Appendix G

Groundwater Level Data

G1. Water Level Monitoring Record

G2. Groundwater Level Summary Table

G3. Hydrographs by Catchment Area

Appendix G

Groundwater Level Data

Measurement of groundwater levels has been ongoing at piezometers and monitoring wells installed on-site since November 2003 and April 2004, respectively. This monitoring has been either by manual measurement, which is performed at a frequency of monthly or by pressure transducers, which have been set to record levels at intervals ranging between 6 hours and 5 minutes. Wells equipped with transducers are generally downloaded monthly at the time that the manual measurements are undertaken.

Several new wells were installed in 2007/2008 and a number of the original 2004 well installations were reconstructed. Following well development and slug testing, pressure transducers were installed in many of the new wells. With regard to the reconstructed wells, the water level record for the original 2004 well installations stops at the time the well installation was removed in 2007. Given that the new wells were completed at different depths, a new water level database was established for these new installations.

The water level data are added to an ACESS database and hydrographs are produced.

Table G1 is a comprehensive listing of the wells and their current monitoring status. Wells with pressure transducers are identified along with the instrument number and the period of record (manual and electronic) for each well is listed.

The manual water level data are provided in Appendix G2.

G1. Water Level Monitoring Record

Table G1. Water Level Monitoring Record

Borehole or Location ID	Monitor ID	Previously Used Monitor ID in GLL Historical Reports			Year Drilled (Well Installed)	Type of Installation & Current Status	Water Level Monitoring method	Instrument Number	Manual		Data Logger	
Jul-07	Jul-07	Work Plan '07	Level 2 Draft '05	Other ID					Period of Record	Monitoring Frequency	Period of Record	Monitoring Frequency Interval Length
TW14	**TW14**	TW14	n/a	n/a	2007 (2007)	Open borehole Test Well - Bedrock	Data Logger	B4079	22-Oct-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present, discontinuous
TW15	**TW15**	TW15	n/a	n/a	2007 (2007)	Open borehole Test Well - Bedrock	Data Logger	B4080	22-Oct-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
TW16	**TW16**	TW16	n/a	n/a	2007 (2007)	Open borehole Test Well - Bedrock	Data Logger	B4075	22-Oct-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB1-I	**MWB1-I-A**	GLL1-S	GLL1-II	1-S	2004	Monitoring Well - Bedrock	Data Logger	B6471	20-Apr-04 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB1-II	**n/a**	GLL1-D	GLL1-I	1-D	2004	Monitor decommissioned in 2007			20-Apr-04 to 20-Mar-07	monthly, some discontinuity	n/a	n/a
	MWB1-II-B	GLL1-D	GLL1-I	1-D	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6472	26-Jun-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB1-II-C	GLL1-D	GLL1-I	1-D	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6473	26-Jun-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB2-I	**MWB2-I-A**	GLL2-S	GLL2-S	2-S	2004	Monitoring Well - Bedrock			26-Jul-04 to present	monthly; discontinuous	n/a	n/a
MWB3	**n/a**	GLL3	GLL3	3	2004	Monitor decommissioned in 2007			20-Apr-04 to 23-Feb-07	monthly; discontinuous	n/a	n/a
	MWB3-A	GLL3	GLL3	3	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B7065	20-Sep-07 to present	monthly	30-May-08 to present	5 min.
	MWB3-B	GLL3	GLL3	3	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B7050	20-Sep-07 to present	monthly	30-May-08 to present	5 min.
MWB4-I	**MWB4-I-A**	GLL4-S	GLL4-II	4-S	2004	Monitoring Well - Bedrock	Data Logger	B6457	20-Apr-04 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB4-II	**n/a**	GLL4-D	GLL4-I	4-D	2004	Monitor decommissioned in 2007			20-Apr-04 to 18-Dec-07	monthly, some discontinuity	n/a	n/a
	MWB4-II-B	GLL4-D	GLL4-I	4-D	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6458	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB4-II-C	GLL4-D	GLL4-I	4-D	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6459	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB6-I	**MWB6-I-A**	GLL6-S	GLL6-II	6-S	2004	Monitoring Well - Bedrock	Data Logger	B6474	20-Apr-04 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB6-II	**n/a**	GLL6-D	GLL6-I	6-D	2004	Monitor decommissioned in 2007			20-Apr-04 to 19-Jan-07	monthly, some discontinuity	n/a	n/a
	MWB6-II-B	GLL6-D	GLL6-I	6-D	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B7049	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB6-II-C	GLL6-D	GLL6-I	6-D	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6437	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB7-I	**MWB7-I-A**	GLL7-S	GLL7-II	7-S	2004	Monitoring Well - Bedrock	Data Logger	B6438	20-Apr-04 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB7-II	**n/a**	GLL7-D	GLL7-I	7-D	2004	Monitor decommissioned in 2007			20-Apr-04 to 19-Jan-07	monthly, some discontinuity	n/a	n/a
	MWB7-II-B	GLL7-D	GLL7-I	7-D	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6435	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB7-II-C	GLL7-D	GLL7-I	7-D	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6436	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB8-I	**MWB8-I-A**	GLL8-S	GLL8-II	8-S	2004	Monitoring Well - Bedrock	Data Logger	B6425	20-Apr-04 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB8-II	**n/a**	GLL8-D	GLL8-I	8-D	2004	Monitor decommissioned in 2007			20-Apr-04 to 19-Jan-07	monthly, some discontinuity	n/a	n/a
	MWB8-II-B	GLL8-D	GLL8-I	8-D	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6442	26-Jun-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB8-II-C	GLL8-D	GLL8-I	8-D	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6439	26-Jun-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB9-I	**MWB9-I-A**	GLL9-S	GLL9-II	9-S	2004	Monitoring Well - Bedrock	Data Logger	B7057	20-Apr-04 to present	monthly, some discontinuity	30-May-08 to present	5 min.
MWB9-II	**MWB9-II-B**	GLL9-D	GLL9-I	9-D	2004	Monitoring Well - Bedrock	Data Logger	B7055	20-Apr-04 to present	monthly, some discontinuity	30-May-08 to present	5 min.
MWB10-I	**n/a**	TW10	A006803	n/a	2004	Open borehole instrumented with monitors in			n/a	n/a	n/a	n/a
	MWB10-I-A	TW10	A006803	n/a	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6426	26-Jun-07 to present	monthly, some discontinuity	12-Jan-08 to present	6 hr. 12-Jan-08 to 28-May-08; 5 min. 28-May-08 to present
	MWB10-I-B	TW10	A006803	n/a	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B5677	26-Jun-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB10-I-C	TW10	A006803	n/a	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B5634	26-Jun-07 to present	monthly, some discontinuity	n/a	n/a
MWB10-II	**n/a**	GLL5	GLL5	5 (6")	2004	Open borehole instrumented with monitors in			20-Apr-04 to 19-Apr-07	monthly, some discontinuity	n/a	n/a
	MWB10-II-D	GLL5	GLL5	5 (6")	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B5739	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB11	**n/a**	TW11	A006801	n/a	2004	Open borehole instrumented with monitors in			n/a	n/a	n/a	n/a
	MWB11-A	TW11	A006801	n/a	2004 (2007)	Replacement Monitoring Well - Bedrock	Manual		20-Sep-07 to present	monthly	n/a	n/a
	MWB11-B	TW11	A006801	n/a	2004 (2007)	Replacement Monitoring Well - Bedrock	Manual		20-Sep-07 to present	monthly	n/a	n/a
	MWB11-C	TW11	A006801	n/a	2004 (2007)	Replacement Monitoring Well - Bedrock	Manual		20-Sep-07 to present	monthly	n/a	n/a
MWB12	**n/a**	TW12	A006789	n/a	2004	Open borehole instrumented with monitors in			n/a	n/a	n/a	n/a
	MWB12-A	TW12	A006789	n/a	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6440	26-Jun-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB12-B	TW12	A006789	n/a	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6466	26-Jun-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB12-C	TW12	A006789	n/a	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6467	26-Jun-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB13	**n/a**	TW13	A006804	n/a		Open borehole instrumented with monitors in			n/a	n/a	n/a	n/a
	MWB13-A	TW13	A006804	n/a	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B7063	20-Sep-07 to present	monthly	30-May-08 to present	5 min.
	MWB13-B	TW13	A006804	n/a	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B7052	20-Sep-07 to present	monthly	30-May-08 to present	5 min.
	MWB13-C	TW13	A006804	n/a	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B7051	20-Sep-07 to present	monthly	30-May-08 to present	5 min.
MWB17	**MWB17-A**	BHB-S	JEGEL BHB-II	B-S	2004	Monitoring Well - Bedrock	Data Logger	B7054	20-Apr-04 to present	monthly, some discontinuity	30-May-08 to present	5 min.
	MWB17-B	BHB-D	JEGEL BHB-I	B-D	2004	Monitoring Well - Bedrock	Data Logger	B7053	20-Apr-04 to present	monthly, some discontinuity	30-May-08 to present	5 min.
MWB18	**n/a**	BHC	JEGEL BHC	C	2004	Monitor decommissioned in 2007			20-Apr-04 to 19-Jan-07	monthly, some discontinuity	n/a	n/a
	MWB18-A	BHC	JEGEL BHC	C	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B5678	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB18-B	BHC	JEGEL BHC	C	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	A7332	23-Jul-07 to present	monthly, some discontinuity	1-Feb-08 to present	6 hr. 1-Feb-08 to 28-May-08; 5 min. 28-May-08 to present, some discontinuity
	n/a	BHD	JEGEL BHD	D	2004	Monitor decommissioned in 2007			20-Apr-04 to 19-Jan-07	monthly, some discontinuity	n/a	n/a
MWB19	**MWB19-A**	BHD	JEGEL BHD	D	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6446	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB19-B	BHD	JEGEL BHD	D	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6443	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB20-I	**MWB20-I-A**	n/a	n/a	n/a		Monitoring Well - Bedrock	Data Logger	B6470	20-Sep-07 to present	monthly	27-Dec-07 to present	6 hr.27-Dec-07 to 28-May-08; 5 min. 28-May-08 to present
MWB20-II	**n/a**	BHE	JEGEL BHE	E	2004	Monitor decommissioned in 2007			20-Apr-04 to 19-Jan-07	monthly, some discontinuity	n/a	n/a
	MWB20-II-B	BHE	JEGEL BHE	E	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6450	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB20-II-C	BHE	JEGEL BHE	E	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	C2922	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present, some discontinuity
MWB21	**n/a**	BHF	JEGEL BHF	F	2004	Monitor decommissioned in 2007			20-Apr-04 to 19-Jan-07	monthly, some discontinuity	n/a	n/a
	MWB21-A	BHF	JEGEL BHF	F	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	B6441	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB21-B	BHF	JEGEL BHF	F	2004 (2007)	Replacement Monitoring Well - Bedrock	Data Logger	A8861	23-Jul-07 to present	monthly, some discontinuity	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB22-I	**MWB22-I-A**	MW1-S	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B6429	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB22-I-C	MW1-S	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B5688	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB22-II	**MWB22-II-B**	MW1-D	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B5679	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB22-II-D	MW1-D	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B4076	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB23-I	**MWB23-I-A**	MW2-S	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B6430	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB23-II	**MWB23-II-B**	MW2-D	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B5690	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB23-II-C	MW2-D	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B4077	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB24-I	**MWB24-I-A**	MW3-S	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B6447	22-Jan-08 to present	monthly	10-Jan-08 to present	6 hr. 10-Jan-08 to 28-May-08; 5 min. 28-May-08 to present
	MWB24-I-B	MW3-S	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B5681	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB24-II	**MWB24-II-C**	MW3-D	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B5691	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB24-II-D	MW3-D	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B4071	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB25-I	**MWB25-I-A**	MW4-S	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B6448	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB25-II	**MWB25-II-B**	MW4-I	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B6445	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present

Table G1. Water Level Monitoring Record

Borehole or Location ID	Monitor ID	Previously Used Monitor ID in GLL Historical Reports			Year Drilled (Well Installed)	Type of Installation & Current Status	Water Level Monitoring method	Instrument Number	Manual		Data Logger	
Jul-07	Jul-07	Work Plan '07	Level 2 Draft '05	Other ID					Period of Record	Monitoring Frequency	Period of Record	Monitoring Frequency Interval Length
MWB25-III	**MWB25-III-C**	MW4-D	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B5680	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB25-III-D	MW4-D	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B4078	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB26-I	**MWB26-I-A**	MW5-S	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B6427	22-Jan-08 to present	monthly, some discontinuity	11-Jan-2008 to present	6 hr. 11-Jan-08 to 28-May-08; 5 min. 28-May-08 to present
	MWB26-I-B	MW5-S	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B6428	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB26-II	**MWB26-II-C**	MW5-D	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B5689	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
	MWB26-II-D	MW5-D	n/a	n/a	2007	Monitoring Well - Bedrock	Data Logger	B4066	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB27-I	**MWB27-I-A**	n/a	n/a	MW6-S	2007	Offsite Monitoring Well - Bedrock	Data Logger	B6468	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB27-II	**MWB27-II-B**	n/a	n/a	MW6-D	2007	Offsite Monitoring Well - Bedrock	Data Logger	B6469	20-Sep-07 to present	monthly	9-Nov-07 to present	6 hr. 9-Nov-07 to 28-May-08; 5 min. 28-May-08 to present
MWB28	**MWB28-A**	n/a	n/a	n/a	2008	Monitoring Well - Bedrock	Data Logger	A8874	22-Apr-08 to present	monthly	2-Apr-08 to present	6 hr. 2-Apr-08 to 28-May-08; 5 min. 28-May-08 to present
	MWB28-B	n/a	n/a	n/a	2008	Monitoring Well - Bedrock	Data Logger	A8899	22-Apr-08 to present	monthly	2-Apr-08 to present	6 hr. 2-Apr-08 to 28-May-08; 5 min. 28-May-08 to present
MWO1-I	**MWO1-I-A**	GLL06-01-III	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016575	27-Nov-06 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
	MWO1-I-B	GLL06-01-II	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016577	27-Nov-06 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present, discontinuous
MWO1-II	**MWO1-II-C**	GLL06-01-I	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016567	27-Nov-06 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 10-Aug-07; 1 hr. 24-Sep-07 to 22-Oct-07; 12 hr. 21-Jan-08 to 24-Mar-08; 6 hr. 22-Apr-08 to 28-May-08; 5 min 28-May-08 to present, discontinuous
MWO2	**MWO2**	GLL06-02	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016534	27-Nov-06 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
MWO4	**MWO4**	GLL06-04	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016569	27-Nov-06 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present, discontinuous
MWO5	**MWO5**	GLL06-05	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016542	27-Nov-06 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
MWO6	**MWO6**	GLL06-06	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016550	27-Nov-06 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
MWO7	**MWO7**	GLL06-07	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016581	21-Sep-07 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
MWO8	**MWO8**	GLL06-08	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016573	27-Nov-06 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
MWO9	**MWO9**	GLL06-09	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016578	21-Sep-07 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
MWO10	**MWO10**	GLL06-10	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016552	27-Nov-06 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
MWO11	**MWO11**	GLL06-11	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016507	21-Sep-07 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
MWO12	**MWO12**	GLL06-12	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016611	27-Nov-06 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
MWO13	**MWO13**	GLL06-13	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016612	21-Sep-07 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
MWO14	**MWO14**	GLL06-14	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016525	27-Nov-06 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
MWO16	**MWO16**	GLL06-16	n/a	n/a	2006	Monitoring Well - Overburden	Data Logger	0031016539	21-Sep-07 to present	monthly, some discontinuity	13-May-06 to present	30 min. 13-May-06 to 22-Oct-07, 6 hr. 22-Oct-07 to 28-May-08, 5 min. 28-May-08 to present
MP1	**MP1**	MP1	MP1	n/a	2003	Mini-piezometer - Wetland	Manual		5-Nov-03 to present	monthly, some discontinuity	n/a	n/a
MP2	**MP2**	MP2	MP2	n/a	2003	Mini-piezometer - Wetland	Manual		5-Nov-03 to present	monthly, some discontinuity	n/a	n/a
MP3	**MP3**	MP3	MP3	n/a	2003	Mini-piezometer - Wetland	lost		5-Nov-03 to 24-Mar-05	monthly, discontinuous	n/a	n/a
MP4	**MP4**	MP4	MP4	n/a	2003	Mini-piezometer - Wetland	lost		5-Nov-03 to 24-Mar-05	monthly, discontinuous	n/a	n/a
MP5	**MP5**	MP5	MP5	n/a	2003	Mini-piezometer - Wetland	Manual		5-Nov-03 to present	monthly, some discontinuity	n/a	n/a
MP6	**MP6**	MP6	MP6	n/a	2003	Mini-piezometer - Wetland	Manual		5-Nov-03 to present	monthly, some discontinuity	n/a	n/a
MP7	**MP7**	MP7	MP7	n/a	2004	Mini-piezometer - Wetland	Manual		20-Jan-04 to present	monthly, some discontinuity	n/a	n/a
MP8	**MP8**	MP8	MP8	n/a	2004	Mini-piezometer - Wetland	Manual		20-Jan-04 to present	monthly, some discontinuity	n/a	n/a
MP9	**MP9**	MP9	MP9	n/a	2004	Mini-piezometer - Wetland	Manual		19-Nov-04 to present	monthly, some discontinuity	n/a	n/a
MP10	**MP10**	MP10	MP10	n/a	2004	Mini-piezometer - Wetland	Manual		19-Nov-04 to present	monthly, some discontinuity	n/a	n/a
MP11	**MP11**	MP11	MP11	n/a	2004	Mini-piezometer - Wetland	Manual		19-Nov-04 to present	monthly, some discontinuity	n/a	n/a
MP12	**MP12**	MP12	MP12	n/a	2004	Mini-piezometer - Wetland	Manual		19-Nov-04 to present	monthly, some discontinuity	n/a	n/a
MP13	**MP13**	MP13	MP13	n/a	2004	Mini-piezometer - Wetland	Manual		19-Nov-04 to present	monthly, some discontinuity	n/a	n/a
MP14	**MP14**	MP14	MP14	n/a	2004	Mini-piezometer - Wetland	Manual		19-Nov-04 to present	monthly, some discontinuity	n/a	n/a
MP15	**MP15**	MP15	MP15	n/a	2005	Mini-piezometer - Wetland	Manual		19-May-05 to present	monthly, some discontinuity	n/a	n/a
MP16	**MP16**	MP16	MP16	n/a	2005	Mini-piezometer - Wetland	Manual		19-May-05 to present	monthly, some discontinuity	n/a	n/a

G2. Groundwater Level Summary Table

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
TW14		292.390	291.740	22-Oct-07	10.19	282.200
				06-Nov-07	10.25	282.140
				22-Nov-07	10.30	282.090
				20-Dec-08	9.95	282.440
				22-Jan-08	7.63	284.760
				19-Feb-08	7.32	285.070
				25-Mar-08	6.92	285.470
				22-Apr-08	6.11	286.280
				27-May-08	7.18	285.210
				24-Jun-08	7.83	284.560
				15-Jul-08	8.09	284.305
				22-Jul-08	21.80	270.590
				23-Jul-08	22.39	270.005
				24-Jul-08	22.31	270.080
				25-Jul-08	22.59	269.800
				26-Jul-08	22.69	269.700
				27-Jul-08	22.80	269.590
				28-Jul-08	22.88	269.510
				29-Jul-08	23.00	269.390
				30-Jul-08	9.20	283.190
				07-Aug-08	8.49	283.900
				09-Sep-08	8.64	283.750
				16-Oct-08	9.61	282.785
				29-Oct-08	n/a	n/a
TW15-A	**TW15**	290.296	290.910	21-Jul-08	9.23	281.066
				22-Jul-08	10.70	279.596
				23-Jul-08	11.02	279.276
				24-Jul-08	11.15	279.146
				25-Jul-08	11.35	278.946
				26-Jul-08	11.52	278.776
				27-Jul-08	11.66	278.636
				28-Jul-08	11.80	278.496
				29-Jul-08	11.93	278.371
				30-Jul-08	7.28	283.016
				07-Aug-08	5.98	284.316
				09-Sep-08	6.09	284.206
				29-Oct-08	6.23	284.071
TW15-B	**TW15**	290.262	290.910	21-Jul-08	11.74	
				22-Jul-08	12.47	277.792
				23-Jul-08	12.53	277.732
				24-Jul-08	12.53	277.732
				25-Jul-08	12.70	277.562
				26-Jul-08	12.79	277.472
				27-Jul-08	12.88	277.382
				28-Jul-08	12.95	277.312
				29-Jul-08	13.04	277.227
				30-Jul-08	6.59	283.672
				07-Aug-08	5.90	284.367
				09-Sep-08	6.07	284.192
				17-Oct-08	6.13	284.132
				29-Oct-08	6.22	284.047
TW15-C	**TW15**	290.280	290.910	21-Jul-08	8.69	281.590
				22-Jul-08	9.01	281.270
				23-Jul-08	8.96	281.325
				24-Jul-08	8.93	281.350
				25-Jul-08	9.01	281.270
				26-Jul-08	9.05	281.235
				27-Jul-08	9.10	281.180

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				28-Jul-08	9.16	281.120
				29-Jul-08	9.24	281.040
				30-Jul-08	6.27	284.010
				07-Aug-08	5.87	284.415
				09-Sep-08	6.07	284.210
				29-Oct-08	6.18	284.100
TW15		290.380	290.380	22-Oct-07	8.17	282.210
				06-Nov-07	8.22	282.160
				22-Nov-07	8.32	282.060
				20-Dec-07	7.90	282.480
				22-Jan-08	5.60	284.780
				19-Feb-08	5.29	285.090
				25-Mar-08	4.92	285.460
				22-Apr-08	4.19	286.190
				27-May-08	5.22	285.160
				24-Jun-08	5.82	284.560
				15-Jul-08	6.06	284.325
TW16		289.370	288.780	22-Oct-07	7.19	282.180
				06-Nov-07	7.25	282.120
				22-Nov-07	7.36	282.010
				20-Dec-07	6.97	282.400
				22-Jan-08	4.62	284.750
				19-Feb-08	*7.29*	282.080
				25-Mar-08	3.86	285.510
				22-Apr-08	2.99	286.380
				27-May-08	4.12	285.250
				24-Jun-08	4.79	284.580
MWB1-I-A	**GLL1-S / GLL1-II / 1-S**	286.361	285.571	20-Jan-04	1.38	284.981
				20-Apr-04	1.19	285.171
				26-Apr-04	1.23	285.131
				03-Jun-04	1.58	284.781
				18-Jun-04	1.60	284.761
				26-Jul-04	3.04	283.321
				25-Aug-04	3.49	282.871
				23-Sep-04	4.03	282.331
				28-Oct-04	3.90	282.461
				19-Nov-04	3.54	282.821
				20-Jan-05	1.38	284.981
				28-Feb-05	1.40	284.961
				24-Mar-05	1.65	284.711
				15-Apr-05	1.02	285.341
				19-May-05	1.40	284.961
				17-Jun-05	2.10	284.261
				14-Jul-05	3.12	283.241
MWB1-I-A	**GLL1-S / GLL1-II / 1-S**	286.361	285.571	19-Aug-05	3.46	282.901
				28-Sep-05	4.66	281.701
				20-Oct-05	3.75	282.611
				18-Nov-05	2.80	283.561
				16-Dec-05	2.55	283.811
				20-Jan-06	1.56	284.801
				17-Feb-06	n/a	n/a
				16-Mar-06	0.98	285.381
				20-Apr-06	1.50	284.861
				18-May-06	1.31	285.056
				16-Jun-06	2.27	284.091
				26-Jul-06	3.07	283.291
				31-Aug-06	3.45	282.911
				22-Sep-06	3.30	283.061

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				20-Oct-06	1.85	284.511
				26-Oct-06	1.88	284.481
				27-Nov-06	1.43	284.931
				18-Dec-06	1.31	285.051
				19-Jan-07	1.29	285.076
				23-Feb-07	2.00	284.361
				20-Mar-07	1.55	284.811
				19-Apr-07	1.22	285.141
				14-May-07	1.82	284.541
				26-Jun-07	2.95	283.411
				23-Jul-07	3.47	282.891
		286.570	285.650	24-Jul-07	3.49	283.080
				13-Sep-07	4.50	282.070
				20-Sep-07	4.57	282.000
				21-Sep-07	4.56	282.010
				22-Oct-07	4.72	281.855
				05-Nov-07	4.75	281.820
		286.530		19-Nov-07	4.73	281.800
				21-Jan-08	1.75	284.780
				20-Feb-08	1.42	285.106
				24-Mar-08	1.26	285.270
				22-Apr-08	0.98	285.550
				26-May-08	1.60	284.930
				24-Jun-08	2.23	284.300
				15-Jul-08	2.52	284.010
				16-Jul-08	2.56	283.970
				21-Jul-08	2.28	284.255
				22-Jul-08	2.00	284.535
				23-Jul-08	1.50	285.028
				24-Jul-08	1.42	285.110
				25-Jul-08	1.42	285.107
				26-Jul-08	1.40	285.132
				27-Jul-08	1.39	285.140
				28-Jul-08	1.40	285.127
				29-Jul-08	1.45	285.083
				30-Jul-08	1.52	285.015
				31-Jul-08	1.61	284.920
				01-Aug-08	1.71	284.820
MWB1-I-A	**GLL1-S / GLL1-II / 1-S**	286.530	285.650	02-Aug-08	1.77	284.760
				03-Aug-08	1.86	284.675
				04-Aug-08	1.92	284.610
				05-Aug-08	1.97	284.562
				09-Sep-08	2.43	284.100
				28-Oct-08	2.69	283.840
MWB1-II-B	**GLL1-D/ GLL1-I / 1-D**	286.670	285.660	26-Jun-07	3.25	283.420
				23-Jul-07	4.13	282.540
				24-Jul-07	4.16	282.510
				13-Sep-07	5.18	281.490
				20-Sep-07	5.26	281.410
				21-Sep-07	5.26	281.410
				22-Oct-07	5.47	281.200
				05-Nov-07	5.52	281.150
				19-Nov-07	5.57	281.105
				21-Jan-08	2.33	284.340
				20-Feb-08	2.07	284.605
				24-Mar-08	1.68	284.990
				22-Apr-08	1.07	285.600
				26-May-08	2.05	284.620

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				24-Jun-08	2.81	283.860
				15-Jul-08	3.07	283.600
				16-Jul-08	3.10	283.570
				21-Jul-08	2.96	283.710
				22-Jul-08	2.98	283.690
				23-Jul-08	2.66	284.010
				24-Jul-08	2.47	284.200
				25-Jul-08	2.42	284.250
				26-Jul-08	2.37	284.305
				27-Jul-08	2.35	284.320
				28-Jul-08	2.36	284.310
				29-Jul-08	2.41	284.265
				30-Jul-08	2.40	284.274
				31-Jul-08	2.42	284.250
				01-Aug-08	2.47	284.200
				02-Aug-08	2.49	284.180
				03-Aug-08	2.57	284.105
				04-Aug-08	2.61	284.060
				05-Aug-08	2.64	284.035
				09-Sep-08	3.02	283.650
				28-Oct-08	3.30	283.367
MWB1-II-C	**GLL1-D/ GLL1-I / 1-D**	286.650	285.660	26-Jun-07	3.31	283.345
				23-Jul-07	4.06	282.590
				24-Jul-07	4.12	282.530
				13-Sep-07	5.08	281.570
				20-Sep-07	5.21	281.440
				21-Sep-07	5.18	281.470
				22-Oct-07	5.39	281.260
				05-Nov-07	5.44	281.210
				19-Nov-07	5.42	281.230
MWB1-II-C	**GLL1-D/ GLL1-I / 1-D**	286.650	285.660	21-Jan-08	2.29	284.360
				20-Feb-08	2.04	284.612
				24-Mar-08	1.77	284.880
				22-Apr-08	1.06	285.590
				26-May-08	2.02	284.630
				24-Jun-08	2.76	283.890
				15-Jul-08	3.01	283.640
				16-Jul-08	3.06	283.590
				21-Jul-08	2.92	283.733
				22-Jul-08	2.86	283.790
				23-Jul-08	2.65	284.005
				24-Jul-08	2.46	284.191
				25-Jul-08	2.41	284.245
				26-Jul-08	2.36	284.295
				27-Jul-08	2.34	284.313
				28-Jul-08	2.35	284.302
				29-Jul-08	2.39	284.256
				30-Jul-08	2.38	284.273
				31-Jul-08	2.40	284.250
				01-Aug-08	2.44	284.210
				02-Aug-08	2.47	284.180
				03-Aug-08	2.54	284.113
				04-Aug-08	2.58	284.070
				05-Aug-08	2.61	284.045
				09-Sep-08	2.96	283.690
				28-Oct-08	3.23	283.420
n/a	**GLL1-D/ GLL1-I / 1-D**	285.948	285.488	20-Jan-04	1.11	284.838
				20-Apr-04	0.89	285.058

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				26-Apr-04	0.92	285.028
				03-Jun-04	1.33	284.618
				18-Jun-04	1.45	284.498
				26-Jul-04	2.34	283.608
				25-Aug-04	2.83	283.118
				23-Sep-04	3.34	282.608
				28-Oct-04	3.48	282.468
				19-Nov-04	3.39	282.558
				20-Jan-05	1.11	284.838
				28-Feb-05	1.16	284.788
				24-Mar-05	1.50	284.448
				15-Apr-05	0.60	285.348
				19-May-05	1.16	284.788
				17-Jun-05	1.85	284.098
				14-Jul-05	2.71	283.238
				19-Aug-05	3.26	282.688
				28-Sep-05	4.45	281.498
				20-Oct-05	3.69	282.263
				18-Nov-05	3.02	282.928
				16-Dec-05	2.37	283.578
				20-Jan-06	1.49	284.458
				17-Feb-06	0.25	285.698
				16-Mar-06	0.63	285.318
n/a	**GLL1-D/ GLL1-I / 1-D**	285.948	285.488	20-Apr-06	1.31	284.638
				18-May-06	1.33	284.618
				16-Jun-06	2.00	283.948
				26-Jul-06	2.69	283.258
				31-Aug-06	3.35	282.598
				22-Sep-06	3.32	282.628
				20-Oct-06	1.94	284.008
				26-Oct-06	1.82	284.128
				27-Nov-06	1.25	284.698
				18-Dec-06	1.12	284.833
				19-Jan-07	1.04	284.908
				23-Feb-07	*3.20*	*282.748*
				20-Mar-07	1.22	284.728
				14-May-06	1.48	284.468
MWB2-I	**GLL2-S / 2-S**	287.820	286.780	26-Apr-04	1.43	286.390
				03-Jun-04	1.45	286.370
				18-Jun-04	1.42	286.400
				26-Jul-04	1.90	285.920
				23-Sep-04	2.12	285.700
				28-Oct-04	2.23	285.590
				20-Jan-05	1.56	286.260
				28-Feb-05	1.56	286.260
				24-Mar-05	1.59	286.230
				15-Apr-05	1.45	286.370
				19-May-05	1.53	286.290
				17-Jun-05	1.72	286.100
				14-Jul-05	2.14	285.680
				26-Jul-05	1.90	285.920
				19-Aug-05	2.32	285.500
				28-Sep-05	2.37	285.450
				20-Oct-05	2.26	285.560
				18-Nov-05	1.76	286.060
				16-Dec-05	1.78	286.040
				20-Jan-06	1.50	286.320
				17-Feb-06	1.33	286.490

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				31-Aug-06	2.27	285.550
				20-Oct-06	n/a	n/a
				18-Dec-06	1.54	286.280
				26-Jun-07	1.94	285.880
				22-Oct-07	2.95	284.875
				19-Nov-07	2.94	284.885
				21-Jan-08	1.71	286.110
				24-Mar-08	1.56	286.260
				23-Apr-08	1.47	286.350
				27-May-08	1.61	286.210
				24-Jun-08	1.69	286.130
				15-Jul-08	1.82	286.000
				21-Jul-08	1.57	286.255
				22-Jul-08	1.61	286.210
				23-Jul-08	1.40	286.418
				24-Jul-08	1.50	286.325
MWB2-I	**GLL2-S / 2-S**	287.820	286.780	25-Jul-08	1.55	286.270
				26-Jul-08	1.52	286.305
				27-Jul-08	1.63	286.195
				28-Jul-08	1.67	286.155
				29-Jul-08	1.70	286.121
				30-Jul-08	1.72	286.105
				07-Aug-08	1.69	286.135
				10-Sep-08	1.74	286.080
				28-Oct-08	1.81	286.010
MWB3-A	**3-D**	286.660	286.140	27-Jul-07	2.37	284.290
				17-Sep-07	2.88	283.780
				20-Sep-07	2.90	283.760
				21-Sep-07	2.89	283.770
				22-Oct-07	2.84	283.820
				19-Nov-07	2.75	283.910
				21-Jan-08	1.39	285.270
				24-Mar-08	1.20	285.460
				23-Apr-08	1.07	285.590
				27-May-08	1.31	285.350
				30-May-08	1.34	285.320
				24-Jun-08	1.47	285.190
				15-Jul-08	1.60	285.060
				16-Jul-08	1.63	285.030
				21-Jul-08	1.42	285.245
				22-Jul-08	1.54	285.125
				23-Jul-08	1.31	285.350
				24-Jul-08	1.39	285.270
				25-Jul-08	1.46	285.200
				26-Jul-08	1.55	285.110
				27-Jul-08	1.54	285.125
				28-Jul-08	1.67	284.995
				29-Jul-08	1.63	285.035
				29-Jul-08	1.63	285.030
				29-Jul-08	1.63	285.030
				29-Jul-08	1.63	285.030
				29-Jul-08	1.63	285.030
				29-Jul-08	1.63	285.030
				29-Jul-08	1.63	285.035
				29-Jul-08	1.63	285.035
				29-Jul-08	1.62	285.040
				29-Jul-08	1.62	285.045
				29-Jul-08	1.61	285.050

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				29-Jul-08	1.62	285.045
				29-Jul-08	1.61	285.050
				29-Jul-08	1.61	285.050
				29-Jul-08	1.61	285.055
				29-Jul-08	1.61	285.055
				29-Jul-08	1.61	285.055
				29-Jul-08	1.60	285.060
				29-Jul-08	1.60	285.060
				29-Jul-08	1.60	285.060
				29-Jul-08	1.60	285.060
MWB3-A	**3-D**	286.660	286.140	29-Jul-08	1.60	285.060
				29-Jul-08	1.60	285.060
				29-Jul-08	1.60	285.060
				29-Jul-08	1.60	285.060
				29-Jul-08	1.60	285.065
				29-Jul-08	1.60	285.065
				29-Jul-08	1.60	285.065
				29-Jul-08	1.60	285.065
				29-Jul-08	1.60	285.065
				29-Jul-08	1.60	285.065
				30-Jul-08	1.57	285.090
				31-Jul-08	1.55	285.115
				01-Aug-08	1.56	285.100
				02-Aug-08	1.56	285.100
				03-Aug-08	1.58	285.078
				04-Aug-08	1.59	285.070
				05-Aug-08	1.60	285.060
				07-Aug-08	1.49	285.170
				10-Sep-08	1.55	285.110
				29-Oct-08	1.58	285.085
MWB3-B	**3-D**	286.670	286.140	27-Jul-07	2.49	284.180
				17-Sep-07	3.07	283.600
				20-Sep-07	3.18	283.490
				21-Sep-07	3.18	283.490
				22-Oct-07	3.22	283.450
				19-Nov-07	3.18	283.490
				21-Jan-08	1.52	285.150
				24-Mar-08	1.19	285.480
				23-Apr-08	0.93	285.740
				27-May-08	1.33	285.340
				30-May-08	1.36	285.310
				24-Jun-08	1.58	285.090
				15-Jul-08	1.74	284.930
				16-Jul-08	1.78	284.890
				21-Jul-08	1.59	285.085
				22-Jul-08	2.22	284.450
				23-Jul-08	2.05	284.620
				24-Jul-08	2.08	284.590
				25-Jul-08	2.15	284.525
				26-Jul-08	2.18	284.488
				27-Jul-08	2.21	284.460
				28-Jul-08	2.25	284.420
				29-Jul-08	2.31	284.360
				29-Jul-08	2.32	284.350
				29-Jul-08	2.32	284.350
				29-Jul-08	2.32	284.350
				29-Jul-08	2.32	284.350
				29-Jul-08	2.31	284.360

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				29-Jul-08	2.30	284.370
				29-Jul-08	2.30	284.375
				29-Jul-08	2.29	284.380
				29-Jul-08	2.29	284.385
MWB3-B	**3-D**	286.670	286.140	29-Jul-08	2.27	284.400
				29-Jul-08	2.27	284.405
				29-Jul-08	2.26	284.410
				29-Jul-08	2.25	284.420
				29-Jul-08	2.24	284.430
				29-Jul-08	2.23	284.440
				29-Jul-08	2.22	284.450
				29-Jul-08	2.21	284.460
				29-Jul-08	2.20	284.470
				29-Jul-08	2.20	284.475
				29-Jul-08	2.17	284.500
				29-Jul-08	2.16	284.515
				29-Jul-08	2.14	284.530
				29-Jul-08	2.13	284.540
				29-Jul-08	2.11	284.560
				29-Jul-08	2.10	284.575
				29-Jul-08	2.09	284.585
				29-Jul-08	2.07	284.600
				29-Jul-08	2.07	284.605
				29-Jul-08	2.06	284.615
				29-Jul-08	2.04	284.630
				29-Jul-08	2.02	284.650
				29-Jul-08	2.01	284.660
				29-Jul-08	2.00	284.670
				29-Jul-08	1.99	284.680
				29-Jul-08	1.98	284.690
				29-Jul-08	1.98	284.695
				29-Jul-08	1.97	284.705
				29-Jul-08	1.96	284.710
				29-Jul-08	1.96	284.715
				29-Jul-08	1.95	284.720
				29-Jul-08	1.95	284.725
				29-Jul-08	1.94	284.730
				29-Jul-08	1.94	284.735
				29-Jul-08	1.93	284.740
				29-Jul-08	1.93	284.740
				29-Jul-08	1.93	284.745
				29-Jul-08	1.92	284.750
				30-Jul-08	1.76	284.915
				31-Jul-08	1.68	284.990
				01-Aug-08	1.69	284.980
				02-Aug-08	1.68	284.990
				03-Aug-08	1.70	284.969
				04-Aug-08	1.71	284.960
				04-Aug-08	1.71	284.960
				05-Aug-08	1.72	284.952
				07-Aug-08	1.62	285.055
				10-Sep-08	1.72	284.950
				29-Oct-08	1.76	284.910
n/a	**3-D/GLL3**	286.821	285.851	20-Jan-04	1.37	285.451
				20-Apr-04	1.35	285.471
				26-Apr-04	1.37	285.451
n/a	**3-D/GLL3**	286.821	285.851	03-Jun-04	1.42	285.401
				18-Jun-04	1.39	285.431

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				26-Jul-04	1.90	284.926
				25-Aug-04	2.13	284.691
				23-Sep-04	2.15	284.671
				28-Oct-04	2.23	284.591
				20-Jan-05	1.37	285.451
				28-Feb-05	1.41	285.411
				24-Mar-05	1.46	285.361
				15-Apr-05	1.33	285.491
				19-May-05	1.42	285.401
				17-Jun-05	1.60	285.221
				14-Jul-05	2.20	284.621
				19-Aug-05	2.40	284.421
				28-Sep-05	2.42	284.401
				20-Oct-05	2.24	284.581
				18-Nov-05	1.93	284.891
				16-Dec-05	1.60	285.221
				20-Jan-06	1.40	285.421
				17-Feb-06	1.26	285.561
				16-Mar-06	1.29	285.531
				20-Apr-06	1.43	285.391
				18-May-06	1.34	285.486
				16-Jun-06	1.68	285.141
				26-Jul-06	1.91	284.911
				31-Aug-06	2.31	284.516
				22-Sep-06	2.01	284.816
				20-Oct-06	1.44	285.381
				25-Oct-06	1.47	285.351
				27-Nov-06	1.43	285.396
				18-Dec-06	1.40	285.421
				19-Jan-07	1.33	285.491
				23-Feb-07	1.55	285.276
				20-Mar-07	1.21	285.611
				14-May-07	1.34	285.481
				26-Jun-07	1.86	284.961
MWB4-I-A	**GLL4-S / GLL4-II / 4-S**	286.637	286.087	20-Jan-08	2.54	284.097
				20-Apr-04	1.69	284.947
				26-Apr-04	1.82	284.822
				03-Jun-04	2.68	283.957
				18-Jun-04	3.02	283.617
				26-Jul-04	4.31	282.332
				25-Aug-04	5.02	281.612
				23-Sep-04	5.77	280.867
				28-Oct-04	6.09	280.547
				19-Nov-04	6.16	280.477
				20-Jan-05	2.54	284.097
				28-Feb-05	2.48	284.157
				24-Mar-05	3.02	283.617
				15-Apr-05	1.54	285.097
				19-May-05	2.13	284.507
MWB4-I-A	**GLL4-S / GLL4-II / 4-S**	286.637	286.087	17-Jun-05	3.45	283.187
				14-Jul-05	4.51	282.132
				19-Aug-05	5.29	281.347
				28-Sep-05	6.84	279.797
				20-Oct-05	6.21	280.427
				18-Nov-05	6.18	280.457
				16-Dec-05	4.58	282.057
				20-Jan-06	3.04	283.597
				17-Feb-06	1.88	284.757

