed
94-3	1.48	74.76	1.08	75.16	1.16	75.08	1.62	74.62
94-4	2.67	74.85	2.35	75.17	2.68	74.84	2.93	74.59
94-5	1.26	74.97	0.93	75.30	1.06	75.17	1.48	74.75
94-6	damaged	damaged	damaged	damaged	damaged	damaged	damaged	damaged
94-7	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed
94-8A	0.37	74.29	0.13	74.53	0.28	74.38	0.47	74.19
94-8B	0.24	74.41	0.20	74.45	0.45	74.20	0.71	73.94
94-9A	0.10	72.98	0.46	72.62	0.52	72.56	0.78	72.30
94-9B	0.34	72.74	0.84	72.24	1.00	72.08	1.40	71.68
94-10	flowing	flowing	0.17	76.42	0.62	75.97	0.95	75.64
94-11	7.20	75.42	6.85	75.77	7.10	75.52	7.41	75.21
94-12	7.66	71.92	7.31	72.27	7.34	72.24	7.41	72.17
95-13	nm	nm	nm	nm	nm	nm	nm	nm
95-14	1.63	74.58	1.28	74.93	1.34	74.87	1.76	74.45
WESA16	PGWMN	PGWMN	PGWMN	PGWMN	PGWMN	PGWMN	PGWMN	PGWMN
96-19	0.38	76.13	0.19	76.32	0.31	76.20	0.69	75.82
96-20	4.68	74.66	4.31	75.03	4.45	74.89	4.89	74.45
96-21	6.95	74.66	6.67	74.94	6.84	74.77	7.16	74.45
96-22	6.96	74.54	6.55	74.95	6.66	74.84	6.94	74.56

Notes:
All elevations are relative to Geodetic datum
BGS = "Below Ground Surface"
nm = not measured
n/a = Monitor was either inaccessible at time of monitoring, or could not be located.
PGWMN = well instrumented for Provincial Groundwater Monitoring Network

TABLE 3

WATER LEVEL DATA

Monitor	12/1/2003		4/20/2004	
	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)
94-1	1.48	74.78	1.19	75.07
94-2	destroyed	destroyed	destroyed	destroyed
94-3	1.27	74.97	0.99	75.25
94-4	2.52	75.00	2.25	75.27
94-5	1.09	75.14	0.83	75.40
94-6	damaged	damaged	damaged	damaged
94-7	destroyed	destroyed	destroyed	destroyed
94-8A	0.40	74.26	0.70	73.96
94-8B	0.39	74.26	0.45	74.20
94-9A	0.45	72.63	0.80	72.28
94-9B	0.80	72.28	0.50	72.58
94-10	0.38	76.21	0.13	76.46
94-11	7.23	75.39	6.71	75.91
94-12	7.22	72.36	7.10	72.48
95-13	nm	nm	nm	nm
95-14	1.42	74.79	1.14	75.07
WESA16	PGWMN	PGWMN	PGWMN	PGWMN
96-19	0.33	76.18	2.37	74.14
96-20	4.48	74.86	4.23	75.11
96-21	6.15	75.46	6.53	75.08
96-22	6.58	74.92	6.35	75.15

Notes:
All elevations are relative to Geodetic datum
BGS = "Below Ground Surface"
nm = not measured
n/a = Monitor was either inaccessible at time of monitoring, or could not be locate
PGWMN = well instrumented for Provincial Groundwater Monitoring Network

TABLE 4

ANNUAL GROUNDWATER MONITORING PROGRAM FOR ON-GOING OPERATIONS

1.0 WATER LEVEL MONITORING COMPONENT

1.1 Monitoring Sessions

May
July
September
December
March

1.2 Monitoring Locations

Groundwater Monitors 94-1, 94-3, 94-4, 94-5, 94-8A, 94-8B, 94-9A, 94-9B, 94-10, 94-11, 94-12, 95-13, 95-14
Monitors 96-19, 96-20, 96-21 and 96-22

2.0 WATER QUALITY MONITORING COMPONENT

2.1 Monitoring Sessions

September
March

2.2 Monitoring Locations

Groundwater Monitors 94-5 and 94-11
Monitors 96-19, 96-20, 96-21 and 96-22

2.3 Field Measured Physical Parameters

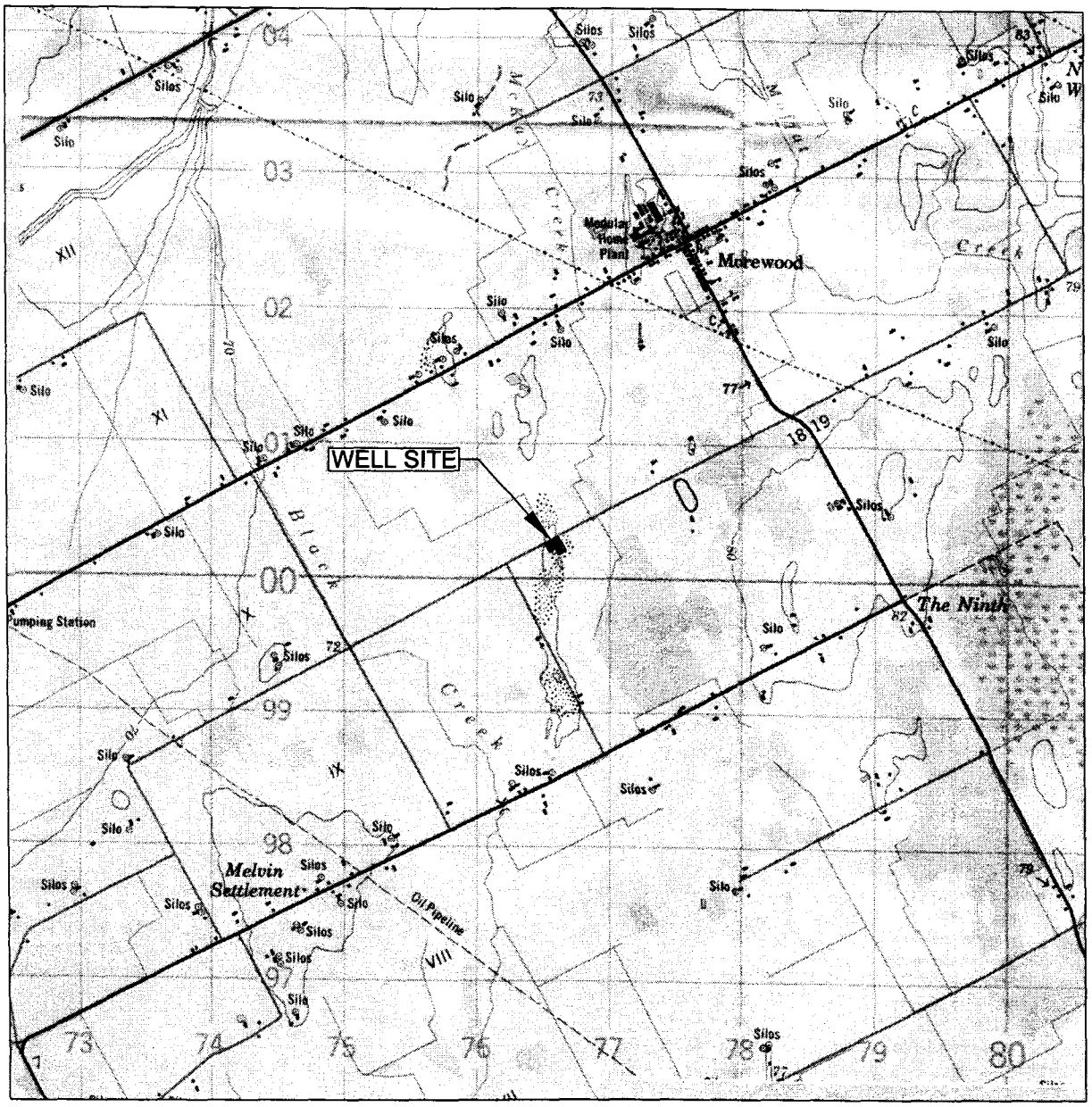
Temperature
Conductivity
pH

2.4 Laboratory Measured Chemical Parameters

Chloride	Benzene	Ammonia*
Nitrate	Toluene	TKN*
Sodium	Ethylbenzene	Nitrite*
Potassium	Xylenes	
Total Phosphorus	Atrazine	

* 96-20 and 96-21 in September 2004 and March 2005 only.