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				16-Mar-06	1.51	285.132
				20-Apr-06	2.49	284.152
				18-May-06	2.80	283.842
				16-Jun-06	3.62	283.017
				26-Jul-06	4.67	281.967
				31-Aug-06	5.44	281.202
				22-Sep-06	5.40	281.237
				20-Oct-06	4.36	282.277
				25-Oct-06	4.00	282.637
				27-Nov-06	2.69	283.947
				18-Dec-06	2.22	284.417
				23-Feb-07	3.20	283.437
				20-Mar-07	2.56	284.077
				19-Apr-07	1.85	284.787
				14-May-07	2.66	283.977
		286.750	286.140	26-Jun-07	4.15	282.600
				23-Jul-07	5.14	281.610
				25-Jul-07	5.19	281.560
				19-Sep-07	6.43	280.320
				20-Sep-07	6.46	280.290
				21-Sep-07	6.45	280.300
				22-Oct-07	6.75	280.000
				07-Nov-07	6.86	279.890
		286.680		19-Nov-07	6.83	279.850
				20-Dec-07	6.65	280.030
				21-Jan-08	3.65	283.030
				20-Feb-08	2.79	283.894
				24-Mar-08	2.34	284.340
				22-Apr-08	1.49	285.190
				22-May-08	2.37	284.310
				25-Jun-08	4.75	281.930
				15-Jul-08	4.03	282.650
				16-Jul-08	4.06	282.620
				21-Jul-08	4.07	282.610
				22-Jul-08	4.30	282.380
				23-Jul-08	3.91	282.775
				24-Jul-08	3.68	283.002
				25-Jul-08	3.62	283.060
				26-Jul-08	3.57	283.110
				27-Jul-08	3.56	283.120
				28-Jul-08	3.57	283.110
				29-Jul-08	3.61	283.067
				30-Jul-08	3.58	283.098
MWB4-I-A	**GLL4-S / GLL4-II / 4-S**	286.680	286.140	31-Jul-08	3.55	283.135
				01-Aug-08	3.63	283.050
				02-Aug-08	3.64	283.040
				03-Aug-08	3.71	282.969
				04-Aug-08	3.73	282.950
				05-Aug-08	3.74	282.945
				09-Sep-08	4.06	282.620
				29-Oct-08	4.44	282.245
MWB4-II-B	**GLL4-D / GLL4-I / 4-D**	286.990	286.170	23-Jul-07	5.43	281.560
				25-Jul-07	5.51	281.480
				19-Sep-07	6.70	280.290
				20-Sep-07	8.83	278.160
				22-Oct-07	7.05	279.945
				06-Nov-07	7.14	279.850
		286.940		19-Nov-07	7.16	279.835

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				20-Dec-07	6.96	280.030
				21-Jan-08	4.02	282.970
				20-Feb-08	3.22	283.767
				24-Mar-08	2.71	284.280
				22-Apr-08	1.88	285.110
				26-May-08	3.01	283.980
				25-Jun-08	4.01	282.980
				15-Jul-08	4.38	282.610
				16-Jul-08	4.41	282.580
				21-Jul-08	4.43	282.565
				22-Jul-08	4.40	282.590
				23-Jul-08	4.31	282.685
				24-Jul-08	4.10	282.892
				25-Jul-08	4.01	282.978
				26-Jul-08	3.95	283.045
				27-Jul-08	3.93	283.062
				28-Jul-08	3.94	283.055
				29-Jul-08	3.99	283.005
				30-Jul-08	3.93	283.056
				31-Jul-08	3.94	283.050
				01-Aug-08	3.97	283.020
				02-Aug-08	4.00	282.995
				03-Aug-08	4.05	282.942
				04-Aug-08	4.07	282.920
				05-Aug-08	4.08	282.912
				09-Sep-08	4.41	282.580
				29-Oct-08	4.78	282.215
MWB4-II-C	**GLL4-D / GLL4-I / 4-D**	286.960	286.170	23-Jul-07	5.42	281.540
				26-Jul-07	5.29	281.670
				19-Sep-07	6.46	280.500
				20-Sep-07	8.18	278.780
				22-Oct-07	6.86	280.100
				06-Nov-07	6.94	280.020
		286.920		19-Nov-07	6.97	279.990
				20-Dec-07	6.78	280.180
MWB4-II-C	**GLL4-D / GLL4-I / 4-D**	286.920	286.170	21-Jan-08	3.92	283.040
				20-Feb-08	3.21	283.750
				24-Mar-08	2.75	284.210
				22-Apr-08	1.95	285.010
				26-May-08	3.07	283.890
				25-Jun-08	4.01	282.910
				15-Jul-08	4.36	282.560
				16-Jul-08	4.40	282.520
				21-Jul-08	4.27	282.650
				22-Jul-08	4.37	282.550
				23-Jul-08	4.22	282.705
				24-Jul-08	4.09	282.830
				25-Jul-08	4.07	282.855
				26-Jul-08	4.03	282.890
				27-Jul-08	4.04	282.885
				28-Jul-08	4.06	282.858
				29-Jul-08	4.12	282.805
				30-Jul-08	3.95	282.973
				31-Jul-08	3.93	282.990
				01-Aug-08	3.96	282.960
				02-Aug-08	3.98	282.945
				03-Aug-08	4.08	282.842
				04-Aug-08	4.05	282.875

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				05-Aug-08	4.05	282.872
				09-Sep-08	4.36	282.560
				29-Oct-08	4.75	282.170
n/a	GLL4-D / GLL4-I / 4-D	286.523	286.113	20-Jan-04	2.34	284.183
				20-Apr-04	1.77	284.753
				26-Apr-04	1.85	284.673
				03-Jun-04	2.57	283.953
				18-Jun-04	2.73	283.793
				26-Jul-04	4.04	282.488
				25-Aug-04	n/a	n/a
				23-Sep-04	n/a	n/a
				28-Oct-04	5.78	280.743
				19-Nov-04	5.84	280.683
				20-Jan-05	2.34	284.183
				28-Feb-05	2.36	284.163
				24-Mar-05	2.85	283.673
				15-Apr-05	1.46	285.063
				19-May-05	2.10	284.423
				17-Jun-05	3.25	283.273
				14-Jul-05	4.27	282.253
				19-Aug-05	5.02	281.503
				28-Sep-05	6.52	280.003
				20-Oct-05	5.91	280.618
				18-Nov-05	6.46	280.063
				16-Dec-05	4.36	282.163
				20-Jan-06	n/a	n/a
				17-Feb-06	1.88	284.643
				16-Mar-06	1.53	284.993
n/a	GLL4-D / GLL4-I / 4-D	286.523	286.113	20-Apr-06	2.45	284.073
				18-May-06	2.75	283.773
				16-Jun-06	3.44	283.083
				26-Jul-06	4.40	282.123
				31-Aug-06	5.17	281.353
				22-Sep-06	5.44	281.083
				20-Oct-06	4.23	282.293
				25-Oct-06	3.78	282.748
				27-Nov-06	2.54	283.983
				18-Dec-06	2.06	284.468
				23-Feb-07	3.26	283.263
				20-Mar-07	2.51	284.009
				14-May-07	2.64	283.883
				26-Jun-07	4.22	282.303
MWB6-I-A	GLL6-S / GLL6-II / 6-S	288.073	287.333	20-Apr-04	2.59	285.483
				26-Apr-04	2.70	285.373
				03-Jun-04	3.16	284.913
				18-Jun-04	3.41	284.663
				26-Jul-04	4.44	283.638
				25-Aug-04	4.56	283.513
				23-Sep-04	4.88	283.193
				28-Oct-04	6.55	281.523
				19-Nov-04	5.56	282.513
				20-Jan-05	3.36	284.713
				28-Feb-05	3.30	284.773
				24-Mar-05	3.65	284.423
				15-Apr-05	2.39	285.683
				19-May-05	2.83	285.243
				17-Jun-05	3.82	284.253
				14-Jul-05	4.64	283.433

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				19-Aug-05	5.24	282.833
				28-Sep-05	5.64	282.433
				20-Oct-05	5.73	282.343
				18-Nov-05	5.60	282.473
				16-Dec-05	4.85	283.223
				20-Jan-06	3.89	284.183
				17-Feb-06	2.83	285.243
				16-Mar-06	2.48	285.593
				20-Apr-06	3.14	284.933
				18-May-06	3.23	284.843
				16-Jun-06	3.85	284.223
				26-Jul-06	4.72	283.353
				31-Aug-06	5.19	282.883
				22-Sep-06	5.37	282.708
				20-Oct-06	4.13	283.948
				25-Oct-06	4.24	283.833
				27-Nov-06	3.38	284.693
				18-Dec-06	3.03	285.043
				19-Jan-07	2.96	285.118
				23-Feb-07	3.85	284.223
				20-Mar-07	3.33	284.743
MWB6-I-A	**GLL6-S / GLL6-II / 6-S**	288.073	287.333	19-Apr-07	2.51	285.568
				14-May-07	3.20	284.873
		288.070	287.270	25-Jun-07	4.42	283.650
				23-Jul-07	5.03	283.045
				24-Jul-07	5.05	283.025
				18-Sep-07	5.92	282.150
				20-Sep-07	5.96	282.110
				22-Oct-07	6.23	281.840
				05-Nov-07	6.31	281.760
				19-Nov-07	6.37	281.700
				21-Jan-08	4.44	283.630
				20-Feb-08	3.95	284.123
				24-Mar-08	3.35	284.720
				22-Apr-08	2.25	285.820
				26-May-08	3.01	285.060
				24-Jun-08	3.91	284.160
				15-Jul-08	4.30	283.770
				16-Jul-08	4.33	283.740
				21-Jul-08	4.39	283.680
				21-Jul-08	4.38	283.695
				22-Jul-08	4.37	283.700
				23-Jul-08	4.30	283.775
				24-Jul-08	4.11	283.960
				25-Jul-08	4.04	284.030
				26-Jul-08	4.00	284.070
				27-Jul-08	4.00	284.070
				28-Jul-08	4.02	284.050
				29-Jul-08	4.05	284.020
				30-Jul-08	4.06	284.015
				31-Jul-08	4.08	283.995
				01-Aug-08	4.10	283.970
				02-Aug-08	4.12	283.955
				03-Aug-08	4.15	283.916
				04-Aug-08	4.17	283.900
				05-Aug-08	4.19	283.883
				10-Sep-08	4.42	283.650
				28-Oct-08	4.61	283.465

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
MWB6-II-B	**GLL6-D / GLL6-I / 6-D**	288.220	287.240	23-Jul-07	5.36	282.860
				24-Jul-07	5.39	282.830
				18-Sep-07	6.32	281.900
				20-Sep-07	6.36	281.860
				22-Oct-07	6.61	281.615
				05-Nov-07	6.68	281.540
				19-Nov-07	6.73	281.490
				21-Jan-08	4.81	283.410
				20-Feb-08	4.32	283.900
				24-Mar-08	3.72	284.500
				22-Apr-08	2.53	285.690
				26-May-08	3.39	284.830
				24-Jun-08	4.31	283.910
				15-Jul-08	4.67	283.550
MWB6-II-B	**GLL6-D / GLL6-I / 6-D**	288.220	287.240	16-Jul-08	4.70	283.520
				21-Jul-08	4.74	283.480
				21-Jul-08	4.73	283.490
				22-Jul-08	4.74	283.480
				23-Jul-08	4.67	283.550
				24-Jul-08	4.53	283.690
				25-Jul-08	4.48	283.740
				26-Jul-08	4.44	283.780
				27-Jul-08	4.44	283.780
				28-Jul-08	4.45	283.775
				29-Jul-08	4.48	283.745
				30-Jul-08	4.47	283.750
				31-Jul-08	4.47	283.750
				01-Aug-08	4.49	283.730
				02-Aug-08	4.51	283.715
				03-Aug-08	4.54	283.682
				04-Aug-08	4.56	283.665
				05-Aug-08	4.56	283.657
				10-Sep-08	4.77	283.450
				28-Oct-08	4.96	283.260
MWB6-II-C	**GLL6-D / GLL6-I / 6-D**	288.230	287.240	23-Jul-07	5.08	283.155
				24-Jul-07	5.10	283.130
				18-Sep-07	5.92	282.310
				20-Sep-08	5.95	282.280
				22-Oct-07	6.18	282.055
				05-Nov-07	6.25	281.980
				19-Nov-07	6.28	281.950
				21-Jan-08	4.46	283.770
				20-Feb-08	4.05	284.180
				24-Mar-08	3.44	284.790
				22-Apr-08	2.32	285.910
				26-May-08	3.11	285.120
				24-Jun-08	3.99	284.240
				15-Jul-08	4.34	283.890
				16-Jul-08	4.37	283.860
				21-Jul-08	*5.42*	282.815
				21-Jul-08	4.40	283.830
				22-Jul-08	4.40	283.830
				23-Jul-08	4.32	283.910
				24-Jul-08	4.18	284.055
				25-Jul-08	4.13	284.105
				26-Jul-08	4.09	284.140
				27-Jul-08	4.09	284.140
				28-Jul-08	4.10	284.130

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				29-Jul-08	4.13	284.100
				30-Jul-08	4.13	284.105
				31-Jul-08	4.14	284.090
				01-Aug-08	4.15	284.080
				02-Aug-08	4.17	284.060
				03-Aug-08	4.21	284.017
				04-Aug-08	4.22	284.010
MWB6-II-C	**GLL6-D / GLL6-I / 6-D**	288.230	287.240	05-Aug-08	4.24	283.995
				10-Sep-08	4.45	283.780
				28-Oct-08	4.63	283.600
n/a	**GLL6-D / GLL6-I / 6-D**	287.868	287.268	20-Apr-04	2.34	285.528
				26-Apr-04	2.44	285.428
				03-Jun-04	2.89	284.978
				18-Jun-04	3.13	284.738
				26-Jul-04	4.10	283.773
				25-Aug-04	4.56	283.308
				23-Sep-04	4.88	282.988
				28-Oct-04	5.20	282.668
				19-Nov-04	5.21	282.658
				20-Jan-05	3.11	284.758
				28-Feb-05	3.05	284.818
				24-Mar-05	3.39	284.478
				15-Apr-05	2.17	285.698
				19-May-05	2.59	285.278
				17-Jun-05	3.57	284.298
				14-Jul-05	4.35	283.523
				19-Aug-05	4.93	282.938
				28-Sep-05	5.31	282.558
				20-Oct-05	5.37	282.498
				18-Nov-05	5.22	282.648
				16-Dec-05	4.51	283.358
				20-Jan-06	3.61	284.258
				17-Feb-06	2.59	285.278
				16-Mar-06	2.25	285.618
				20-Apr-06	2.91	284.958
				18-May-06	2.99	284.878
				16-Jun-06	3.61	284.258
				26-Jul-06	4.40	283.468
				31-Aug-06	4.87	283.003
				22-Sep-06	5.01	282.858
				20-Oct-06	4.41	283.463
				25-Oct-06	3.94	283.928
				27-Nov-06	3.12	284.748
				18-Dec-06	2.79	285.078
				19-Jan-07	2.71	285.158
				23-Feb-07	3.76	284.108
				20-Mar-07	2.62	285.248
				14-May-07	3.10	284.768
				26-Jul-07	4.42	283.448
MWB7-I-A	**GLL7-S /GLL7-II / 7-S**	286.073	285.423	20-Apr-04	2.99	283.083
				26-Apr-04	3.09	282.983
				03-Jun-04	3.49	282.583
				18-Jun-04	3.50	282.573
				26-Jul-04	4.04	282.038
				25-Aug-04	4.76	281.313
				23-Sep-04	5.05	281.023
				28-Oct-04	5.45	280.623
MWB7-I-A	**GLL7-S /GLL7-II / 7-S**	286.073	285.423	19-Nov-04	5.47	280.603

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				20-Jan-05	3.39	282.683
				28-Feb-05	3.41	282.663
				24-Mar-05	3.63	282.443
				15-Apr-05	2.84	283.233
				19-May-05	3.23	282.843
				17-Jun-05	3.84	282.233
				14-Jul-05	4.51	281.563
				19-Aug-05	5.00	281.073
				28-Sep-05	5.48	280.593
				20-Oct-05	5.63	280.443
				18-Nov-05	6.10	279.973
				16-Dec-05	4.68	281.393
				20-Jan-06	3.77	282.303
				17-Feb-06	3.11	282.963
				16-Mar-06	2.80	283.278
				20-Apr-06	3.46	282.613
				18-May-06	3.48	282.593
				16-Jun-06	3.96	282.113
				26-Jul-06	4.46	281.613
				31-Aug-06	5.02	281.058
				22-Sep-06	5.10	280.973
				20-Oct-06	3.98	282.093
				25-Oct-06	3.97	282.103
				27-Nov-06	3.46	282.613
				18-Dec-06	3.28	282.793
				19-Jan-07	3.18	282.893
				23-Feb-07	3.86	282.218
				20-Mar-07	3.36	282.718
				19-Apr-07	2.84	283.233
				14-May-07	3.51	282.563
		286.160	285.510	26-Jun-07	4.26	281.900
				23-Jul-07	4.80	281.360
				25-Jul-07	4.84	281.320
				18-Sep-07	5.72	280.440
				20-Sep-07	5.76	280.400
				21-Sep-07	5.76	280.400
				22-Oct-07	6.03	280.130
				07-Nov-07	6.11	280.050
				19-Nov-07	6.15	280.010
				21-Jan-08	4.11	282.050
				20-Feb-08	3.68	282.480
				24-Mar-08	3.43	282.730
				23-Apr-08	2.76	283.400
				26-May-08	3.40	282.760
				25-Jun-08	3.98	282.180
				15-Jul-08	4.23	281.930
				16-Jul-08	4.27	281.890
				21-Jul-08	4.10	282.065
				22-Jul-08	4.12	282.045
				22-Jul-08	4.13	282.030
				23-Jul-08	3.92	282.245
MWB7-I-A	**GLL7-S /GLL7-II / 7-S**	286.160	285.510	24-Jul-08	3.87	282.290
				25-Jul-08	3.94	282.222
				26-Jul-08	*2.94*	283.224
				27-Jul-08	3.97	282.190
				28-Jul-08	3.99	282.175
				29-Jul-08	3.86	282.300
				30-Jul-08	4.05	282.115

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				31-Jul-08	4.05	282.115
				01-Aug-08	4.08	282.080
				02-Aug-08	4.09	282.070
				03-Aug-08	4.14	282.022
				04-Aug-08	4.15	282.010
				05-Aug-08	4.15	282.010
				14-Aug-08	3.87	282.290
				10-Sep-08	4.20	281.960
				29-Oct-08	4.38	281.785
MWB7-I-B	**GLL7-D / GLL7-I / 7-D**	286.350	285.480	23-Jul-07	4.94	281.410
				25-Jul-07	4.98	281.370
				18-Sep-07	5.87	280.480
				20-Sep-07	5.91	280.440
				22-Oct-07	6.18	280.170
				07-Nov-07	6.25	280.100
		286.270		19-Nov-07	6.20	280.070
				21-Jan-08	4.18	282.090
				20-Feb-08	3.79	282.480
				24-Mar-08	3.55	282.720
				23-Apr-08	2.90	283.370
				26-May-08	3.50	282.770
				25-Jun-08	4.05	282.220
				15-Jul-08	4.29	281.985
				16-Jul-08	4.33	281.940
				21-Jul-08	4.15	282.125
				22-Jul-08	4.16	282.106
				22-Jul-08	4.17	282.100
				23-Jul-08	3.97	282.303
				24-Jul-08	3.96	282.310
				25-Jul-08	4.01	282.259
				26-Jul-08	4.02	282.250
				27-Jul-08	4.55	281.720
				28-Jul-08	4.08	282.195
				29-Jul-08	4.13	282.145
				30-Jul-08	4.13	282.140
				31-Jul-08	4.13	282.140
				01-Aug-08	4.16	282.110
				02-Aug-08	4.17	282.100
				03-Aug-08	4.22	282.054
				04-Aug-08	4.23	282.040
				05-Aug-08	4.23	282.040
				14-Aug-08	3.96	282.310
				10-Sep-08	4.28	281.990
				29-Oct-08	4.45	281.820
MWB7-I-C	**GLL7-D / GLL7-I / 7-D**	286.310	285.480	23-Jul-07	4.66	281.650
				25-Jul-07	4.72	281.590
				18-Sep-07	5.61	280.700
				20-Sep-07	5.78	280.530
				22-Oct-07	5.92	280.390
				07-Nov-07	6.00	280.310
		286.250		19-Nov-07	5.98	280.270
				21-Jan-08	3.97	282.280
				20-Feb-08	3.52	282.730
				24-Mar-08	3.18	283.070
				23-Apr-08	2.26	283.990
				26-May-08	3.40	282.850
				25-Jun-08	3.74	282.510
				15-Jul-08	4.00	282.250

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				16-Jul-08	4.04	282.210
				21-Jul-08	3.93	282.325
				22-Jul-08	3.94	282.310
				22-Jul-08	3.95	282.300
				23-Jul-08	3.80	282.455
				24-Jul-08	3.75	282.505
				25-Jul-08	3.77	282.485
				26-Jul-08	3.79	282.460
				27-Jul-08	3.78	282.470
				28-Jul-08	3.81	282.440
				29-Jul-08	4.04	282.210
				30-Jul-08	3.85	282.400
				31-Jul-08	3.84	282.410
				01-Aug-08	3.87	282.380
				02-Aug-08	3.88	282.370
				03-Aug-08	3.92	282.330
				04-Aug-08	3.93	282.320
				05-Aug-08	3.94	282.313
				14-Aug-08	3.65	282.600
				10-Sep-08	4.03	282.220
				29-Oct-08	4.22	282.035
n/a	**GLL7-D / GLL7-I / 7-D**	285.726	285.416	20-Apr-04	2.16	283.566
				26-Apr-04	2.26	283.466
				03-Jun-04	2.71	283.016
				18-Jun-04	2.80	282.926
				26-Jul-04	3.62	282.106
				25-Aug-04	4.09	281.636
				23-Sep-04	4.40	281.326
				28-Oct-04	4.80	280.926
				19-Nov-04	4.83	280.896
				20-Jan-05	2.65	283.076
				28-Feb-05	2.62	283.106
				24-Mar-05	2.91	282.816
				15-Apr-05	1.88	283.846
				19-May-05	2.36	283.366
				17-Jun-05	3.12	282.606
				14-Jul-05	3.81	281.921
n/a	**GLL7-D / GLL7-I / 7-D**	285.726	285.416	19-Aug-05	4.32	281.406
				28-Sep-05	4.81	280.916
				20-Oct-05	4.96	280.766
				18-Nov-05	5.55	280.176
				16-Dec-05	4.04	281.686
				20-Jan-06	3.15	282.576
				17-Feb-06	2.30	283.426
				16-Mar-06	2.03	283.701
				20-Apr-06	2.68	283.046
				18-May-06	2.75	282.976
				16-Jun-06	3.21	282.516
				26-Jul-06	3.79	281.936
				31-Aug-06	4.34	281.386
				22-Sep-06	4.45	281.276
				20-Oct-06	3.51	282.216
				25-Oct-06	3.37	282.356
				27-Nov-06	2.69	283.036
				18-Dec-06	2.45	283.281
				19-Jan-07	2.34	283.386
				23-Feb-07	3.53	282.196
				20-Mar-06	3.07	282.656

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				14-May-06	3.19	282.536
				26-Jun-07	4.26	281.466
MWB8-I-A	**GLL8-S / GLL8-II / 8-S**	281.740	281.550	20-Jan-04	2.32	279.420
				20-Apr-04	2.13	279.610
				26-Apr-04	2.17	279.570
				03-Jun-04	2.36	279.385
				18-Jun-04	2.25	279.490
				26-Jul-04	3.11	278.635
				25-Aug-04	3.41	278.330
				23-Sep-04	3.71	278.030
				28-Oct-04	3.58	278.160
				19-Nov-04	3.71	278.030
				20-Jan-05	2.32	279.420
				28-Feb-05	2.31	279.430
				24-Mar-05	n/a	n/a
				15-Apr-05	2.03	279.710
				19-May-05	2.32	279.420
				17-Jun-05	2.52	279.220
				14-Jul-05	3.32	278.420
				19-Aug-05	3.59	278.150
				28-Sep-05	4.60	277.140
				20-Oct-05	3.83	277.910
				18-Nov-05	3.94	277.800
				16-Dec-05	3.08	278.660
				20-Jan-06	2.35	279.390
				17-Feb-06	1.90	279.840
				16-Mar-06	1.98	279.760
				20-Apr-06	2.37	279.370
				18-May-06	2.47	279.270
				16-Jun-06	2.85	278.890
MWB8-I-A	**GLL8-S / GLL8-II / 8-S**	281.740	281.550	26-Jul-06	3.18	278.560
				31-Aug-06	3.62	278.120
				22-Sep-06	3.51	278.230
				20-Oct-06	2.41	279.330
				25-Oct-06	2.47	279.275
				27-Nov-06	2.37	279.370
				18-Dec-06	2.24	279.500
				19-Jan-07	2.44	279.300
				23-Feb-07	2.51	279.230
				20-Mar-07	2.20	279.540
				19-Apr-07	2.48	279.260
				14-May-07	2.42	279.320
		281.770	281.620	26-Jun-07	3.04	278.730
				05-Jul-07	3.18	278.590
				23-Jul-07	4.15	277.620
				18-Sep-07	4.09	277.680
				20-Sep-07	4.11	277.660
				21-Sep-07	4.11	277.660
				22-Oct-07	4.18	277.590
				06-Nov-07	4.17	277.600
				19-Nov-07	4.21	277.560
				21-Jan-08	2.57	279.200
				20-Feb-08	2.27	279.500
				24-Mar-08	2.20	279.570
				23-Apr-08	2.03	279.740
				22-May-08	2.40	279.370
				25-Jun-08	2.66	279.110
				15-Jul-08	2.83	278.940

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				16-Jul-08	2.93	278.840
				21-Jul-08	2.37	279.400
				22-Jul-08	2.45	279.320
				23-Jul-08	1.99	279.780
				24-Jul-08	2.18	279.590
				25-Jul-08	2.32	279.454
				26-Jul-08	2.40	279.375
				27-Jul-08	2.45	279.320
				28-Jul-08	2.50	279.270
				29-Jul-08	2.57	279.200
				30-Jul-08	2.62	279.150
				31-Jul-08	2.64	279.135
				01-Aug-08	2.69	279.080
				02-Aug-08	2.70	279.070
				03-Aug-08	2.76	279.010
				04-Aug-08	2.79	278.980
				05-Aug-08	2.82	278.955
				09-Sep-08	2.69	279.080
				28-Oct-08	2.92	278.850
MWB8-II-B	**GLL8-D / GLL8-I / 8-D**	282.470	281.520	26-Jun-07	3.73	278.740
				23-Jul-07	4.06	278.410
				05-Jul-07	3.87	278.600
				25-Jul-07	4.19	278.280
MWB8-II-B	**GLL8-D / GLL8-I / 8-D**	282.470	281.520	18-Sep-07	4.72	277.750
				20-Sep-07	4.77	277.700
				21-Sep-07	4.77	277.700
				22-Oct-07	4.86	277.610
				06-Nov-07	4.85	277.620
				19-Nov-07	4.89	277.580
				21-Jan-08	4.96	277.510
				20-Feb-08	3.04	279.435
				24-Mar-08	2.95	279.520
				23-Apr-08	2.84	279.630
				26-May-08	3.18	279.290
				25-Jun-08	3.37	279.100
				15-Jul-08	3.54	278.930
				16-Jul-08	3.63	278.840
				21-Jul-08	3.17	279.300
				22-Jul-08	3.23	279.240
				23-Jul-08	2.95	279.520
				24-Jul-08	3.04	279.430
				25-Jul-08	3.12	279.348
				26-Jul-08	3.18	279.291
				27-Jul-08	3.21	279.260
				28-Jul-08	3.23	279.245
				29-Jul-08	3.32	279.150
				30-Jul-08	3.27	279.200
				31-Jul-08	3.37	279.105
				01-Aug-08	3.41	279.060
				02-Aug-08	3.43	279.040
				03-Aug-08	3.48	278.990
				04-Aug-08	3.52	278.950
				05-Aug-08	3.54	278.935
				09-Sep-08	3.36	279.110
				28-Oct-08	3.65	278.820
MWB8-II-C	**GLL8-D / GLL8-I / 8-D**	282.460	281.520	26-Jun-07	3.63	278.830
				23-Jul-07	3.48	278.980
				05-Jul-07	3.77	278.690

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				25-Jul-07	4.07	278.390
				18-Sep-07	4.63	277.830
				20-Sep-07	4.67	277.790
				21-Sep-07	4.76	277.700
				22-Oct-07	4.76	277.700
				06-Nov-07	4.76	277.700
				19-Nov-07	4.79	277.670
				21-Jan-08	*5.51*	276.950
				20-Feb-08	2.96	279.504
				24-Mar-08	2.89	279.570
				23-Apr-08	2.78	279.680
				26-May-08	3.09	279.370
				25-Jun-08	3.28	279.180
				15-Jul-08	3.46	279.000
				16-Jul-08	3.54	278.920
				21-Jul-08	3.10	279.360
MWB8-II-C	**GLL8-D / GLL8-I / 8-D**	282.460	281.520	22-Jul-08	3.16	279.300
				23-Jul-08	2.90	279.565
				24-Jul-08	2.98	279.480
				25-Jul-08	3.06	279.403
				26-Jul-08	3.10	279.358
				27-Jul-08	3.13	279.330
				28-Jul-08	3.18	279.285
				29-Jul-08	3.24	279.220
				30-Jul-08	3.29	279.175
				31-Jul-08	3.28	279.180
				01-Aug-08	3.32	279.140
				02-Aug-08	3.35	279.114
				03-Aug-08	3.40	279.065
				04-Aug-08	3.43	279.030
				05-Aug-08	3.45	279.012
				09-Sep-08	3.28	279.185
				28-Oct-08	3.56	278.905
n/a	**GLL8-D / GLL8-I / 8-D**	282.100	281.470	20-Jan-04	2.54	279.560
				20-Apr-04	2.39	279.710
				26-Apr-04	2.42	279.680
				03-Jun-04	2.56	279.540
				18-Jun-04	2.49	279.610
				26-Jul-04	3.27	278.830
				25-Aug-04	3.56	278.540
				23-Sep-04	3.58	278.520
				28-Oct-04	3.90	278.200
				19-Nov-04	3.84	278.260
				20-Jan-05	2.54	279.560
				28-Feb-05	2.52	279.580
				24-Mar-05	2.56	279.540
				15-Apr-05	2.36	279.740
				19-May-05	2.52	279.580
				17-Jun-05	2.70	279.400
				14-Jul-05	3.43	278.675
				19-Aug-05	3.66	278.440
				28-Sep-05	4.70	277.400
				20-Oct-05	3.95	278.155
				18-Nov-05	4.19	277.910
				16-Dec-05	3.32	278.780
				20-Jan-06	2.63	279.470
				17-Feb-06	2.28	279.820
				16-Mar-06	2.33	279.770

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				20-Apr-06	2.58	279.520
				18-May-06	2.48	279.620
				16-Jun-06	2.99	279.110
				26-Jul-06	3.31	278.795
				31-Aug-06	3.69	278.415
				22-Sep-06	3.62	278.480
				20-Oct-06	2.70	279.400
				25-Oct-06	2.72	279.380
				27-Nov-06	2.56	279.545
n/a	GLL8-D / GLL8-I / 8-D	282.100	281.470	18-Dec-06	2.46	279.640
		282.070		19-Jan-07	2.23	279.875
				23-Feb-07	2.84	279.260
				20-Mar-07	2.53	279.575
				14-May-07	2.75	279.350
				26-Jun-07	3.04	279.060
MWB9-I-A	GLL9-S / GLL9-II / 9-S	285.504	284.644	20-Apr-04	2.38	283.124
				26-Apr-04	2.46	283.044
				03-Jun-04	2.79	282.714
				18-Jun-04	2.93	282.579
				26-Jul-04	3.60	281.904
				25-Aug-04	3.95	281.554
				23-Sep-04	4.18	281.324
				28-Oct-04	4.45	281.054
				19-Nov-04	4.46	281.044
				20-Jan-05	3.10	282.404
				28-Feb-05	2.91	282.594
				24-Mar-05	3.09	282.414
				15-Apr-05	2.16	283.344
				19-May-05	2.57	282.934
				17-Jun-05	3.22	282.284
				14-Jul-05	3.76	281.744
				19-Aug-05	4.22	281.284
				28-Sep-05	4.54	280.964
				20-Oct-05	4.63	280.874
				18-Nov-05	4.71	280.794
				16-Dec-05	4.12	281.384
				20-Jan-06	3.43	282.074
				17-Feb-06	2.48	283.024
				16-Mar-06	2.34	283.164
				20-Apr-06	2.83	282.674
				18-May-06	2.77	282.734
				16-Jun-06	3.57	281.934
				26-Jul-06	3.76	281.744
				31-Aug-06	4.17	281.334
				22-Sep-06	4.21	281.294
				20-Oct-06	3.70	281.804
				25-Oct-06	3.59	281.915
				27-Nov-06	2.97	282.534
				18-Dec-06	2.69	282.814
				19-Jan-07	2.62	282.884
				23-Feb-07	3.20	282.304
				20-Mar-07	2.98	282.529
				19-Apr-07	3.04	282.464
				14-May-07	2.82	282.684
		285.350	284.700	26-Jun-07	3.80	281.550
				23-Jul-07	4.19	281.160
				19-Sep-07	4.89	280.460
				20-Sep-07	4.92	280.430

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				22-Oct-07	5.15	280.200
				19-Nov-07	5.24	280.110
MWB9-I-A	**GLL9-S / GLL9-II / 9-S**	285.350	284.700	22-Jan-08	3.87	281.480
				20-Feb-08	3.41	281.940
				25-Mar-08	2.97	282.380
				23-Apr-08	2.06	283.290
				26-May-08	2.73	282.620
				30-May-08	2.86	282.490
				25-Jun-08	3.33	282.020
				15-Jul-08	3.55	281.800
				16-Jul-08	3.59	281.760
				21-Jul-08	3.53	281.825
				22-Jul-08	3.55	281.800
				23-Jul-08	3.24	282.110
				24-Jul-08	3.35	282.000
				25-Jul-08	3.39	281.957
				26-Jul-08	3.40	281.948
				27-Jul-08	3.41	281.944
				28-Jul-08	3.42	281.930
				29-Jul-08	3.44	281.910
				30-Jul-08	3.45	281.900
				31-Jul-08	3.45	281.905
				01-Aug-08	3.46	281.890
				02-Aug-08	3.47	281.880
				03-Aug-08	3.53	281.825
				04-Aug-08	3.51	281.845
				05-Aug-08	3.51	281.840
				09-Sep-08	3.52	281.830
				29-Oct-08	3.72	281.630
MWB9-II-B	**GLL9-D / GLL9-I / 9-D**	285.435	284.735	20-Apr-04	3.02	282.415
				26-Apr-04	3.05	282.385
				03-Jun-04	3.22	282.215
				18-Jun-04	3.21	282.225
				26-Jul-04	3.76	281.680
				25-Aug-04	4.05	281.385
				23-Sep-04	4.23	281.205
				28-Oct-04	4.46	280.975
				19-Nov-04	4.45	280.985
				20-Jan-05	3.41	282.025
				28-Feb-05	3.27	282.165
				24-Mar-05	3.40	282.035
				15-Apr-05	*6.14*	279.295
				19-May-05	3.07	282.365
				17-Jun-05	3.51	281.925
				14-Jul-05	3.94	281.500
				19-Aug-05	4.30	281.135
				28-Sep-05	4.54	280.895
				20-Oct-05	4.61	280.825
				18-Nov-05	4.64	280.795
				16-Dec-05	4.17	281.265
				20-Jan-06	3.86	281.575
				17-Feb-06	3.07	282.365
				16-Mar-06	3.00	282.435
MWB9-II-B	**GLL9-D / GLL9-I / 9-D**	285.435	284.735	20-Apr-06	3.28	282.155
				18-May-06	3.20	282.235
				16-Jun-06	3.25	282.185
				26-Jul-06	3.93	281.505
				31-Aug-06	4.28	281.155

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				22-Sep-06	4.62	280.815
				20-Oct-06	3.84	281.595
				25-Oct-06	3.76	281.679
				27-Nov-06	3.36	282.075
				18-Dec-06	3.18	282.260
				19-Jan-07	3.14	282.295
				23-Feb-07	3.53	281.905
				20-Mar-07	3.37	282.065
				19-Apr-07	2.41	283.025
				14-May-07	3.27	282.165
		285.610	284.630	26-Jun-07	3.55	282.060
				23-Jul-07	4.02	281.590
				19-Sep-07	4.92	280.690
				20-Sep-07	4.98	280.630
				22-Oct-07	5.11	280.500
				19-Nov-07	5.18	280.430
				21-Jan-08	4.05	281.560
				20-Feb-08	3.67	281.940
				25-Mar-08	3.38	282.230
				23-Apr-08	2.82	282.790
				26-May-08	3.21	282.400
				30-May-08	3.29	282.320
				25-Jun-08	3.61	282.000
				15-Jul-08	3.77	281.840
				16-Jul-08	3.82	281.790
				21-Jul-08	3.68	281.935
				22-Jul-08	3.73	281.880
				23-Jul-08	3.49	282.121
				24-Jul-08	3.59	282.019
				25-Jul-08	3.65	281.962
				26-Jul-08	3.67	281.945
				27-Jul-08	3.68	281.930
				28-Jul-08	3.68	281.930
				29-Jul-08	3.69	281.920
				30-Jul-08	3.70	281.910
				31-Jul-08	3.70	281.915
				01-Aug-08	3.71	281.900
				02-Aug-08	3.72	281.895
				03-Aug-08	3.73	281.876
				04-Aug-08	3.74	281.870
				05-Aug-08	3.75	281.861
				09-Sep-08	3.67	281.940
				29-Oct-08	3.87	281.740
MWB10-I-A	**TW10**	293.150	292.450	26-Jun-07	9.43	283.725
				05-Jul-07	9.63	283.520
				23-Jul-07	10.14	283.010
MWB10-I-A	**TW10**	293.150	292.450	14-Sep-07	11.19	281.960
				20-Sep-07	11.27	281.880
				22-Oct-07	11.54	281.610
				06-Nov-07	11.61	281.540
		293.090		19-Nov-07	11.59	281.500
				20-Dec-07	11.43	281.660
				21-Jan-08	8.83	284.260
				19-Feb-08	8.73	284.360
				25-Mar-08	7.98	285.110
				23-Apr-08	6.77	286.320
				27-May-08	8.13	284.960
				24-Jun-08	8.97	284.120

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				15-Jul-08	9.32	283.775
				21-Jul-08	9.53	283.560
				22-Jul-08	9.65	283.445
				23-Jul-08	9.69	283.400
				24-Jul-08	9.66	283.435
				25-Jul-08	9.65	283.445
				26-Jul-08	9.61	283.480
				27-Jul-08	9.63	283.465
				28-Jul-08	9.65	283.440
				29-Jul-08	9.72	283.370
				30-Jul-08	9.42	283.670
				14-Aug-08	8.86	284.230
				09-Sep-08	9.38	283.710
				28-Oct-08	9.60	283.487
MWB10-I-B	**TW10**	293.120	292.450	26-Jun-07	9.48	283.640
				05-Jul-07	9.65	283.470
				23-Jul-07	9.67	283.450
				14-Sep-07	11.13	281.990
				20-Sep-07	11.24	281.880
				22-Oct-07	11.50	281.620
				06-Nov-07	11.57	281.550
		293.070		19-Nov-07	11.57	281.500
				20-Dec-07	11.38	281.690
				21-Jan-08	9.12	283.950
				19-Feb-08	8.69	284.380
				25-Mar-08	7.99	285.080
				23-Apr-08	6.85	286.220
				27-May-08	8.16	284.910
				24-Jun-08	8.97	284.100
				15-Jul-08	9.31	283.760
				21-Jul-08	9.67	283.400
				22-Jul-08	9.79	283.278
				23-Jul-08	9.82	283.250
				24-Jul-08	9.78	283.289
				25-Jul-08	9.78	283.290
				26-Jul-08	9.76	283.310
				27-Jul-08	9.78	283.295
				28-Jul-08	9.81	283.260
				29-Jul-08	9.88	283.190
				30-Jul-08	9.42	283.650
MWB10-I-B	**TW10**	293.070	292.450	14-Aug-08	8.84	284.230
				09-Sep-08	9.38	283.690
				28-Oct-08	9.58	283.490
MWB10-I-C	**TW10**	293.390	292.450	26-Jun-07	9.45	283.940
				05-Jul-07	9.68	283.710
				23-Jul-07	10.17	283.220
				14-Sep-07	10.92	282.470
				20-Sep-07	11.02	282.370
				22-Oct-07	11.24	282.150
				06-Nov-07	11.30	282.090
		293.320		19-Nov-07	11.25	282.070
				20-Dec-07	10.99	282.330
				21-Jan-08	9.15	284.170
				19-Feb-08	8.39	284.930
				25-Mar-08	7.83	285.490
				23-Apr-08	6.93	286.390
				23-May-08	7.82	285.500
				24-Jun-08	8.72	284.600