NOTE: All laboratory analyses on groundwater samples are to be performed by a private analytical laboratory and the method detection limits (MDLs) for the specific analyses are to be commensurate with the standards established in the Ontario Drinking Water Quality Standards (MOE, 2003).



SPECIAL NOTE
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT

Golder Associates
Ottawa, Ontario

SCALE	1 : 50, 000
DATE	MAY 2004
DESIGN	
CADD	J.M.
CHECK	P.A.S.B.
REVIEW	P.A.S.

FILE No. 031120862-01
PROJECT No. 03-1120-862 REV.

TITLE

KEYPLAN

FIGURE 1

N/active/03-1120-862-01.dwg

FIGURE 3

Groundwater Elevations in Vicinity of the Village of Winchester Well Site

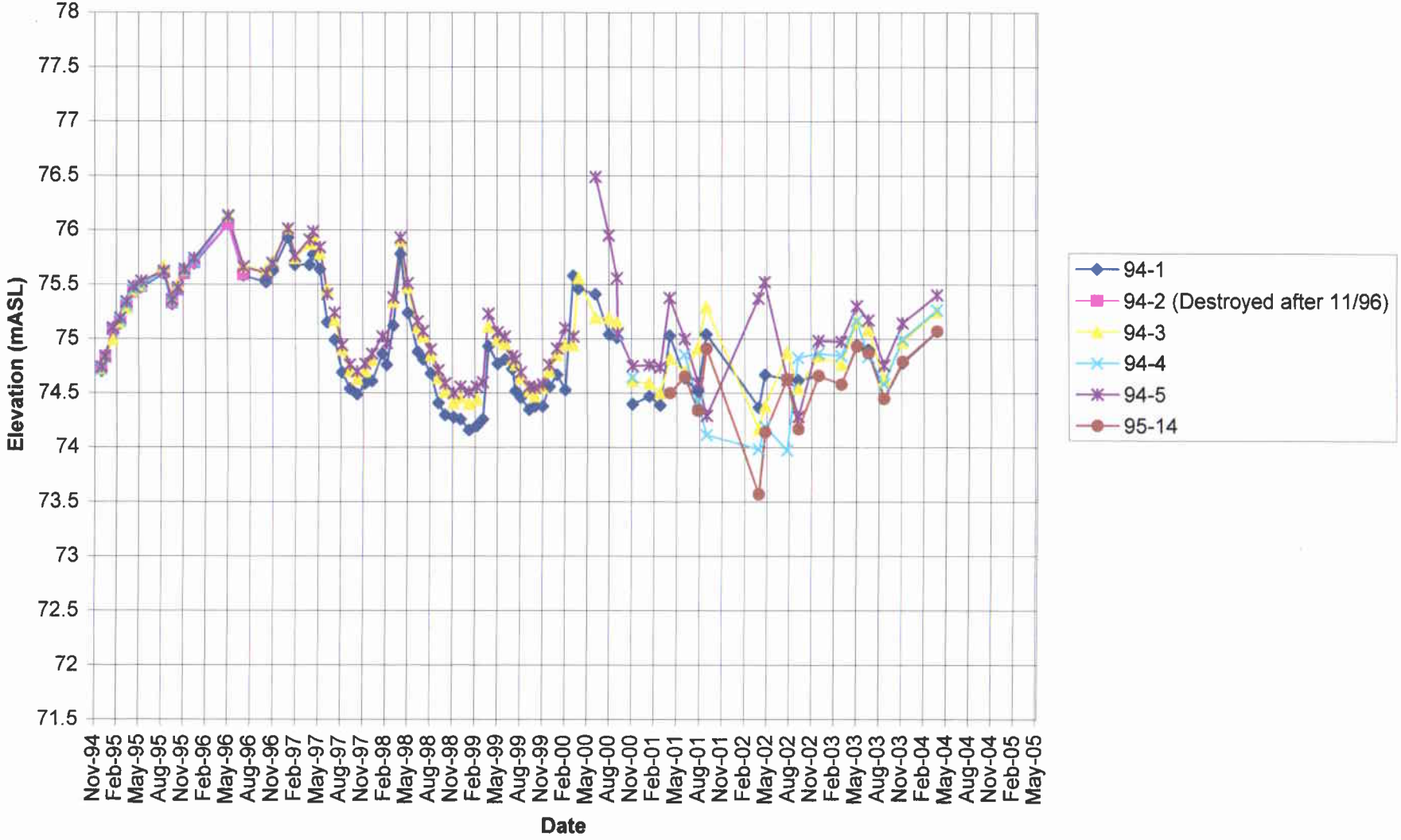


FIGURE 4

Groundwater Elevations in Morewood Esker

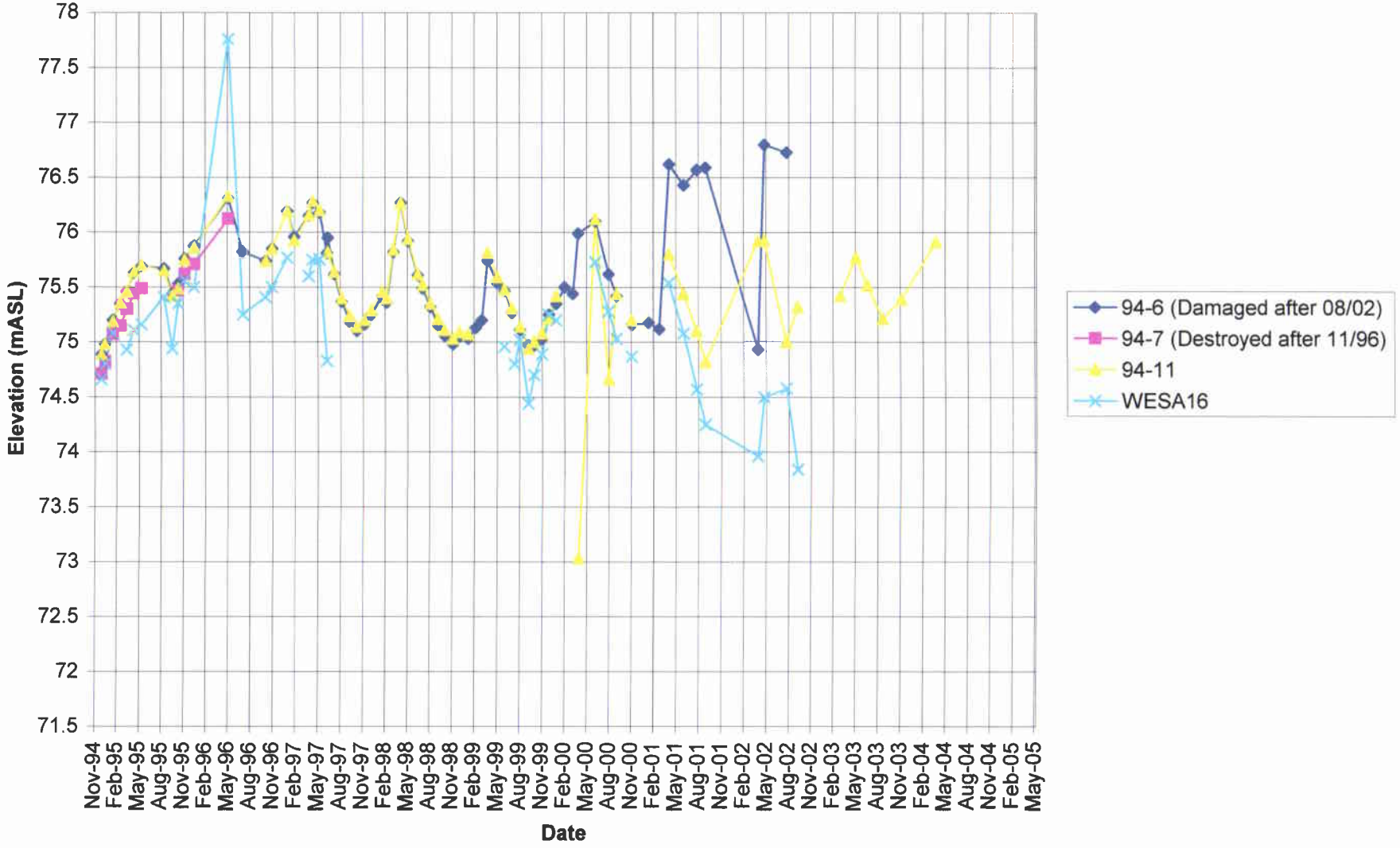


FIGURE 5

Groundwater Elevations in Various Geological Formations

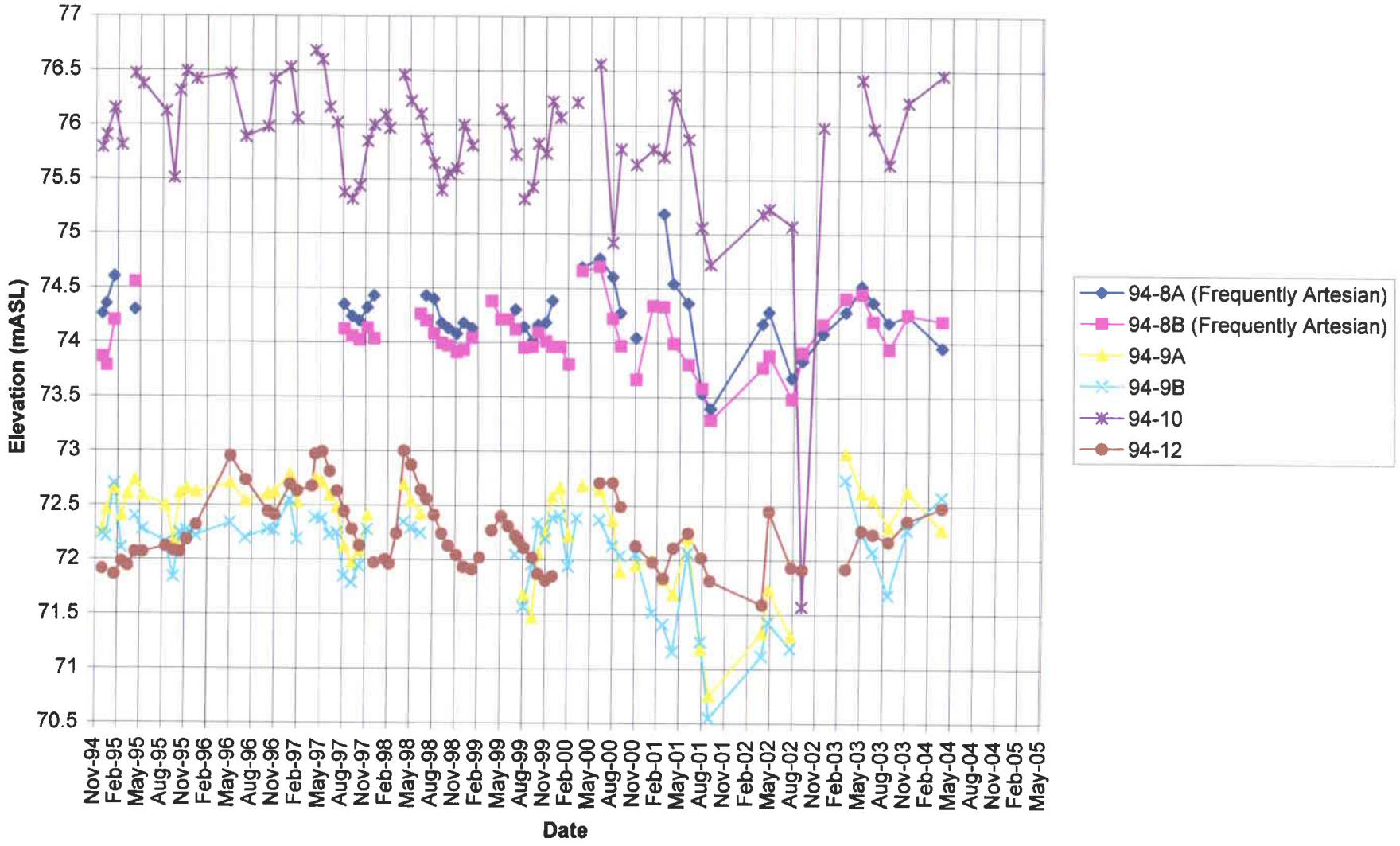
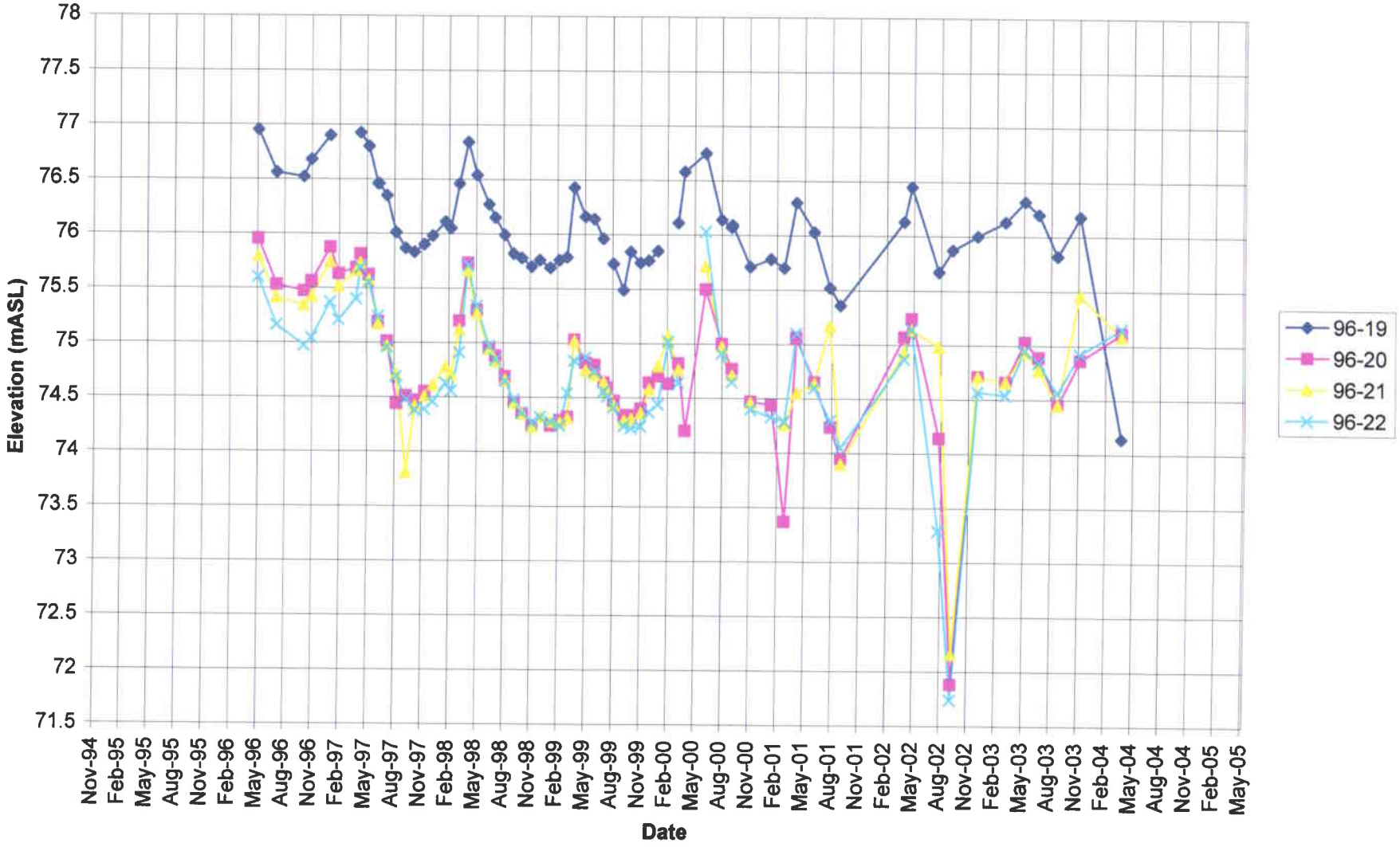


FIGURE 6
Groundwater Elevations in 96-Series Monitoring Wells



APPENDIX A

REPORT OF MONITORING RESULTS

LIST OF ABBREVIATIONS

The abbreviations commonly employed on the "Chemical and Physical Analyses Data Sheets", on the figures, in the tables and in the text of the report as related to the water quality monitoring programs are as follows:

ODWQS	Ontario Drinking Water Quality Standard (Ministry of the Environment, 2003)
<	parameter not detected in concentration at or higher than the analytical laboratory's method detection limit (MDL). Specific MDL concentrations are indicated following "<" sign.
N	nitrogen
P	phosphorus
$CaCO_3$	calcium carbonate
C	degrees Celsius
microS/cm	microsiemens per centimetre
NTU	Nephelometric Turbidity Unit
TCU	True Colour Unit
mL	millilitre
mg/L	milligrams per litre
ppm	parts per million
COND.	conductivity
DIS. OXYGEN	dissolved oxygen
TKN	total kjeldahl nitrogen
BOD	biochemical oxygen demand
COD	chemical oxygen demand
DOC	dissolved organic carbon
EC	*Escherichia coli*
TOC	total organic carbon
TS	total solids
TSS	total suspended solids
TDS	total dissolved solids
TC	total coliform
FC	faecal coliform
FS	faecal streptococcus
BKGD	background

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WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **94-5** Sheet: 1

Parameter	ODWQS	Date Sampled: 18-Oct-1994	26-Oct-1994	03-Nov-1994	15-May-1995	19-Sep-1995
Atrazine	0.005					
Chloride	250				12.0	11.0
Conductivity (uS/cm)					350	405
Nitrate (as N)	10	<0.10	<0.10	<0.10	<0.10	<0.10
pH (pH units)	6.5-8.5				7.1	8.4
Phosphorus (total)						0.060
Potassium						2.0
Sodium	200				7.0	6.0
Temperature (C)	15				8.5	12.0
TPH-Diesel						
TPH-Gasoline						
TPH-Gasoline/Diesel						
TPH-Heavy Oils						
VOC's:						
Benzene	5				<0.5000	<0.5000
Ethylbenzene	2.4				<0.5000	<0.5000
Toluene	24				<0.5000	<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300				<1.0000	<1.0000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

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WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **94-5** Sheet: 2

Date Sampled:		09-May-1996	10-Oct-1996	18-Apr-1997	16-May-1997	16-Sep-1997
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	9.0	9.0	9.0	10.0	8.0
Conductivity (uS/cm)		360	445	330	300	290
Nitrate (as N)	10	<0.10	<0.10	<0.10	<0.10	<0.10
pH (pH units)	6.5-8.5	7.9	7.7	6.3	7.2	7.0
Phosphorus (total)		4.540	0.020	<0.010	0.840	0.210
Potassium		2.0	2.0	2.0	2.0	2.0
Sodium	200	7.0	13.0	8.0	9.0	7.0
Temperature (C)	15	8.5	8.0	6.5	7.0	9.0
TPH-Diesel						
TPH-Gasoline						
TPH-Gasoline/Diesel						
TPH-Heavy Oils						
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300	<1.0000	<1.0000	<1.5000	<1.5000	<1.5000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

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WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **94-5** Sheet: 3

Date Sampled:		16-Mar-1998	25-Jun-1998	17-Sep-1998	16-Mar-1999	22-Jun-1999
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	10.0	11.0	9.0	9.0	7.0
Conductivity (uS/cm)		360	420	420	400	470
Nitrate (as N)	10	<0.10	<0.10	<0.10	0.37	<0.10
pH (pH units)	6.5-8.5	7.0	6.1	7.4	7.8	7.6
Phosphorus (total)		0.050	<0.010	<0.010	0.240	0.670
Potassium		2.0	2.0	2.0	2.0	2.0
Sodium	200	7.0	7.0	6.0	7.0	6.0
Temperature (C)	15	2.0	11.0	12.0	10.0	11.0
TPH-Diesel						
TPH-Gasoline						
TPH-Gasoline/Diesel						
TPH-Heavy Oils						
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300	<1.5000	<1.5000	<1.5000	<1.5000	<1.5000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

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WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **94-5** Sheet: 4

Date Sampled:		21-Sep-1999	22-Mar-2000	20-Sep-2000	15-Oct-2000	14-Mar-2001
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	8.0	7.0	10.0	9.0	12.0
Conductivity (uS/cm)		506	400	503		330
Nitrate (as N)	10	<0.10	<0.10	<0.10	<0.10	<0.10
pH (pH units)	6.5-8.5	7.5	7.4	7.0		8.2
Phosphorus (total)		1.130	0.030	0.370	0.730	0.520
Potassium		2.0	2.0	2.0	2.0	2.0
Sodium	200	7.0	6.0	6.0	7.0	7.0
Temperature (C)	15	9.0	8.0	12.4		7.0
TPH-Diesel					<0.2	
TPH-Gasoline					<0.2	
TPH-Gasoline/Diesel					<0.2	
TPH-Heavy Oils					<1	
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	5.0000	1.3000	<0.5000
Xylene-m/p				<0.5000	<1.0000	<1.0000
Xylene-o				<0.5000	<0.5000	<0.5000
Xylenes	300	<1.5000	<1.5000			