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				15-Jul-08	9.00	284.325
				21-Jul-08	10.32	283.000
				22-Jul-08	10.46	282.859
				23-Jul-08	10.44	282.880
				24-Jul-08	10.42	282.904
				25-Jul-08	10.45	282.875
				26-Jul-08	10.44	282.880
				27-Jul-08	10.49	282.830
				28-Jul-08	10.53	282.790
				29-Jul-08	10.61	282.710
				30-Jul-08	9.20	284.120
				14-Aug-08	8.53	284.790
				09-Sep-08	9.07	284.250
				28-Oct-08	9.22	284.097
MWB10-II-D	**GLL5 / 5**	292.900	292.430	28-Aug-07	10.33	282.570
				14-Sep-07	10.44	282.460
				20-Sep-07	11.16	281.740
				22-Oct-07	10.04	282.860
				06-Nov-07	9.61	283.290
		292.880		19-Nov-07	9.60	283.280
				20-Dec-07	9.75	283.130
				22-Jan-08	9.70	283.180
				19-Feb-08	9.50	283.380
				25-Mar-08	9.25	283.630
				23-Apr-08	8.96	283.920
				27-May-08	8.75	284.130
				24-Jun-08	8.81	284.070
				15-Jul-08	8.86	284.020
				21-Jul-08	35.71	257.170
				22-Jul-08	35.27	257.610
				23-Jul-08	34.30	258.580
				24-Jul-08	33.57	259.310
				25-Jul-08	32.80	260.085
				26-Jul-08	32.05	260.830
MWB10-II-D	**GLL5 / 5**	292.880	292.430	27-Jul-08	31.36	261.520
				28-Jul-08	30.64	262.245
				29-Jul-08	30.00	262.885
				30-Jul-08	29.34	263.540
				14-Aug-08	21.68	271.200
				09-Sep-08	9.00	283.880
				15-Oct-08	9.32	283.560
n/a	**TW10**	293.524	292.754	20-Jan-04	7.91	285.614
				03-Jun-04	8.24	285.289
				18-Jun-04	8.36	285.164
				26-Jul-04	n/a	n/a
				25-Aug-04	10.39	283.134
				23-Sep-04	10.74	282.784
				28-Oct-04	7.91	285.614
				20-Jan-05	8.05	285.474
				28-Feb-05	8.54	284.984
				24-Mar-05	7.10	286.424
				15-Apr-05	7.83	285.694
				19-May-05	8.84	284.684
				17-Jun-05	9.62	283.904
				14-Jul-05	10.29	283.234
				19-Aug-05	10.82	282.704
				28-Sep-05	10.91	282.614
				20-Oct-05	11.50	282.024

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				18-Nov-05	n/a	n/a
				16-Dec-05	n/a	n/a
				20-Jan-06	8.61	284.914
				17-Feb-06	7.66	285.864
				16-Mar-06	7.17	286.354
				20-Apr-06	8.17	285.354
				18-May-06	8.35	285.174
				16-Jun-06	8.89	284.634
				26-Jul-06	9.69	283.834
				31-Aug-06	n/a	n/a
				20-Oct-06	n/a	n/a
				25-Oct-06	9.53	283.994
				27-Nov-06	8.08	285.449
				18-Dec-06	n/a	n/a
				19-Jan-07	7.65	285.879
				23-Feb-07	8.81	284.719
				20-Mar-07	7.92	285.609
				19-Apr-07	7.60	285.924
				14-May-07	8.20	285.324
n/a	**GLL5 / 5**	292.970	292.401	20-Jan-04	7.76	285.210
				20-Apr-04	7.39	285.580
				26-Apr-04	7.69	285.280
				03-Jun-04	8.08	284.890
				18-Jun-04	8.21	284.760
				26-Jul-04	9.25	283.720
				23-Sep-04	9.80	283.170
				28-Oct-04	10.54	282.430
				19-Nov-04	10.59	282.380
n/a	**GLL5 / 5**	292.970	292.401	20-Jan-05	7.76	285.210
				28-Feb-05	7.90	285.070
				24-Mar-05	8.40	284.570
				15-Apr-05	6.95	286.020
				19-May-05	7.68	285.290
				17-Jun-05	8.69	284.280
				14-Jul-05	8.52	284.450
				19-Aug-05	10.15	282.820
				28-Sep-05	10.68	282.290
				20-Oct-05	10.77	282.205
				18-Nov-05	10.53	282.440
				16-Dec-05	n/a	n/a
				20-Jan-06	8.51	284.460
				17-Feb-06	7.52	285.450
				16-Mar-06	7.03	285.940
				20-Apr-06	8.03	284.940
				18-May-06	8.21	284.760
				16-Jun-06	8.75	284.220
				26-Jul-06	9.50	283.470
				31-Aug-06	10.14	282.830
				22-Sep-06	10.30	282.670
				20-Oct-06	n/a	n/a
				25-Oct-06	n/a	n/a
				18-Dec-06	8.06	284.910
				19-Jan-07	7.51	285.465
				23-Feb-07	8.56	284.410
				20-Mar-07	7.77	285.200
				19-Apr-07	7.46	285.515
MWB11-A	**TW11**	285.710	284.640	27-Jul-07	4.19	281.520
				19-Sep-07	5.00	280.710

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				21-Sep-07	5.03	280.680
				22-Oct-07	5.26	280.450
				19-Nov-07	*7.55*	278.160
				21-Jan-08	4.07	281.640
				19-Feb-08	3.59	282.120
				25-Mar-08	3.15	282.560
				23-Apr-08	2.26	283.450
				26-May-08	2.85	282.860
				25-Jun-08	3.46	282.250
				15-Jul-08	3.67	282.040
				22-Jul-08	3.68	282.032
				23-Jul-08	*5.69*	280.020
				24-Jul-08	3.56	282.150
				25-Jul-08	3.57	282.138
				26-Jul-08	3.56	282.146
				27-Jul-08	3.57	282.145
				28-Jul-08	3.57	282.145
				28-Jul-08	3.57	282.145
				29-Jul-08	3.59	282.125
				30-Jul-08	3.59	282.125
				09-Sep-08	3.64	282.070
				29-Oct-08	3.85	281.865
MWB11-B	**TW11**	285.710	284.640	27-Jul-07	4.20	281.510
				19-Sep-07	4.98	280.730
				21-Sep-07	5.00	280.710
				22-Oct-07	5.21	280.500
				19-Nov-07	*7.51*	278.200
				21-Jan-08	4.07	281.640
				19-Feb-08	3.68	282.030
				25-Mar-08	3.28	282.430
				23-Apr-08	2.40	283.310
				22-May-08	2.91	282.800
				25-Jun-08	3.55	282.160
				15-Jul-08	3.74	281.970
				22-Jul-08	3.73	281.980
				23-Jul-08	*5.69*	280.020
				24-Jul-08	3.63	282.080
				25-Jul-08	3.64	282.067
				26-Jul-08	3.64	282.075
				27-Jul-08	3.64	282.075
				28-Jul-08	3.64	282.070
				29-Jul-08	3.66	282.055
				30-Jul-08	3.65	282.060
				09-Sep-08	3.78	281.930
				29-Oct-08	3.87	281.840
MWB11-C	**TW11**	285.720	284.640	27-Jul-07	4.22	281.500
				19-Sep-07	5.00	280.720
				21-Sep-07	5.02	280.700
				22-Oct-07	5.23	280.490
				19-Nov-07	*7.48*	278.240
				21-Jan-08	4.11	281.610
				19-Feb-08	3.75	281.970
				25-Mar-08	3.35	282.370
				23-Apr-08	2.47	283.250
				26-May-08	3.06	282.660
				25-Jun-08	3.58	282.140
				15-Jul-08	3.77	281.950
				22-Jul-08	3.76	281.958

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				23-Jul-08	*5.71*	280.010
				24-Jul-08	3.67	282.055
				25-Jul-08	3.68	282.040
				26-Jul-08	3.67	282.050
				27-Jul-08	3.67	282.050
				28-Jul-08	3.68	282.045
				29-Jul-08	3.69	282.030
				30-Jul-08	3.70	282.025
				09-Sep-08	3.73	281.990
				29-Oct-08	3.91	281.810
MWB12-A	**TW12**	292.120	291.100	26-Jun-07	7.27	284.850
				23-Jul-07	7.73	284.390
				24-Jul-07	7.75	284.370
				13-Sep-07	8.25	283.870
				20-Sep-07	8.28	283.840
				21-Sep-07	8.28	283.840
MWB12-A	**TW12**	292.120	291.100	22-Oct-07	8.21	283.910
				05-Nov-07	8.17	283.950
				19-Nov-07	8.11	284.010
				21-Jan-08	6.82	285.300
				20-Feb-08	6.63	285.494
				24-Mar-08	6.62	285.500
				22-Apr-08	6.48	285.640
				23-May-08	6.78	285.340
				24-Jun-08	6.98	285.140
				15-Jul-08	7.10	285.020
				16-Jul-08	7.13	284.990
				21-Jul-08	6.94	285.180
				22-Jul-08	6.96	285.160
				23-Jul-08	6.79	285.335
				24-Jul-08	6.79	285.335
				25-Jul-08	6.85	285.275
				26-Jul-08	6.88	285.243
				27-Jul-08	6.91	285.215
				28-Jul-08	6.94	285.178
				29-Jul-08	7.00	285.122
				30-Jul-08	6.99	285.131
				31-Jul-08	6.98	285.140
				01-Aug-08	7.00	285.120
				02-Aug-08	7.01	285.110
				03-Aug-08	7.05	285.070
				04-Aug-08	7.05	285.070
				05-Aug-08	7.06	285.063
				09-Sep-08	8.10	284.020
				28-Oct-08	7.03	285.090
MWB12-B	**TW12**	292.150	291.100	26-Jun-07	7.26	284.890
				23-Jul-07	7.63	284.520
				24-Jul-07	7.72	284.430
				13-Sep-07	8.11	284.040
				20-Sep-07	8.18	283.970
				21-Sep-07	8.13	284.020
				22-Oct-07	8.11	284.040
				05-Nov-07	8.08	284.070
		292.120		19-Nov-07	8.01	284.110
				21-Jan-08	6.80	285.320
				20-Feb-08	6.63	285.486
				24-Mar-08	6.64	285.480
				22-Apr-08	6.55	285.570

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				27-May-08	6.81	285.310
				24-Jun-08	6.88	285.240
				15-Jul-08	7.00	285.120
				16-Jul-08	7.04	285.080
				21-Jul-08	6.83	285.295
				22-Jul-08	7.01	285.115
				23-Jul-08	6.84	285.280
				24-Jul-08	6.89	285.233
				25-Jul-08	6.95	285.175
				26-Jul-08	6.96	285.163
MWB12-B	**TW12**	292.120	291.100	27-Jul-08	6.98	285.143
				28-Jul-08	7.05	285.070
				29-Jul-08	7.05	285.070
				29-Jul-08	7.05	285.070
				29-Jul-08	7.05	285.070
				29-Jul-08	7.05	285.070
				29-Jul-08	7.05	285.070
				29-Jul-08	7.05	285.070
				29-Jul-08	7.05	285.070
				29-Jul-08	7.05	285.070
				29-Jul-08	7.05	285.070
				29-Jul-08	7.05	285.070
				29-Jul-08	7.05	285.070
				29-Jul-08	7.05	285.075
				29-Jul-08	7.05	285.075
				29-Jul-08	7.04	285.080
				29-Jul-08	7.04	285.080
				29-Jul-08	7.04	285.080
				29-Jul-08	7.04	285.080
				29-Jul-08	7.04	285.080
				29-Jul-08	7.04	285.080
				29-Jul-08	7.04	285.080
				29-Jul-08	7.04	285.080
				29-Jul-08	7.04	285.080
				29-Jul-08	7.04	285.085
				29-Jul-08	7.04	285.085
				29-Jul-08	7.03	285.090
				29-Jul-08	7.03	285.090
				29-Jul-08	7.03	285.090
				29-Jul-08	7.03	285.090
				29-Jul-08	7.03	285.090
				29-Jul-08	7.03	285.090
				29-Jul-08	7.03	285.095
				29-Jul-08	7.03	285.095
				29-Jul-08	7.02	285.100
				29-Jul-08	7.02	285.100
				29-Jul-08	7.02	285.100
				29-Jul-08	7.02	285.105
				29-Jul-08	7.01	285.110
				29-Jul-08	7.01	285.115
				29-Jul-08	7.00	285.120
				29-Jul-08	7.00	285.120
				29-Jul-08	6.99	285.130
				29-Jul-08	6.99	285.130
				29-Jul-08	6.99	285.135
				29-Jul-08	6.99	285.135
				29-Jul-08	6.98	285.140
				29-Jul-08	6.98	285.140
				29-Jul-08	6.98	285.145
				29-Jul-08	6.98	285.145
				29-Jul-08	6.98	285.145

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				29-Jul-08	6.98	285.145
				29-Jul-08	6.97	285.155
				29-Jul-08	6.97	285.155
				29-Jul-08	6.97	285.155
MWB12-B	**TW12**	292.120	291.100	29-Jul-08	6.97	285.155
				29-Jul-08	6.96	285.160
				29-Jul-08	6.96	285.160
				29-Jul-08	6.96	285.160
				30-Jul-08	6.91	285.207
				31-Jul-08	6.89	285.230
				01-Aug-08	6.91	285.210
				02-Aug-08	6.91	285.210
				03-Aug-08	7.00	285.125
				04-Aug-08	6.94	285.180
				05-Aug-08	6.95	285.173
				09-Sep-08	6.86	285.260
				28-Oct-08	6.92	285.200
MWB12-C	**TW12**	292.170	291.100	26-Jun-07	7.20	284.970
				23-Jul-07	7.72	284.450
				26-Jul-07	7.34	284.830
				13-Sep-07	8.24	283.930
				20-Sep-07	8.28	283.890
				21-Sep-07	8.28	283.890
				22-Oct-07	8.24	283.930
				05-Nov-07	8.20	283.970
		292.140		19-Nov-07	8.14	284.005
				21-Jan-08	6.85	285.290
				20-Feb-08	6.66	285.480
				24-Mar-08	6.66	285.480
				22-Apr-08	6.52	285.620
				27-May-08	6.83	285.310
				24-Jun-08	6.94	285.200
				15-Jul-08	7.06	285.080
				16-Jul-08	7.10	285.040
				21-Jul-08	6.89	285.250
				22-Jul-08	7.03	285.110
				23-Jul-08	6.86	285.280
				24-Jul-08	6.89	285.248
				25-Jul-08	6.95	285.190
				26-Jul-08	6.97	285.170
				27-Jul-08	6.99	285.149
				28-Jul-08	7.03	285.111
				29-Jul-08	7.08	285.062
				29-Jul-08	7.08	285.060
				29-Jul-08	7.08	285.060
				29-Jul-08	7.08	285.060
				29-Jul-08	7.08	285.060
				29-Jul-08	7.08	285.060
				29-Jul-08	7.08	285.060
				29-Jul-08	7.08	285.065
				29-Jul-08	7.08	285.065
				29-Jul-08	7.08	285.065
				29-Jul-08	7.08	285.065
				29-Jul-08	7.08	285.065
				29-Jul-08	7.07	285.070
				29-Jul-08	7.07	285.070
				29-Jul-08	7.07	285.070
MWB12-C	**TW12**	292.140	291.100	29-Jul-08	7.07	285.070
				29-Jul-08	7.07	285.075

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				29-Jul-08	7.07	285.075
				29-Jul-08	7.07	285.075
				29-Jul-08	7.06	285.080
				29-Jul-08	7.06	285.085
				29-Jul-08	7.05	285.090
				29-Jul-08	7.05	285.090
				29-Jul-08	7.05	285.095
				29-Jul-08	7.04	285.100
				29-Jul-08	7.04	285.100
				29-Jul-08	7.04	285.100
				29-Jul-08	7.04	285.105
				29-Jul-08	7.03	285.110
				29-Jul-08	7.03	285.110
				29-Jul-08	7.03	285.110
				29-Jul-08	7.03	285.115
				29-Jul-08	7.03	285.115
				29-Jul-08	7.02	285.120
				29-Jul-08	7.02	285.120
				29-Jul-08	7.02	285.120
				29-Jul-08	7.02	285.120
				29-Jul-08	7.02	285.120
				29-Jul-08	7.02	285.120
				29-Jul-08	7.02	285.120
				30-Jul-08	6.97	285.170
				31-Jul-08	6.95	285.190
				01-Aug-08	6.97	285.170
				02-Aug-08	6.97	285.170
				03-Aug-08	7.01	285.127
				04-Aug-08	7.01	285.135
				05-Aug-08	7.01	285.127
				09-Sep-08	6.96	285.180
				28-Oct-08	6.99	285.150
n/a	TW12	291.920	290.890	19-May-05	6.61	285.310
				17-Jun-05	6.81	285.110
				14-Jul-05	7.36	284.560
				19-Aug-05	7.52	284.400
				28-Sep-05	8.37	283.550
				20-Oct-05	7.36	284.560
				18-Nov-05	7.14	284.780
				16-Dec-05	6.81	285.115
				20-Jan-06	6.56	285.360
				17-Feb-06	6.40	285.520
				16-Mar-06	6.32	285.600
				20-Apr-06	6.63	285.290
				18-May-06	6.54	285.380
				16-Jun-06	6.90	285.020
				26-Jul-06	7.10	284.820
				31-Aug-06	n/a	n/a
				25-Oct-06	6.64	285.280
				27-Nov-06	6.58	285.340
n/a	TW12	291.920	290.890	18-Dec-06	6.56	285.360
				19-Jan-07	6.54	285.380
				23-Feb-07	6.78	285.140
				20-Mar-07	6.51	285.410
				19-Apr-07	6.52	285.400
				14-May-07	6.70	285.220
MWB13-A	TW13	287.930	287.100	27-Jul-07	6.32	281.610
				19-Sep-07	7.17	280.760

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				21-Sep-07	7.20	280.730
				22-Oct-07	7.45	280.480
				19-Nov-07	5.35	282.580
				21-Jan-08	6.16	281.770
				19-Feb-08	5.71	282.220
				25-Mar-08	5.20	282.730
				23-Apr-08	4.10	283.830
				22-May-08	4.73	283.200
				30-May-08	4.99	282.940
				25-Jun-08	5.54	282.390
				15-Jul-08	5.78	282.150
				16-Jul-08	*6.79*	281.140
				21-Jul-08	5.79	282.144
				22-Jul-08	5.80	282.130
				23-Jul-08	5.70	282.233
				24-Jul-08	5.67	282.256
				25-Jul-08	5.68	282.255
				26-Jul-08	5.67	282.265
				27-Jul-08	5.66	282.271
				28-Jul-08	5.67	282.260
				29-Jul-08	5.68	282.250
				30-Jul-08	5.69	282.245
				31-Jul-08	5.68	282.250
				01-Aug-08	5.70	282.230
				02-Aug-08	5.70	282.230
				03-Aug-08	5.72	282.208
				04-Aug-08	5.73	282.200
				05-Aug-08	5.74	282.190
				09-Sep-08	5.78	282.150
				28-Oct-08	5.97	281.965
				29-Oct-08	5.97	281.962
MWB13-B	**TW13**	287.920	287.100	27-Jul-07	6.31	281.610
				19-Sep-07	7.15	280.770
				21-Sep-07	7.17	280.750
				22-Oct-07	7.42	280.505
				19-Nov-07	5.35	282.570
				21-Jan-08	6.15	281.770
				19-Feb-08	5.71	282.210
				25-Mar-08	5.21	282.710
				23-Apr-08	4.15	283.770
				26-May-08	4.87	283.050
				30-May-08	5.01	282.910
				25-Jun-08	5.54	282.380
				15-Jul-08	5.77	282.150
MWB13-B	**TW13**	287.920	287.100	16-Jul-08	*6.79*	281.130
				21-Jul-08	5.79	282.135
				22-Jul-08	5.80	282.125
				23-Jul-08	5.70	282.223
				24-Jul-08	5.68	282.240
				25-Jul-08	5.68	282.242
				26-Jul-08	5.65	282.270
				27-Jul-08	5.66	282.260
				28-Jul-08	5.67	282.250
				29-Jul-08	5.69	282.230
				30-Jul-08	5.69	282.230
				31-Jul-08	5.68	282.240
				01-Aug-08	5.70	282.220
				02-Aug-08	5.72	282.200

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				03-Aug-08	5.73	282.195
				04-Aug-08	5.73	282.190
				05-Aug-08	5.74	282.176
				09-Sep-08	5.77	282.150
				28-Oct-08	5.96	281.960
				29-Oct-08	5.96	281.962
MWB13-C	**TW13**	287.920	287.100	27-Jul-07	6.31	281.610
				19-Sep-07	7.13	280.790
				21-Sep-07	7.15	280.770
				22-Oct-07	7.39	280.530
				19-Nov-07	5.30	282.620
				21-Jan-08	6.14	281.780
				19-Feb-08	5.73	282.190
				25-Mar-08	5.25	282.670
				23-Apr-08	4.23	283.690
				26-May-08	4.93	282.990
				30-May-08	5.06	282.860
				25-Jun-08	5.57	282.350
				15-Jul-08	5.79	282.130
				16-Jul-08	*6.80*	281.120
				21-Jul-08	5.80	282.125
				22-Jul-08	5.81	282.110
				23-Jul-08	5.71	282.208
				24-Jul-08	5.70	282.225
				25-Jul-08	5.70	282.224
				26-Jul-08	5.67	282.255
				27-Jul-08	5.68	282.240
				28-Jul-08	5.69	282.230
				29-Jul-08	5.70	282.220
				30-Jul-08	5.71	282.215
				31-Jul-08	5.70	282.220
				01-Aug-08	5.72	282.200
				02-Aug-08	5.70	282.220
				03-Aug-08	5.74	282.177
				04-Aug-08	5.75	282.170
				05-Aug-08	5.76	282.163
				09-Sep-08	5.78	282.140
				28-Oct-08	5.96	281.960
MWB17-A	**BHB-S / BHB-II**	291.065	290.805	20-Apr-04	4.70	286.365
				26-Apr-04	4.70	286.365
				03-Jun-04	4.82	286.245
				18-Jun-04	4.81	286.255
				26-Jul-04	5.60	285.465
				25-Aug-04	5.81	285.255
				23-Sep-04	5.90	285.165
				28-Oct-04	6.05	285.015
				20-Jan-05	4.79	286.275
				28-Feb-05	4.86	286.205
				24-Mar-05	5.00	286.065
				15-Apr-05	4.74	286.325
				19-May-05	4.81	286.255
				17-Jun-05	5.26	285.805
				14-Jul-05	5.83	285.235
				19-Aug-05	6.09	284.975
				28-Sep-05	6.22	284.845
				20-Oct-05	6.08	284.985
				18-Nov-05	5.30	285.765
				16-Dec-05	5.32	285.745

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				20-Jan-06	4.80	286.265
				17-Feb-06	4.64	286.425
				16-Mar-06	4.51	286.555
				20-Apr-06	4.83	286.235
				18-May-06	4.72	286.345
				16-Jun-06	5.36	285.705
				26-Jul-06	5.65	285.415
				31-Aug-06	6.01	285.055
				22-Sep-06	5.81	285.255
				20-Oct-06	4.80	286.270
				25-Oct-06	4.95	286.115
				27-Nov-06	4.91	286.160
				18-Dec-06	4.84	286.225
				19-Jan-07	4.78	286.285
				23-Feb-07	4.89	286.180
				20-Mar-07	5.19	285.880
				19-Apr-07	4.59	286.475
				14-May-07	5.30	285.765
		291.120	290.840	26-Jun-07	5.55	285.570
				23-Jul-07	6.56	284.560
				17-Sep-07	6.57	284.550
				20-Sep-07	7.20	283.920
				22-Oct-07	6.68	284.440
				19-Nov-07	6.68	284.440
				21-Jan-08	5.06	286.060
				24-Mar-08	5.17	285.950
				22-Apr-08	4.94	286.180
				26-May-08	5.23	285.890
				30-May-08	5.23	285.890
				24-Jun-08	5.14	285.980
				15-Jul-08	5.37	285.750
				16-Jul-08	5.43	285.690
MWB17-A	**BHB-S / BHB-II**	291.120	290.840	21-Jul-08	5.08	286.045
				22-Jul-08	5.06	286.060
				23-Jul-08	4.72	286.400
				24-Jul-08	4.71	286.415
				25-Jul-08	4.76	286.360
				26-Jul-08	4.82	286.300
				27-Jul-08	4.89	286.230
				28-Jul-08	4.95	286.170
				29-Jul-08	5.05	286.075
				30-Jul-08	5.10	286.020
				31-Jul-08	5.13	285.995
				01-Aug-08	5.17	285.950
				02-Aug-08	5.21	285.910
				03-Aug-08	5.27	285.852
				04-Aug-08	5.29	285.830
				05-Aug-08	5.31	285.810
				07-Aug-08	5.19	285.930
				10-Sep-08	5.34	285.780
				28-Oct-08	5.36	285.760
MWB17-B	**BHB-D / BHB-I**	290.985	290.805	20-Apr-04	4.94	286.045
				26-Apr-04	5.00	285.985
				03-Jun-04	5.14	285.845
				18-Jun-04	5.16	285.825
				26-Jul-04	5.95	285.035
				25-Aug-04	6.21	284.775
				23-Sep-04	6.31	284.675

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				28-Oct-04	6.46	284.525
				20-Jan-05	5.15	285.835
				28-Feb-05	5.19	285.795
				24-Mar-05	5.34	285.645
				15-Apr-05	4.94	286.045
				19-May-05	5.12	285.865
				17-Jun-05	5.57	285.415
				14-Jul-05	6.24	284.745
				19-Aug-05	6.53	284.455
				28-Sep-05	6.68	284.305
				20-Oct-05	6.54	284.445
				18-Nov-05	5.89	285.095
				16-Dec-05	5.72	285.265
				20-Jan-06	5.22	285.765
				17-Feb-06	4.91	286.075
				16-Mar-06	4.87	286.115
				20-Apr-06	5.17	285.815
				18-May-06	5.09	285.895
				16-Jun-06	5.67	285.315
				26-Jul-06	6.03	284.955
				31-Aug-06	6.44	284.545
				22-Sep-06	6.24	284.745
				20-Oct-06	5.35	285.640
				25-Oct-06	5.42	285.565
				27-Nov-06	5.26	285.725
				18-Dec-06	5.18	285.805
MWB17-B	**BHB-D / BHB-I**	290.985	290.805	19-Jan-07	5.12	285.865
				23-Feb-07	5.54	285.445
				20-Mar-07	4.77	286.215
				19-Apr-07	5.02	285.965
				14-May-07	4.94	286.045
		291.150	290.840	26-Jun-07	5.99	285.160
				23-Jul-07	6.56	284.590
				17-Sep-07	7.18	283.970
				20-Sep-07	7.20	283.950
				22-Oct-07	7.25	283.900
				19-Nov-07	7.23	283.920
				21-Jan-08	6.59	284.560
				24-Mar-08	4.73	286.425
				22-Apr-08	4.59	286.560
				26-May-08	4.84	286.310
				30-May-08	4.95	286.200
				24-Jun-08	5.57	285.580
				15-Jul-08	5.78	285.370
				16-Jul-08	5.84	285.310
				21-Jul-08	5.60	285.555
				22-Jul-08	5.69	285.460
				23-Jul-08	5.39	285.760
				24-Jul-08	5.42	285.730
				25-Jul-08	5.50	285.650
				26-Jul-08	5.56	285.590
				27-Jul-08	5.61	285.545
				28-Jul-08	5.66	285.495
				29-Jul-08	5.72	285.430
				30-Jul-08	5.68	285.475
				31-Jul-08	5.68	285.470
				01-Aug-08	5.69	285.460
				02-Aug-08	5.72	285.431

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				03-Aug-08	5.75	285.398
				04-Aug-08	5.77	285.380
				05-Aug-08	5.79	285.365
				07-Aug-08	5.71	285.440
				10-Sep-08	5.80	285.350
				28-Oct-08	5.83	285.325
MWB18-A	**BHC**	288.030	287.080	23-Jul-07	4.11	283.925
				07-Aug-07	4.37	283.660
				13-Sep-07	4.99	283.040
				20-Sep-07	5.07	282.960
				22-Oct-07	5.20	282.835
				05-Nov-07	5.20	282.830
				19-Nov-07	5.20	282.830
				21-Jan-08	3.00	285.030
				19-Feb-08	2.56	285.470
				25-Mar-08	2.34	285.690
				22-Apr-08	1.84	286.190
				27-May-08	2.64	285.390
				24-Jun-08	3.08	284.950
				15-Jul-08	3.30	284.730
MWB18-A	**BHC**	288.030	287.080	22-Jul-08	4.44	283.590
				23-Jul-08	4.28	283.755
				24-Jul-08	4.29	283.740
				25-Jul-08	4.39	283.645
				26-Jul-08	4.45	283.585
				27-Jul-08	4.52	283.513
				28-Jul-08	4.59	283.442
				29-Jul-08	4.67	283.358
				30-Jul-08	3.50	284.530
				09-Sep-08	3.36	284.670
				15-Oct-08	3.40	284.630
				29-Oct-08	3.43	284.600
MWB18-B	**BHC**	288.060	287.080	23-Jul-07	4.11	283.950
				07-Aug-07	4.38	283.680
				13-Sep-07	5.00	283.060
				20-Sep-07	5.08	282.980
				22-Oct-07	5.19	282.875
				05-Nov-07	5.18	282.880
				19-Nov-07	5.19	282.870
				21-Jan-08	3.12	284.940
				19-Feb-08	2.77	285.290
				25-Mar-08	2.51	285.550
				22-Apr-08	2.01	286.050
				27-May-08	2.74	285.320
				24-Jun-08	3.17	284.890
				15-Jul-08	3.38	284.680
				22-Jul-08	4.75	283.310
				23-Jul-08	4.62	283.445
				24-Jul-08	4.62	283.445
				25-Jul-08	4.69	283.366
				26-Jul-08	4.72	283.340
				27-Jul-08	4.76	283.296
				28-Jul-08	4.82	283.243
				29-Jul-08	4.89	283.172
				30-Jul-08	3.50	284.560
				09-Sep-08	3.39	284.670
				15-Oct-08	3.46	284.600
				15-Oct-08	3.58	284.480

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				29-Oct-08	3.49	284.566
n/a	BHC	287.681	287.041	20-Jan-04	2.03	285.651
				20-Apr-04	1.80	285.881
				26-Apr-04	1.96	285.721
				03-Jun-04	2.24	285.441
				18-Jun-04	2.26	285.421
				26-Jul-04	3.08	284.601
				25-Aug-04	3.47	284.211
				23-Sep-04	3.66	284.021
				28-Oct-04	3.94	283.741
				20-Jan-05	2.03	285.651
				28-Feb-05	2.11	285.571
				24-Mar-05	2.32	285.361
				15-Apr-05	1.71	285.971
n/a	BHC	287.681	287.041	19-May-05	2.07	285.611
				17-Jun-05	2.59	285.091
				14-Jul-05	3.27	284.411
				19-Aug-05	3.67	284.011
				28-Sep-05	3.91	283.771
				20-Oct-05	3.84	283.841
				18-Nov-05	4.93	282.751
				16-Dec-05	2.86	284.826
				20-Jan-06	2.31	285.371
				17-Feb-06	n/a	n/a
				16-Mar-06	1.64	286.041
				20-Apr-06	2.17	285.511
				18-May-06	2.19	285.491
				16-Jun-06	2.68	285.001
				26-Jul-06	3.12	284.561
				22-Sep-06	3.53	284.151
				20-Oct-06	2.56	285.121
				25-Oct-06	2.53	285.151
				27-Nov-06	2.15	285.531
				18-Dec-06	2.52	285.161
				19-Jan-07	2.02	285.661
				23-Feb-07	2.68	285.001
				20-Mar-07	2.09	285.591
				14-May-07	2.33	285.351
				26-Jun-07	3.16	284.521
MWB19-A	BHD	288.500	287.590	06-Jul-07	3.96	284.540
				23-Jul-07	4.40	284.100
				17-Sep-07	5.32	283.180
				20-Sep-07	5.35	283.150
				22-Oct-07	5.50	283.000
				05-Nov-07	5.53	282.970
				19-Nov-07	5.54	282.960
				20-Dec-07	4.74	283.760
				21-Jan-08	3.22	285.280
				20-Feb-08	2.94	285.565
				24-Mar-08	2.77	285.730
				22-Apr-08	2.18	286.320
				27-May-08	2.95	285.550
				24-Jun-08	3.31	285.190
				15-Jul-08	3.48	285.020
				16-Jul-08	3.52	284.980
				21-Jul-08	3.49	285.010
				22-Jul-08	3.44	285.060
				23-Jul-08	3.35	285.150

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				24-Jul-08	3.21	285.295
				25-Jul-08	3.22	285.280
				26-Jul-08	3.25	285.246
				27-Jul-08	3.30	285.200
				28-Jul-08	3.35	285.150
				29-Jul-08	3.42	285.085
				29-Jul-08	3.43	285.068
				29-Jul-08	3.43	285.068
MWB19-A	**BHD**	288.500	287.590	29-Jul-08	3.43	285.068
				29-Jul-08	*3.74*	284.763
				29-Jul-08	3.44	285.065
				29-Jul-08	3.44	285.065
				30-Jul-08	3.44	285.060
				31-Jul-08	3.44	285.065
				01-Aug-08	3.44	285.060
				02-Aug-08	3.45	285.055
				03-Aug-08	3.47	285.034
				04-Aug-08	3.47	285.030
				05-Aug-08	3.48	285.018
				07-Aug-08	3.45	285.050
				10-Sep-08	3.73	284.770
				28-Oct-08	3.53	284.975
MWB19-B	**BHD**	288.500	287.590	06-Jul-07	4.07	284.430
				23-Jul-07	4.46	284.040
				17-Sep-07	5.30	283.200
				20-Sep-07	5.33	283.170
				22-Oct-07	5.48	283.020
				05-Nov-07	5.51	282.990
				19-Nov-07	5.52	282.980
				20-Dec-07	4.74	283.760
				21-Jan-08	*7.69*	280.810
				20-Feb-08	3.37	285.130
				24-Mar-08	2.77	285.730
				22-Apr-08	2.13	286.370
				27-May-08	2.88	285.620
				24-Jun-08	3.39	285.110
				15-Jul-08	3.66	284.845
				16-Jul-08	3.69	284.810
				21-Jul-08	3.65	284.855
				22-Jul-08	4.02	284.480
				23-Jul-08	3.92	284.580
				24-Jul-08	3.81	284.690
				25-Jul-08	3.83	284.675
				26-Jul-08	3.84	284.658
				27-Jul-08	3.89	284.615
				28-Jul-08	3.94	284.560
				29-Jul-08	4.01	284.495
				29-Jul-08	4.03	284.474
				29-Jul-08	4.02	284.477
				29-Jul-08	4.02	284.477
				29-Jul-08	4.02	284.477
				29-Jul-08	4.02	284.480
				29-Jul-08	4.01	284.486
				29-Jul-08	4.01	284.489
				29-Jul-08	4.01	284.495
				29-Jul-08	4.00	284.498
				29-Jul-08	4.00	284.504
				29-Jul-08	3.99	284.510

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				29-Jul-08	3.98	284.522
				29-Jul-08	3.96	284.538
MWB19-B	**BHD**	288.500	287.590	29-Jul-08	3.95	284.550
				29-Jul-08	3.94	284.562
				29-Jul-08	3.93	284.573
				29-Jul-08	3.92	284.583
				29-Jul-08	3.91	284.592
				29-Jul-08	3.90	284.602
				29-Jul-08	3.89	284.608
				29-Jul-08	3.88	284.617
				29-Jul-08	3.87	284.629
				29-Jul-08	3.86	284.638
				29-Jul-08	3.85	284.649
				29-Jul-08	3.84	284.656
				29-Jul-08	3.83	284.666
				29-Jul-08	3.83	284.675
				29-Jul-08	3.82	284.679
				29-Jul-08	3.82	284.682
				29-Jul-08	3.81	284.687
				29-Jul-08	3.81	284.690
				29-Jul-08	3.81	284.693
				29-Jul-08	3.80	284.697
				29-Jul-08	3.80	284.701
				29-Jul-08	3.79	284.706
				29-Jul-08	3.79	284.708
				29-Jul-08	3.79	284.711
				29-Jul-08	3.79	284.714
				29-Jul-08	3.78	284.717
				29-Jul-08	3.78	284.720
				29-Jul-08	3.78	284.722
				30-Jul-08	3.64	284.865
				31-Jul-08	3.58	284.920
				01-Aug-08	3.58	284.920
				02-Aug-08	3.58	284.925
				03-Aug-08	3.60	284.900
				04-Aug-08	3.61	284.890
				05-Aug-08	3.62	284.885
				07-Aug-08	3.58	284.920
				10-Sep-08	3.55	284.950
				28-Oct-08	3.75	284.750
n/a	**BHD**	288.242	287.522	20-Jan-04	2.48	285.762
				20-Apr-04	2.28	285.962
				26-Apr-04	2.44	285.802
				03-Jun-04	2.68	285.562
				18-Jun-04	2.75	285.492
				26-Jul-04	3.56	284.682
				25-Aug-04	3.95	284.292
				23-Sep-04	4.15	284.092
				28-Oct-04	4.50	283.742
				20-Jan-05	2.48	285.762
				28-Feb-05	2.58	285.662
				24-Mar-05	2.85	285.392
				15-Apr-05	2.04	286.202
				19-May-05	2.46	285.782
n/a	**BHD**	288.242	287.522	17-Jun-05	3.12	285.122
				14-Jul-05	3.83	284.412
				19-Aug-05	4.28	283.962
				28-Sep-05	4.58	283.662

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				20-Oct-05	4.52	283.722
				18-Nov-05	4.03	284.212
				16-Dec-05	3.46	284.782
				20-Jan-06	2.80	285.442
				17-Feb-06	2.26	285.982
				16-Mar-06	1.97	286.272
				20-Apr-06	2.59	285.652
				18-May-06	2.63	285.612
				16-Jun-06	3.17	285.072
				26-Jul-06	n/a	n/a
				31-Aug-06	4.19	284.052
				22-Sep-06	4.13	284.112
				20-Oct-06	3.11	285.137
				25-Oct-06	3.07	285.176
				27-Nov-06	2.64	285.607
				18-Dec-06	2.81	285.432
				19-Jan-07	2.42	285.822
				23-Feb-07	3.04	285.202
				20-Mar-07	2.50	285.747
				14-May-07	2.76	285.482
MWB20-I-A		290.530	289.710	07-Aug-07	8.89	281.640
				14-Sep-07	9.59	280.940
				20-Sep-07	9.69	280.840
				21-Sep-07	9.69	280.840
				22-Oct-07	9.98	280.550
				09-Nov-07	10.09	280.440
				19-Nov-07	10.13	280.400
				20-Dec-07	9.97	280.560
				21-Jan-08	7.26	283.270
				20-Feb-08	6.58	283.955
				24-Mar-08	6.44	284.090
				23-Apr-08	5.32	285.210
				22-May-08	6.41	284.120
				25-Jun-08	7.45	283.080
				15-Jul-08	7.78	282.755
				16-Jul-08	7.83	282.700
				21-Jul-08	7.71	282.824
				22-Jul-08	7.75	282.785
				23-Jul-08	7.63	282.905
				24-Jul-08	7.56	282.970
				25-Jul-08	7.59	282.945
				26-Jul-08	7.59	282.945
				27-Jul-08	7.62	282.910
				28-Jul-08	7.67	282.858
				29-Jul-08	7.75	282.782
				30-Jul-08	7.65	282.882
				31-Jul-08	7.60	282.930
				01-Aug-08	7.61	282.920
MWB20-I-A		290.530	289.710	02-Aug-08	7.61	282.920
				03-Aug-08	7.66	282.875
				04-Aug-08	7.67	282.860
				05-Aug-08	7.66	282.873
				09-Sep-08	7.86	
				29-Oct-08	8.16	282.670
MWB20-II-B	**BHE**	291.390		06-Jul-07	8.95	282.440
				23-Jul-07	9.41	281.980
				14-Sep-07	10.42	280.970
				20-Sep-07	10.52	280.870