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

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WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **94-5** Sheet: 5

Date Sampled:		18-Sep-2001	15-May-2002	30-Sep-2002	01-Apr-2003	16-Sep-2003
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.002	<0.002	<0.002
Chloride	250	12.0	13.0	12.0	14.0	14.0
Conductivity (uS/cm)		500	560	450	500	500
Nitrate (as N)	10	<0.10	<0.10	<0.10	<0.10	<0.10
pH (pH units)	6.5-8.5	7.4	7.4	7.6	7.4	7.5
Phosphorus (total)		0.010	0.090	0.030	0.120	0.050
Potassium		2.0	2.0	2.0	1.0	2.0
Sodium	200	7.0	8.0	6.0	6.0	8.0
Temperature (C)	15	10.0	8.0	11.1	9.0	11.5
TPH-Diesel						
TPH-Gasoline						
TPH-Gasoline/Diesel						
TPH-Heavy Oils						
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p		<1.0000	<1.0000	<1.0000	<1.0000	<1.0000
Xylene-o		<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylenes	300					

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

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WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **94-5** Sheet: 6

Date Sampled: 20-Apr-2004

Parameter	ODWQS	
Atrazine	0.005	<0.002
Chloride	250	15.0
Conductivity (uS/cm)		600
Nitrate (as N)	10	<0.10
pH (pH units)	6.5-8.5	7.8
Phosphorus (total)		0.100
Potassium		2.0
Sodium	200	7.0
Temperature (C)	15	10.5
TPH-Diesel		
TPH-Gasoline		
TPH-Gasoline/Diesel		
TPH-Heavy Oils		
VOC's:		
Benzene	5	<0.5000
Ethylbenzene	2.4	<0.5000
Toluene	24	<0.5000
Xylene-m/p		<1.0000
Xylene-o		<0.5000
Xylenes	300	

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **94-11** Sheet: 1

Date Sampled:		09-May-1996	10-Oct-1996	18-Apr-1997	16-May-1997	16-Sep-1997
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	7.0	5.0	9.0	4.0	3.0
Conductivity (uS/cm)		360	447	330	320	260
Nitrate (as N)	10	<0.10	<0.10	<0.10	<0.10	0.29
pH (pH units)	6.5-8.5	8.0	7.6	7.7	7.0	7.1
Phosphorus (total)		8.590	0.020	2.280	1.080	0.560
Potassium		2.0	2.0	2.0	2.0	2.0
Sodium	200	3.0	8.0	4.0	4.0	4.0
Temperature (C)	15	9.4	7.0	6.0	7.0	10.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300	<1.0000	<1.0000	<1.5000	<1.5000	<1.5000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **94-11** Sheet: 2

Date Sampled:		16-Mar-1998	25-Jun-1998	17-Sep-1998	16-Mar-1999	22-Jun-1999
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005		<0.005
Chloride	250	7.0	7.0	5.0	Under Ice	5.0
Conductivity (uS/cm)		340	420	410		520
Nitrate (as N)	10	0.44	0.11	0.20		<0.10
pH (pH units)	6.5-8.5	7.1	6.3	7.3		7.4
Phosphorus (total)		0.020	<0.010	0.010		1.670
Potassium		3.0	<1.0	2.0		2.0
Sodium	200	4.0	4.0	3.0		5.0
Temperature (C)	15	1.0	12.0	11.0		11.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000		<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000		<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000		<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300	<1.5000	<1.5000	<1.5000		<1.5000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **94-11** Sheet: 3

Date Sampled:		21-Sep-1999	22-Mar-2000	20-Sep-2000	14-Mar-2001	18-Sep-2001
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005		<0.005
Chloride	250	7.0	8.0	19.0	Under Ice	7.0
Conductivity (uS/cm)		551	500	584		1500
Nitrate (as N)	10	0.17	0.18	3.03		<0.10
pH (pH units)	6.5-8.5	7.3	7.5	7.2		7.4
Phosphorus (total)		4.450	0.110	0.050		1.910
Potassium		2.0	2.0	2.0		2.0
Sodium	200	6.0	6.0	5.0		5.0
Temperature (C)	15	8.2	8.0	12.3		10.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000		<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000		<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000		<0.5000
Xylene-m/p				<0.5000		<1.0000
Xylene-o				<0.5000		<0.5000
Xylenes	300	<1.5000	<1.5000			

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **94-11** Sheet: 4

Date Sampled:		15-May-2002	30-Sep-2002	01-Apr-2003	16-Sep-2003	20-Apr-2004
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.002	<0.002	<0.002	<0.002
Chloride	250	15.0	13.0	9.0	9.0	10.0
Conductivity (uS/cm)		550	550	510	500	600
Nitrate (as N)	10	0.25	1.50	<0.10	0.20	<0.10
pH (pH units)	6.5-8.5	7.1	7.7	7.5	7.4	7.8
Phosphorus (total)		0.050	0.090	0.130	0.040	0.060
Potassium		2.0	2.0	2.0	2.0	2.0
Sodium	200	7.0	6.0	5.0	7.0	7.0
Temperature (C)	15	8.0	10.6	7.7	11.3	10.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p		<1.0000	<1.0000	<1.0000	<1.0000	<1.0000
Xylene-o		<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylenes	300					

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

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WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-19** Sheet: 1

Date Sampled:		09-May-1996	10-Oct-1996	18-Apr-1997	16-May-1997	16-Sep-1997
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	8.0	8.0	7.0	7.0	6.0
Conductivity (uS/cm)		370	437	300	300	260
Nitrate (as N)	10	<0.10	<0.10	<0.10	<0.10	<0.10
pH (pH units)	6.5-8.5	7.8	7.7	6.9	7.7	7.2
Phosphorus (total)		1.470	0.020	0.190	2.420	0.230
Potassium		1.0	1.0	1.0	1.0	1.0
Sodium	200	3.0	8.0	3.0	3.0	3.0
Temperature (C)	15	8.3	9.0	6.0	7.0	9.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300	<1.0000	<1.0000	<1.5000	<1.5000	<1.5000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-19** Sheet: 2

Date Sampled:		16-Mar-1998	25-Jun-1998	17-Sep-1998	16-Mar-1999	22-Jun-1999
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	7.0	8.0	8.0	11.0	11.0
Conductivity (uS/cm)		300	400	340	380	440
Nitrate (as N)	10	<0.10	<0.10	<0.10	3.16	<0.10
pH (pH units)	6.5-8.5	6.6	6.1	7.1	7.4	7.5
Phosphorus (total)		0.010	<0.010	<0.010	0.610	0.830
Potassium		2.0	2.0	<1.0	1.0	1.0
Sodium	200	3.0	3.0	2.0	10.0	3.0
Temperature (C)	15	2.0	11.0	12.0	8.0	12.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300	<1.5000	<1.5000	<1.5000	<1.5000	<1.5000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-19** Sheet: 3