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				21-Sep-07	10.52	280.870
				22-Oct-07	10.79	280.600
				06-Nov-07	10.88	280.510
				19-Nov-07	10.94	280.450
				20-Dec-07	10.77	280.620
				21-Jan-08	8.32	283.070
				20-Feb-08	7.86	283.535
				24-Mar-08	7.43	283.960
				23-Apr-08	6.37	285.020
				26-May-08	7.58	283.810
				25-Jun-08	8.36	283.030
				15-Jul-08	8.67	282.720
				16-Jul-08	8.71	282.680
				21-Jul-08	8.62	282.773
				22-Jul-08	8.71	282.680
				23-Jul-08	8.61	282.780
				24-Jul-08	8.55	282.840
				25-Jul-08	8.56	282.830
				26-Jul-08	8.55	282.840
				27-Jul-08	8.58	282.815
				28-Jul-08	8.62	282.775
				29-Jul-08	8.69	282.703
				29-Jul-08	8.68	282.708
				29-Jul-08	8.68	282.708
				29-Jul-08	8.68	282.710
				29-Jul-08	8.68	282.710
				29-Jul-08	8.68	282.710
				29-Jul-08	8.68	282.710
				29-Jul-08	8.68	282.710
				29-Jul-08	8.68	282.711
				29-Jul-08	8.68	282.714
				29-Jul-08	8.68	282.714
				29-Jul-08	8.68	282.715
				29-Jul-08	8.67	282.716
				29-Jul-08	8.67	282.717
				29-Jul-08	8.67	282.719
				29-Jul-08	8.67	282.720
				29-Jul-08	8.67	282.721
				29-Jul-08	8.67	282.721
				29-Jul-08	8.67	282.723
				29-Jul-08	8.67	282.725
				29-Jul-08	8.67	282.725
MWB20-II-B	**BHE**	291.390		29-Jul-08	8.66	282.726
				29-Jul-08	8.66	282.732
				29-Jul-08	8.65	282.737
				29-Jul-08	8.65	282.740
				29-Jul-08	8.65	282.744
				29-Jul-08	8.64	282.747
				29-Jul-08	8.64	282.750
				29-Jul-08	8.64	282.751
				29-Jul-08	8.64	282.754
				29-Jul-08	8.63	282.758
				29-Jul-08	8.63	282.758
				29-Jul-08	8.63	282.760
				29-Jul-08	8.63	282.760
				29-Jul-08	8.63	282.762
				29-Jul-08	8.63	282.764
				29-Jul-08	8.62	282.768

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				29-Jul-08	8.63	282.765
				29-Jul-08	8.63	282.765
				29-Jul-08	8.62	282.767
				29-Jul-08	8.62	282.768
				29-Jul-08	8.62	282.769
				29-Jul-08	8.62	282.770
				29-Jul-08	8.62	282.771
				29-Jul-08	8.62	282.770
				30-Jul-08	8.53	282.859
				31-Jul-08	8.50	282.895
				01-Aug-08	8.51	282.880
				02-Aug-08	8.51	282.880
				03-Aug-08	8.56	282.835
				04-Aug-08	8.57	282.825
				05-Aug-08	8.56	282.832
				09-Sep-08	8.74	282.650
				29-Oct-08	9.01	282.380
MWB20-II-C	**BHE**	291.360		06-Jul-07	8.86	282.500
				23-Jul-07	9.34	282.020
				14-Sep-07	10.36	281.000
				20-Sep-07	10.47	280.890
				21-Sep-07	10.47	280.890
				22-Oct-07	10.74	280.620
				06-Nov-07	10.83	280.530
				19-Nov-07	10.89	280.475
				20-Dec-07	10.70	280.660
				21-Jan-08	8.17	283.190
				20-Feb-08	7.66	283.705
				24-Mar-08	7.25	284.110
				23-Apr-08	6.27	285.090
				26-May-08	7.46	283.900
				25-Jun-08	8.24	283.120
				15-Jul-08	8.57	282.795
				16-Jul-08	8.61	282.750
				21-Jul-08	8.45	282.908
				22-Jul-08	8.69	282.675
MWB20-II-C	**BHE**	291.360		23-Jul-08	8.53	282.830
				24-Jul-08	8.50	282.862
				25-Jul-08	8.53	282.830
				26-Jul-08	8.55	282.815
				27-Jul-08	8.58	282.780
				28-Jul-08	8.64	282.725
				29-Jul-08	8.71	282.648
				30-Jul-08	8.43	282.931
				31-Jul-08	8.38	282.980
				01-Aug-08	8.38	282.980
				02-Aug-08	8.39	282.975
				03-Aug-08	8.44	282.925
				04-Aug-08	8.45	282.915
				05-Aug-08	8.44	282.922
				09-Sep-08	8.65	282.710
				29-Oct-08	8.92	282.440
n/a	**BHE**	290.980	290.560	20-Jan-04	6.75	284.230
				20-Apr-04	6.37	284.610
				26-Apr-04	6.54	284.440
				03-Jun-04	7.17	283.810
				18-Jun-04	7.21	283.770
				26-Jul-04	8.40	282.580

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				25-Aug-04	n/a	n/a
				23-Sep-04	n/a	n/a
				28-Oct-04	9.93	281.050
				20-Jan-05	6.75	284.230
				28-Feb-05	6.91	284.070
				24-Mar-05	7.38	283.600
				15-Apr-05	5.93	285.050
				19-May-05	6.70	284.280
				17-Jun-05	7.71	283.270
				14-Jul-05	8.62	282.365
				19-Aug-05	9.26	281.720
				28-Sep-05	10.74	280.240
				20-Oct-05	10.11	280.870
				18-Nov-05	10.19	280.790
				16-Dec-05	8.73	282.255
				20-Jan-06	7.58	283.400
				17-Feb-06	6.52	284.460
				16-Mar-06	6.16	284.820
				20-Apr-06	7.12	283.865
				18-May-06	7.37	283.610
				16-Jun-06	7.89	283.090
				26-Jul-06	8.67	282.310
				31-Aug-06	9.40	281.585
				22-Sep-06	9.64	281.345
				20-Oct-06	8.50	282.480
				25-Oct-06	8.06	282.920
				27-Nov-06	7.00	283.980
				18-Dec-06	6.66	284.320
				19-Jan-07	7.51	283.475
				23-Feb-07	7.62	283.360
n/a	**BHE**	290.980	290.560	20-Mar-07	6.63	284.350
				14-May-07	7.94	283.040
MWB21-A	**BHF**	295.070	294.090	23-Jul-07	12.65	282.416
				25-Jul-07	12.72	282.350
				18-Sep-07	13.66	281.410
				20-Sep-07	13.71	281.360
				22-Oct-07	13.98	281.090
				05-Nov-07	14.05	281.020
		295.030		19-Nov-07	14.06	281.010
				21-Jan-08	11.95	283.120
				19-Feb-08	11.51	283.560
				24-Mar-08	10.85	284.220
				23-Apr-08	9.59	285.480
				27-May-08	10.78	284.290
				24-Jun-08	11.62	283.450
				15-Jul-08	11.95	283.120
				16-Jul-08	12.00	283.070
				21-Jul-08	12.00	283.075
				22-Jul-08	12.02	283.050
				23-Jul-08	11.98	283.090
				24-Jul-08	11.89	283.140
				25-Jul-08	11.86	283.175
				26-Jul-08	11.81	283.220
				27-Jul-08	11.81	283.225
				28-Jul-08	11.83	283.205
				29-Jul-08	11.87	283.160
				29-Jul-08	11.88	283.150
				29-Jul-08	11.88	283.150

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				29-Jul-08	11.88	283.154
				29-Jul-08	11.88	283.154
				29-Jul-08	11.88	283.154
				29-Jul-08	11.88	283.154
				29-Jul-08	11.87	283.157
				29-Jul-08	11.87	283.158
				29-Jul-08	11.87	283.160
				29-Jul-08	11.87	283.161
				29-Jul-08	11.87	283.160
				29-Jul-08	11.87	283.162
				29-Jul-08	11.87	283.162
				29-Jul-08	11.87	283.163
				29-Jul-08	11.87	283.163
				29-Jul-08	11.87	283.163
				29-Jul-08	11.87	283.163
				30-Jul-08	11.81	283.220
				31-Jul-08	11.79	283.240
				01-Aug-08	11.80	283.230
				02-Aug-08	11.81	283.220
				03-Aug-08	11.85	283.185
				04-Aug-08	11.86	283.170
				05-Aug-08	11.86	283.175
				14-Aug-08	11.54	283.490
				10-Sep-08	12.05	282.980
MWB21-A	**BHF**	295.030	294.090	28-Oct-08	12.24	282.790
MWB21-B	**BHF**	295.080	294.090	23-Jul-07	12.38	282.705
				25-Jul-07	12.42	282.660
				18-Sep-07	13.36	281.720
				20-Sep-07	13.39	281.690
				22-Oct-07	13.66	281.420
				05-Nov-07	13.72	281.360
		295.030		19-Nov-07	13.71	281.320
				21-Jan-08	11.60	283.430
				19-Feb-08	11.13	283.900
				24-Mar-08	10.49	284.540
				23-Apr-08	9.30	285.730
				27-May-08	10.40	284.630
				24-Jun-08	11.22	283.810
				15-Jul-08	11.57	283.460
				16-Jul-08	11.61	283.420
				21-Jul-08	11.63	283.405
				22-Jul-08	11.79	283.240
				23-Jul-08	11.75	283.280
				24-Jul-08	11.65	283.380
				25-Jul-08	11.62	283.410
				26-Jul-08	11.58	283.450
				27-Jul-08	11.58	283.450
				28-Jul-08	11.59	283.440
				29-Jul-08	11.64	283.395
				29-Jul-08	11.66	283.370
				29-Jul-08	11.66	283.373
				29-Jul-08	11.66	283.373
				29-Jul-08	11.66	283.374
				29-Jul-08	11.66	283.375
				29-Jul-08	11.65	283.377
				29-Jul-08	11.65	283.382
				29-Jul-08	11.65	283.382
				29-Jul-08	11.65	283.383

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				29-Jul-08	11.64	283.386
				29-Jul-08	11.64	283.388
				29-Jul-08	11.64	283.392
				29-Jul-08	11.64	283.395
				29-Jul-08	11.63	283.397
				29-Jul-08	11.63	283.398
				29-Jul-08	11.63	283.399
				29-Jul-08	11.63	283.405
				29-Jul-08	11.62	283.407
				29-Jul-08	11.62	283.408
				29-Jul-08	11.62	283.409
				29-Jul-08	11.62	283.411
				29-Jul-08	11.66	283.369
				29-Jul-08	11.60	283.426
				29-Jul-08	11.59	283.443
				29-Jul-08	11.58	283.450
				29-Jul-08	11.58	283.451
				29-Jul-08	11.58	283.452
MWB21-B	**BHF**	295.030	294.090	29-Jul-08	11.58	283.454
				29-Jul-08	11.57	283.458
				29-Jul-08	11.57	283.460
				29-Jul-08	11.57	283.462
				29-Jul-08	11.57	283.465
				29-Jul-08	11.56	283.468
				30-Jul-08	11.40	283.630
				31-Jul-08	11.42	283.610
				01-Aug-08	11.43	283.600
				02-Aug-08	11.44	283.595
				03-Aug-08	11.47	283.558
				04-Aug-08	11.48	283.550
				05-Aug-08	11.49	283.541
				14-Aug-08	11.15	283.880
				10-Sep-08	11.70	283.330
				28-Oct-08	11.89	283.145
n/a	**BHF**	294.750	294.120	20-Apr-04	9.48	285.270
				26-Apr-04	9.66	285.090
				03-Jun-04	10.17	284.585
				18-Jun-04	10.38	284.370
				26-Jul-04	11.63	283.120
				25-Aug-04	11.91	282.837
				23-Sep-04	12.25	282.500
				28-Oct-04	12.67	282.080
				20-Jan-05	10.11	284.640
				28-Feb-05	10.12	284.630
				24-Mar-05	10.58	284.170
				15-Apr-05	9.17	285.580
				19-May-05	9.76	284.990
				17-Jun-05	10.82	283.930
				14-Jul-05	11.63	283.125
				19-Aug-05	12.23	282.520
				28-Sep-05	12.74	282.010
				20-Oct-05	12.86	281.890
				18-Nov-05	12.71	282.040
				16-Dec-05	11.82	282.930
				20-Jan-06	10.82	283.930
				17-Feb-06	9.72	285.030
				16-Mar-06	9.23	285.520
				20-Apr-06	10.13	284.620

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				18-May-06	10.27	284.480
				16-Jun-06	10.85	283.900
				26-Jul-06	11.65	283.100
				31-Aug-06	12.21	282.540
				22-Sep-06	12.39	282.365
				20-Oct-06	11.45	283.305
				25-Oct-06	11.07	283.680
				27-Nov-06	10.20	284.555
				18-Dec-06	9.94	284.810
				19-Jan-07	9.74	285.015
				23-Feb-07	11.11	283.645
				20-Mar-07	10.35	284.400
n/a	**BHF**	294.750	294.120	14-May-07	10.47	284.285
MWB22-I-A	**MW1-S**	291.810	290.880	03-Jul-07	7.85	283.960
				12-Sep-07	9.37	282.439
				21-Sep-07	9.49	282.320
				22-Oct-07	9.70	282.115
				06-Nov-07	9.75	282.060
				19-Nov-07	9.77	282.040
				20-Dec-07	9.47	282.340
				22-Jan-08	6.99	284.820
				19-Feb-08	6.72	285.090
				25-Mar-08	6.29	285.520
				22-Apr-08	5.43	286.380
				27-May-08	6.56	285.250
				24-Jun-08	7.19	284.620
				15-Jul-08	7.50	284.310
				21-Jul-08	9.22	282.590
				22-Jul-08	12.15	279.660
				23-Jul-08	12.53	279.285
				24-Jul-08	12.52	279.290
				25-Jul-08	12.53	279.285
				26-Jul-08	12.53	279.280
				27-Jul-08	12.54	279.275
				28-Jul-08	12.53	279.280
				29-Jul-08	12.53	279.285
				30-Jul-08	9.26	282.550
				09-Sep-08	7.56	284.250
				15-Oct-08	7.63	284.180
				29-Oct-08	7.70	284.110
MWB22-I-C	**MW1-S**	291.850	290.880	03-Jul-07	7.86	283.990
				12-Sep-07	9.31	282.538
				21-Sep-07	9.44	282.410
				22-Oct-07	9.63	282.220
				06-Nov-07	9.68	282.170
				19-Nov-07	9.70	282.150
				20-Dec-07	9.37	282.480
				22-Jan-08	7.05	284.800
				19-Feb-08	6.76	285.090
				25-Mar-08	6.36	285.490
				22-Apr-08	5.55	286.300
				27-May-08	6.61	285.240
				24-Jun-08	7.24	284.610
				15-Jul-08	7.52	284.335
				21-Jul-08	18.13	273.720
				22-Jul-08	19.22	272.630
				23-Jul-08	19.47	272.385
				24-Jul-08	19.64	272.210

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				25-Jul-08	19.85	272.000
				26-Jul-08	19.95	271.900
				27-Jul-08	20.04	271.810
				28-Jul-08	20.09	271.760
				29-Jul-08	20.18	271.670
				29-Jul-08	20.13	271.720
MWB22-I-C	**MW1-S**	291.850	290.880	29-Jul-08	18.37	273.480
				29-Jul-08	14.76	277.090
				29-Jul-08	13.56	278.290
				29-Jul-08	12.50	279.350
				29-Jul-08	12.29	279.560
				29-Jul-08	12.18	279.670
				29-Jul-08	12.07	279.780
				29-Jul-08	12.01	279.840
				29-Jul-08	11.95	279.900
				29-Jul-08	11.88	279.970
				29-Jul-08	11.82	280.030
				29-Jul-08	11.75	280.100
				29-Jul-08	11.64	280.210
				29-Jul-08	11.45	280.400
				29-Jul-08	11.18	280.670
				29-Jul-08	11.09	280.760
				29-Jul-08	11.00	280.850
				29-Jul-08	10.93	280.920
				29-Jul-08	10.87	280.980
				29-Jul-08	10.82	281.030
				29-Jul-08	10.77	281.080
				29-Jul-08	10.73	281.120
				29-Jul-08	10.69	281.160
				29-Jul-08	10.66	281.190
				29-Jul-08	10.63	281.225
				29-Jul-08	10.60	281.255
				29-Jul-08	10.55	281.305
				29-Jul-08	10.52	281.330
				29-Jul-08	10.52	281.330
				29-Jul-08	10.48	281.370
				29-Jul-08	10.45	281.400
				29-Jul-08	10.43	281.420
				29-Jul-08	10.41	281.440
				29-Jul-08	10.40	281.455
				29-Jul-08	10.38	281.475
				29-Jul-08	10.36	281.490
				29-Jul-08	10.34	281.510
				29-Jul-08	10.33	281.518
				29-Jul-08	10.31	281.540
				29-Jul-08	10.30	281.555
				29-Jul-08	10.28	281.570
				29-Jul-08	10.21	281.640
				29-Jul-08	10.15	281.700
				29-Jul-08	10.10	281.750
				29-Jul-08	10.05	281.800
				29-Jul-08	10.00	281.850
				29-Jul-08	9.97	281.880
				29-Jul-08	9.93	281.920
				29-Jul-08	9.90	281.955
				29-Jul-08	9.86	281.990
				29-Jul-08	9.83	282.020
				29-Jul-08	9.79	282.060

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
MWB22-I-C	MW1-S	291.850	290.880	29-Jul-08	9.76	282.090
				29-Jul-08	9.73	282.120
				29-Jul-08	9.70	282.150
				29-Jul-08	9.68	282.170
				29-Jul-08	9.66	282.195
				29-Jul-08	9.63	282.225
				29-Jul-08	9.60	282.250
				29-Jul-08	9.58	282.270
				30-Jul-08	8.10	283.750
				09-Sep-08	7.58	284.270
				15-Oct-08	7.74	284.110
				16-Oct-08	8.49	283.360
				29-Oct-08	7.70	284.150
MWB22-II-B	MW1-D	291.500	290.740	03-Jul-07	7.54	283.960
				12-Sep-07	9.05	282.453
				21-Sep-07	9.17	282.330
				22-Oct-07	9.37	282.130
				06-Nov-07	9.42	282.080
				19-Nov-07	9.44	282.060
				20-Dec-07	9.13	282.370
				22-Jan-08	6.70	284.800
				19-Feb-08	6.42	285.080
				25-Mar-08	6.01	285.490
				22-Apr-08	5.20	286.300
				23-May-08	6.16	285.340
				24-Jun-08	6.92	284.580
				15-Jul-08	7.21	284.290
				21-Jul-08	10.61	280.890
				22-Jul-08	12.08	279.420
				22-Jul-08	12.08	279.420
				23-Jul-08	12.44	279.060
				24-Jul-08	12.65	278.850
				25-Jul-08	12.88	278.625
				26-Jul-08	13.05	278.455
				27-Jul-08	13.19	278.310
				28-Jul-08	13.32	278.180
				29-Jul-08	13.44	278.060
				30-Jul-08	8.46	283.038
				09-Sep-08	7.27	284.230
				18-Sep-08	7.24	284.265
				15-Oct-08	7.38	284.120
				16-Oct-08	7.70	283.800
				29-Oct-08	7.41	284.095
MWB22-II-D	MW1-D	291.480	290.740	03-Jul-07	7.54	283.940
				12-Sep-07	9.00	282.483
				21-Sep-07	9.11	282.370
				22-Oct-07	9.32	282.160
				06-Nov-07	9.35	282.130
				19-Nov-07	9.37	282.110
				20-Dec-07	9.03	282.450
				22-Jan-08	6.75	284.730
				19-Feb-08	6.43	285.050
MWB22-II-D	MW1-D	291.480	290.740	25-Mar-08	6.07	285.410
				22-Apr-08	5.34	286.140
				27-May-08	6.35	285.130
				24-Jun-08	6.93	284.550
				15-Jul-08	7.20	284.280
				21-Jul-08	9.84	281.640

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				22-Jul-08	10.28	281.200
				23-Jul-08	10.19	281.290
				24-Jul-08	10.18	281.300
				25-Jul-08	10.28	281.200
				26-Jul-08	10.32	281.160
				27-Jul-08	10.36	281.120
				28-Jul-08	10.42	281.060
				29-Jul-08	10.50	280.980
				30-Jul-08	7.46	284.020
				09-Sep-08	7.27	284.210
				15-Oct-08	7.43	284.050
				16-Oct-08	7.91	283.570
				29-Oct-08	7.40	284.080
MWB23-I-A	**MW2-S**	289.350	288.790	26-Jul-07	6.00	283.350
				12-Sep-07	6.90	282.450
				20-Sep-07	8.65	280.700
				22-Oct-07	7.22	282.130
				06-Nov-07	7.27	282.080
				19-Nov-07	7.30	282.050
				20-Dec-07	7.00	282.350
				22-Jan-08	4.56	284.790
				19-Feb-08	4.26	285.090
				25-Mar-08	3.83	285.520
				22-Apr-08	2.98	286.370
				27-May-08	4.10	285.250
				24-Jun-08	4.78	284.570
				15-Jul-08	5.07	284.285
				21-Jul-08	5.47	283.880
				22-Jul-08	9.48	279.870
				23-Jul-08	9.61	279.740
				24-Jul-08	9.80	279.550
				25-Jul-08	10.03	279.320
				26-Jul-08	10.19	279.160
				27-Jul-08	10.33	279.020
				28-Jul-08	10.45	278.905
				29-Jul-08	10.57	278.785
				30-Jul-08	6.01	283.338
				09-Sep-08	5.13	284.220
				16-Oct-08	5.54	283.810
				29-Oct-08	5.27	284.080
MWB23-II-B	**MW2-D**	289.700	288.770	26-Jul-07	6.39	283.310
				12-Sep-07	7.28	282.420
				20-Sep-07	9.19	280.510
				22-Oct-07	7.60	282.100
				06-Nov-07	7.64	282.060
				19-Nov-07	7.67	282.030
MWB23-II-B	**MW2-D**	289.700	288.770	20-Dec-07	7.37	282.330
				22-Jan-08	5.01	284.690
				19-Feb-08	4.70	285.000
				25-Mar-08	4.28	285.420
				22-Apr-08	3.44	286.260
				23-May-08	4.14	285.560
				24-Jun-08	5.20	284.500
				15-Jul-08	5.47	284.230
				21-Jul-08	5.76	283.945
				22-Jul-08	11.08	278.625
				23-Jul-08	11.13	278.570
				24-Jul-08	11.26	278.440

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				25-Jul-08	11.43	278.270
				26-Jul-08	11.55	278.155
				27-Jul-08	11.65	278.055
				28-Jul-08	11.74	277.965
				29-Jul-08	11.84	277.860
				30-Jul-08	6.01	283.687
				09-Sep-08	5.53	284.170
				18-Sep-08	7.50	282.205
				16-Oct-08	6.09	283.610
				29-Oct-08	5.66	284.037
MWB23-II-C	**MW2-D**	289.690	288.770	26-Jul-07	6.40	283.290
				12-Sep-07	7.26	282.430
				20-Sep-07	8.72	280.970
				22-Oct-07	7.59	282.105
				06-Nov-07	7.64	282.050
				19-Nov-07	7.67	282.020
				20-Dec-07	7.37	282.320
				22-Jan-08	5.10	284.590
				19-Feb-08	4.83	284.860
				25-Mar-08	4.37	285.320
				22-Apr-08	3.53	286.160
				27-May-08	4.59	285.100
				24-Jun-08	5.24	284.450
				15-Jul-08	5.49	284.203
				21-Jul-08	5.66	284.030
				22-Jul-08	8.37	281.320
				23-Jul-08	8.31	281.380
				24-Jul-08	8.33	281.365
				25-Jul-08	8.41	281.280
				26-Jul-08	8.45	281.240
				27-Jul-08	8.51	281.180
				28-Jul-08	8.58	281.115
				29-Jul-08	8.66	281.035
				30-Jul-08	5.82	283.870
				09-Sep-08	5.54	284.150
				16-Oct-08	6.00	283.690
				29-Oct-08	5.69	284.004
MWB24-I-A	**MW3-S**	291.600	290.620	04-Jul-07	7.24	284.360
				13-Sep-07	dry at 7.60	
				20-Sep-07	dry at 7.61	
MWB24-I-A	**MW3-S**	291.600	290.620	21-Sep-07	dry at 7.64	
				22-Oct-07	dry at 7.58	
				06-Nov-07	dry at 7.59	
				19-Nov-07	dry at 7.59	
				20-Dec-07	dry at 7.58	
				22-Jan-08	6.12	285.480
				19-Feb-08	6.06	285.540
				25-Mar-08	5.77	285.830
				22-Apr-08	5.12	286.480
				27-May-08	6.08	285.520
				24-Jun-08	6.56	285.040
				15-Jul-08	6.79	284.815
				21-Jul-08	7.19	284.410
				22-Jul-08	dry at 7.66	
				23-Jul-08	7.55	284.050
				24-Jul-08	dry at 7.66	
				25-Jul-08	dry at 7.65	
				26-Jul-08	dry at 7.615	

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				27-Jul-08	dry at 7.63	
				28-Jul-08	dry at 7.625	
				29-Jul-08	dry at 7.535	
				30-Jul-08	dry at 7.545	
				09-Sep-08	6.85	284.750
				16-Oct-08	6.97	284.630
				29-Oct-08	6.95	284.655
MWB24-I-B	**MW3-S**	291.620	290.620	04-Jul-07	7.25	284.370
				13-Sep-07	8.48	283.140
				20-Sep-07	8.55	283.070
				21-Sep-07	8.55	283.070
				22-Oct-07	8.67	282.950
				06-Nov-07	8.69	282.930
				19-Nov-07	8.68	282.940
				20-Dec-07	8.24	283.380
				22-Jan-08	6.36	285.260
				19-Feb-08	6.16	285.460
				25-Mar-08	5.83	285.790
				22-Apr-08	5.21	286.410
				27-May-08	6.11	285.510
				24-Jun-08	6.58	285.040
				15-Jul-08	6.81	284.810
				21-Jul-08	7.59	284.030
				22-Jul-08	8.57	283.055
				23-Jul-08	8.72	282.900
				24-Jul-08	9.79	281.835
				25-Jul-08	8.87	282.750
				26-Jul-08	9.44	282.176
				27-Jul-08	9.02	282.600
				28-Jul-08	9.09	282.530
				29-Jul-08	9.17	282.450
				30-Jul-08	7.51	284.110
				09-Sep-08	6.87	284.750
				16-Oct-08	6.98	284.640
MWB24-I-B	**MW3-S**	291.620	290.620	29-Oct-08	6.98	284.640
MWB24-II-C	**MW3-D**	291.120	290.560	28-Aug-07	7.83	283.295
				13-Sep-07	8.03	283.090
				20-Sep-07	8.10	283.020
				21-Sep-07	8.10	283.020
				22-Oct-07	8.20	282.920
				06-Nov-07	8.21	282.910
				19-Nov-07	8.20	282.920
				20-Dec-07	7.74	283.380
				22-Jan-08	4.98	286.140
				19-Feb-08	5.73	285.390
				25-Mar-08	5.47	285.650
				22-Apr-08	4.89	286.230
				23-May-08	5.62	285.500
				24-Jun-08	6.06	285.060
				15-Jul-08	6.37	284.750
				21-Jul-08	7.64	283.480
				22-Jul-08	8.45	282.670
				23-Jul-08	8.49	282.630
				24-Jul-08	8.55	282.575
				25-Jul-08	8.63	282.490
				26-Jul-08	8.69	282.430
				27-Jul-08	8.77	282.350
				28-Jul-08	8.84	282.285

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				29-Jul-08	8.91	282.215
				30-Jul-08	6.83	284.290
				09-Sep-08	6.42	284.700
				16-Oct-08	6.54	284.580
				29-Oct-08	6.54	284.580
MWB24-II-D	**MW3-D**	291.110	290.560	28-Aug-07	8.35	282.760
				13-Sep-07	8.55	282.560
				20-Sep-07	8.65	282.460
				21-Sep-07	8.65	282.460
				22-Oct-07	8.84	282.270
				06-Nov-07	8.89	282.220
				19-Nov-07	8.93	282.180
				20-Dec-07	8.58	282.530
				22-Jan-08	6.43	284.680
				19-Feb-08	5.14	285.970
				25-Mar-08	5.73	285.380
				22-Apr-08	5.02	286.090
				27-May-08	5.97	285.140
				24-Jun-08	6.56	284.550
				15-Jul-08	6.80	284.310
				21-Jul-08	9.75	281.360
				22-Jul-08	10.39	280.725
				23-Jul-08	10.33	280.780
				24-Jul-08	10.34	280.770
				25-Jul-08	10.42	280.695
				26-Jul-08	10.45	280.665
				27-Jul-08	10.50	280.610
				28-Jul-08	10.55	280.560
MWB24-II-D	**MW3-D**	291.110	290.560	29-Jul-08	10.62	280.490
				30-Jul-08	7.04	284.070
				09-Sep-08	6.85	284.260
				16-Oct-08	6.92	284.190
				29-Oct-08	6.97	284.145
MWB25-I-A	**MW4-S**	291.720	290.820	27-Nov-06	6.05	285.670
				26-Jul-07	7.63	284.090
				13-Sep-07	8.27	283.450
				20-Sep-07	8.35	283.370
				22-Oct-07	8.39	283.330
				07-Nov-07	8.37	283.350
		291.660		19-Nov-07	8.29	283.370
				20-Dec-07	7.73	283.930
				22-Jan-08	6.32	285.340
				19-Feb-08	5.11	286.550
				25-Mar-08	5.89	285.770
				22-Apr-08	5.39	286.270
				23-May-08	6.06	285.600
				24-Jun-08	6.47	285.190
				15-Jul-08	6.65	285.010
				21-Jul-08	6.63	285.030
				22-Jul-08	7.02	284.640
				23-Jul-08	7.00	284.665
				24-Jul-08	7.00	284.660
				25-Jul-08	7.08	284.581
				26-Jul-08	7.14	284.516
				27-Jul-08	7.22	284.440
				28-Jul-08	7.25	284.415
				29-Jul-08	7.38	284.280
				30-Jul-08	6.95	284.710

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				09-Sep-08	6.71	284.950
				16-Oct-08	6.91	284.750
				28-Oct-08	6.71	284.950
MWB25-II-B	**MW4-I**	291.970	291.070	27-Nov-06	6.32	285.650
				26-Jul-07	8.02	283.950
				13-Sep-07	8.67	283.300
				20-Sep-07	8.72	283.250
				22-Oct-07	8.79	283.180
				07-Nov-07	8.78	283.190
		291.900		19-Nov-07	8.69	283.210
				20-Dec-07	8.18	283.720
				22-Jan-08	6.53	285.370
				19-Feb-08	6.43	285.470
				25-Mar-08	6.17	285.730
				22-Apr-08	5.64	286.260
				27-May-08	6.41	285.490
				24-Jun-08	6.78	285.120
				15-Jul-08	6.98	284.920
				21-Jul-08	7.69	284.210
				22-Jul-08	8.01	283.895
				23-Jul-08	7.99	283.910
				24-Jul-08	8.01	283.890
MWB25-II-B	**MW4-I**	291.900	291.070	25-Jul-08	8.08	283.820
				26-Jul-08	8.13	283.766
				27-Jul-08	8.20	283.700
				28-Jul-08	8.24	283.660
				29-Jul-08	8.33	283.570
				30-Jul-08	7.34	284.565
				09-Sep-08	7.04	284.860
				16-Oct-08	7.39	284.510
				28-Oct-08	7.10	284.800
MWB25-III-C	**MW4-D**	291.460	290.920	28-Aug-07	7.98	283.480
				13-Sep-07	8.18	283.280
				20-Sep-07	9.82	281.640
				22-Oct-07	8.72	282.740
				07-Nov-07	8.28	283.180
		291.430		19-Nov-07	8.22	283.210
				20-Dec-07	7.74	283.690
				22-Jan-08	6.17	285.260
				19-Feb-08	5.94	285.490
				25-Mar-08	5.70	285.730
				22-Apr-08	5.17	286.260
				28-May-08	5.94	285.490
				24-Jun-08	6.31	285.120
				15-Jul-08	6.51	284.920
				21-Jul-08	7.23	284.200
				22-Jul-08	7.54	283.890
				23-Jul-08	7.52	283.910
				24-Jul-08	7.54	283.890
				25-Jul-08	7.62	283.815
				26-Jul-08	7.67	283.765
				27-Jul-08	7.73	283.700
				28-Jul-08	7.81	283.625
				29-Jul-08	7.88	283.555
				30-Jul-08	6.86	284.570
				09-Sep-08	6.56	284.870
				16-Oct-08	6.92	284.510
				28-Oct-08	6.63	284.805

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
MWB25-III-D	**MW4-D**	291.470	290.920	28-Aug-07	8.22	283.255
				13-Sep-07	8.52	282.950
				20-Sep-07	10.05	281.420
				22-Oct-07	8.29	283.180
				07-Nov-07	8.74	282.730
		291.440		19-Nov-07	8.71	282.730
				20-Dec-07	8.29	283.150
				22-Jan-08	6.44	285.000
				19-Feb-08	6.19	285.250
				25-Mar-08	5.86	285.580
				22-Apr-08	5.27	286.170
				27-May-08	6.07	285.370
				24-Jun-08	6.56	284.880
				15-Jul-08	6.79	284.655
				21-Jul-08	8.07	283.370
				22-Jul-08	8.11	283.330
MWB25-III-D	**MW4-D**	291.440	290.920	23-Jul-08	8.00	283.440
				24-Jul-08	7.98	283.460
				25-Jul-08	8.03	283.412
				26-Jul-08	8.05	283.386
				27-Jul-08	8.10	283.340
				28-Jul-08	8.18	283.265
				29-Jul-08	8.23	283.210
				30-Jul-08	6.88	284.560
				09-Sep-08	6.83	284.610
				16-Oct-08	7.13	284.310
				28-Oct-08	6.91	284.530
MWB26-I-A	**MW5-S**	291.970	291.040	03-Jul-07	7.62	284.350
				13-Sep-07	dry	
				20-Sep-07	dry at 8.4	
				21-Sep-07	dry at 8.30	
				22-Oct-07	dry at 8.27	
				06-Nov-07	dry at 8.28	
				19-Nov-07	dry at 8.27	
				20-Dec-07	dry at 8.28	
				22-Jan-08	6.35	285.620
				19-Feb-08	6.53	285.440
				25-Mar-08	6.11	285.860
				22-Apr-08	5.26	286.710
				27-May-08	6.37	285.600
				24-Jun-08	7.00	284.970
				15-Jul-08	7.30	284.675
				21-Jul-08	7.70	284.270
				22-Jul-08	8.23	283.740
				23-Jul-08	8.25	283.725
				24-Jul-08	8.25	283.720
				25-Jul-08	8.25	283.720
				26-Jul-08	8.25	283.720
				27-Jul-08	8.26	283.715
				28-Jul-08	8.25	283.720
				29-Jul-08	8.25	283.718
				30-Jul-08	8.26	283.710
				09-Sep-08	7.36	284.610
				16-Oct-08	7.50	284.470
				29-Oct-08	7.45	284.520
MWB26-I-B	**MW5-S**	292.020	291.040	03-Jul-07	7.81	284.210
				13-Sep-07	9.21	282.810
				20-Sep-07	9.28	282.740

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				21-Sep-07	9.28	282.740
				22-Oct-07	9.47	282.550
				06-Nov-07	9.49	282.530
				19-Nov-07	9.50	282.520
				20-Dec-07	9.12	282.900
				22-Jan-08	6.96	285.060
				19-Feb-08	6.71	285.310
				25-Mar-08	6.32	285.700
				22-Apr-08	5.59	286.430
				27-May-08	6.59	285.430
MWB26-I-B	**MW5-S**	292.020	291.040	24-Jun-08	7.17	284.850
				15-Jul-08	7.43	284.590
				21-Jul-08	7.79	284.230
				22-Jul-08	10.76	281.260
				23-Jul-08	11.07	280.950
				24-Jul-08	11.24	280.780
				25-Jul-08	11.39	280.630
				26-Jul-08	11.50	280.520
				27-Jul-08	11.61	280.410
				28-Jul-08	11.50	280.520
				29-Jul-08	11.79	280.230
				30-Jul-08	8.57	283.450
				09-Sep-08	7.47	284.550
				16-Oct-08	7.57	284.450
				29-Oct-08	7.57	284.450
MWB26-II-C	**MW5-D**	292.020	291.140	03-Jul-07	7.92	284.100
				13-Sep-07	9.34	282.680
				20-Sep-07	9.40	282.620
				21-Sep-07	9.44	282.580
				22-Oct-07	9.59	282.430
				06-Nov-07	9.63	282.390
				19-Nov-08	9.65	282.370
				20-Dec-07	9.28	282.740
				22-Jan-08	7.12	284.900
				19-Feb-08	6.84	285.180
				25-Mar-08	6.46	285.560
				22-Apr-08	5.72	286.300
				27-May-08	6.73	285.290
				24-Jun-08	7.30	284.720
				15-Jul-08	7.57	284.450
				21-Jul-08	7.79	284.230
				22-Jul-08	13.02	279.000
				23-Jul-08	13.14	278.880
				24-Jul-08	13.26	278.760
				25-Jul-08	13.40	278.620
				26-Jul-08	13.48	278.540
				27-Jul-08	13.57	278.455
				28-Jul-08	13.64	278.385
				29-Jul-08	13.72	278.300
				30-Jul-08	8.20	283.825
				09-Sep-08	7.62	284.400
				16-Oct-08	7.62	284.400
				29-Oct-08	7.64	284.380
MWB26-II-D	**MW5-D**	292.030	291.140	03-Jul-07	8.03	284.000
				13-Sep-07	9.43	282.600
				20-Sep-07	9.53	282.500
				21-Sep-07	9.52	282.510
				22-Oct-07	9.71	282.320

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				06-Nov-07	9.75	282.280
				19-Nov-08	9.78	282.250
				20-Dec-07	9.43	282.600
				22-Jan-08	7.28	284.750
MWB26-II-D	**MW5-D**	292.030	291.140	19-Feb-08	6.98	285.050
				25-Mar-08	6.59	285.440
				22-Apr-08	5.87	286.160
				27-May-08	6.84	285.190
				24-Jun-08	7.44	284.590
				15-Jul-08	6.71	285.325
				21-Jul-08	7.76	284.270
				22-Jul-08	11.23	280.805
				23-Jul-08	11.17	280.865
				24-Jul-08	11.19	280.845
				25-Jul-08	11.26	280.770
				26-Jul-08	11.29	280.740
				27-Jul-08	11.34	280.690
				28-Jul-08	11.40	280.635
				29-Jul-08	11.46	280.570
				30-Jul-08	7.96	284.070
				09-Sep-08	7.69	284.340
				18-Sep-08	7.65	284.385
				16-Oct-08	7.77	284.260
				29-Oct-08	7.83	284.200
MWB27-I-A		271.310	270.81	05-Jul-07	1.79	269.520
				19-Sep-07	2.28	269.030
				21-Sep-07	2.30	269.010
		271.410		22-Oct-07	2.21	269.100
				09-Nov-07	2.63	268.680
				19-Nov-07	2.18	269.130
				21-Jan-08	1.38	269.930
				20-Feb-08	1.22	270.090
				25-Mar-08	1.16	270.150
				23-Apr-08	1.17	270.140
				27-May-08	1.48	269.830
				25-Jun-08	1.63	269.780
				16-Jul-08	1.80	269.610
				21-Jul-08	1.39	270.020
				22-Jul-08	1.46	269.955
				23-Jul-08	1.23	270.185
				24-Jul-08	1.23	270.184
				25-Jul-08	1.28	270.131
				26-Jul-08	1.26	270.154
				27-Jul-08	1.27	270.140
				28-Jul-08	1.32	270.095
				29-Jul-08	1.39	270.020
				30-Jul-08	1.44	269.970
				31-Jul-08	1.44	269.975
				01-Aug-08	1.49	269.920
				02-Aug-08	1.51	269.900
				03-Aug-08	1.56	269.855
				04-Aug-08	1.58	269.830
				05-Aug-08	1.60	269.810
				07-Aug-08	1.40	270.012
				10-Sep-08	1.45	269.960
				29-Oct-08	1.45	269.963
MWB27-II-B		271.360	270.48	05-Jul-07	1.79	269.570
				19-Sep-07	2.30	269.060

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				21-Sep-07	2.31	269.050
		271.810		22-Oct-07	2.24	269.570
				09-Nov-07	2.18	269.630
				19-Nov-07	2.63	269.180
				21-Jan-08	1.81	270.000
				20-Feb-08	1.64	270.170
				25-Mar-08	1.57	270.240
				23-Apr-08	1.53	270.280
				27-May-08	1.87	269.940
				25-Jun-08	2.03	269.780
				16-Jul-08	2.22	269.590
				21-Jul-08	1.80	270.010
				22-Jul-08	1.86	269.950
				23-Jul-08	1.64	270.170
				24-Jul-08	1.64	270.175
				25-Jul-08	1.70	270.113
				26-Jul-08	1.69	270.120
				27-Jul-08	1.69	270.120
				28-Jul-08	1.73	270.080
				29-Jul-08	1.81	270.005
				30-Jul-08	1.86	269.955
				31-Jul-08	1.84	269.970
				01-Aug-08	1.90	269.910
				02-Aug-08	1.92	269.890
				03-Aug-08	1.97	269.842
				04-Aug-08	1.99	269.820
				05-Aug-08	2.01	269.800
				07-Aug-08	1.82	269.995
				10-Sep-08	1.87	269.940
				29-Oct-08	1.88	269.933
MWB28-A		293.430	292.420	22-Apr-08	7.79	285.640
				22-May-08	9.02	284.410
				25-Jun-08	10.17	283.260
				15-Jul-08	10.49	282.940
				16-Jul-08	10.52	282.910
				21-Jul-08	10.55	282.876
				22-Jul-08	10.52	282.915
				23-Jul-08	10.43	283.000
				24-Jul-08	10.24	283.188
				25-Jul-08	10.13	283.305
				26-Jul-08	10.02	283.410
				27-Jul-08	9.98	283.453
				28-Jul-08	9.97	283.458
				29-Jul-08	10.00	283.427
				30-Jul-08	9.93	283.502
				31-Jul-08	9.92	283.510
				01-Aug-08	9.95	283.480
				02-Aug-08	9.97	283.465
				03-Aug-08	10.03	283.400
				04-Aug-08	10.06	283.370
MWB28-A		293.430	292.420	05-Aug-08	10.07	283.362
				07-Aug-08	10.10	283.330
				09-Sep-08	10.50	282.930
				16-Oct-08	10.66	282.770
				29-Oct-08	10.85	282.582
MWB28-B		293.430	292.420	22-Apr-08	7.23	286.200
				22-May-08	9.02	284.410
				25-Jun-08	10.18	283.250

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				15-Jul-08	10.49	282.940
				16-Jul-08	10.53	282.900
				21-Jul-08	10.54	282.890
				22-Jul-08	10.52	282.910
				23-Jul-08	10.42	283.010
				24-Jul-08	10.24	283.195
				25-Jul-08	10.12	283.306
				26-Jul-08	10.02	283.410
				27-Jul-08	9.98	283.450
				28-Jul-08	9.98	283.455
				29-Jul-08	10.01	283.424
				30-Jul-08	9.93	283.499
				31-Jul-08	9.93	283.500
				01-Aug-08	9.96	283.470
				02-Aug-08	9.97	283.465
				03-Aug-08	10.03	283.400
				04-Aug-08	10.06	283.370
				05-Aug-08	10.07	283.356
				07-Aug-08	10.12	283.310
				09-Sep-08	10.51	282.920
				16-Oct-08	10.68	282.750
				29-Oct-08	10.85	282.580
MWO1-I-A	**GLL06-01-III**	287.850	287.330	27-Nov-06	1.71	286.138
				25-Jul-07	1.73	286.120
				10-Aug-07	dry at 2.02	
				20-Sep-07	dry at 2.03	
				22-Oct-07	dry at 2.03	
				19-Nov-07	dry at 2.03	
				21-Jan-08	1.51	286.340
				24-Mar-08	1.35	286.500
				22-Apr-08	1.25	286.600
				27-May-08	1.41	286.440
				24-Jun-08	1.48	286.370
				15-Jul-08	1.63	286.220
				21-Jul-08	1.35	286.500
				22-Jul-08	1.41	286.445
				23-Jul-08	1.18	286.675
				24-Jul-08	1.28	286.575
				25-Jul-08	1.35	286.500
				26-Jul-08	1.40	286.455
				27-Jul-08	1.43	286.425
				28-Jul-08	1.46	286.388
				29-Jul-08	1.50	286.350
				30-Jul-08	1.52	286.330
MWO1-I-A	**GLL06-01-III**	287.850	287.330	07-Aug-08	1.49	286.365
				10-Sep-08	1.55	286.300
				15-Oct-08	1.64	286.210
				28-Oct-08	1.62	286.230
MWO1-I-B	**GLL06-01-II**	287.860	287.330	27-Nov-06	1.62	286.238
				25-Jul-07	1.75	286.115
				10-Aug-07	2.33	285.530
				20-Sep-07	2.66	285.200
				22-Oct-07	2.76	285.100
				19-Nov-07	2.75	285.110
				21-Jan-08	1.53	286.330
				24-Mar-08	1.36	286.500
				22-Apr-08	1.26	286.600
				27-May-08	1.41	286.450

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				24-Jun-08	1.49	286.370
				15-Jul-08	1.64	286.220
				21-Jul-08	1.37	286.490
				22-Jul-08	1.42	286.442
				23-Jul-08	1.20	286.660
				24-Jul-08	1.30	286.565
				25-Jul-08	1.36	286.500
				26-Jul-08	1.40	286.456
				27-Jul-08	1.44	286.425
				28-Jul-08	1.47	286.390
				29-Jul-08	1.51	286.355
				30-Jul-08	1.53	286.334
				07-Aug-08	1.50	286.363
				10-Sep-08	1.56	286.300
				15-Oct-08	1.65	286.210
				28-Oct-08	1.63	286.235
MWO1-II-C	**GLL06-01-I**	287.930	287.260	27-Nov-06	1.79	286.140
				25-Jul-07	1.81	286.120
				10-Aug-07	2.42	285.510
				20-Sep-07	2.76	285.170
				22-Oct-07	2.81	285.120
				19-Nov-07	2.77	285.165
				21-Jan-08	1.63	286.300
				24-Mar-08	1.47	286.460
				22-Apr-08	1.35	286.580
				27-May-08	1.52	286.410
				24-Jun-08	1.59	286.340
				15-Jul-08	1.72	286.210
				21-Jul-08	1.41	286.520
				22-Jul-08	1.56	286.375
				23-Jul-08	1.36	286.569
				24-Jul-08	1.42	286.510
				25-Jul-08	1.38	286.555
				26-Jul-08	1.41	286.519
				27-Jul-08	1.44	286.495
				28-Jul-08	1.56	286.370
				29-Jul-08	1.59	286.337
				30-Jul-08	1.57	286.360
MWO1-II-C	**GLL06-01-I**	287.930	287.260	07-Aug-08	1.58	286.353
				10-Sep-08	1.66	286.270
				15-Oct-08	1.72	286.210
				28-Oct-08	1.70	286.235
MWO2	**GLL06-02**	287.480	286.760	27-Nov-06	1.49	285.990
				25-Jul-07	2.30	285.180
				10-Aug-07	dry at 3.0	
				20-Sep-07	dry at 3.0	
				22-Oct-07	dry at 2.99	
				19-Nov-07	dry at 2.995	
				21-Jan-08	1.98	285.500
				24-Mar-08	1.43	286.050
				22-Apr-08	0.76	286.720
				27-May-08	1.15	286.330
				24-Jun-08	1.90	285.580
				15-Jul-08	2.19	285.290
				21-Jul-08	2.10	285.380
				22-Jul-08	1.10	286.380
				23-Jul-08	1.81	285.673
				24-Jul-08	1.79	285.692

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				25-Jul-08	1.81	285.670
				26-Jul-08	1.84	285.645
				27-Jul-08	1.86	285.620
				28-Jul-08	1.90	285.578
				29-Jul-08	1.95	285.533
				30-Jul-08	1.97	285.515
				07-Aug-08	dry at 3.015	
				10-Sep-08	2.30	285.180
				15-Oct-08	2.34	285.140
				28-Oct-08	2.38	285.105
MWO4	**GLL06-04**	287.300	286.530	27-Nov-06	1.83	285.465
				25-Jul-07	2.30	285.000
				10-Aug-07	dry at 2.625	
				20-Sep-07	dry at 2.63	
				22-Oct-07	dry at 2.62	
				19-Nov-07	dry at 2.62	
				21-Jan-08	1.94	285.360
				24-Mar-08	1.75	285.555
				23-Apr-08	1.62	285.680
				27-May-08	1.86	285.440
				24-Jun-08	2.02	285.280
				15-Jul-08	2.17	285.130
				21-Jul-08	dry at 1.98	
				24-Jul-08	1.86	285.440
				25-Jul-08	dry at 1.97	
				26-Jul-08	dry at 1.96	
				27-Jul-08	dry at 1.963	
				28-Jul-08	dry at 1.965	
				29-Jul-08	dry at 1.967	
				30-Jul-08	1.89	285.409
				07-Aug-08	dry at 1.972	
				28-Oct-08	n/a	n/a
MWO5	**GLL06-05**	287.340	286.500	27-Nov-06	1.82	285.521
				25-Jul-07	2.43	284.910
				10-Aug-07	dry at 3.18	
				20-Sep-07	dry at 3.18	
				22-Oct-07	dry at 3.17	
				19-Nov-07	dry at 3.165	
				21-Jan-08	2.00	285.340
				24-Mar-08	1.73	285.610
				23-Apr-08	1.46	285.880
				27-May-08	1.89	285.450
				24-Jun-08	2.10	285.240
				15-Jul-08	2.25	285.095
				21-Jul-08	2.06	285.280
				22-Jul-08	2.13	285.212
				23-Jul-08	1.85	285.490
				24-Jul-08	1.96	285.385
				25-Jul-08	2.04	285.300
				26-Jul-08	2.10	285.243
				27-Jul-08	2.38	284.960
				28-Jul-08	2.19	285.148
				29-Jul-08	2.25	285.090
				30-Jul-08	2.23	285.106
				07-Aug-08	2.16	285.185
				10-Sep-08	2.22	285.120
				17-Oct-08	2.25	285.090
				29-Oct-08	2.22	285.118

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
MWO6	**GLL06-06**	286.210	285.530	27-Nov-06	1.18	285.026
				25-Jul-07	dry at 2.21	
				10-Aug-07	dry at 2.21	
				20-Sep-07	dry at 2.21	
				22-Oct-07	dry at 2.2	
				19-Nov-07	dry at 2.2	
				21-Jan-08	1.54	284.667
				24-Mar-08	1.01	285.200
				22-Apr-08	0.760	285.450
				26-May-08	1.35	284.860
				24-Jun-08	1.95	284.260
				15-Jul-08	dry at 2.31	
				22-Jul-08	1.79	284.425
				23-Jul-08	1.25	284.960
				24-Jul-08	1.18	285.035
				25-Jul-08	1.16	285.050
				26-Jul-08	1.16	285.050
				27-Jul-08	2.16	284.053
				28-Jul-08	1.17	285.040
				29-Jul-08	1.21	285.004
				30-Jul-08	1.28	284.935
				07-Aug-08	*dry at 4.322*	
				09-Sep-08	2.17	284.040
				16-Oct-08	dry at 2.30	
				28-Oct-08	dry at 2.30	
MWO7	**GLL06-07**	290.740	289.900	25-Jul-07	dry at 4.2	
MWO7	**GLL06-07**	290.740	289.900	10-Aug-07	dry at 4.2	
				20-Sep-07	dry at 4.21	
				22-Oct-07	dry at 4.2	
				19-Nov-07	dry at 4.2	
				21-Jan-08	dry at 4.2	
				24-Mar-08	dry at 4.20	
				22-Apr-08	dry at 4.2	
				26-May-08	dry at 4.28	
				24-Jun-08	dry at 4.28	
				15-Jul-08	dry at 4.28	
				22-Jul-08	dry at 4.29	
				23-Jul-08	*dry at 4.36*	
				24-Jul-08	dry at 4.285	
				25-Jul-08	dry at 4.28	
				26-Jul-08	dry at 4.29	
				27-Jul-08	dry at 4.29	
				28-Jul-08	dry at 4.29	
				29-Jul-08	dry at 4.29	
				30-Jul-08	dry at 4.29	
				07-Aug-08	dry at 4.29	
				09-Sep-08	dry at 4.29	
				17-Oct-08	dry at 4.30	
				28-Oct-08	dry at 4.29	
MWO8	**GLL06-08**	282.830	282.020	27-Nov-06	1.87	280.959
				25-Jul-07	2.05	280.780
				10-Aug-07	dry at 2.735	
				20-Sep-07	dry at 2.73	
				22-Oct-07	dry at 2.72	
				19-Nov-07	dry at 1.71	
				21-Jan-08	1.93	280.900
				20-Feb-08	1.76	281.074
				24-Mar-08	1.81	281.020

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				23-Apr-08	1.77	281.060
				27-May-08	1.86	280.970
				25-Jun-08	1.91	280.920
				15-Jul-08	1.96	280.870
				22-Jul-08	1.90	280.935
				23-Jul-08	1.76	281.068
				24-Jul-08	1.85	280.983
				25-Jul-08	1.89	280.945
				26-Jul-08	1.90	280.928
				27-Jul-08	1.91	280.920
				28-Jul-08	1.92	280.909
				29-Jul-08	1.94	280.895
				30-Jul-08	1.93	280.899
				07-Aug-08	1.87	280.960
				09-Sep-08	1.85	280.980
				15-Oct-08	1.99	280.840
				29-Oct-08	2.00	280.832
MWO9	**GLL06-09**	286.220	285.580	25-Jul-07	3.06	283.160
				10-Aug-07	dry at 3.05	
				20-Sep-07	dry at 3.06	
MWO9	**GLL06-09**	286.220	285.580	22-Oct-07	dry at 3.05	
				19-Nov-07	dry at 3.05	
				21-Jan-08	dry at 3.05	
				20-Feb-08	dry at 3.056	
				24-Mar-08	2.87	283.350
				23-Apr-08	2.34	283.880
				26-May-08	3.04	283.180
				25-Jun-08	dry at 3.14	
				15-Jul-08	dry at 3.14	
				22-Jul-08	dry at 3.16	
				23-Jul-08	3.06	283.163
				24-Jul-08	dry at 3.145	
				25-Jul-08	dry at 3.145	
				26-Jul-08	3.06	283.160
				27-Jul-08	dry at 3.143	
				28-Jul-08	dry at 3.14	
				29-Jul-08	dry at 3.135	
				30-Jul-08	dry at 3.14	
				07-Aug-08	dry at 3.137	
				09-Sep-08	dry at 3.14	
				15-Oct-08	dry at 3.14	
				28-Oct-08	dry at 3.14	
MWO10	**GLL06-10**	285.750	284.960	27-Nov-06	2.17	283.584
				25-Jul-07	n/a	n/a
				10-Aug-07	dry at 3.11	
				20-Sep-07	dry at 3.115	
				22-Oct-07	dry at 3.1	
				19-Nov-07	dry at 3.11	
				21-Jan-08	2.75	283.000
				24-Mar-08	1.65	284.100
				23-Apr-08	*0.59*	285.160
				27-May-08	1.48	284.270
				25-Jun-08	2.67	283.080
				15-Jul-08	dry at 3.2	
				22-Jul-08	n/a	n/a
				23-Jul-08	*3.08*	282.673
				24-Jul-08	2.76	282.990
				25-Jul-08	2.74	283.010

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				25-Jul-08	2.74	283.010
				26-Jul-08	2.77	282.985
				27-Jul-08	2.80	282.955
				28-Jul-08	2.85	282.905
				29-Jul-08	2.92	282.830
				30-Jul-08	2.97	282.785
				07-Aug-08	dry at 3.195	
				14-Aug-08	2.80	282.950
				10-Sep-08	dry at 3.19	
				15-Oct-08	dry at 3.2	
				29-Oct-08	dry at 3.19	
MWO11	**GLL06-11**	286.760	286.000	25-Jul-07	dry at 2.38	
				10-Aug-07	dry at 2.38	
				20-Sep-07	dry at 2.39	
MWO11	**GLL06-11**	286.760	286.000	22-Oct-07	dry at 2.38	
				19-Nov-07	dry at 2.735	
				21-Jan-08	dry at 2.38	
				24-Mar-08	2.01	284.748
				22-Apr-08	*0.88*	285.880
				26-May-08	1.66	285.100
				24-Jun-08	2.46	284.300
				15-Jul-08	dry at 2.46	
				21-Jul-08	dry at 2.39	
				22-Jul-08	dry at 2.464	
				23-Jul-08	2.46	284.299
				24-Jul-08	dry at 2.47	
				25-Jul-08	dry at 2.42	
				26-Jul-08	dry at 2.465	
				27-Jul-08	dry at 2.465	
				28-Jul-08	dry at 2.465	
				29-Jul-08	dry at 2.465	
				30-Jul-08	dry at 2.466	
				07-Aug-08	dry at 2.465	
				10-Sep-08	dry at 2.46	
				15-Oct-08	dry at 2.47	
				28-Oct-08	dry at 2.47	
MWO12	**GLL06-12**	283.848	283.160	27-Nov-06	1.59	282.255
				25-Jul-07	2.00	281.848
				10-Aug-07	dry at 2.72	
				20-Sep-07	dry at 2.91	
				22-Oct-07	dry at 2.9	
				19-Nov-07	dry at 2.92	
				21-Jan-08	2.44	281.411
				19-Feb-08	1.91	281.938
				24-Mar-08	1.59	282.258
				23-Apr-08	1.00	282.848
				26-May-08	1.34	282.508
				25-Jun-08	1.81	282.038
				15-Jul-08	2.02	281.833
				22-Jul-08	1.99	281.863
				23-Jul-08	1.76	282.092
				24-Jul-08	1.84	282.008
				25-Jul-08	1.88	281.968
				26-Jul-08	1.90	281.953
				27-Jul-08	1.91	281.943
				28-Jul-08	1.92	281.933
				29-Jul-08	1.93	281.918
				30-Jul-08	1.94	281.913

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				07-Aug-08	1.94	281.913
				09-Sep-08	1.90	281.948
				17-Oct-08	2.12	281.728
				29-Oct-08	2.15	281.700
MWO13	**GLL06-13**	286.510	285.590	25-Jul-07	dry at 4.1	
				10-Aug-07	dry at 4.1	
				20-Sep-07	dry at 4.08	
				22-Oct-07	dry at 4.11	
MWO13	**GLL06-13**	286.510	285.590	19-Nov-07	dry at 4.11	
				21-Jan-08	dry at 4.11	
				19-Feb-08	dry at 4.11	
				24-Mar-08	dry at 4.11	
				23-Apr-08	3.84	282.670
				26-May-08	dry at 4.11	
				25-Jun-08	dry@4.19	
				15-Jul-08	dry at 4.19	
				22-Jul-08	dry at 4.19	
				23-Jul-08	dry at 4.19	
				24-Jul-08	dry at 4.19	
				25-Jul-08	dry at 4.19	
				26-Jul-08	dry at 4.19	
				27-Jul-08	dry at 4.19	
				28-Jul-08	dry at 4.19	
				29-Jul-08	dry at 4.19	
				30-Jul-08	dry at 4.19	
				07-Aug-08	dry at 4.20	
				09-Sep-08	dry at 4.19	
				17-Oct-08	dry at 4.19	
				28-Oct-08	dry at 4.19	
MWO14	**GLL06-14**	289.210	288.450	27-Nov-06	2.90	286.307
				25-Jul-07	dry at 2.93	
				10-Aug-07	dry at 2.925	
				20-Sep-07	dry at 2.93	
				22-Oct-07	dry at 2.92	
				19-Nov-07	dry at 2.925	
				21-Jan-08	2.83	286.380
				24-Mar-08	2.54	286.675
				23-Apr-08	1.74	287.470
				27-May-08	dry at 2.92	
				24-Jun-08	dry@3.01	
				15-Jul-08	*dry at 3.57*	
				21-Jul-08	dry at 3.01	
				22-Jul-08	dry at 3.009	
				23-Jul-08	3.01	286.203
				24-Jul-08	dry at 3.01	
				25-Jul-08	2.93	286.283
				26-Jul-08	dry at 3.01	
				27-Jul-08	dry at 3.02	
				28-Jul-08	dry at 3.03	
				29-Jul-08	dry at 3.04	
				30-Jul-08	dry at 3.008	
				07-Aug-08	dry at 3.006	
				14-Aug-08	*dry at 3.65*	
				10-Sep-08	dry at 3.01	
				15-Oct-08	dry at 3.01	
				28-Oct-08	dry at 3.01	
MWO16	**GLL06-16**	292.330	291.480	25-Jul-07	2.97	289.360
				10-Aug-07	dry at 3.54	

Table G2: Summary of Groundwater Elevations (manual measurements)
St Marys Flamborough Quarry

Monitor ID	Previously used Monitor ID	Elevation		Date	Depth To Water Below Top of Pipe (m)	Groundwater Elevation (m.a.s.l.)
		Top of Pipe (m.a.s.l.)	Ground (m.a.s.l.)			
				20-Sep-07	dry at 3.56	
				22-Oct-07	dry at 3.54	
MWO16	**GLL06-16**	292.330	291.480	19-Nov-07	dry at 3.54	
				21-Jan-08	dry at 3.55	
				24-Mar-08	dry at 3.54	
				22-Apr-08	dry at 3.54	
				27-May-08	dry at 3.62	
				25-Jun-08	dry@3.62	
				15-Jul-08	dry at 3.63	
				22-Jul-08	dry at 3.66	
				23-Jul-08	*3.71*	288.621
				24-Jul-08	dry at 3.63	
				25-Jul-08	dry at 3.63	
				26-Jul-08	dry at 3.628	
				27-Jul-08	dry at 3.63	
				28-Jul-08	dry at 3.63	
				29-Jul-08	dry at 3.63	
				30-Jul-08	dry at 3.625	
				07-Aug-08	dry at 3.626	
				09-Sep-08	dry at 3.63	
				17-Oct-08	dry at 3.64	
				29-Oct-08	dry at 3.625	
				suspect values italicized		

Table G2: Summary of Groundwater Elevations
Mini-pizometers (manual measurements)
St Marys Flamborough Quarry

Piezometer	Stick up (m)	Depth BGS (m)	Ground Elevation (masl)	Top Elevation (original) (masl)	Top Elevation (following resurvey - June 2007) (masl)	5-Nov-03		18-Nov-03		20-Jan-04		19-Mar-04		19-Apr-04		26-Apr-04	
						Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)
1	0.670	0.750	285.060	285.710	285.700	1.580	284.130	0.840	284.870	Frozen		0.620	285.090	0.600	285.110	nd	
Outside			285.060	285.710	285.700	Dry	dry	0.670	285.040	nd		Frozen	Frozen			nd	
2	1.420	0.910	284.570	286.940	286.060	1.880	285.060	1.130	285.810	Frozen	Frozen	1.045	285.895	1.150	285.790	1.100	285.840
Stream			284.570	286.940	286.060	1.220	285.720	1.125	285.815	Frozen	Frozen	1.045	285.895	1.130	285.810	1.120	285.820
3	0.740	0.830	285.610	286.345	n/a	0.870	285.475	0.735	285.610	nd		Frozen	Frozen	0.670	285.675	1.005	285.340
Outside			285.610	286.345	n/a	nd		0.740	285.605	nd		Frozen	Frozen	0.720	285.625	0.700	285.645
4	1.085	1.085	285.640	286.727	n/a	0.950	285.777	1.125	285.602	nd		Frozen	Frozen	1.040	285.687	1.045	285.682
Outside			285.640	286.727	n/a	nd		Dry	Dry	nd		Frozen	Frozen	1.090	285.637	1.080	285.647
5	0.842	0.728	286.220	287.045	287.160	1.350	285.695	0.860	286.185	Frozen	Frozen	0.690	286.355	0.780	286.265	0.940	286.105
Outside			286.220	287.045	287.160	nd		0.840	286.205	nd		0.700	286.345	0.830	286.215	0.825	286.220
6	0.880	1.300	286.300	287.053	287.190	dry	dry	0.880	286.173	Frozen	Frozen	1.070	285.983	0.810	286.243	0.820	286.233
Outside			286.300	287.053	287.190	nd		0.880	286.173	nd		1.065	285.988	0.860	286.193	0.855	286.198
7	1.010	1.490	280.550	281.858	281.730	n/a		n/a		Frozen	Frozen	nd		1.090	280.768	1.130	280.728
Stream			280.550	281.858	281.730	n/a		n/a		Frozen	Frozen	nd		0.885	280.973	0.855	281.003
8	1.050	2.095	280.400	281.966	281.850	n/a		n/a		Frozen	Frozen	nd		1.685	280.281	0.910	281.056
Stream			280.400	281.966	281.850	n/a		n/a		Frozen	Frozen	nd		0.835	281.131	0.910	281.056
9	0.610	1.205	281.580	282.167	282.300	n/a		n/a		n/a		n/a		n/a		n/a	
Outside			281.580	282.167	282.300	n/a		n/a		n/a		n/a		n/a		n/a	
10	0.940	0.875	280.890	281.740	281.890	n/a		n/a		n/a		n/a		n/a		n/a	
Outside			280.890	281.740	281.890	n/a		n/a		n/a		n/a		n/a		n/a	
11	1.330	0.485	280.550	281.694	282.010	n/a		n/a		n/a		n/a		n/a		n/a	
Stream			280.550	281.694	282.010	n/a		n/a		n/a		n/a		n/a		n/a	
12	0.650	1.165	285.100	285.838	285.960	n/a		n/a		n/a		n/a		n/a		n/a	
Outside			285.100	285.838	285.960	n/a		n/a		n/a		n/a		n/a		n/a	
13	0.860	0.955	285.150	285.710	285.830	n/a		n/a		n/a		n/a		n/a		n/a	
Stream			285.150	285.710	285.830	n/a		n/a		n/a		n/a		n/a		n/a	
14	0.955	0.860	285.110	285.984	286.100	n/a		n/a		n/a		n/a		n/a		n/a	
Stream			285.110	285.984	286.100	n/a		n/a		n/a		n/a		n/a		n/a	
15	0.150		285.380	285.657	285.490	n/a		n/a		n/a		n/a		n/a		n/a	
Outside			285.380	285.657	285.490	n/a		n/a		n/a		n/a		n/a		n/a	
16	0.687		285.380	286.034	286.150	n/a		n/a		n/a		n/a		n/a		n/a	
Outside			285.380	286.034	286.150	n/a		n/a		n/a		n/a		n/a		n/a	
17	1.38	1.5															
Outside																	
18	1.64	1.24															
Outside																	
19	1.45	1.43															
Outside																	

Table G2: Summary of Groundwater Elevations
Mini-pizometers (manual measurements)
St Marys Flamborough Quarry

Piezometer	Stick up (m)	Depth BGS (m)	Ground Elevation (masl)	Top Elevation (original) (masl)	Top Elevation (following resurvey - June 2007) (masl)	3-Jun-04		18-Jun-04		26-Jul-04		25-Aug-04		23-Sep-04		28-Oct-04	
						Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)
1	0.670	0.750	285.060	285.710	285.700	0.675	285.035	0.650	285.060	1.075	284.635	1.115	284.595	1.150	284.560	1.040	284.670
Outside			285.060	285.710	285.700	0.660	285.050	nd		nd				dry	dry	Dry	dry
2	1.420	0.910	284.570	286.940	286.060	1.160	285.780	1.150	285.790	1.340	285.600	1.340	285.600	1.380	285.560	1.340	285.600
Stream			284.570	286.940	286.060	1.180	285.760	1.170	285.770	1.340	285.600	1.255	285.685	1.360	285.580	1.350	285.590
3	0.740	0.830	285.610	286.345	n/a	0.685	285.660	0.684	285.661	nd		1.330	285.015	nd		nd	
Outside			285.610	286.345	n/a	0.710	285.635	0.710	285.635	nd				nd		nd	
4	1.085	1.085	285.640	286.727	n/a	1.050	285.677	1.050	285.677	nd		1.690	285.037	nd		nd	
Outside			285.640	286.727	n/a	1.070	285.657	1.070	285.657	nd				nd		nd	
5	0.842	0.728	286.220	287.045	287.160	0.810	286.235	0.810	286.235	0.870	286.175	0.920	286.125	nd		1.110	285.935
Outside			286.220	287.045	287.160	0.855	286.190	0.855	286.190	dry	dry			nd		Dry	dry
6	0.880	1.300	286.300	287.053	287.190	0.835	286.218	0.830	286.223	0.915	286.138	0.960	286.093	nd		1.120	285.933
Outside			286.300	287.053	287.190	0.865	286.188	0.865	286.188	dry	dry			nd		Dry	dry
7	1.010	1.490	280.550	281.858	281.730	0.845	281.013	0.810	281.048	0.980	280.878	1.280	280.578	1.320	280.538	1.390	280.468
Stream			280.550	281.858	281.730	0.865	280.993	0.815	281.043	0.985	280.873			Dry	dry	Dry	dry
8	1.050	2.095	280.400	281.966	281.850	0.925	281.041	0.870	281.096	1.015	280.951	1.320	280.646	1.370	280.596	1.430	280.536
Stream			280.400	281.966	281.850	0.915	281.051	0.865	281.101	1.045	280.921			Dry	dry	Dry	dry
9	0.610	1.205	281.580	282.167	282.300	n/a		n/a		n/a		n/a		n/a		n/a	
Outside			281.580	282.167	282.300	n/a		n/a		n/a		n/a		n/a		n/a	
10	0.940	0.875	280.890	281.740	281.890	n/a		n/a		n/a		n/a		n/a		n/a	
Outside			280.890	281.740	281.890	n/a		n/a		n/a		n/a		n/a		n/a	
11	1.330	0.485	280.550	281.694	282.010	n/a		n/a		n/a		n/a		n/a		n/a	
Stream			280.550	281.694	282.010	n/a		n/a		n/a		n/a		n/a		n/a	
12	0.650	1.165	285.100	285.838	285.960	n/a		n/a		n/a		n/a		n/a		n/a	
Outside			285.100	285.838	285.960	n/a		n/a		n/a		n/a		n/a		n/a	
13	0.860	0.955	285.150	285.710	285.830	n/a		n/a		n/a		n/a		n/a		n/a	
Stream			285.150	285.710	285.830	n/a		n/a		n/a		n/a		n/a		n/a	
14	0.955	0.860	285.110	285.984	286.100	n/a		n/a		n/a		n/a		n/a		n/a	
Stream			285.110	285.984	286.100	n/a		n/a		n/a		n/a		n/a		n/a	
15	0.150		285.380	285.657	285.490	n/a		n/a		n/a		n/a		n/a		n/a	
Outside			285.380	285.657	285.490	n/a		n/a		n/a		n/a		n/a		n/a	
16	0.687		285.380	286.034	286.150	n/a		n/a		n/a		n/a		n/a		n/a	
Outside			285.380	286.034	286.150	n/a		n/a		n/a		n/a		n/a		n/a	
17	1.38	1.5															
Outside																	
18	1.64	1.24															
Outside																	
19	1.45	1.43															
Outside																	

Table G2: Summary of Groundwater Elevations
Mini-pizometers (manual measurements)
St Marys Flamborough Quarry

Piezometer	Stick up (m)	Depth BGS (m)	Ground Elevation (masl)	Top Elevation (original) (masl)	Top Elevation (following resurvey - June 2007) (masl)	19-Nov-04		8-Dec-04		20-Jan-05		28-Feb-05		24-Mar-05		15-Apr-05	
						Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)	Water Level BTC (m)	Water Elevation (masl)
1	0.670	0.750	285.060	285.710	285.700			0.740	284.970	Frozen	Frozen	0.660	285.050	0.640	285.070	0.600	285.110
Outside			285.060	285.710	285.700			dry	dry	nd		nd		dry	Dry	dry	Dry
2	1.420	0.910	284.570	286.940	286.060			1.520	285.420	Frozen	Frozen	0.810	286.130	1.080	285.860	1.065	285.875
Stream			284.570	286.940	286.060			1.310	285.630	Frozen	Frozen	0.800	286.140	1.100	285.840	1.085	285.855
3	0.740	0.830	285.610	286.345	n/a	nd		nd		nd		nd		0.720	285.625	nd	
Outside			285.610	286.345	n/a	nd		nd		nd		nd		Frozen	Frozen	nd	
4	1.085	1.085	285.640	286.727	n/a	nd		nd		nd		nd		1.090	285.637	nd	
Outside			285.640	286.727	n/a	nd		nd		nd		nd		Frozen	Frozen	nd	
5	0.842	0.728	286.220	287.045	287.160			nd		Frozen	Frozen	nd		0.830	286.215	0.800	286.245
Outside			286.220	287.045	287.160			nd		nd		nd		Frozen	Frozen	dry	Dry
6	0.880	1.300	286.300	287.053	287.190			nd		Frozen	Frozen	nd		Frozen	Frozen	0.840	286.213
Outside			286.300	287.053	287.190			nd		nd		nd		Frozen	Frozen	0.870	286.183
7	1.010	1.490	280.550	281.858	281.730			nd		Frozen	Frozen	Frozen	Frozen	0.890	280.968	0.860	280.998
Stream			280.550	281.858	281.730			nd		Frozen	Frozen	Frozen	Frozen	0.890	280.968	0.840	281.018
8	1.050	2.095	280.400	281.966	281.850			nd		Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	0.880	281.086
Stream			280.400	281.966	281.850			nd		Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	0.890	281.076
9	0.610	1.205	281.580	282.167	282.300	1.780	280.387	1.100	281.067	nd		nd		0.620	281.547	0.550	281.617
Outside			281.580	282.167	282.300			dry	dry	nd		nd		Frozen	Frozen	0.610	281.557
10	0.940	0.875	280.890	281.740	281.890	1.935	279.805	1.250	280.490	nd		nd		0.900	280.840	0.870	280.870
Outside			280.890	281.740	281.890			0.920	280.820	nd		nd		Frozen	Frozen	0.890	280.850
11	1.330	0.485	280.550	281.694	282.010	1.795	279.899	1.375	280.319	nd		nd		1.140	280.554	1.080	280.614
Stream			280.550	281.694	282.010	1.250	280.444	1.150	280.544	nd		nd		1.140	280.554	1.090	280.604
12	0.650	1.165	285.100	285.838	285.960	2.070	283.768	0.570	285.268	nd		nd		Frozen	Frozen	0.440	285.398
Outside			285.100	285.838	285.960			0.770	285.068	nd		nd		Frozen	Frozen	0.680	285.158
13	0.860	0.955	285.150	285.710	285.830	2.090	283.620	1.010	284.700	nd		nd		0.400	285.310	0.370	285.340
Stream			285.150	285.710	285.830			0.620	285.090	nd		nd		Frozen	Frozen	0.530	285.180
14	0.955	0.860	285.110	285.984	286.100	2.090	283.894	1.290	284.694	nd		nd		Frozen	Frozen	0.580	285.404
Stream			285.110	285.984	286.100	0.870	285.114	0.790	285.194	nd		nd		Frozen	Frozen	0.730	285.254
15	0.150		285.380	285.657	285.490	n/a		n/a		n/a		n/a		n/a		n/a	
Outside			285.380	285.657	285.490	n/a		n/a		n/a		n/a		n/a		n/a	
16	0.687		285.380	286.034	286.150	n/a		n/a		n/a		n/a		n/a		n/a	
Outside			285.380	286.034	286.150	n/a		n/a		n/a		n/a		n/a		n/a	
17	1.38	1.5															
Outside																	
18	1.64	1.24															
Outside																	
19	1.45	1.43															
Outside																	

Table G2: Summary of Groundwater Elevations
Mini-pizometers (manual measurements)
St Marys Flamborough Quarry

Piezometer	Stick up (m)	Depth BGS (m)	Ground Elevation (masl)	Top Elevation (original) (masl)	Top Elevation (following resurvey - June 2007) (masl)	19-May-05		17-Jun-05		14-Jul-05		19-Aug-05		28-Sep-05		20-Oct-05	
						Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)
1	0.670	0.750	285.060	285.710	285.700	0.770	284.940	0.880	284.830	1.200	284.510	1.200	284.510	1.140	284.570	1.075	284.635
Outside			285.060	285.710	285.700	dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	nd	
2	1.420	0.910	284.570	286.940	286.060	1.220	285.720	1.260	285.680	1.340	285.600	1.300	285.640	1.350	285.590	1.360	285.580
Stream			284.570	286.940	286.060	1.250	285.690	1.280	285.660	1.320	285.620	1.300	285.640	1.380	285.560	1.360	285.580
3	0.740	0.830	285.610	286.345	n/a	nd		nd		nd		nd		nd		nd	
Outside			285.610	286.345	n/a	nd		nd		nd		nd		nd		nd	
4	1.085	1.085	285.640	286.727	n/a	nd		nd		nd		nd		nd		nd	
Outside			285.640	286.727	n/a	nd		nd		nd		nd		nd		nd	
5	0.842	0.728	286.220	287.045	287.160	0.830	286.215	0.840	286.205	1.110	285.935	1.190	285.855	1.270	285.775	nd	
Outside			286.220	287.045	287.160	dry	Dry	Dry	Dry	Dry	Dry	nd		nd		nd	
6	0.880	1.300	286.300	287.053	287.190	0.860	286.193	0.870	286.183	1.180	285.873	1.240	285.813	1.300	285.753	nd	
Outside			286.300	287.053	287.190	dry	Dry	Dry	Dry	Dry	Dry	nd		nd		nd	
7	1.010	1.490	280.550	281.858	281.730	0.890	280.968	0.930	280.928	1.250	280.608	1.330	280.528	1.360	280.498	1.420	280.438
Stream			280.550	281.858	281.730	0.890	280.968	0.930	280.928	Dry	Dry	dry	Dry	Dry	Dry	nd	
8	1.050	2.095	280.400	281.966	281.850	0.930	281.036	0.960	281.006	1.300	280.666	1.360	280.606	1.400	280.566	1.460	280.506
Stream			280.400	281.966	281.850	0.940	281.026	0.980	280.986	Dry	Dry	Dry	Dry	Dry	Dry	nd	
9	0.610	1.205	281.580	282.167	282.300	0.580	281.587	0.620	281.547	0.870	281.297	1.110	281.057	1.200	280.967	1.310	280.857
Outside			281.580	282.167	282.300	0.600	281.567	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	nd	
10	0.940	0.875	280.890	281.740	281.890	0.880	280.860	0.900	280.840	1.020	280.720	1.050	280.690	1.100	280.640	1.170	280.570
Outside			280.890	281.740	281.890	0.900	280.840	0.920	280.820	Dry	Dry	Dry	Dry	Dry	Dry	nd	
11	1.330	0.485	280.550	281.694	282.010	1.130	280.564	1.160	280.534	1.250	280.444	1.320	280.374	1.350	280.344	1.420	280.274
Stream			280.550	281.694	282.010	1.140	280.554	1.170	280.524	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
12	0.650	1.165	285.100	285.838	285.960	0.500	285.338	0.600	285.238	0.920	284.918	1.100	284.738	1.230	284.608	1.140	284.698
Outside			285.100	285.838	285.960	0.740	285.098	0.790	285.048	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
13	0.860	0.955	285.150	285.710	285.830	0.420	285.290	0.510	285.200	1.010	284.700	1.110	284.600	1.100	284.610	0.935	284.775
Stream			285.150	285.710	285.830	0.570	285.140	0.590	285.120	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
14	0.955	0.860	285.110	285.984	286.100	0.670	285.314	0.720	285.264	1.090	284.894	1.470	284.514	1.350	284.634	1.240	284.744
Stream			285.110	285.984	286.100	0.770	285.214	0.800	285.184	Dry	Dry	Dry	Dry	nd		nd	
15	0.150		285.380	285.657	285.490	0.020	285.637	0.220	285.437	0.205	285.452	0.200	285.457	0.030	285.627	0.035	285.622
Outside			285.380	285.657	285.490	0.070	285.587	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
16	0.687		285.380	286.034	286.150	1.010	285.024	0.850	285.184	1.500	284.534	1.690	284.344	1.680	284.354	1.510	284.524
Outside			285.380	286.034	286.150	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
17	1.38	1.5															
Outside																	
18	1.64	1.24															
Outside																	
19	1.45	1.43															
Outside																	

Table G2: Summary of Groundwater Elevations
Mini-pizometers (manual measurements)
St Marys Flamborough Quarry