Date Sampled:		21-Sep-1999	22-Mar-2000	20-Sep-2000	14-Mar-2001	18-Sep-2001
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	10.0	10.0	14.0	14.0	17.0
Conductivity (uS/cm)		441	470	461	330	460
Nitrate (as N)	10	<0.10	<0.10	<0.10	<0.10	<0.10
pH (pH units)	6.5-8.5	7.4	7.4	7.2	7.6	7.5
Phosphorus (total)		0.520	0.180	0.310	0.160	0.030
Potassium		1.0	1.0	1.0	1.0	1.0
Sodium	200	4.0	4.0	3.0	4.0	5.0
Temperature (C)	15	8.8	7.0	11.4	7.0	10.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p				<0.5000	<1.0000	<1.0000
Xylene-o				<0.5000	<0.5000	<0.5000
Xylenes	300	<1.5000	<1.5000			

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-19** Sheet: 4

Date Sampled:		15-May-2002	30-Sep-2002	01-Apr-2003	16-Sep-2003	20-Apr-2004
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.002	<0.002	<0.002	<0.002
Chloride	250	12.0	13.0	10.0	12.0	13.0
Conductivity (uS/cm)		480	440	450	485	500
Nitrate (as N)	10	<0.10	<0.10	<0.10	<0.10	<0.10
pH (pH units)	6.5-8.5	7.4	7.7	7.2	7.5	7.7
Phosphorus (total)		0.040	0.120	0.340	0.020	0.070
Potassium		1.0	1.0	<1.0	2.0	1.0
Sodium	200	5.0	3.0	4.0	5.0	4.0
Temperature (C)	15	10.0	11.8	6.8	11.4	8.5
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p		<1.0000	<1.0000	<1.0000	<1.0000	<1.0000
Xylene-o		<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylenes	300					

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-20** Sheet: 1

Date Sampled:		10-May-1996	10-Oct-1996	18-Apr-1997	16-May-1997	16-Sep-1997
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	13.0	13.0	11.0	20.0	18.0
Conductivity (uS/cm)		410	465	380	380	310
Nitrate (as N)	10	1.65	0.41	2.38	3.11	2.54
pH (pH units)	6.5-8.5	7.9	7.7	6.6	6.9	7.0
Phosphorus (total)		0.860	0.010	1.450	2.000	0.350
Potassium		2.0	2.0	2.0	2.0	2.0
Sodium	200	2.0	6.0	1.0	2.0	2.0
Temperature (C)	15	8.3	6.5	6.0	7.0	9.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300	<1.0000	<1.0000	<1.5000	<1.5000	<1.5000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-20** Sheet: 2

Date Sampled:		16-Mar-1998	25-Jun-1998	17-Sep-1998	16-Mar-1999	22-Jun-1999
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	18.0	25.0	21.0	26.0	22.0
Conductivity (uS/cm)		380	600	440	490	610
Nitrate (as N)	10	0.73	0.93	2.99	0.92	0.10
pH (pH units)	6.5-8.5	6.9	6.3	7.4	7.4	7.5
Phosphorus (total)		<0.010	<0.010	<0.010	1.490	0.710
Potassium		2.0	2.0	6.0	2.0	1.0
Sodium	200	2.0	3.0	2.0	4.0	5.0
Temperature (C)	15	2.0	10.0	12.0	9.0	10.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300	<1.5000	<1.5000	<1.5000	<1.5000	<1.5000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-20** Sheet: 3

Date Sampled:		21-Sep-1999	22-Mar-2000	20-Sep-2000	14-Mar-2001	18-Sep-2001
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	25.0	27.0	31.0	35.0	41.0
Conductivity (uS/cm)		665	580	567	350	1700
Nitrate (as N)	10	0.67	0.70	2.21	1.93	1.21
pH (pH units)	6.5-8.5	7.4	7.3	7.1	7.4	7.1
Phosphorus (total)		0.420	0.180	0.120	0.490	0.200
Potassium		2.0	1.0	2.0	2.0	2.0
Sodium	200	4.0	4.0	4.0	6.0	4.0
Temperature (C)	15	9.1	8.0	11.4	6.0	10.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p				<0.5000	<1.0000	<1.0000
Xylene-o				<0.5000	<0.5000	<0.5000
Xylenes	300	<1.5000	<1.5000			

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-20** Sheet: 4

Date Sampled:		15-May-2002	30-Sep-2002	01-Apr-2003	16-Sep-2003	20-Apr-2004
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.002	<0.002	<0.002	<0.002
Chloride	250	49.0	21.0	28.0	24.0	38.0
Conductivity (uS/cm)		580	570	800	600	550
Nitrate (as N)	10	0.10	6.03	1.15	3.10	1.95
pH (pH units)	6.5-8.5	7.4	7.4	7.3	7.4	7.6
Phosphorus (total)		0.050	0.490	0.240	0.130	0.080
Potassium		2.0	2.0	2.0	2.0	2.0
Sodium	200	6.0	7.0	6.0	8.0	10.0
Temperature (C)	15	10.0	11.0	8.9	11.3	9.5
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p		<1.0000	<1.0000	<1.0000	<1.0000	<1.0000
Xylene-o		<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylenes	300					

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-21** Sheet: 1

Date Sampled:		10-May-1996	10-Oct-1996	18-Apr-1997	16-May-1997	16-Sep-1997
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	10.0	10.0	9.0	9.0	9.0
Conductivity (uS/cm)		440	667	500	400	380
Nitrate (as N)	10	0.31	1.23	1.22	1.27	1.07
pH (pH units)	6.5-8.5	7.9	7.8	6.2	7.2	7.1
Phosphorus (total)		5.340	0.010	1.000	0.530	0.560
Potassium		4.0	4.0	4.0	4.0	4.0
Sodium	200	7.0	10.0	6.0	6.0	7.0
Temperature (C)	15	9.7	7.0	6.0	7.0	10.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300	<1.0000	<1.0000	<1.5000	<1.5000	<1.5000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-21** Sheet: 2

Date Sampled:		16-Mar-1998	25-Jun-1998	17-Sep-1998	16-Mar-1999	22-Jun-1999
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	9.0	10.0	9.0	9.0	7.0
Conductivity (uS/cm)		450	640	520	500	540
Nitrate (as N)	10	1.20	1.30	1.20	0.80	0.81
pH (pH units)	6.5-8.5	7.0	6.3	7.1	7.6	7.4
Phosphorus (total)		<0.010	0.030	<0.010	1.570	1.270
Potassium		5.0	5.0	4.0	4.0	4.0
Sodium	200	6.0	6.0	6.0	7.0	7.0
Temperature (C)	15	1.0	10.0	12.0	9.0	10.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300	<1.5000	<1.5000	<1.5000	<1.5000	<1.5000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-21** Sheet: 3

Date Sampled:		21-Sep-1999	22-Mar-2000	20-Sep-2000	14-Mar-2001	18-Sep-2001
Parameter	ODWQS					
Atrazine	0.005	<0.005		<0.005	<0.005	<0.005
Chloride	250	8.0	NA	9.0	9.0	16.0
Conductivity (uS/cm)		615		573	330	1600
Nitrate (as N)	10	0.94		0.94	0.92	11.20
pH (pH units)	6.5-8.5	7.4		6.8	7.6	7.4
Phosphorus (total)		0.340		2.690	1.480	0.340
Potassium		4.0		4.0	4.0	4.0
Sodium	200	7.0		6.0	7.0	7.0
Temperature (C)	15	8.9		12.8	6.0	11.0
VOC's:						
Benzene	5	<0.5000		<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000		<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000		<0.5000	<0.5000	<0.5000
Xylene-m/p				<0.5000	<1.0000	<1.0000
Xylene-o				<0.5000	<0.5000	<0.5000
Xylenes	300	<1.5000				

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-21** Sheet: 4

Date Sampled:		15-May-2002	30-Sep-2002	01-Apr-2003	16-Sep-2003	20-Apr-2004
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.002	<0.002	<0.002	<0.002
Chloride	250	11.0	12.0	12.0	11.0	7.0
Conductivity (uS/cm)		560	560	600	600	610
Nitrate (as N)	10	8.15	11.40	14.70	10.50	4.44
pH (pH units)	6.5-8.5	7.4	7.4	7.5	7.5	7.6
Phosphorus (total)		<0.010	0.430	2.050	0.080	0.050
Potassium		4.0	4.0	4.0	5.0	4.0
Sodium	200	9.0	6.0	5.0	8.0	7.0
Temperature (C)	15	10.0	11.5	9.1	11.0	10.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p		<1.0000	<1.0000	<1.0000	<1.0000	<1.0000
Xylene-o		<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylenes	300					

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-22** Sheet: 1

Date Sampled:		10-May-1996	10-Oct-1996	18-Apr-1997	16-May-1997	16-Sep-1997
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	6.0	5.0	3.0	3.0	2.0
Conductivity (uS/cm)		440	496	360	350	330
Nitrate (as N)	10	0.42	1.16	0.39	0.11	0.15
pH (pH units)	6.5-8.5	7.9	7.7	6.8	7.0	6.3
Phosphorus (total)		1.660	0.020	<0.010	0.470	0.860
Potassium		2.0	1.0	2.0	1.0	2.0
Sodium	200	4.0	7.0	3.0	3.0	4.0
Temperature (C)	15	9.4	7.5	6.0	7.0	8.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300	<1.0000	<1.0000	<1.5000	<1.5000	<1.5000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-22** Sheet: 2

Date Sampled:		16-Mar-1998	25-Jun-1998	17-Sep-1998	16-Mar-1999	22-Jun-1999
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	2.0	2.0	3.0	2.0	2.0
Conductivity (uS/cm)		410	580	420	460	540
Nitrate (as N)	10	0.20	<0.10	<0.10	<0.10	0.10
pH (pH units)	6.5-8.5	6.5	6.1	7.1	7.4	7.5
Phosphorus (total)		<0.010	<0.010	<0.010	0.270	0.450
Potassium		2.0	1.0	3.0	1.0	1.0
Sodium	200	3.0	4.0	3.0	4.0	4.0
Temperature (C)	15	2.0	10.0	10.0	8.5	10.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p						
Xylene-o						
Xylenes	300	<1.5000	<1.5000	<1.5000	<1.5000	<1.5000

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-22** Sheet: 3

Date Sampled:		21-Sep-1999	22-Mar-2000	20-Sep-2000	14-Mar-2001	18-Sep-2001
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	1.0	2.0	2.0	2.0	1.0
Conductivity (uS/cm)		566	480	500	330	480
Nitrate (as N)	10	0.10	<0.10	<0.10	<0.10	<0.10
pH (pH units)	6.5-8.5	7.4	7.2	6.9	7.3	6.5
Phosphorus (total)		0.830	0.300	0.860	0.350	0.080
Potassium		1.0	1.0	1.0	1.0	1.0
Sodium	200	4.0	4.0	3.0	4.0	4.0
Temperature (C)	15	8.7	8.0	10.9	6.0	11.0
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p				<0.5000	<1.0000	<1.0000
Xylene-o				<0.5000	<0.5000	<0.5000
Xylenes	300	<1.5000	<1.5000			

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

Golder Associates

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS **Project: 031120862**

Sample Source: **96-22** Sheet: 4

Date Sampled:		15-May-2002	30-Sep-2002	01-Apr-2003	16-Sep-2003	20-Apr-2004
Parameter	ODWQS					
Atrazine	0.005	<0.005	<0.002	<0.002	<0.002	<0.002
Chloride	250	1.0	2.0	1.0	2.0	3.0
Conductivity (uS/cm)		490	470	450	490	700
Nitrate (as N)	10	<0.10	<0.10	<0.10	<0.10	<0.10
pH (pH units)	6.5-8.5	7.2	7.4	7.2	7.4	7.5
Phosphorus (total)		0.010	0.180	0.350	0.040	0.060
Potassium		1.0	1.0	<1.0	1.0	1.0
Sodium	200	6.0	3.0	<2.0	5.0	4.0
Temperature (C)	15	10.0	10.4	9.0	10.8	10.5
VOC's:						
Benzene	5	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Ethylbenzene	2.4	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Toluene	24	<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylene-m/p		<1.0000	<1.0000	<1.0000	<1.0000	<1.0000
Xylene-o		<0.5000	<0.5000	<0.5000	<0.5000	<0.5000
Xylenes	300					

All VOC's reported in µg/L. All other values reported in mg/L unless otherwise noted.

APPENDIX C

ANNUAL RECORDS OF WATER TAKING
(2000 to 2003)

Ministry of the Environment / Ministère de l'Environnement

Annual Record of Water Taking

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Personal information contained on this form is collected under the authority of the Ontario Water Resources Act, Section 34. The purpose of the form is to record details and information about the taking of water annually. Questions should be directed to the Ministry of the Environment's Regional Office in your area.

See examples on the manually printed form for instructions on completing form.

Year	Permit No.
2000	96-P-4068

Source (Separate record to be kept for each source)

Well # 7A, 7B, 7C Ground Water

Name of Permittee

Village of Winchester
547 St. Lawrence Street, Winchester, Ontario K0C 2K0

Mailing Address

c/o Ontario Clean Water Agency
5 Industrial Drive, Chesterville, Ontario K0C 1H0

Location of Taking	Twp. or Municipality	Concession	Lot
Thompson Road	Winchester Twp.	Conc. 9	Pt. Lot 15

(1) Date of Taking	(2) Monthly Hours of Taking	(3) Rate of Taking (☐ Imp gpm ☐ U.S. gpm ☒ Litres/sec)	(4) Amount of Taking (☐ Day ☐ Week ☒ Month)	(5) Remarks
JAN. 2000	295.2	19.7	20,947 m3	
FEB. 2000	265.2	19.3	18,412 m3	
MAR. 2000	307.1	19.4	21,436 m3	
APR. 2000	305.9	19.7	21,840 m3	
MAY 2000	348.7	20	25,097 m3	
JUNE 2000	377.2	20.8	27,866 m3	
JULY 2000	375.6	20.8	27,937 m3	
AUG. 2000	377.3	19.9	27,066 m3	
SEPT. 2000	391	20.2	28,411 m3	
OCT. 2000	374.5	20.4	27,523 m3	
NOV. 2000	384	20.1	27,811 m3	
DEC. 2000	369.7	20.2	26,846 m3	

I certify that the above information is true, complete and accurate.