Piezometer	Stick up (m)	Depth BGS (m)	Ground Elevation (masl)	Top Elevation (original) (masl)	Top Elevation (following resurvey - June 2007) (masl)	18-Nov-05		16-Dec-05		20-Jan-06		17-Feb-06		16-Mar-06		20-Apr-06	
						Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)
1	0.670	0.750	285.060	285.710	285.700	1.370	284.340	0.950	284.760	0.610	285.100	0.570	285.140	0.825	284.885	0.700	285.010
Outside			285.060	285.710	285.700	Dry	Dry	Dry	Dry	Dry	Dry	0.565	285.145	0.850	284.860	Dry	Dry
2	1.420	0.910	284.570	286.940	286.060	1.320	285.620	Frozen	Frozen	1.040	285.900	0.970	285.970	0.350	286.590	1.145	285.795
Stream			284.570	286.940	286.060	1.340	285.600	Frozen	Frozen	1.080	285.860	1.000	285.940	0.415	286.525	1.700	285.240
3	0.740	0.830	285.610	286.345	n/a	nd		nd		nd		nd		nd		nd	
Outside			285.610	286.345	n/a	nd		nd		nd		nd		nd		nd	
4	1.085	1.085	285.640	286.727	n/a	nd		nd		nd		*0.800*	*285.927*	nd		nd	
Outside			285.640	286.727	n/a	nd		nd		nd		*0.840*	*285.887*	nd		nd	
5	0.842	0.728	286.220	287.045	287.160	0.900	286.145	0.900	286.145	0.830	286.215	0.780	286.265	0.780	286.265	nd	
Outside			286.220	287.045	287.160	Dry	Dry	Dry	Dry	Dry	Dry	0.810	286.235	0.820	286.225	nd	
6	0.880	1.300	286.300	287.053	287.190	0.870	286.183	0.860	286.193	0.860	286.193	nd		0.810	286.243	nd	
Outside			286.300	287.053	287.190	Dry	Dry	Dry	Dry	Dry	Dry	nd		0.840	286.213	nd	
7	1.010	1.490	280.550	281.858	281.730	0.950	280.908	Frozen	Frozen	1.870	279.988	0.790	281.068	0.840	281.018	0.890	280.968
Stream			280.550	281.858	281.730	0.960	280.898	Frozen	Frozen	Frozen	Frozen	0.800	281.058	0.850	281.008	0.900	280.958
8	1.050	2.095	280.400	281.966	281.850	1.010	280.956	Frozen	Frozen	0.950	281.016	0.860	281.106	0.920	281.046	0.950	281.016
Stream			280.400	281.966	281.850	1.010	280.956	Frozen	Frozen	Frozen	Frozen	0.830	281.136	0.890	281.076	0.950	281.016
9	0.610	1.205	281.580	282.167	282.300	0.890	281.277	0.950	281.217	0.630	281.537	Frozen	Frozen	0.610	281.557	nd	
Outside			281.580	282.167	282.300	Dry	Dry	Dry	Dry	Dry	Dry	nd		Dry	Dry	nd	
10	0.940	0.875	280.890	281.740	281.890	0.960	280.780	Frozen	Frozen	0.920	280.820	Frozen	Frozen	0.920	280.820	nd	
Outside			280.890	281.740	281.890	Dry	Dry	Dry	Dry	0.930	280.810	nd		Dry	Dry	nd	
11	1.330	0.485	280.550	281.694	282.010	1.190	280.504	1.190	280.504	1.120	280.574	Frozen	Frozen	1.090	280.604	nd	
Stream			280.550	281.694	282.010	1.190	280.504	1.200	280.494	1.120	280.574	nd		1.090	280.604	nd	
12	0.650	1.165	285.100	285.838	285.960	0.820	285.018	Frozen	Frozen	0.610	285.228	Frozen	Frozen	0.510	285.328	0.520	285.318
Outside			285.100	285.838	285.960	0.780	285.058	Frozen	Frozen	Frozen	Frozen	nd		0.590	285.248	0.710	285.128
13	0.860	0.955	285.150	285.710	285.830	Frozen	Frozen	Frozen	Frozen	0.370	285.340	Frozen	Frozen	0.320	285.390	0.430	285.280
Stream			285.150	285.710	285.830	0.500	285.210	Frozen	Frozen	0.530	285.180	nd		0.460	285.250	0.560	285.150
14	0.955	0.860	285.110	285.984	286.100	0.830	285.154	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	0.570	285.414	0.680	285.304
Stream			285.110	285.984	286.100	0.830	285.154	Frozen	Frozen	Frozen	Frozen	nd		Frozen	Frozen	0.770	285.214
15	0.150		285.380	285.657	285.490	0.030	285.627	0.030	285.627	0.090	285.567	Frozen	Frozen	0.055	285.602	0.130	285.527
Outside			285.380	285.657	285.490	Dry	Dry	Dry	Dry	Dry	Dry	nd		0.180	285.477	0.230	285.427
16	0.687		285.380	286.034	286.150	0.890	285.144	0.820	285.214	0.815	285.219	Frozen	Frozen	0.510	285.524	0.695	285.339
Outside			285.380	286.034	286.150	Dry	Dry	Frozen	Frozen	0.690	285.344	Frozen	Frozen	0.690	285.344	Dry	Dry
17	1.38	1.5															
Outside																	
18	1.64	1.24															
Outside																	
19	1.45	1.43															
Outside																	

Table G2: Summary of Groundwater Elevations
Mini-pizometers (manual measurements)
St Marys Flamborough Quarry

Piezometer	Stick up (m)	Depth BGS (m)	Ground Elevation (masl)	Top Elevation (original) (masl)	Top Elevation (following resurvey - June 2007) (masl)	18-May-06		16-Jun-06		26-Jul-06		31-Aug-06		22-Sep-06		20-Oct-06	
						Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)
1	0.670	0.750	285.060	285.710	285.700	0.700	285.010	0.980	284.730	0.980	284.730	1.060	284.650	0.985	284.725	0.710	285.000
Outside			285.060	285.710	285.700	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2	1.420	0.910	284.570	286.940	286.060	1.160	285.780	1.260	285.680	1.260	285.680	1.270	285.670	1.285	285.655	1.170	285.770
Stream			284.570	286.940	286.060	1.190	285.750	1.280	285.660	1.270	285.670	1.280	285.660	1.310	285.630	1.200	285.740
3	0.740	0.830	285.610	286.345	n/a	nd		nd		nd		nd		nd		nd	
Outside			285.610	286.345	n/a	nd		nd		nd		nd		nd		nd	
4	1.085	1.085	285.640	286.727	n/a	nd		nd		nd		nd		nd		nd	
Outside			285.640	286.727	n/a	nd		nd		nd		nd		nd		nd	
5	0.842	0.728	286.220	287.045	287.160	0.830	286.215	0.880	286.165	1.200	285.845	1.260	285.785	nd		0.840	286.205
Outside			286.220	287.045	287.160	nd		Dry	Dry	Dry	Dry	nd		nd		Dry	Dry
6	0.880	1.300	286.300	287.053	287.190	0.850	286.203	0.910	286.143	1.780	285.273	1.290	285.763	nd		0.880	286.173
Outside			286.300	287.053	287.190	nd		Dry	Dry	Dry	Dry	nd		nd		Dry	Dry
7	1.010	1.490	280.550	281.858	281.730	0.840	281.018	0.950	280.908	0.970	280.888	1.360	280.498	nd		0.880	280.978
Stream			280.550	281.858	281.730	0.850	281.008	0.960	280.898	0.970	280.888	Dry	Dry	nd		0.890	280.968
8	1.050	2.095	280.400	281.966	281.850	0.880	281.086	1.000	280.966	1.010	280.956	1.410	280.556	nd		0.935	281.031
Stream			280.400	281.966	281.850	0.890	281.076	1.000	280.966	1.020	280.946	Dry	Dry	nd		0.950	281.016
9	0.610	1.205	281.580	282.167	282.300	0.610	281.557	0.730	281.437	0.830	281.337	1.010	281.157	nd		0.720	281.447
Outside			281.580	282.167	282.300	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	nd		Dry	Dry
10	0.940	0.875	280.890	281.740	281.890	0.920	280.820	0.950	280.790	0.970	280.770	1.110	280.630	nd		0.950	280.790
Outside			280.890	281.740	281.890	0.940	280.800	0.950	280.790	Dry	Dry	Dry	Dry	nd		0.950	280.790
11	1.330	0.485	280.550	281.694	282.010	1.090	280.604	1.180	280.514	1.180	280.514	1.305	280.389	nd		1.100	280.594
Stream			280.550	281.694	282.010	1.090	280.604	1.180	280.514	1.180	280.514	Dry	Dry	nd		1.140	280.554
12	0.650	1.165	285.100	285.838	285.960	0.460	285.378	0.560	285.278	0.670	285.168	1.610	284.228	nd		0.600	285.238
Outside			285.100	285.838	285.960	0.660	285.178	0.780	285.058	Dry	Dry	Dry	Dry	nd		0.680	285.158
13	0.860	0.955	285.150	285.710	285.830	nd		0.580	285.130	0.700	285.010	0.850	284.860	nd		0.370	285.340
Stream			285.150	285.710	285.830	nd		0.620	285.090	Dry	Dry	Dry	Dry	nd		0.540	285.170
14	0.955	0.860	285.110	285.984	286.100	0.650	285.334	0.750	285.234	0.870	285.114	1.200	284.784	nd		0.700	285.284
Stream			285.110	285.984	286.100	0.740	285.244	0.840	285.144	0.820	285.164	Dry	Dry	nd		0.770	285.214
15	0.150		285.380	285.657	285.490	nd		0.070	285.587	0.040	285.617	nd		nd		0.080	285.577
Outside			285.380	285.657	285.490	nd		nd		Dry	Dry	nd		nd		0.080	285.577
16	0.687		285.380	286.034	286.150	0.610	285.424	1.020	285.014	1.220	284.814	nd		nd		0.640	285.394
Outside			285.380	286.034	286.150	0.690	285.344	nd		Dry	Dry	nd		nd		0.580	285.454
17	1.38	1.5															
Outside																	
18	1.64	1.24															
Outside																	
19	1.45	1.43															
Outside																	

Table G2: Summary of Groundwater Elevations
Mini-pizometers (manual measurements)
St Marys Flamborough Quarry

Piezometer	Stick up (m)	Depth BGS (m)	Ground Elevation (masl)	Top Elevation (original) (masl)	Top Elevation (following resurvey - June 2007) (masl)	25-Oct-06		27-Nov-06		18-Dec-06		19-Jan-07		23-Feb-07		20-Mar-07	
						Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)
1	0.670	0.750	285.060	285.710	285.700	0.760	284.950	0.520	285.190	0.670	285.040	0.540	285.170	0.735	284.975	0.690	285.020
Outside			285.060	285.710	285.700	Dry	Dry	nd		0.560	285.150	Frozen	Frozen	Dry	Dry	Frozen	Frozen
2	1.420	0.910	284.570	286.940	286.060	1.190	285.750	0.955	285.985	0.985	285.955	0.995	285.945	Frozen	Frozen	Frozen	Frozen
Stream			284.570	286.940	286.060	1.210	285.730	nd		1.000	285.940	1.020	285.920	Frozen	Frozen	1.130	285.810
3	0.740	0.830	285.610	286.345	n/a	nd		nd		nd		nd		nd		nd	
Outside			285.610	286.345	n/a	nd		nd		nd		nd		nd		nd	
4	1.085	1.085	285.640	286.727	n/a	nd		nd		nd		nd		nd		nd	
Outside			285.640	286.727	n/a	nd		nd		nd		nd		nd		nd	
5	0.842	0.728	286.220	287.045	287.160	0.860	286.185	0.845	286.200	0.840	286.205	0.825	286.220	Frozen	Frozen	0.800	286.245
Outside			286.220	287.045	287.160	Dry	Dry	nd		Dry	Dry	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
6	0.880	1.300	286.300	287.053	287.190	0.890	286.163	0.880	286.173	0.870	286.183	0.855	286.198	Frozen	Frozen	0.825	286.228
Outside			286.300	287.053	287.190	Dry	Dry	nd		Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.850	286.203
7	1.010	1.490	280.550	281.858	281.730	0.915	280.943	0.890	280.968	0.870	280.988	Frozen	Frozen	Frozen	Frozen	0.880	280.978
Stream			280.550	281.858	281.730	0.917	280.941	nd		0.880	280.978	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
8	1.050	2.095	280.400	281.966	281.850	0.958	281.008	0.970	280.996	0.920	281.046	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
Stream			280.400	281.966	281.850	0.955	281.011	nd		0.920	281.046	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
9	0.610	1.205	281.580	282.167	282.300	0.710	281.457	0.610	281.557	0.590	281.577	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
Outside			281.580	282.167	282.300	Dry	Dry	nd		0.640	281.527	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
10	0.940	0.875	280.890	281.740	281.890	0.945	280.795	0.930	280.810	0.920	280.820	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
Outside			280.890	281.740	281.890	Dry	Dry	nd		0.940	280.800	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
11	1.330	0.485	280.550	281.694	282.010	1.130	280.564	1.120	280.574	1.100	280.594	1.100	280.594	Frozen	Frozen	1.100	280.594
Stream			280.550	281.694	282.010	1.170	280.524	nd		1.120	280.574	1.120	280.574	1.140	280.554	1.130	280.564
12	0.650	1.165	285.100	285.838	285.960	0.590	285.248	0.520	285.318	0.495	285.343	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
Outside			285.100	285.838	285.960	0.710	285.128	nd		0.685	285.153	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
13	0.860	0.955	285.150	285.710	285.830	0.410	285.300	0.385	285.325	0.385	285.325	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
Stream			285.150	285.710	285.830	0.570	285.140	nd		0.550	285.160	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
14	0.955	0.860	285.110	285.984	286.100	0.690	285.294	0.680	285.304	0.650	285.334	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
Stream			285.110	285.984	286.100	0.810	285.174	nd		0.670	285.314	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
15	0.150		285.380	285.657	285.490	0.140	285.517	0.045	285.612	0.080	285.577	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
Outside			285.380	285.657	285.490	nd	nd	nd		0.080	285.577	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
16	0.687		285.380	286.034	286.150	0.690	285.344	0.660	285.374	0.640	285.394	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
Outside			285.380	286.034	286.150	Dry	Dry	nd		Dry	Dry	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
17	1.38	1.5															
Outside																	
18	1.64	1.24															
Outside																	
19	1.45	1.43															
Outside																	

Table G2: Summary of Groundwater Elevations
Mini-pizometers (manual measurements)
St Marys Flamborough Quarry

Piezometer	Stick up (m)	Depth BGS (m)	Ground Elevation (masl)	Top Elevation (original) (masl)	Top Elevation (following resurvey - June 2007) (masl)	19-Apr-07		14-May-07		26-Jun-07		23-Jul-07		20-Sep-07		22-Oct-07	
						Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)
1	0.670	0.750	285.060	285.710	285.700	0.625	285.085	0.830	284.880	1.220	284.480	1.170	284.530	1.260	284.440	1.380	284.320
Outside			285.060	285.710	285.700	Dry	Dry	Dry	Dry	1.220	284.480	Dry	Dry	Dry	Dry	1.360	284.340
2	1.420	0.910	284.570	286.940	286.060	1.035	285.905	1.190	285.750	Dry	Dry	1.250	284.810	1.310	284.750	1.300	284.760
Stream			284.570	286.940	286.060	1.060	285.880	1.200	285.740	Dry	Dry	1.260	284.800	1.290	284.770	Dry	Dry
3	0.740	0.830	285.610	286.345	n/a	nd		nd		nd		nd		nd		nd	
Outside			285.610	286.345	n/a	nd		nd		nd		nd		nd		nd	
4	1.085	1.085	285.640	286.727	n/a	nd		nd		nd		nd		nd		nd	
Outside			285.640	286.727	n/a	nd		nd		nd		nd		nd		nd	
5	0.842	0.728	286.220	287.045	287.160	0.820	286.225	0.840	286.205	0.850	286.310	1.310	285.850	1.920	285.240	Dry	Dry
Outside			286.220	287.045	287.160	0.840	286.205	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
6	0.880	1.300	286.300	287.053	287.190	0.845	286.208	0.875	286.178	0.920	286.270	1.360	285.830	Dry	Dry	Dry	Dry
Outside			286.300	287.053	287.190	0.860	286.193	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
7	1.010	1.490	280.550	281.858	281.730	0.870	280.988	0.910	280.948	0.990	280.740	1.350	280.380	1.720	280.010	1.810	279.920
Stream			280.550	281.858	281.730	0.855	281.003	0.920	280.938	0.990	280.740	Dry	Dry	Dry	Dry	Dry	Dry
8	1.050	2.095	280.400	281.966	281.850	0.940	281.026	0.935	281.031	0.900	280.950	1.385	280.465	Dry	Dry	Dry	Dry
Stream			280.400	281.966	281.850	0.900	281.066	0.970	280.996	1.040	280.810	Dry	Dry	Dry	Dry	Dry	Dry
9	0.610	1.205	281.580	282.167	282.300	0.620	281.547	0.640	281.527	0.825	281.475	1.125	281.175	Dry	Dry	Dry	Dry
Outside			281.580	282.167	282.300	0.640	281.527	0.650	281.517	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
10	0.940	0.875	280.890	281.740	281.890	0.902	280.838	0.930	280.810	0.975	280.915	1.160	280.730	1.800	280.090	1.790	280.100
Outside			280.890	281.740	281.890	0.980	280.760	0.930	280.810	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
11	1.330	0.485	280.550	281.694	282.010	1.080	280.614	1.140	280.554	1.180	280.830	1.360	280.650	1.870	280.140	Dry	Dry
Stream			280.550	281.694	282.010	1.110	280.584	1.150	280.544	1.200	280.810	Dry	Dry	Dry	Dry	Dry	Dry
12	0.650	1.165	285.100	285.838	285.960	0.610	285.228	0.485	285.353	0.570	285.390	0.845	285.115	1.450	284.510	1.615	284.345
Outside			285.100	285.838	285.960	0.740	285.098	0.745	285.093	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
13	0.860	0.955	285.150	285.710	285.830	0.560	285.150	0.460	285.250	0.760	285.070	1.220	284.610	nd		1.640	284.190
Stream			285.150	285.710	285.830	0.560	285.150	0.580	285.130	Dry	Dry	Dry	Dry	nd		Dry	Dry
14	0.955	0.860	285.110	285.984	286.100	0.620	285.364	0.680	285.304	0.830	285.270	1.310	284.790	Dry	Dry	1.915	284.185
Stream			285.110	285.984	286.100	0.740	285.244	0.790	285.194	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
15	0.150		285.380	285.657	285.490	0.080	285.577	0.080	285.577	0.040	285.450	1.190	284.300	Dry	Dry	Dry	Dry
Outside			285.380	285.657	285.490	0.210	285.447	0.250	285.407	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
16	0.687		285.380	286.034	286.150	0.625	285.409	0.770	285.264	1.320	284.830	1.800	284.350	Dry	Dry	Dry	Dry
Outside			285.380	286.034	286.150	0.870	285.164	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
17	1.38	1.5															
Outside																	
18	1.64	1.24															
Outside																	
19	1.45	1.43															
Outside																	

Table G2: Summary of Groundwater Elevations
Mini-pizometers (manual measurements)
St Marys Flamborough Quarry

Piezometer	Stick up (m)	Depth BGS (m)	Ground Elevation (masl)	Top Elevation (original) (masl)	Top Elevation (following resurvey - June 2007) (masl)	19-Nov-07		22-Jan-08		25-Mar-08		23-Apr-08		27-May-08		25-Jun-08	
						Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)
1	0.670	0.750	285.060	285.710	285.700	1.300	284.400	0.660	285.040	nd		Dry	Dry	0.830	284.870	0.920	284.780
Outside			285.060	285.710	285.700	Dry	Dry	Frozen	Frozen	nd		Dry	Dry	Dry	Dry	Dry	Dry
2	1.420	0.910	284.570	286.940	286.060	1.410	284.650	Frozen	Frozen	nd		1.090	284.970	1.240	1.240	1.300	284.760
Stream			284.570	286.940	286.060	Frozen	Frozen	Frozen	Frozen	nd		1.110	284.950	1.280	284.780	1.310	284.750
3	0.740	0.830	285.610	286.345	n/a	nd		nd		nd		nd		nd	nd	nd	nd
Outside			285.610	286.345	n/a	nd		nd		nd		nd		nd	nd	nd	nd
4	1.085	1.085	285.640	286.727	n/a	nd		nd		nd		nd		nd	nd	nd	nd
Outside			285.640	286.727	n/a	nd		nd		nd		nd		nd	nd	nd	nd
5	0.842	0.728	286.220	287.045	287.160	Dry	Dry	Frozen	Frozen	nd		0.930	286.230	0.870	286.290	0.880	286.280
Outside			286.220	287.045	287.160	Dry	Dry	Frozen	Frozen	nd		0.870	286.290	Dry	Dry	Dry	Dry
6	0.880	1.300	286.300	287.053	287.190	Dry	Dry	Frozen	Frozen	nd		0.94	286.250	0.900	286.290	0.900	286.290
Outside			286.300	287.053	287.190	Dry	Dry	Frozen	Frozen	nd		0.91	286.280	Dry	Dry	Dry	Dry
7	1.010	1.490	280.550	281.858	281.730	1.820	279.910	Frozen	Frozen	0.910	280.820	0.840	280.890	0.900	280.830	0.940	280.790
Stream			280.550	281.858	281.730	Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.840	280.890	0.910	280.820	0.940	280.790
8	1.050	2.095	280.400	281.966	281.850	Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.900	280.950	0.960	280.890	0.990	280.860
Stream			280.400	281.966	281.850	Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.890	280.960	0.950	280.900	0.990	280.860
9	0.610	1.205	281.580	282.167	282.300	Dry	Dry	1.130	281.170	0.710	281.590	0.640	281.660	0.660	281.640	0.750	281.550
Outside			281.580	282.167	282.300	Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.680	281.620	Dry	Dry	Dry	Dry
10	0.940	0.875	280.890	281.740	281.890	1.810	280.080	Frozen	Frozen	Frozen	Frozen	0.940	280.950	0.950	280.940	0.970	280.920
Outside			280.890	281.740	281.890	Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.880	281.010	0.970	280.920	Dry	Dry
11	1.330	0.485	280.550	281.694	282.010	Dry	Dry	1.190	280.820	Frozen	Frozen	1.080	280.930	1.150	280.860	1.170	280.840
Stream			280.550	281.694	282.010	Dry	Dry	Frozen	Frozen	Frozen	Frozen	1.090	280.920	1.150	280.860	1.170	280.840
12	0.650	1.165	285.100	285.838	285.960	1.630	284.330	0.980	284.980	Frozen	Frozen	0.520	285.440	1.030	284.930	0.530	285.430
Outside			285.100	285.838	285.960	Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.680	285.280	0.790	285.170	0.750	285.210
13	0.860	0.955	285.150	285.710	285.830	1.545	284.285	Frozen	Frozen	Frozen	Frozen	0.430	285.400	1.040	284.790	0.530	285.300
Stream			285.150	285.710	285.830	Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.550	285.280	0.610	285.220	0.600	285.230
14	0.955	0.860	285.110	285.984	286.100	1.840	284.260	Frozen	Frozen	Frozen	Frozen	0.620	285.480	0.710	285.390	0.750	285.350
Stream			285.110	285.984	286.100	Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.770	285.330	0.820	285.280	0.820	285.280
15	0.150		285.380	285.657	285.490	Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.080	285.410	0.060	285.430	0.020	285.470
Outside			285.380	285.657	285.490	Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.210	285.280	0.200	285.290	0.210	285.280
16	0.687		285.380	286.034	286.150	Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.590	285.560	0.820	285.330	0.920	285.230
Outside			285.380	286.034	286.150	Dry	Dry	Frozen	Frozen	Frozen	Frozen	0.510	285.640	Dry	Dry	Dry	Dry
17	1.38	1.5															
Outside																	
18	1.64	1.24															
Outside																	
19	1.45	1.43															
Outside																	

Table G2: Summary of Groundwater Elevations
Mini-pizometers (manual measurements)
St Marys Flamborough Quarry

Piezometer	Stick up (m)	Depth BGS (m)	Ground Elevation (masl)	Top Elevation (original) (masl)	Top Elevation (following resurvey - June 2007) (masl)	21-Jul-08		22-Jul-08		23-Jul-08		24-Jul-08		25-Jul-08		26-Jul-08	
						Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)
1	0.670	0.750	285.060	285.710	285.700	1.220	284.480	1.240	284.460	0.980	284.720	0.960	284.740	0.960	284.740	0.930	284.770
Outside			285.060	285.710	285.700	1.240	284.460	1.260	284.440	0.990	284.710	0.980	284.720	0.975	284.725	0.950	284.750
2	1.420	0.910	284.570	286.940	286.060	0.830	285.230	0.820	285.240	0.700	285.360	0.580	285.480	0.560	285.500	0.530	285.530
Stream			284.570	286.940	286.060	Dry	Dry	Dry	Dry	0.560	285.500	0.540	285.520	0.540	285.520	0.500	285.560
3	0.740	0.830	285.610	286.345	n/a	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Outside			285.610	286.345	n/a	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	1.085	1.085	285.640	286.727	n/a	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Outside			285.640	286.727	n/a	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	0.842	0.728	286.220	287.045	287.160	0.850	286.310	0.850	286.310	0.830	286.330	0.840	286.320	0.850	286.310	0.850	286.310
Outside			286.220	287.045	287.160	0.790	286.370	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
6	0.880	1.300	286.300	287.053	287.190	0.880	286.310	0.880	286.310	0.850	286.340	0.870	286.320	0.880	286.310	0.880	286.310
Outside			286.300	287.053	287.190	0.850	286.340	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
7	1.010	1.490	280.550	281.858	281.730	0.870	280.860	0.900	280.830	0.780	280.950	0.860	280.870	0.905	280.825	0.930	280.800
Stream			280.550	281.858	281.730	0.870	280.860	0.900	280.830	0.780	280.950	0.850	280.880	0.900	280.830	0.920	280.810
8	1.050	2.095	280.400	281.966	281.850	0.900	280.950	0.950	280.900	0.820	281.030	0.900	280.950	0.940	280.910	0.950	280.900
Stream			280.400	281.966	281.850	0.900	280.950	0.950	280.900	0.820	281.030	0.910	280.940	0.940	280.910	0.970	280.880
9	0.610	1.205	281.580	282.167	282.300	nd	nd	0.755	281.545	0.680	281.620	0.740	281.560	0.764	281.536	0.780	281.520
Outside			281.580	282.167	282.300	nd	nd	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
10	0.940	0.875	280.890	281.740	281.890	nd	nd	0.950	280.940	0.880	281.010	0.940	280.950	0.944	280.946	0.950	280.940
Outside			280.890	281.740	281.890	nd	nd	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
11	1.330	0.485	280.550	281.694	282.010	nd	nd	1.140	280.870	1.030	280.980	1.100	280.910	1.130	280.880	1.150	280.860
Stream			280.550	281.694	282.010	nd	nd	1.145	280.865	1.030	280.980	1.110	280.900	1.140	280.870	1.160	280.850
12	0.650	1.165	285.100	285.838	285.960	0.490	285.470	0.500	285.460	0.490	285.470	0.500	285.460	0.508	285.452	0.520	285.440
Outside			285.100	285.838	285.960	0.730	285.230	0.760	285.200	0.690	285.270	0.700	285.260	0.720	285.240	0.700	285.260
13	0.860	0.955	285.150	285.710	285.830	0.480	285.350	0.560	285.270	0.370	285.460	0.460	285.370	0.510	285.320	0.510	285.320
Stream			285.150	285.710	285.830	0.590	285.240	0.590	285.240	0.550	285.280	0.565	285.265	0.630	285.200	0.570	285.260
14	0.955	0.860	285.110	285.984	286.100	0.730	285.370	0.745	285.355	0.700	285.400	0.700	285.400	0.710	285.390	0.710	285.390
Stream			285.110	285.984	286.100	0.820	285.280	0.830	285.270	0.780	285.320	0.800	285.300	0.810	285.290	0.820	285.280
15	0.150		285.380	285.657	285.490	0.110	285.380	0.170	285.320	0.650	284.840	0.080	285.410	0.130	285.360	0.220	285.270
Outside			285.380	285.657	285.490	Dry	Dry	Dry	Dry	0.100	285.390	0.090	285.400	Dry	Dry	Dry	Dry
16	0.687		285.380	286.034	286.150	0.830	285.320	0.860	285.290	0.720	285.430	0.720	285.430	0.773	285.377	0.835	285.315
Outside			285.380	286.034	286.150	Dry	Dry	Dry	Dry	0.690	285.460	0.710	285.440	Dry	Dry	Dry	Dry
17	1.38	1.5															
Outside																	
18	1.64	1.24															
Outside																	
19	1.45	1.43															
Outside																	

Table G2: Summary of Groundwater Elevations
Mini-pizometers (manual measurements)
St Marys Flamborough Quarry

Piezometer	Stick up (m)	Depth BGS (m)	Ground Elevation (masl)	Top Elevation (original) (masl)	Top Elevation (following resurvey - June 2007) (masl)	27-Jul-08		28-Jul-08		29-Jul-08		30-Jul-08		07-Aug-08		09-Sep-08	
						Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)
1	0.670	0.750	285.060	285.710	285.700	0.930	284.770	1.010	284.690	1.100	284.600	1.175	284.525	nd	nd	0.870	284.830
Outside			285.060	285.710	285.700	0.950	284.750	1.020	284.680	1.115	284.585	1.180	284.520	nd	nd	Dry	Dry
2	1.420	0.910	284.570	286.940	286.060	0.510	285.550	0.530	285.530	0.580	285.480	0.645	285.415	nd	nd	1.230	284.830
Stream			284.570	286.940	286.060	0.530	285.530	0.580	285.480	Dry		Dry		nd	nd	1.230	284.830
3	0.740	0.830	285.610	286.345	n/a	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Outside			285.610	286.345	n/a	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	1.085	1.085	285.640	286.727	n/a	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Outside			285.640	286.727	n/a	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	0.842	0.728	286.220	287.045	287.160	0.850	286.310	0.860	286.300	0.860	286.300	0.860	286.300	nd	nd	0.850	286.310
Outside			286.220	287.045	287.160	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	nd	nd	Dry	Dry
6	0.880	1.300	286.300	287.053	287.190	0.880	286.310	0.885	286.305	0.885	286.305	0.890	286.300	nd	nd	0.890	286.300
Outside			286.300	287.053	287.190	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	nd	nd	Dry	Dry
7	1.010	1.490	280.550	281.858	281.730	0.950	280.780	0.950	280.780	0.960	280.770	0.970	280.760	nd	nd	0.900	280.830
Stream			280.550	281.858	281.730	0.930	280.800	0.940	280.790	0.940	280.790	0.950	280.780	nd	nd	0.905	280.825
8	1.050	2.095	280.400	281.966	281.850	0.970	280.880	0.980	280.870	1.000	280.850	1.005	280.845	nd	nd	0.940	280.910
Stream			280.400	281.966	281.850	0.990	280.860	0.990	280.860	0.995	280.855	1.010	280.840	nd	nd	0.950	280.900
9	0.610	1.205	281.580	282.167	282.300	0.790	281.510	0.790	281.510	0.810	281.490	0.800	281.500	nd	nd	0.730	281.570
Outside			281.580	282.167	282.300	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	nd	nd	Dry	Dry
10	0.940	0.875	280.890	281.740	281.890	0.950	280.940	0.950	280.940	0.950	280.940	0.955	280.935	nd	nd	0.940	280.950
Outside			280.890	281.740	281.890	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	nd	nd	Dry	Dry
11	1.330	0.485	280.550	281.694	282.010	1.160	280.850	1.160	280.850	1.175	280.835	1.180	280.830	nd	nd	1.130	280.880
Stream			280.550	281.694	282.010	1.170	280.840	1.170	280.840	1.175	280.835	1.180	280.830	nd	nd	1.145	280.865
12	0.650	1.165	285.100	285.838	285.960	0.520	285.440	0.530	285.430	0.535	285.425	0.545	285.415	0.565	285.395	0.590	285.370
Outside			285.100	285.838	285.960	0.695	285.265	0.740	285.220	0.785	285.175	0.795	285.165	0.750	285.210	0.750	285.210
13	0.860	0.955	285.150	285.710	285.830	0.520	285.310	0.550	285.280	0.580	285.250	0.585	285.245	0.508	285.322	0.510	285.320
Stream			285.150	285.710	285.830	0.570	285.260	0.605	285.225	0.625	285.205	0.630	285.200	0.590	285.240	0.600	285.230
14	0.955	0.860	285.110	285.984	286.100	0.710	285.390	0.720	285.380	0.725	285.375	0.730	285.370	nd	nd	0.770	285.330
Stream			285.110	285.984	286.100	0.830	285.270	0.835	285.265	0.840	285.260	0.840	285.260	nd	nd	0.830	285.270
15	0.150		285.380	285.657	285.490	0.260	285.230	0.320	285.170	0.400	285.090	0.465	285.025	nd	nd	0.230	285.260
Outside			285.380	285.657	285.490	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	nd	nd	Dry	Dry
16	0.687		285.380	286.034	286.150	0.885	285.265	0.925	285.225	0.990	285.160	1.020	285.130	0.935	285.215	1.020	285.130
Outside			285.380	286.034	286.150	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	0.750	285.400	Dry	Dry
17	1.38	1.5															
Outside																	
18	1.64	1.24															
Outside																	
19	1.45	1.43															
Outside																	

Table G2: Summary of Groundwater Elevations
Mini-pizometers (manual measurements)
St Marys Flamborough Quarry

Piezometer	Stick up (m)	Depth BGS (m)	Ground Elevation (masl)	Top Elevation (original) (masl)	Top Elevation (following resurvey - June 2007) (masl)	17-Oct-08		28-Oct-08	
						Water Level BTC (m)	Water Elevation (mASL)	Water Level BTC (m)	Water Elevation (mASL)
1	0.670	0.750	285.060	285.710	285.700	nd	285.700	0.847	284.853
Outside			285.060	285.710	285.700	nd	285.700	0.600	285.100
2	1.420	0.910	284.570	286.940	286.060	nd	286.060	1.230	284.830
Stream			284.570	286.940	286.060	nd	286.060	1.245	284.815
3	0.740	0.830	285.610	286.345	n/a	nd	nd	nd	nd
Outside			285.610	286.345	n/a	nd	nd	nd	nd
4	1.085	1.085	285.640	286.727	n/a	nd	nd	nd	nd
Outside			285.640	286.727	n/a	nd	nd	nd	nd
5	0.842	0.728	286.220	287.045	287.160	nd	nd	0.865	286.295
Outside			286.220	287.045	287.160	nd	nd	Dry	
6	0.880	1.300	286.300	287.053	287.190	nd	nd	0.895	286.295
Outside			286.300	287.053	287.190	nd	nd	Dry	
7	1.010	1.490	280.550	281.858	281.730	nd	nd	0.940	280.790
Stream			280.550	281.858	281.730	nd	nd	0.940	280.790
8	1.050	2.095	280.400	281.966	281.850	nd	nd	0.980	280.870
Stream			280.400	281.966	281.850	nd	nd	0.995	280.855
9	0.610	1.205	281.580	282.167	282.300	nd	nd	0.810	281.490
Outside			281.580	282.167	282.300	nd	nd	Dry	
10	0.940	0.875	280.890	281.740	281.890	nd	nd	0.940	280.950
Outside			280.890	281.740	281.890	nd	nd	Dry	
11	1.330	0.485	280.550	281.694	282.010	nd	nd	1.160	280.850
Stream			280.550	281.694	282.010	nd	nd	1.170	280.840
12	0.650	1.165	285.100	285.838	285.960	0.620	285.960	0.630	285.330
Outside			285.100	285.838	285.960	0.760	285.960	0.757	285.203
13	0.860	0.955	285.150	285.710	285.830	0.570	285.830	0.530	285.300
Stream			285.150	285.710	285.830	0.610	285.830	0.610	285.220
14	0.955	0.860	285.110	285.984	286.100	nd	nd	0.770	285.330
Stream			285.110	285.984	286.100	nd	nd	0.825	285.275
15	0.150		285.380	285.657	285.490	nd	nd	0.400	285.090
Outside			285.380	285.657	285.490	nd	nd	0.140	285.350
16	0.687		285.380	286.034	286.150	nd	nd	0.960	285.190
Outside			285.380	286.034	286.150	nd	nd	Dry	
17	1.38	1.5				1.31		1.240	
Outside						1.26		1.250	
18	1.64	1.24				1.53		1.495	
Outside						1.55		1.540	
19	1.45	1.43				1.38		1.31	
Outside						1.31		1.31	

G3. Hydrographs by Catchment Area

Appendix G3

Hydrographs by Catchment

The water level hydrographs were developed for the various piezometers and monitoring wells completed for this study. These hydrographs are grouped (and discussed below) according to the well's location within one of the sub-catchment areas mapped on the site designated A to H (shown in Figure 3.31). These drainage catchments were delineated by Stovel and Associates (2006) and modified by Stantec (2008) based on topographic mapping, aerial photography interpretation and field verification. The hydrograph groupings are provided in Figure G3A through Figure G3H, Appendix G3. Included in these figures are corresponding precipitation data from the Environment Canada City of Hamilton Airport meteorological station.

An analysis of the vertical gradients in the nested monitors and the mini piezometers, as well as review of the Stantec hydrological results was conducted to determine the relationship between the shallow and deeper bedrock units and the groundwater/surface water interactions on the site. The discussion below applies only to the portions of the catchments that lie within the site boundaries.

Catchment Area A (Figures G3A-1 to G3A-5)

Catchment Area A, which is located on the northern portion of the site, is the largest catchment area. This Catchment discharges to Tributary A of Mountsberg Creek, and its associated wetlands. The Lower Mountsberg Creek Wetland Complex, a Provincially significant wetland (PSW), covers about half this catchment area (northwest portion of the Catchment). The instrumentation within this Catchment and water level observations are discussed below.

Mini-Piezometers

Nine (9) mini-piezometers (MP) have been installed within this catchment. The database includes water levels measured both within the mini-piezometer and levels taken outside the mini-piezometer from the same reference point. The outside measurements represent surface water levels. The comparison of the levels provides and indication of the hydraulic gradient within the overburden at the location.

MP3 and MP4 are located in the northern portion of the PSW. At MP3, ground and surface water levels were collected on five out of 10 occasions, all during the spring. These five measurements showed slight downward gradients on three occasions and upward gradients on two occasions. At MP4, ground and surface water levels were collected on seven out of 11 occasions, with six measurements during the spring and one measurement in the winter. Upward gradients dominated on six of the seven dates indicating groundwater discharge. The water level at MP4 was above ground surface during the spring indicating springtime discharge to the wetland. A comparison of the groundwater elevations between MP3 and MP4 for the remaining dates, show an upward gradient in the fall and a slight downward gradient in the summer.

MP5 and MP6 are located at the northern property boundary, within the PSW. At both mini-piezometers, upward gradients dominated during the spring. However, a comparison between the MP5 and MP6 monthly groundwater elevations show a dominant downward gradient throughout the remaining seasons of the year. The water level data indicate that this area is under discharge conditions in the spring and recharge conditions for the other seasons of the year. The water level at MP5 is occasionally above ground surface during the spring indicating springtime discharge to the wetland, whereas the water level at MP6 was consistently at or below the ground surface.

The remaining five mini-piezometers (MP12 to MP16) within Catchment A are located in the central portion of the PSW. The water level observations at MP12 indicate a consistent upward gradients during the spring. Very few surface water level measurements were obtained at the remaining four mini-piezometers (MP13 to MP16), however the groundwater level at MP12, MP14 and MP16 was above the ground surface in the spring (suggesting groundwater discharge) and at MP12 and MP14 was occasionally above ground surface during the fall. MP12 and MP14 are located in the vicinity of seeps that have previously been mapped on the property. The water level at MP15 was generally above the ground surface throughout the year and at MP13 was below the ground surface.

Overburden Monitoring Wells

There are seven overburden monitoring wells at five locations within Catchment A. Monitoring nest MWO1 includes three overburden wells, with the deep well (MWO1-II-C) screened in the sand overlying the bedrock, the intermediate depth well (MWO1-I-B) screened in a layer of sand and gravel till and the shallow well (MWO1-I-A) in silt till. The hydrographs for this well nest shows that the gradient is upward between the sand and gravel till, and the shallow silt till. A downward gradient exist between the sand and gravel till and the sand overlying the bedrock.

The hydrographs for wells closely correlate fluctuating seasonally. This indicates good hydraulic connection across the overburden sequence and an absence of a confining layer within the sequence.

The remaining overburden monitoring wells (MWO2, MWO4, MWO5, MWO7) within Catchment A, are screened in either sand to silt till overlying the bedrock.