Blair Henderson, Acting Operations Manager

Signature: Blair Henderson

Date: FEB 08/2001

Ministry Of The Environment
Ministère de l'Environnement

Annual Record Of Ground Water Taking
Registre annuel de prélèvement d'eau souterraine

Personal information contained on this form is collected under the authority of the Ontario Water Resources Act, Section 20. The Purpose of the form is to record details and information about the taking of water annually. Questions should be directed to the Ministry of the Environment's Regional office in your area.

Les renseignements personnels qui figurent dans le présent formulaire sont recueillis en vertu de l'article 20 de la Loi sur les ressources en eau de l'Ontario. La présente sert à consigner aux dossiers les détails et les renseignements concernant la prise d'eau annuelle. Prière d'adresser toute question au bureau régional du ministère de l'Environnement le plus proche.

Year: 2001 *Année*

Permit No.: 96-P-4068 *N° de permis*

Source: Groundwater Wellfield #7a,b,c

Name of Permittee: VILLAGE OF WINCHESTER *Nom du titulaire du permis*

Mailing Address: O.C.W.A. 5 INDUSTRIAL DRIVE CHESTERVILLE , ON K0C1H0 *Adresse postale*

Location Of Taking: *Lieu de la prise d'eau*	Twp. or Municipality: *Canton ou municipalité*	Concession:	Lot:
13224 THOMPSON RD.	NORTH DUNDAS	CON. 9	PT. LOT 15

Date Of Taking *Date de la prise d'eau*	Hours Of Taking *Heure*	Rate Of Taking Litres/sec *Débit de prise d'eau*	Amount Of Taking m^3 *Volume des prises*	Maximum Rate of Taking m^3 /day *Taux de prélèvement maximum*	Remarks *Observations*
JAN	394.20	20.10	28,527	1,103	
FEB	371.80	19.72	26,339	1,045	
MAR	416.70	19.96	29,951	1,119	
APR	370.30	20.10	26,800	1,027	
MAY	461.00	20.15	33,437	1,277	
JUN	483.90	20.18	35,154	1,477	
JUL	498.00	20.17	36,164	1,386	
AUG	551.70	20.04	39,817	1,698	
SEP	471.50	20.03	35,986	1,304	
OCT	444.90	20.09	32,184	1,369	
NOV	390.00	20.09	28,188	1,038	
DEC	378.30	19.54	26,669	1,025	

I certify that the above information is true, complete and accurate. Signature Date
J'atteste que les renseignements ci-dessus sont vrais, complets et exacts.

Eric Hunter Jan 28/02

Ministry Of The Environment
Ministère de l'Environnement

Annual Record Of Ground Water Taking
Registre annuel de prélèvement d'eau souterraine

Personal information contained on this form is collected under the authority of the Ontario Water Resources Act, Section 20. The Purpose of the form is to record details and information about the taking of water annually. Questions should be directed to the Ministry of the Environment's Regional office in your area.

Les renseignements personnes qui figurent dans le présent formulaire sont resueillis en vertu de l'article 20 de la Loi sur les ressources en eau de l'Ontario. La présente sert à consigner aux dossiers les détails et les renseignements concernant la prise d'eau annuelle. Priére d'adresser toute Question au bureau régional du ministére de l'Environnement le Plus proche.

Year: 2002 *Année*

Permit No.: 96-P-4068 *N° de permis*

Source: Groundwater Wellfield #7a,b,c

Name of Permittee: VILLAGE OF WINCHESTER *Nom du titulaire du permis*

Mailing Address: O.C.W.A. 5 INDUSTRIAL DRIVE CHESTERVILLE , ON K0C1H0 *Adresse postale*

Location Of Taking: *Lieu de la prise d'eau*	Twp. or Municipality: *Canton ou municipalité*	Concession:	Lot:
13224 THOMPSON RD	NORTH DUNDAS	CON. 9	PT. LOT 15

Date Of Taking *Date de la prise d'eau*	Hours Of Taking *Heure*	Rate Of Taking Litres/sec *Débit de prise d'eau*	Amount Of Taking m^3 *Volume des prises*	Maximum Rate of Taking m^3 /day *Taux de prélèvement maximum*	Remarks *Observations*
JAN	383.60	19.88	27,460	999	
FEB	321.40	20.17	23,334	910	
MAR	363.60	20.47	26,802	990	
APR	366.10	19.72	25,968	1,038	
MAY	411.05	20.66	30,577	1,189	
JUN	361.00	20.83	27,066	1,121	
JUL	435.72	20.76	32,500	1,336	
AUG	421.50	20.74	31,467	1,145	
SEP	382.70	20.33	28,012	1,039	
OCT	395.29	19.99	28,306	1,138	
NOV	339.60	20.40	24,944	1,138	
DEC	332.90	20.27	24,292	885	

I certify that the above information is true, complete and accurate. Signature Date
J'atteste que les renseignements ci-dessus sont vrais, complets et exacts.

Ministry Of The Environment
Ministère de l'Environnement

Annual Record Of Ground Water Taking
Registre annuel de prélèvement d'eau souterraine

Personal information contained on this form is collected under the authority of the Ontario Water Resources Act, Section 20. The Purpose of the form is to record details and information about the taking of water annually. Questions should be directed to the Ministry of the Environment's Regional office in your area.

Les renseignements personnel qui figurent dans le présent formulaire sont recueillis en vertu de l'article 20 de la Loi sur les ressources en eau de l'Ontario. Le présent formulaire sert à consigner aux dossiers les détails et les renseignements concernant la prise d'eau annuelle. Prière d'adresser toutes questions au bureau régional du ministère de l'Environnement le plus proche.

Year(Année): 2003 Permit No.(N° de permis): 96-P-4068

Location: RW7 - Winchester Well Field #7

Source: Groundwater

Name of Permittee: VILLAGE OF WINCHESTER
Nom du titulaire du permis

Mailing Address: O.C.W.A. 5 INDUSTRIAL DRIVE CHESTERVILLE
Adresse postale

Location Of Taking: *Lieu de la prise d'eau*	Twp. or Municipality: *Canton ou municipalité*	Concession:	Lot:
13224 THOMPSON RD	NORTH DUNDAS	CON. 9	PT. LOT 15

Date Of Taking *Date de la prise d'eau*	Total Hours Of Taking (Hour) *Heure*	Avg. Daily Rate Of Taking (L/sec) *Débit de prise d'eau*	Total Amount Of Taking (m^3) *Volume des prises*	Peak Daily Flow (m^3/day) *Prélèvement maximum journalier*	Max. Daily Rate of Taking (L/sec) *Débit de pointe journalier*	(L/min)
JAN	362.00	20.00	26,071.00	907.00		
FEB	350.60	20.16	25,450.00	1,006.00		
MAR	405.40	20.21	29,492.00	1,091.00		
APR	379.40	20.34	27,788.00	1,320.00		
MAY	367.10	19.39	25,002.00	951.00		
JUN	461.80	19.25	32,488.00	1,354.00		
JUL	400.80	20.05	28,842.00	1,263.00		
AUG	417.49	21.20	31,738.00	1,347.00		
SEP	570.20	20.12	41,205.00	1,684.00		
OCT	383.10	19.26	34,049.00	1,654.00	20.93	
NOV	435.20	20.47	31,909.00	1,298.00	22.30	
DEC	405.80	20.89	30,256.00	1,209.00	22.20	
Total:			364,290			
Criteria:		22.70		1,961.00	22.70	

I certify that the above information is true, complete and accurate. Signature Date
J'atteste que les renseignements ci-dessus sont vrais, complets et exacts.