Bedrock

There are 21 bedrock monitoring wells at eight locations within Catchment A. The specific depth horizon against which the wells are screened are summarized below:

Horizon	Monitoring Well
Upper Amabel	MWB3R-A, MWB12-A, MWB17-A, MWB18-A, MWB19-A, MWB24-I-A, MWB24-I-B, MWB25-I-A
Middle Amabel	MWB12-B, MWB18-B, MWB24-II-C, MWB25-II-B, MWB25-II-C
Lower Amabel	MWB3R-B, MWB12-C, MWB17-B, MWB19-B, MWB24-II-D, MWB25-III-D

At monitoring location MWB3R, upward gradients exist between MWB3/GLL3-D (Lower Amabel) and the shallow overburden (MP14) and between MWO4 (deep overburden) and MP14 (shallow overburden). The gradients is downward between the MWB3R-A (Upper Amabel) and MWB3R-B (Lower Amabel).

The hydrograph curves for the three wells at monitoring nest MWB12 closely follow the same trend. Vertical gradients appear to change seasonally with upward gradients between MWB12-C (Lower Amabel) and MWB12-A (Upper Amabel) during the fall and winter and then downward gradients between these two wells during the spring. Upward gradients were noted between MWB12-B (Middle) and MWB12-A (Upper Amabel) during the fall and winter, and downward gradients during the spring.

The hydrograph curves for the Upper and Lower Amabel wells at monitoring nest MWB17 follow the same seasonal pattern as each other. Gradients are consistently downwards throughout the year between the Upper and Lower Amabel at MWB17. Level loggers were installed at MWB19 in the fall of 2007. Fall water levels were similar between the Upper and Lower Amabel, showing very little differential. MWB19 also shows dominantly downward gradients throughout the winter.

The hydrograph curves for well nests MWB24 and MWB25 follow a similar pattern. At both monitoring nests, there are dominantly downward gradients between the Upper and the Middle Amabel and between the Middle and the Lower Amabel.

Catchment Area B (Figure G3B-1)

Catchment Area B, which is located towards the western edge of the site covers about 4.2 ha. This Catchment ultimately discharges to Tributary B of Mountsberg Creek. There are no MP's or overburden monitors located within this Catchment.

Bedrock

There are two bedrock monitoring wells at location MWB28 within Catchment B. The specific depth horizon against which the wells are screened are summarized below:

Horizon	Monitoring Well
Upper Amabel	MWB28-A
Middle Amabel	MWB28-B

This monitoring nest was drilled in February/March 2008. Both wells were instrumented with level loggers in April but this information has not been downloaded. Monthly manual measurements were collected in April, May and June 2008. Two of the three water levels show a very slight downward gradient. The May water levels for both monitors were the same (at an elevation of 294.41 mASL).

Catchment Area C (Figures G3C-1 to G3C-2)

Catchment Area C located in the southwestern portion of the site encompasses and area of about 33.6 ha. This Catchment discharges to Tributary C of Mountsberg Creek. The instrumentation within this Catchment and water level observations are discussed below.

Overburden

The two shallow overburden monitoring wells (MWO9, MWO16) within Catchment C are both located along the western property boundary. MWO9 screened just above the assumed bedrock surface, is occasionally dry. This indicates that the water table occasionally lies within the shallow bedrock. MWO16 has a total depth of about 2.9 m and is screened in the silty sand till overlying the assumed bedrock surface. This monitoring well has remained dry, indicating that the shallow water table in this area lies within the bedrock.

Bedrock

There are 17 bedrock monitoring wells at five locations within Catchment C. The specific depth horizon against which the wells are screened are summarized below:

Horizon	Monitoring Well
Upper Amabel	MWB4-I-A, MWB10-I-A, MWB20-I-A, MWB23-I-A, MWB26-I-A, MWB26-I-B
Middle Amabel	MWB4-II-B, MWB10-I-B, MWB20-II-B, MWB23-II-B, MWB26-II-C
Lower Amabel	MWB4-II-C, MWB10-I-C, MWB20-II-C, MWB23-II-C, MWB26-II-D
Cabot Head	MWB10-II-D

Prior to 2006, the water level at well nest MWB4 shows variable vertical gradients between the Upper Amabel and the Lower Amabel with no seasonal relationship. More recent data show an upward gradient between the Lower and Middle Amabel and the Lower and Upper Amabel during the fall, and a downward gradient between the Lower and Middle Amabel and the Lower and Upper Amabel during winter and early spring.

At well nest MWB10, the hydrographs for the three wells installed in the Amabel formation indicate a small upward between the Lower and the Upper Amabel, and between the Lower and Middle Amabel. MWB10-II-D, the deepest well in the nest, is screened against the Cabot Head Formation. The water level observed at this monitoring well does not exhibit the same pattern as the other wells in the nest. MWB10-II-D shows very little fluctuation with water levels between 283.08 mASL and 286.6 mASL (0.52 m range). No seasonal water level pattern is apparent.

At MWB20, the three wells installed in the Amabel Formation exhibit similar water level elevations, as they do at the other installations within Catchment B. Slight upward gradients are noted in the fall and early winter between the Lower and Middle Amabel and the Upper Amabel. Between mid-winter and spring, the groundwater elevations were generally higher in the Upper Amabel and lower in the Middle Amabel. This well nest was constructed in JEGEL Borehole BHE, an open hole through the Amabel extending into the Cabot Head. The water level observed at this former installation, showed seasonal water level fluctuations with the highest water levels occurring in the spring, followed by a decline through the summer/fall and a recovery in the late fall/early winter.

MWB23 and MWB26 both consistently show downward gradients between the Upper and Lower Amabel.

Catchment Area D (Figures G3D-1 to G3D-2)

Catchment Area D is located in the eastern portion of the site and covers about 39.9 ha. The instrumentation located within this Catchment and water level observations are discussed below.

Overburden

The three overburden wells (MWO8, MWO10 and MWO11) in Catchment D are screened in till overburden at the top of the assumed bedrock surface. MWO10 and MWO11 show similar hydrograph curves indicating a response to precipitation. All three overburden monitors are dry during the summer months indicating that the water level fluctuates seasonally between the overburden and the shallow bedrock.

Bedrock

There are 11 bedrock monitoring wells at four locations within Catchment D. The specific depth horizon against which the wells are screened are summarized below:

Horizon	Monitoring Well
Upper Amabel	MWB6-I-A, MWB7-I-A, MWB8-I-A,
Middle Amabel	MWB6-II-B, MWB7-II-B, MWB8-II-B, MWB21-A
Lower Amabel	MWB6-II-C, MWB7-II-C, MWB8-II-C, MWB21-B

At well nest MWB6 the gradient between the Lower Amabel and the Middle Amabel was upward over the period record (November 2007 to March 2008), whereas the gradient between the Upper and the Middle Amabel was downward.

At well nest MWB7 the gradient is upward between the Lower Amabel and Upper Amabel over the same period. The water levels observed in the Upper and Middle Amabel are very similar (flat gradient) with a slight upward gradient between the Middle Amabel Upper Amabel during the fall to mid-winter period.

The gradient at well net MWB8 is generally upward across the bedrock profile. Occasionally in the fall and early spring, the gradient between the Upper and Lower Amabel reverses and is downward, whereas the gradient between the Lower and Middle Amabel remains upward.

The two bedrock wells at MWB21 exhibit consistently upward gradients between the Lower and the Middle Amabel over the period of record (July 2007 to March 2008).

Catchment Area E (Figures G3E-1 to G3E-3)

Catchment Area E is located at the eastern edge of the site and covers an area of about 21.5 ha. The catchment discharges to the wetlands around Flamboro Creek. The instrumentation located within this Catchment and water level observations are discussed below.

Mini-Piezometers

The five mini-piezometers (MP7 through MP11) installed within Catchment D are located within the PSW adjacent to Flamboro Creek at the eastern edge of the site. MP 7 and 8 are next to the culvert that diverts creek flow below 11th Concession 11 Road. E, near to surface water station SW-FC. Gradients at this location are upward (groundwater discharge) throughout the year. The water level at MP8 is consistently above ground surface throughout the year. The level at MP7 is also higher than ground surface during the spring and occasionally in the early summer and fall. This indicates shallow discharge from the overburden into this wetland area throughout most of the year. Seasonal trends are apparent at this location with the water level declining throughout the summer and then rebounding in the late fall. Monitoring at surface water station SW-FC indicates that flow at this location is not strongly influenced by groundwater inputs and is mainly in a result of runoff and snowmelt.

MP 11, which is located immediately north of Flamboro Creek and MP10, and MP9, which are further removed from the creek, are installed in the wetland area. Very little surface water data (external water level measurements) are available for these mini-piezometers. MP9 and MP10 exhibit water levels that are higher than ground surface during the spring and MP11, closest to the creek, exhibits a water level above the ground surface during the spring and occasionally during the fall. The groundwater elevations show groundwater flow towards the creek with higher groundwater elevations at MP9 progressively decreasing towards MP11.

Overburden

The two overburden wells in this Catchment, MWO12 and MWO13, are screened in the till immediately overlying the bedrock. As with the most of the overburden wells on the site, both of these well are occasionally dry during the summer/fall indicating the water table fluctuates between the overburden and the shallow bedrock.

Bedrock

There are eight bedrock monitors at three locations within Catchment E. The specific depth horizon against which the wells are screened are summarized below:

Horizon	Monitoring Well
Upper Amabel	MWB9-I-A, MWB11-A, MWB13-A
Middle Amabel	MWB11-B
Lower Amabel	MWB11-C, MWB13-B, MWB13-C
Fossil Hill/Merriton/Cabot Head	MWB9-II-B

The gradient at well nest MWB9 is consistently downward between the Upper Amabel and the underlying Fossil Hill/Merritton and Cabot Head formations.

Groundwater elevations at MWB11 between the wells installed within the Upper, Middle and Lower Amabel are similar indicating a flat gradient (dominate flow being horizontal). The gradient is slightly downward during the spring as a result of a higher water level in the Upper Amabel well in comparison to the Middle and Lower Amabel wells.

The gradient at well nest MWB13 is also flat with the water levels observed in the wells screened against the Upper Amabel, Lower Amabel and Lower Amabel/Fossil Hill horizons exhibiting very little difference (<0.05 m).

Catchment Area F (Figure G3F-1)

Catchment Area F, which is located between Catchment Areas A and C covers about 1.9 ha. Surface water runoff is internalized and infiltrates into the ground. There are no mini-piezometers or overburden monitoring wells located within this Catchment.

Bedrock

There are five bedrock monitoring wells at two locations within Catchment F. The specific depth horizon against which the wells are screened are summarized below:

Horizon	Monitoring Well
Upper Amabel	MWB22-I-A
Middle Amabel	MWB22-II-B
Lower Amabel	MWB22-I-C, MWB22-II-D
Open Hole through Amabel and into Cabot Head	TW15

Groundwater elevations in the Upper (MWB22-I-A) and Upper/Middle (MWB22-II-B) exhibit a flat gradient through the fall and early winter, followed by a slight downward gradient over the balance of the winter into spring. An upward gradient dominates exists between the Lower Amabel monitoring wells (MWB22-I-C, MWB22-II-D) and the Upper and Middle Amabel during the fall and early winter. This gradient reverses from early winter to spring to downward.

Catchment Area G (Figure G3G-1)

Catchment Area G is located in the central portion of the site and covers about 5 ha. Surface water runoff is internalized and infiltrates into the ground. This area has bedrock-controlled topography with several outcrops noted. Only a single overburden well was installed within this Catchment.

Overburden

The overburden well in this catchment, MWO14, is screened in the gravely sand till immediately overlying the bedrock. It is occasionally dry in the late summer and early fall indicating the fluctuation of the water table between the overburden and the shallow bedrock.

Catchment Area H (Figure G3H-1)

Catchment Area H is located in the western corner of the site covering an area of about 1 ha. This Catchment discharges to Mountsberg Creek. The instrumentation located within this Catchment and water level observations are discussed below.

Mini-Piezometers

MP1 and MP2 are located near the northwest property boundary. MP2 is in Tributary A while MP1 is on the bank adjacent to Tributary A. The surface water level database for MP1 is limited to six measurements. The gradient is slightly downward for two measurements taken in the fall and spring, slight upward on three occasions (spring) and a neutral gradient was detected on one occasion (winter). No surface water measurements were recorded at MP2.

In the absence of surface water readings, water levels at MP1 were compared to those at MP2. The two mini-piezometers are located within 3 m of each other and therefore can be used to provide information on the vertical gradients in the area. The hydrographs for the two mini-piezometers show that upward gradients were consistently observed at this location throughout the year, indicating that there is some groundwater discharge. MP1 water levels were above ground surface during the spring indicating springtime discharge to the wetland. MP2, in Tributary A, shows water levels above the creek bed throughout most of the year, indicating baseflow to Tributary A. Both MP's show seasonal trends with lower groundwater elevations in the summer and higher groundwater elevations in the spring, reflective of the position of the water table.

Overburden

MWO6 is discussed below with bedrock monitoring location MWB1 as they are in close proximity to each other.

Bedrock

There are three bedrock monitoring wells at location MWB1 within Catchment H. The specific depth horizon against which the wells are screened are summarized below:

Horizon	Monitoring Well
Upper Amabel	MWB1-I-A
Middle Amabel	MWB1-II-B
Lower Amabel	MWB1-II-C

Monitoring nest MWB1 is adjacent to overburden monitor MWO6. Comparing the overburden groundwater elevation, to historic data for former monitoring well GLL1-D completed near the base of the Amabel Formation, indicated that the gradient was consistently downward. More recent results also show downward gradients between the overburden and the Lower Amabel. Upward gradients occur between MWC1-I-A (Upper Amabel) and MWO6 (overburden) and between MWB1-II-C (Lower Amabel) and MWB1-II-B (Middle Amabel).

Summary

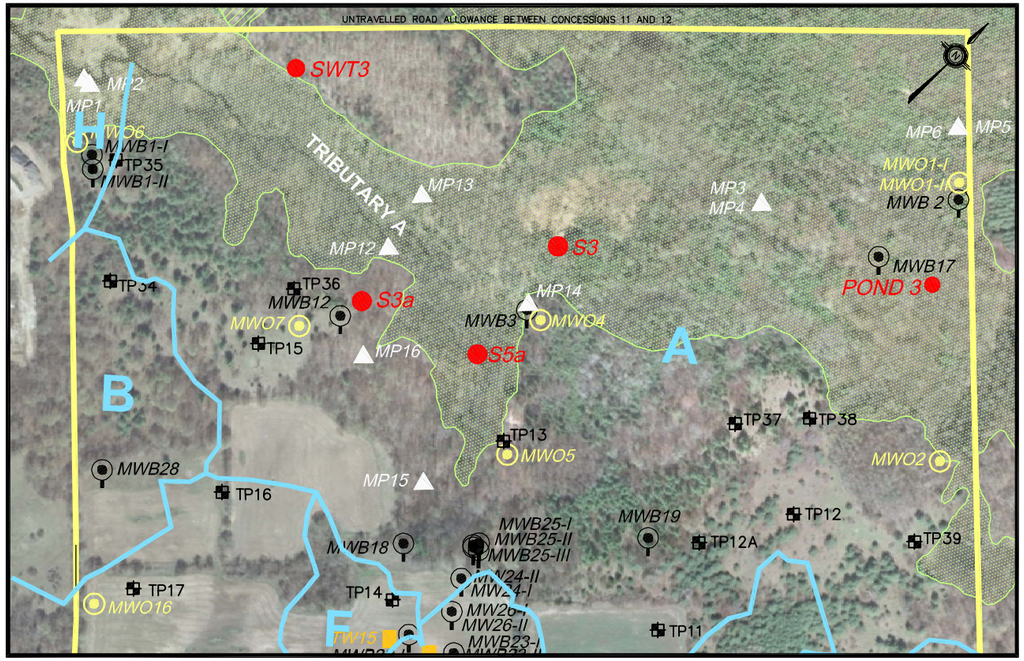
Groundwater level data have been collected by either manual measurement or with data loggers installed in selected wells. The period of record extends from April 2004 through March 30, 2008. The hydrographs generated using these data are presented in this Appendix. The hydrographs exhibit the typical rise and fall of groundwater levels observed in Ontario reflecting seasonal fluctuation. The water levels for 2007 reflect unusually dry conditions consistent with the low precipitation observed in 2007.

The hydrographs have been grouped by their locations within the various catchments defined by Stovel and Associates (2006) and modified by Stantec (2008) to produce a series of figures (Figures G3A through G3H).

Mini-piezometers have been installed in the wetlands on the site. The mini-piezometers (MP1, MP2, MP12) are located in the western portion of Catchment A and exhibit upward gradients throughout the year. MP3 and MP4, in the eastern portion of Catchment A, show upward gradients during the wetter seasons (spring and fall) and downward gradients for the drier seasons. Springtime upward gradients exist at MP5 and MP6, along the northeastern property boundary, with downward gradients dominant for the rest of the year. MP7 and MP8, adjacent to Flamboro Creek, show upward gradients throughout the year. The mini-piezometer results indicate that the wetland areas on the site are groundwater discharge areas during the spring (and at some locations all year) and likely connected to the water table. The water table in the northern and southeastern portion of the site within the wetland associated with the Mountsberg and Flamboro creeks is near surface.

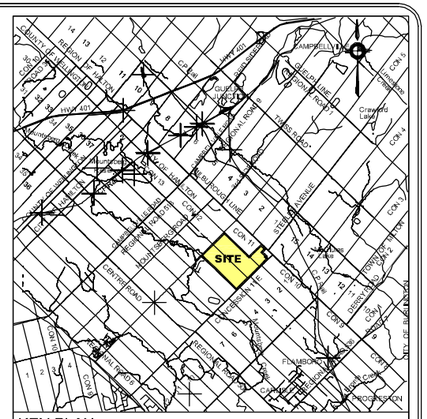
Most of the overburden monitoring wells are screened within the overburden immediately above the assumed bedrock surface (note wells were advanced to refusal on bedrock). Water levels at the monitoring wells are dry during the drier seasons of the year indicating that the water table fluctuates between the overburden and the shallow bedrock.

Bedrock monitoring wells on the site all show similar seasonal trends with the highest water levels occurring in the spring, declining throughout the summer and into the early fall, then rebounding in the late fall/early winter, with cooler weather conditions and increasing precipitation. The seasonal trends indicate that the water levels are responsive to climatic conditions. The hydraulic gradients as observed at nested bedrock monitoring wells are relatively flat, indicating that the bedrock sequence (Upper, Middle and Lower Amabel Formation) is hydraulically connected with no clear evidence of a horizontally continuous zone of bedrock with either higher of lower transmissivity. This observation tends to support the profiling of the hydrogeologic properties presented previously.



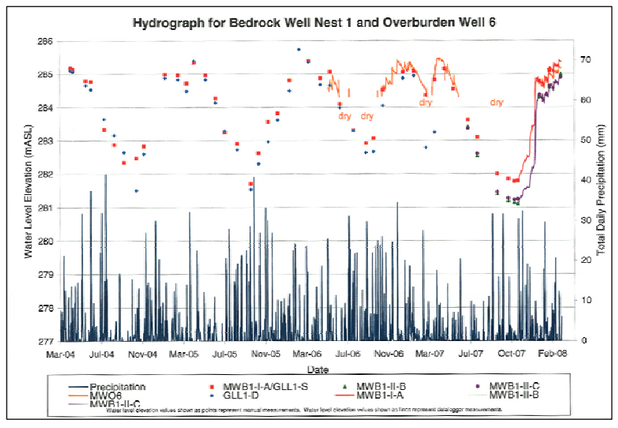
Watershed A - Monitor Summary

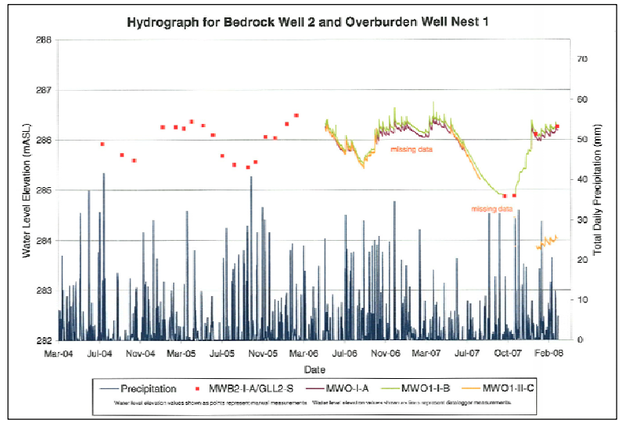
Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Monitoring Well - Bedrock				
MWB2-I	MWB2-I-A	282.70	285.89	3.62
MWB2-II	MWB2-II-B			
MWB3R	MWB3-A	273.34	279.43	7.77
	MWB3-B	254.14	258.71	8.53
MWB3	GLL3			
MWB12	MWB12-A	279.11	282.16	4.85
	MWB12-B	272.10	275.15	4.55
	MWB12-C	254.63	259.20	6.91
	TW12			
MWB17	MWB17-A	282.01	285.02	3.31
	MWB17-B	251.76	254.77	3.31
MWB18	MWB18-A	266.05	269.10	4.62
	MWB18-B	252.59	258.68	7.59
	BHC			
MWB19	MWB19-A	279.97	283.02	4.82
	MWB19-B	257.08	260.13	5.56
	BHD			
MWB24-I	MWB24-I-A	284.07	285.59	2.49
	MWB24-I-B	277.64	280.69	3.96
MWB24-II	MWB24-II-C	267.16	273.26	8.10
	MWB24-II-D	250.96	254.06	5.10
MWB25-I	MWB25-I-A	281.58	284.62	3.77
MWB25-II	MWB25-II-B	272.78	275.83	3.66
MWB25-III	MWB25-III-C	270.12	276.22	7.90
	MWB25-III-D	251.82	254.92	5.70

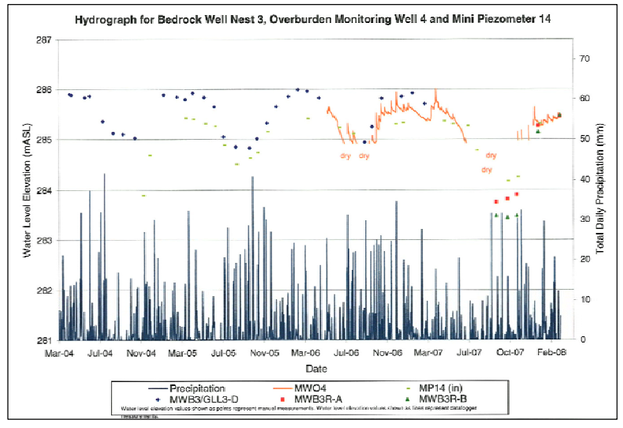


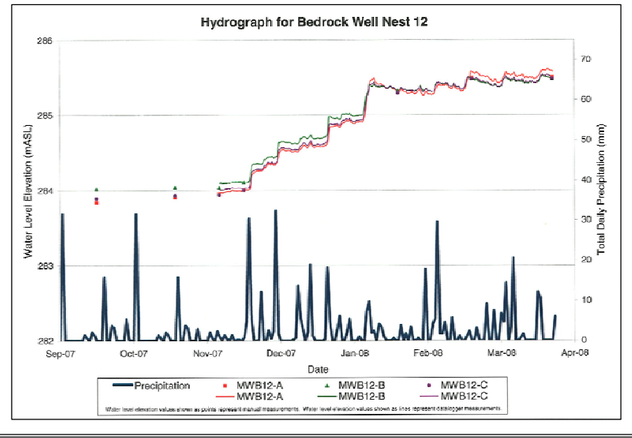
LEGEND:

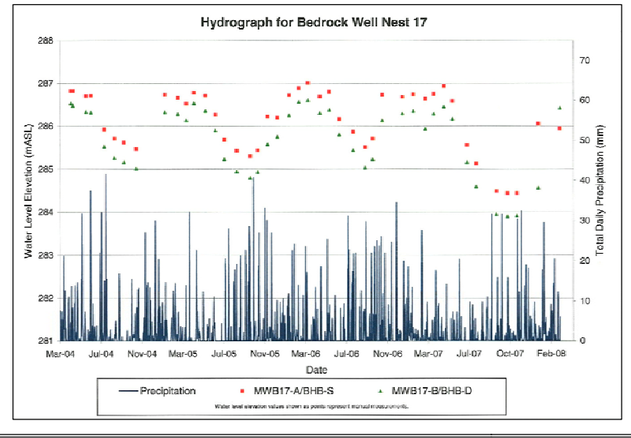
- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TW14 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY

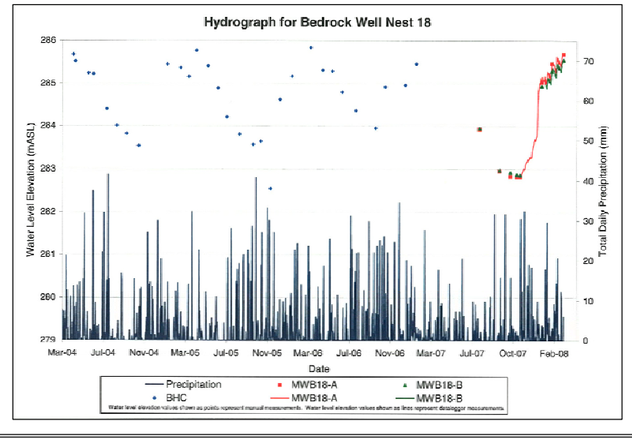












SCALE

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St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

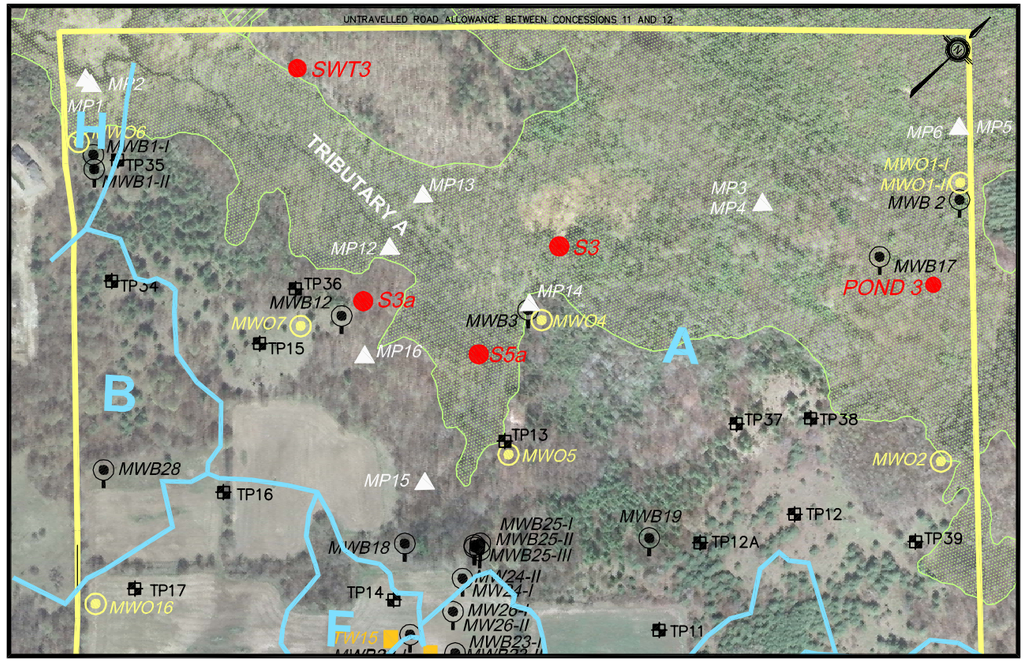
Watershed A
Bedrock Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

Gartner Lee

G3A-1

N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED A.dwg Layout:FIG 1 Plotted: Oct 28, 2008 @ 3:30pm by crawfordjm



Watershed A - Monitor Summary

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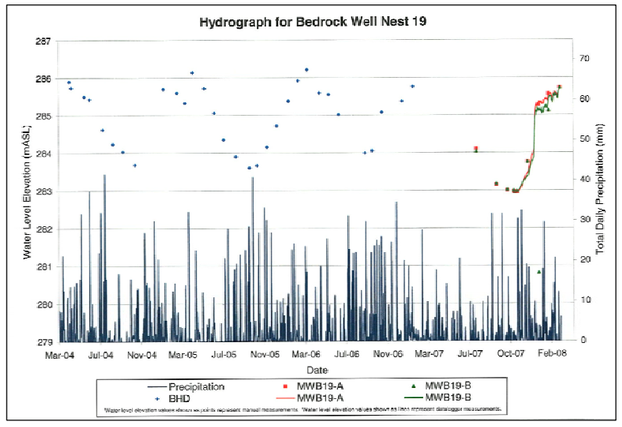
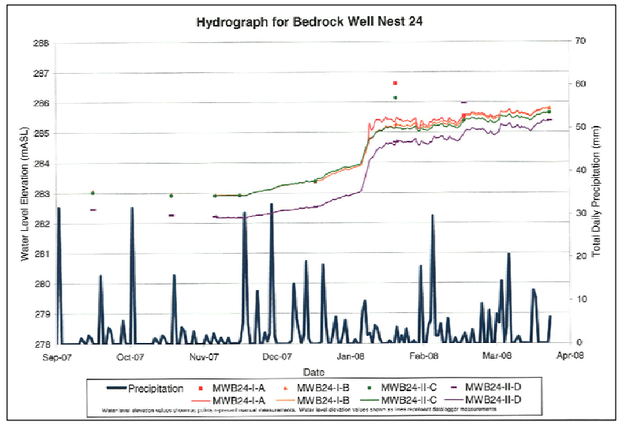
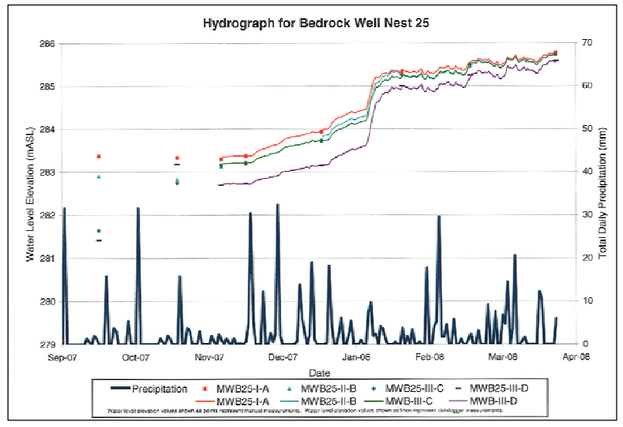
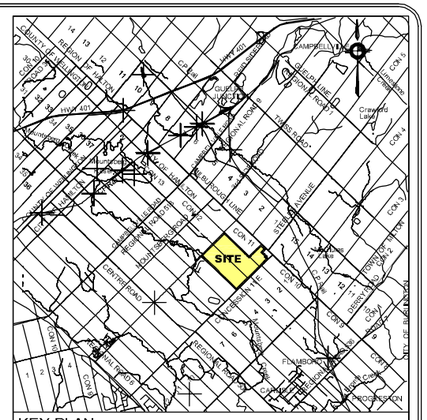








LEGEND:

MP14	LOCATION OF PIEZOMETER
MWB19	LOCATION OF BEDROCK MONITORING WELL NEST
MWO16	LOCATION OF OVERBURDEN MONITORING WELL NEST
TW14	LOCATION OF TEST WELL
SW-FC2	LOCATION OF STANTEC SURFACE WATER MONITOR
	PROVINCIALLY SIGNIFICANT WETLAND
	WATERSHED BOUNDARY

SCALE

0 50 100 200 300 400 m

1 : 10,000

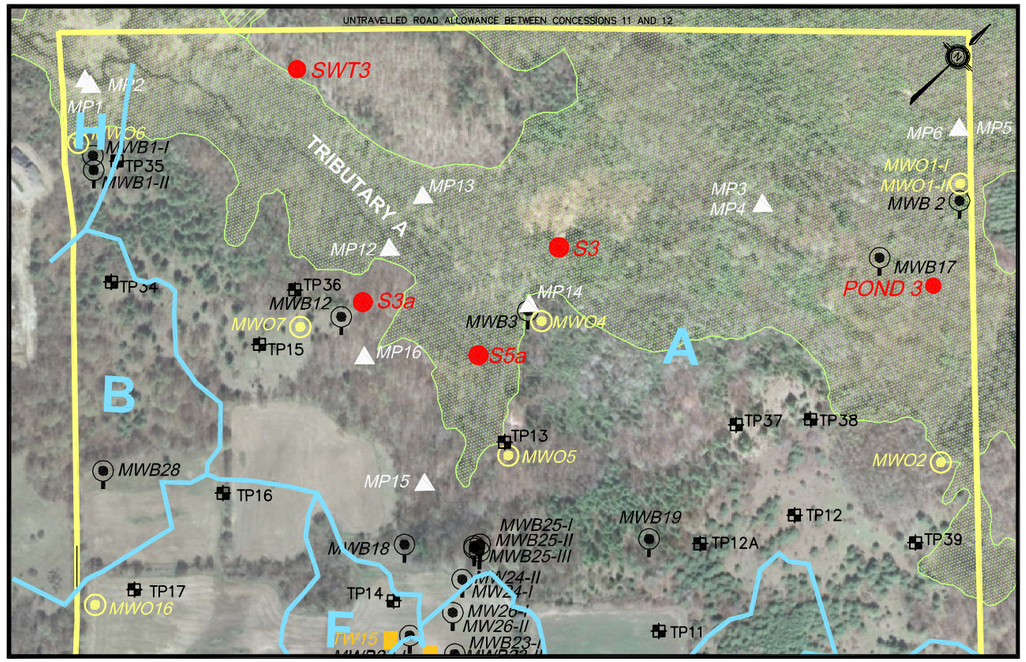
St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

Watershed A
Bedrock Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

Gartner Lee G3A-2

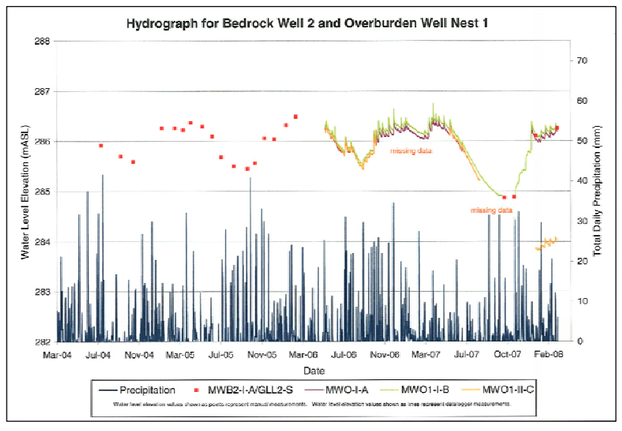
N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED A.dwg Layout:FIG 2 Plotted: Oct 28, 2008 @ 3:39pm by crawfordjm

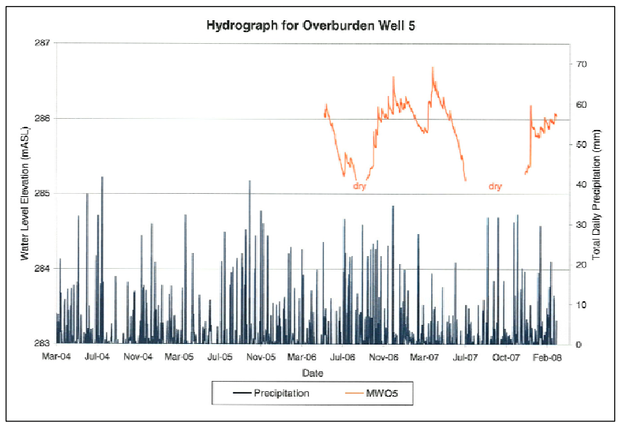


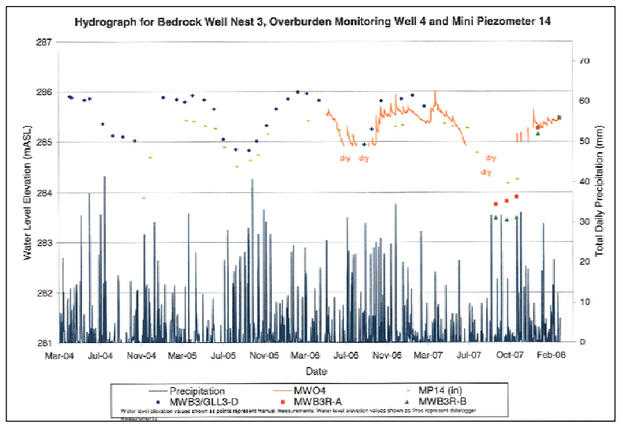
Watershed A - Monitor Summary

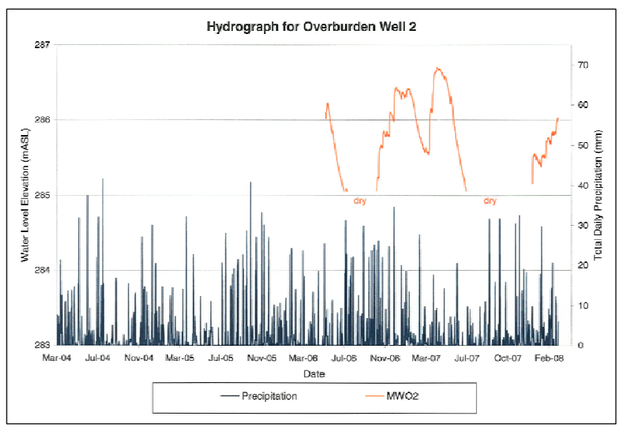
Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Monitoring Well - Overburden				
MWO1-I	MWO1-I-A	285.81	286.81	1.61
	MWO1-I-B	284.28	285.28	1.61
MWO1-II	MWO1-II-C	276.90	277.40	1.11
MWO2	MWO2	285.07	286.07	1.61
MWO4	MWO4	284.53	285.44	1.52
MWO5	MWO5	283.45	284.36	1.52
MWO6	MWO6	283.68	284.14	1.07
MWO7	MWO7	286.40	287.40	1.61

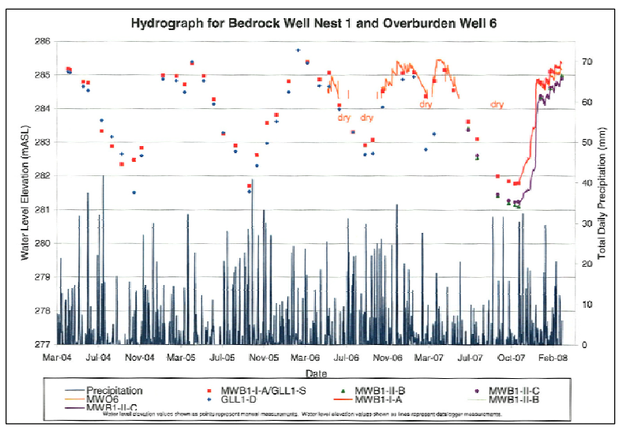
Note: MW07 is DRY

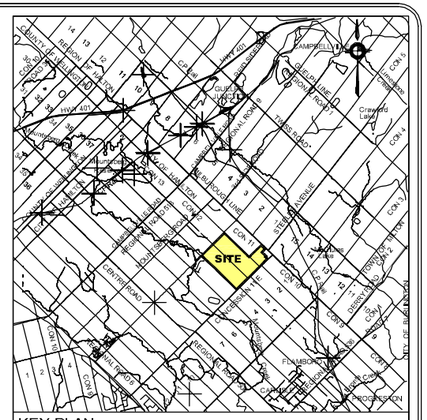












KEY PLAN
ADAPTED FROM LOVELL ENVIRONMENTAL CONSULTANTS INC.

LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
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- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY

SCALE

0 50 100 200 300 400 m

1 : 10,000

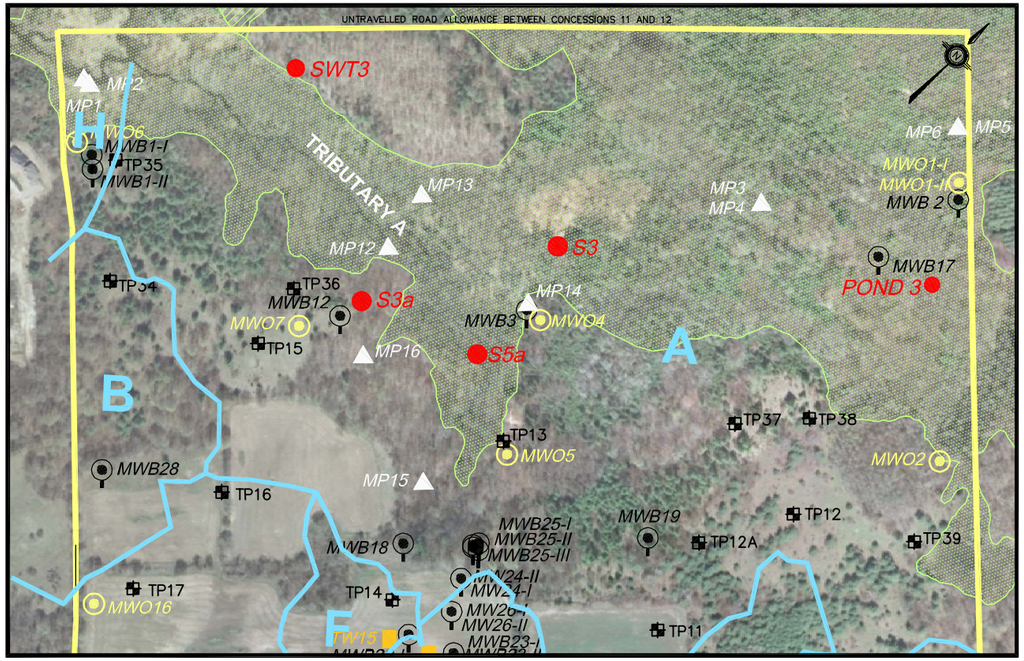
St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

Watershed A
Overburden Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

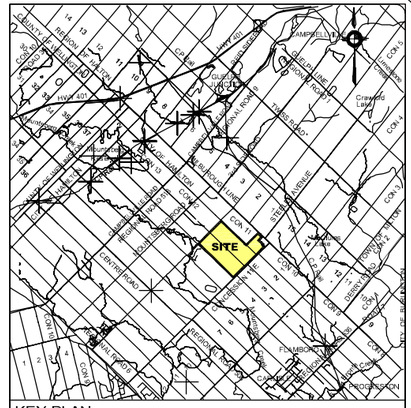
Gartner Lee G3A-3

N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED A.dwg Layout:FIG 3 Plotted: Oct 28, 2008 @ 3:46pm by crawfordjm



Watershed A - Monitor Summary

Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Piezometers				
MP3	MP3	284.78		
MP4	MP4	284.55		
MP5	MP5	285.49		
MP6	MP6	285.00		
MP12	MP12	283.93		
MP13	MP13	284.19		
MP14	MP14	284.25		
MP15	MP15	285.14		
MP16	MP16	283.98		



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SCALE

0 50 100 200 300 400 m

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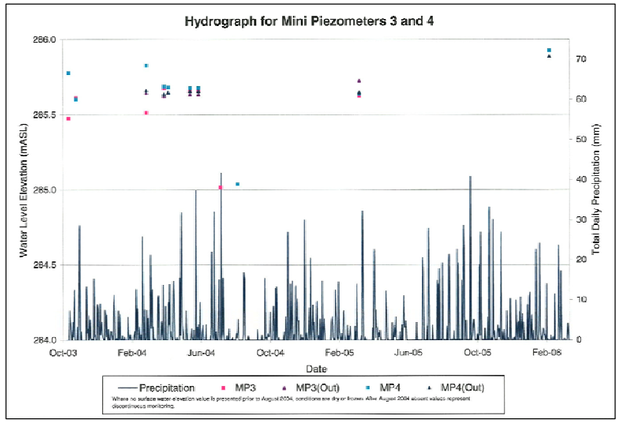
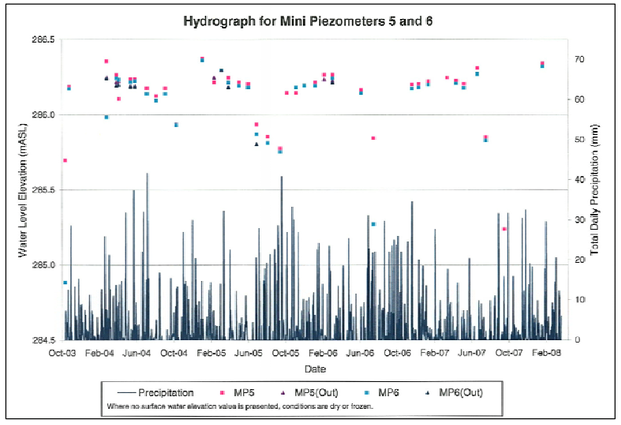
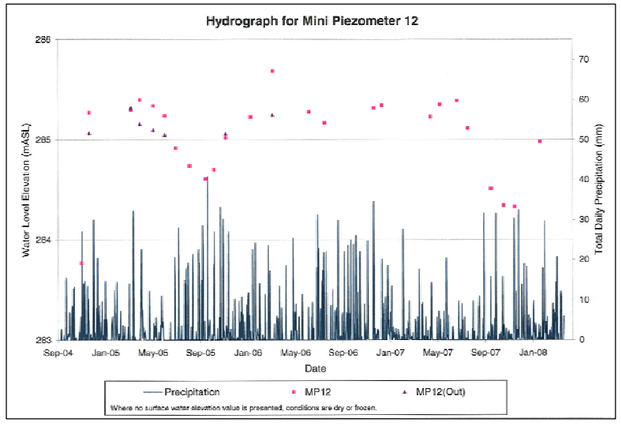
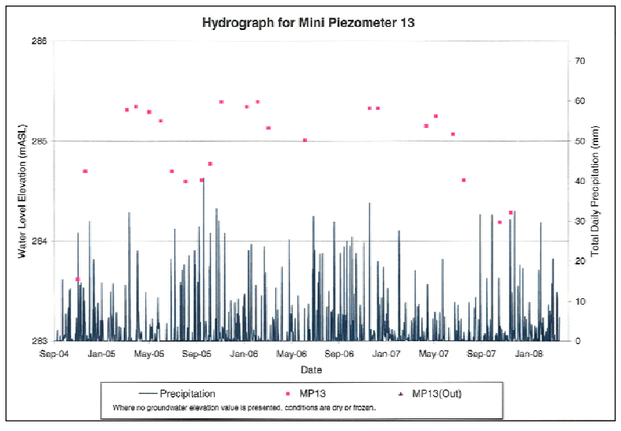
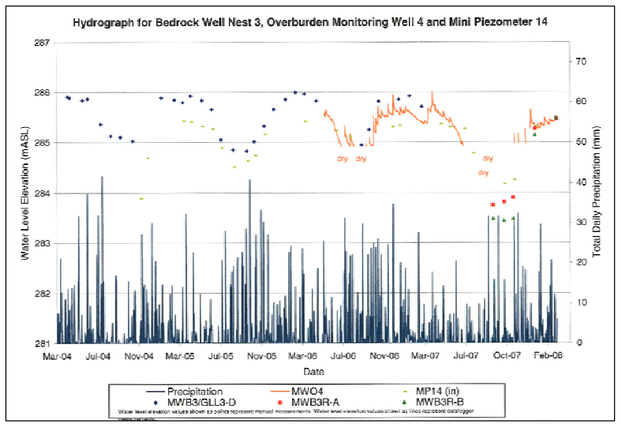
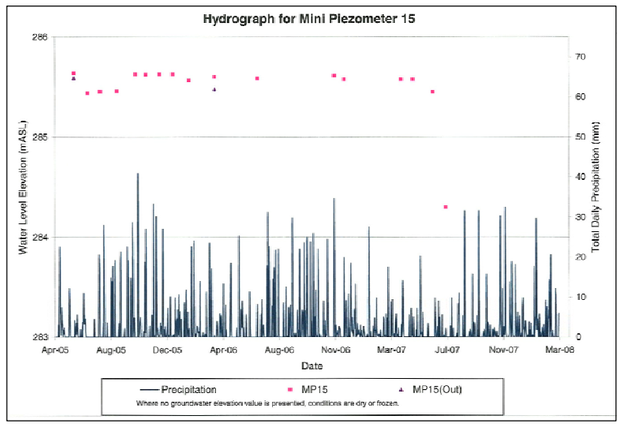












St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

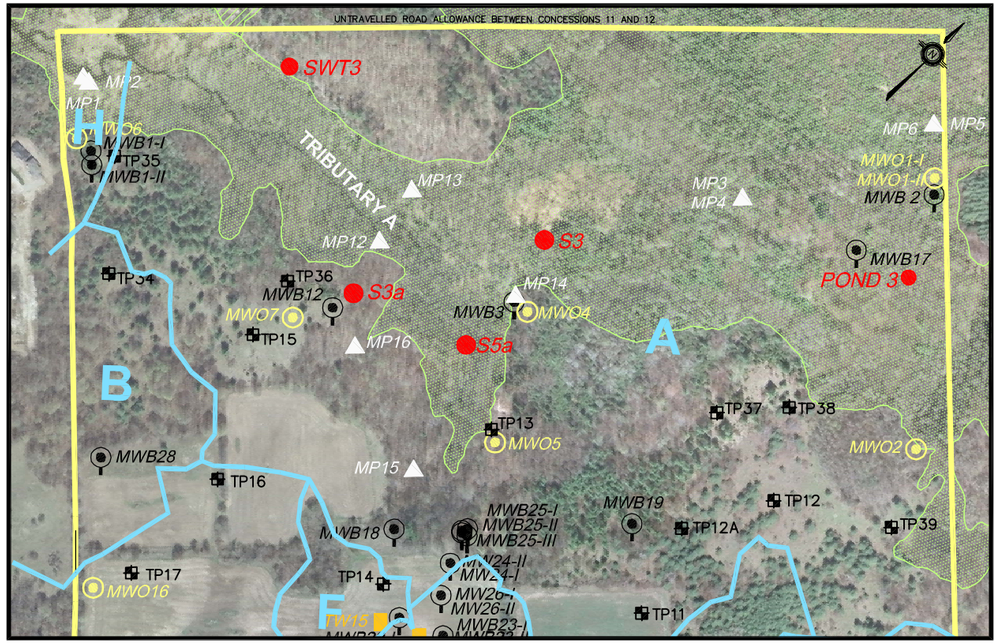
Watershed A
Piezometer Hydrographs

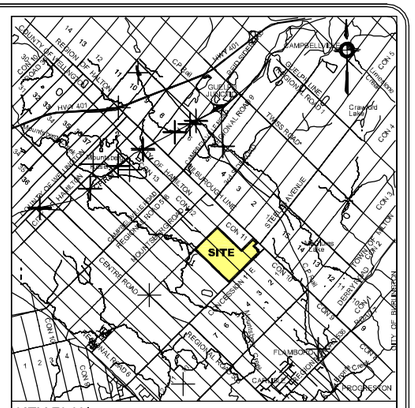
Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

Gartner Lee

G3A-4

N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED A.dwg Layout: FIG 4 Plotted: Oct 28, 2008 @ 3:52pm by crawfordjm





KEY PLAN
ADAPTED FROM LOVE ENVIRONMENTAL CONSULTANTS INC.

LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TW14 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY

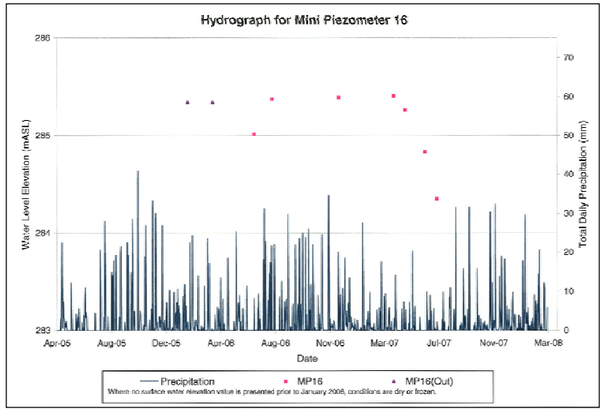
SCALE

0 50 100 200 300 400 m

1 : 10,000

Watershed A - Monitor Summary

Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Piezometers				
MP3	MP3	284.78		
MP4	MP4	284.55		
MP5	MP5	285.49		
MP6	MP6	285.00		
MP12	MP12	283.93		
MP13	MP13	284.19		
MP14	MP14	284.25		
MP15	MP15	285.14		
MP16	MP16	283.98		



St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

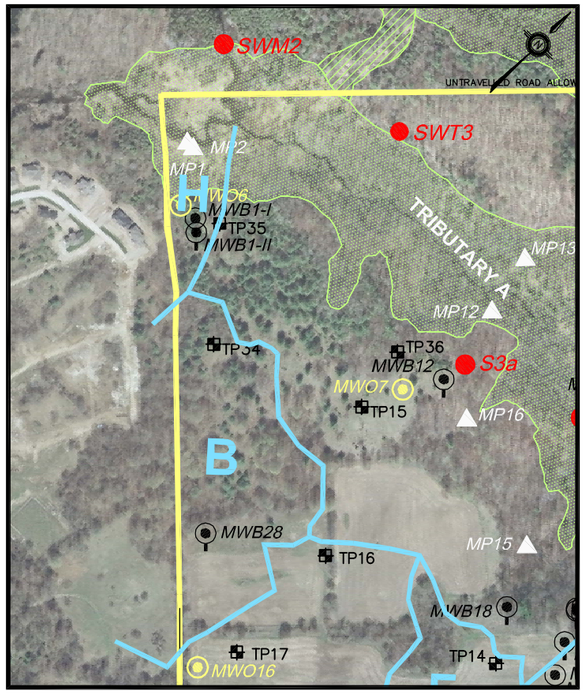
Watershed A
Piezometer Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

Gartner Lee

G3A-5

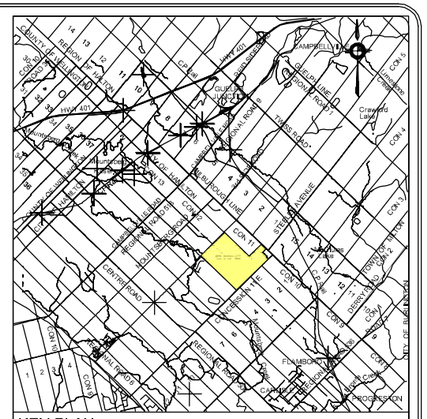
N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED A.dwg Layout:FIG 5 Plotted: Oct 28, 2008 @ 3:57pm by crawfordjm



Watershed B - Monitor Summary

Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Monitoring Well - Bedrock				
MWB28	MWB28-A	277.57	280.57	4.84
	MWB28-B	265.57	271.57	8.18

Note: No hydrograph for MWB28 - Water level monitoring commenced in spring 2008.



KEY PLAN
ADAPTED FROM LOAD ENVIRONMENTAL CONSULTANTS INC.

LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TWT4 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY

SCALE

0 50 100 200 300 400 m

1 : 10,000

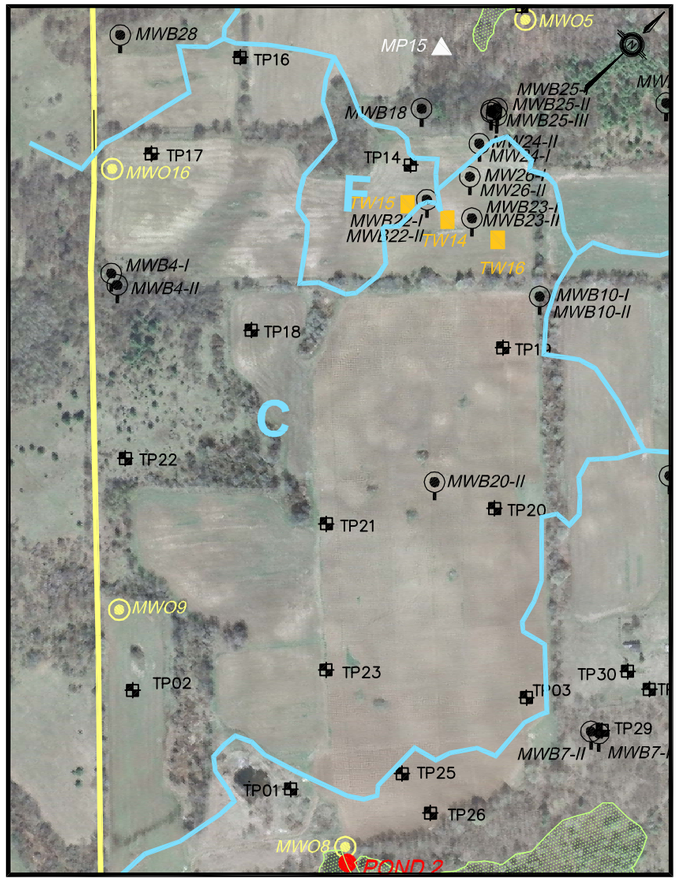
St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

Watershed B Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

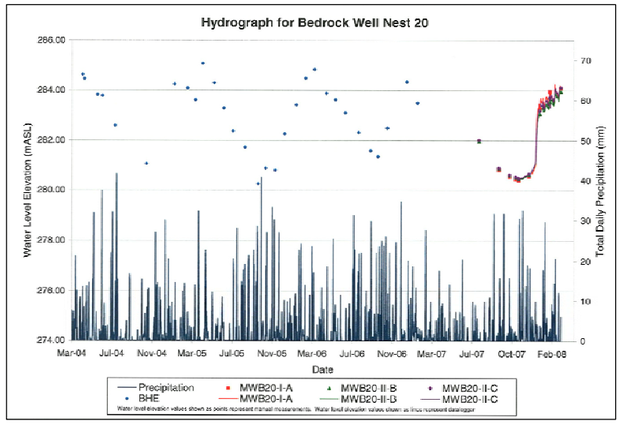
Gartner Lee G3B-1

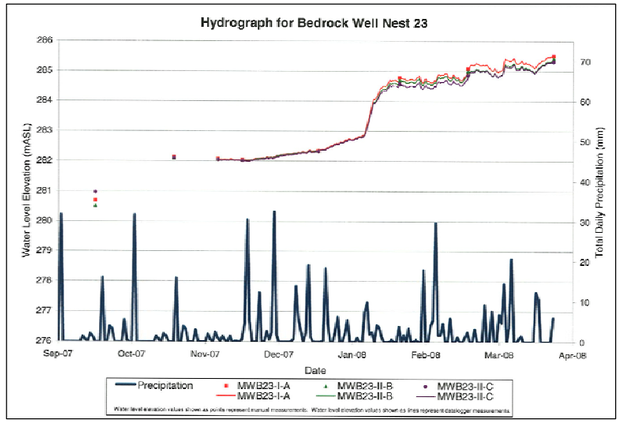
N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED C.dwg Layout:FIG 6) Plotted: Oct 28, 2008 @ 4:05pm by crawfordjm

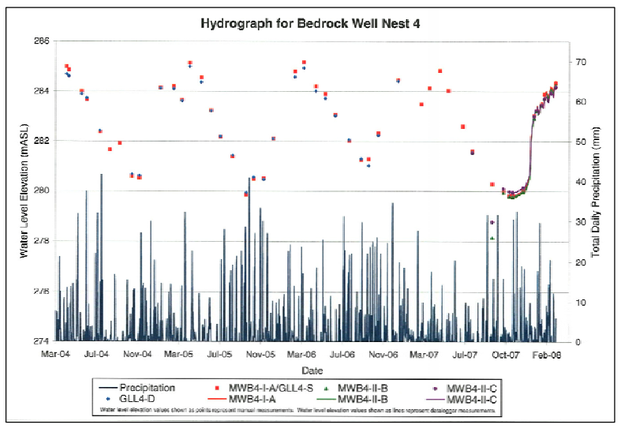


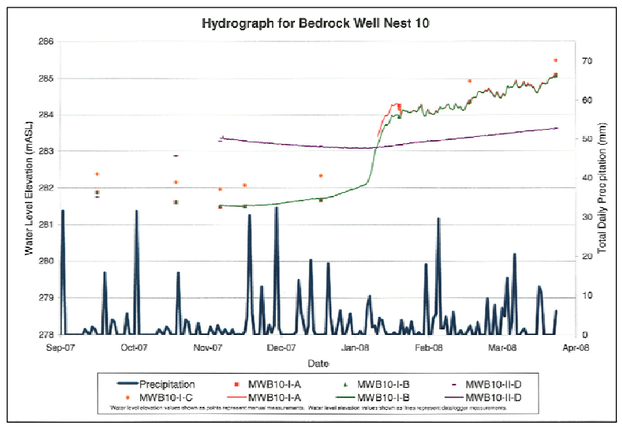
Watershed C - Monitor Summary

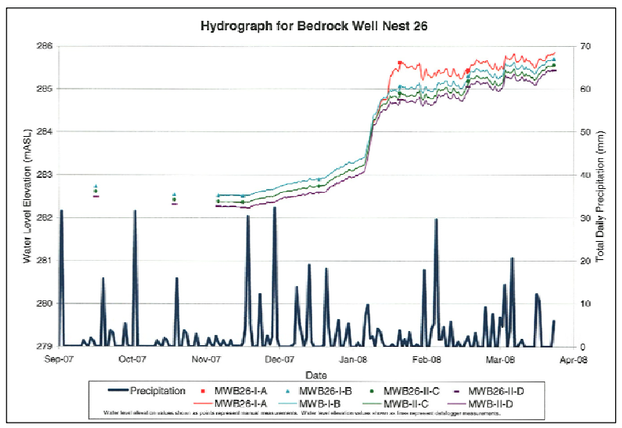
Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Monitoring Well - Bedrock				
MWB4-I	MWB4-I-A	278.52	281.72	3.50
MWB4-II	MWB4-II-B	271.34	275.91	6.65
	MWB4-II-C	250.69	253.73	4.90
	GLL4-D			
MWB10-I	MWB10-I-A	276.70	279.75	5.13
	MWB10-I-B	267.20	270.25	4.82
	MWB10-I-C	258.19	261.23	5.46
	TW10			
MWB10-II	MWB10-II-D	246.03	247.53	3.10
	GLL5			
MWB20-I	MWB20-I-A	280.26	284.83	6.28
MWB20-II	MWB20-II-B	270.98	274.03	4.90
	MWB20-II-C	256.00	259.05	4.45
	BHE			
MWB23-I	MWB23-I-A	275.68	280.26	5.59
MWB23-II	MWB23-II-B	267.79	270.84	5.18
	MWB23-II-C	252.04	255.09	5.61
MWB26-I	MWB26-I-A	283.72	285.25	2.30
	MWB26-I-B	277.20	280.25	3.66
MWB26-II	MWB26-II-C	265.08	268.13	5.03
	MWB26-II-D	251.52	254.56	5.18

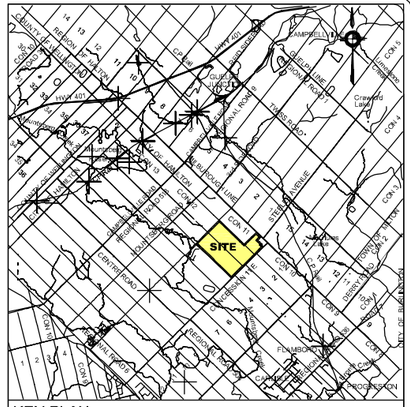












KEY PLAN
ADAPTED FROM LOVELL ENVIRONMENTAL CONSULTANTS INC.

LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TW14 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY

SCALE

0 50 100 200 300 400 m

1 : 10,000

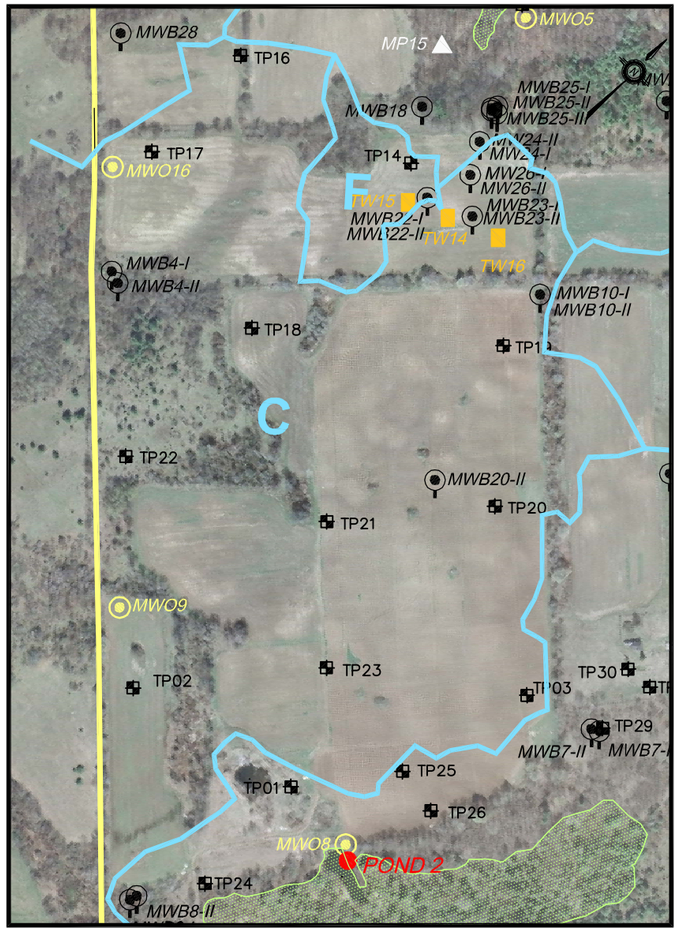
St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

Watershed C
Bedrock Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

Gartner Lee

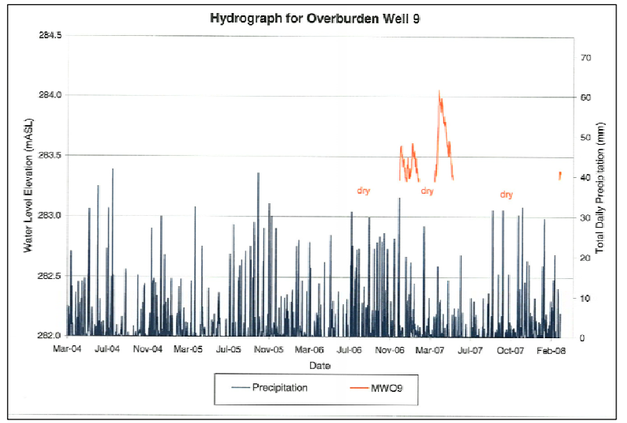
G3C-1

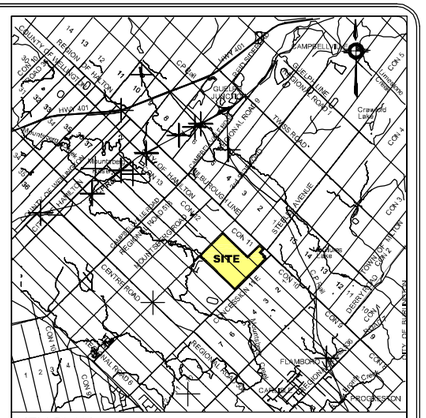


Watershed C - Monitor Summary

Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Monitoring Well - Overburden				
MWO9	MWO9	283.08	283.99	1.52
MWO16	MWO16	288.63	289.63	1.61

Note: MW16 is DRY





LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TW14 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY

SCALE

0 50 100 200 300 400 m

1 : 10,000

St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

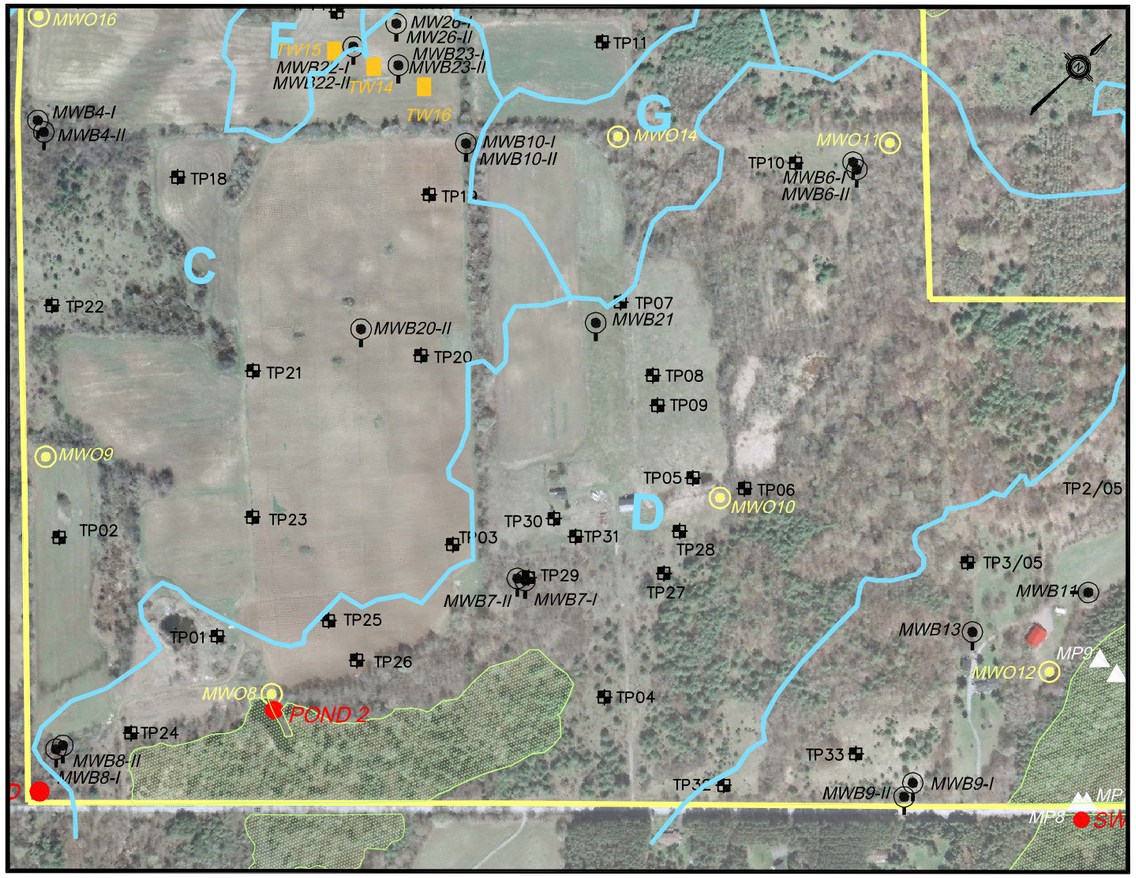
Watershed C
Overburden Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

Gartner Lee

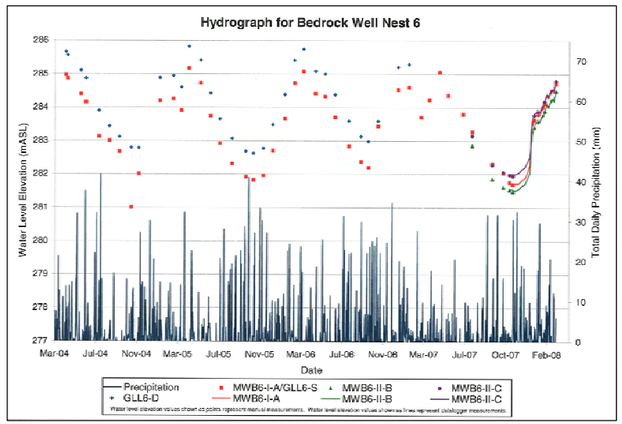
G3C-2

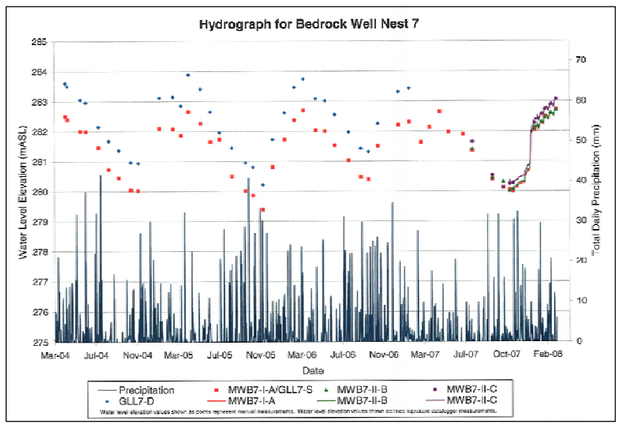
N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED C.dwg Layout:FIG 8 Plotted: Oct 28, 2008 @ 4:15pm by crawfordjm

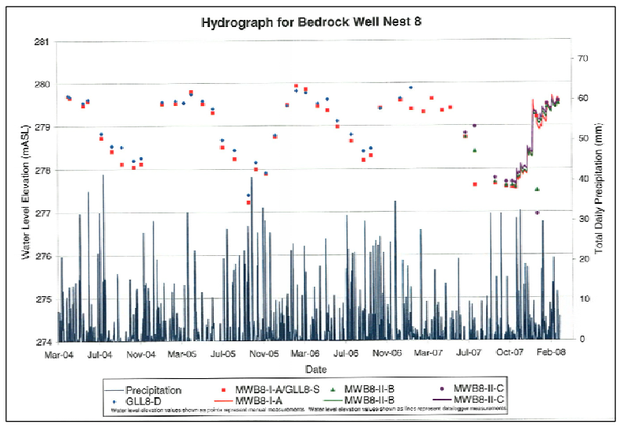


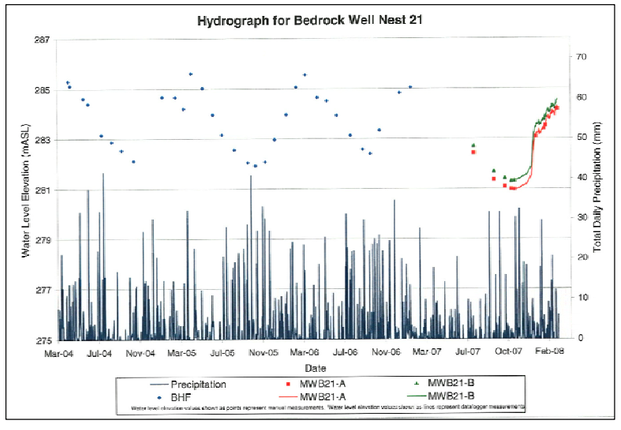
Watershed D - Monitor Summary

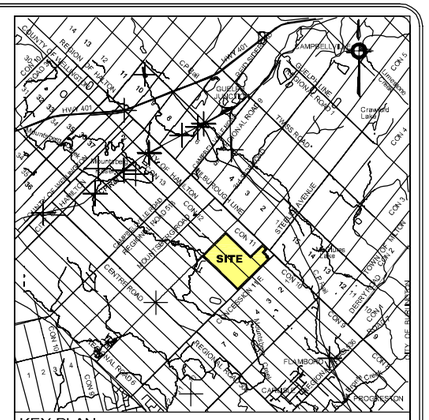
Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Monitoring Well - Bedrock				
MWB6-I	MWB6-I-A	281.17	284.37	3.50
MWB6-II	MWB6-II-B	266.16	272.25	8.28
	MWB6-II-C	257.98	261.03	4.85
	GLL6-D			
MWB7-I	MWB7-I-A	279.41	282.61	3.50
MWB7-II	MWB7-II-B	269.07	273.64	6.71
	MWB7-II-C	250.07	253.12	4.98
	GLL7-D			
MWB8-I	MWB8-I-A	275.07	278.27	3.50
MWB8-II	MWB8-II-B	268.06	271.10	4.95
	MWB8-II-C	257.06	260.11	5.46
	GLL8-D			
MWB21	MWB21-A	270.98	274.03	5.10
	MWB21-B	256.29	260.87	5.74
	BHF			











KEY PLAN
ADAPTED FROM LOVELL ENVIRONMENTAL CONSULTANTS INC.

LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TW14 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY

SCALE
0 50 100 200 300 400 m
1 : 10,000

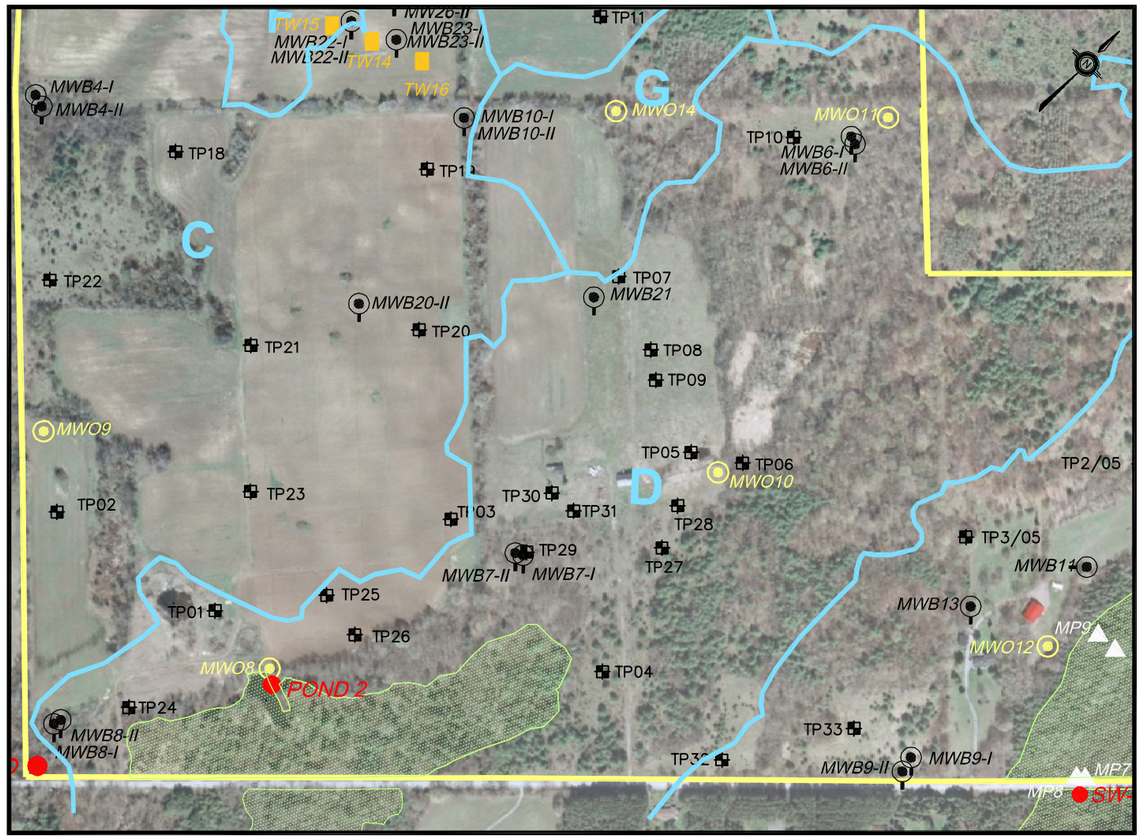
St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

Watershed D
Bedrock Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

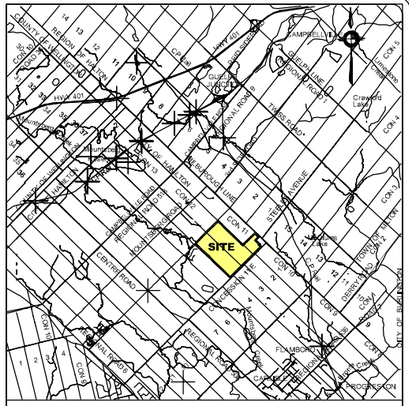
Gartner Lee G3D-1

N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED D.dwg Layout:FIG 9 Plotted: Oct 28, 2008 @ 4:22pm by crawfordjm



Watershed D - Monitor Summary

Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Monitoring Well - Overburden				
MWO8	MWO8	279.52	280.43	1.52
MWO10	MWO10	282.56	283.47	1.52
MWO11	MWO11	284.17	285.08	1.52

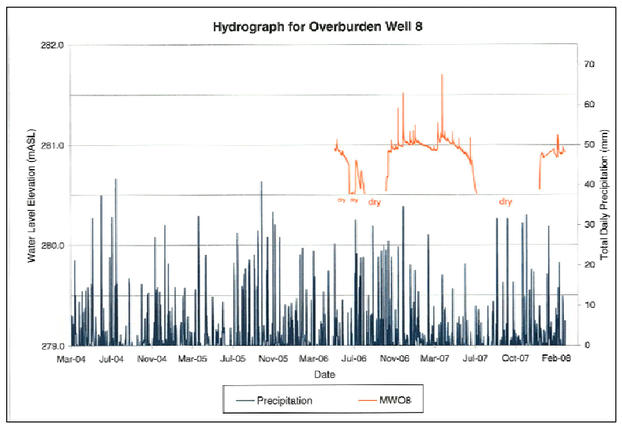


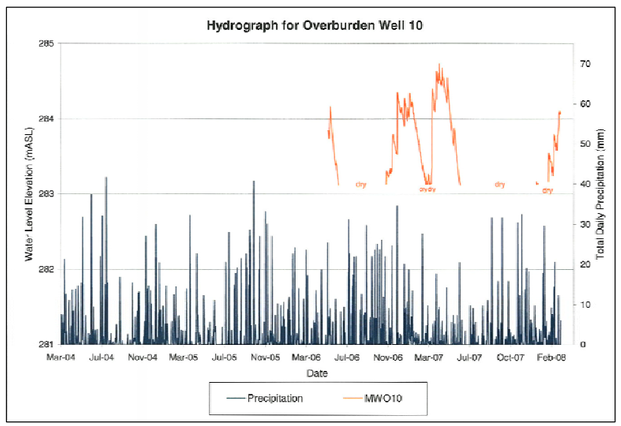
KEY PLAN

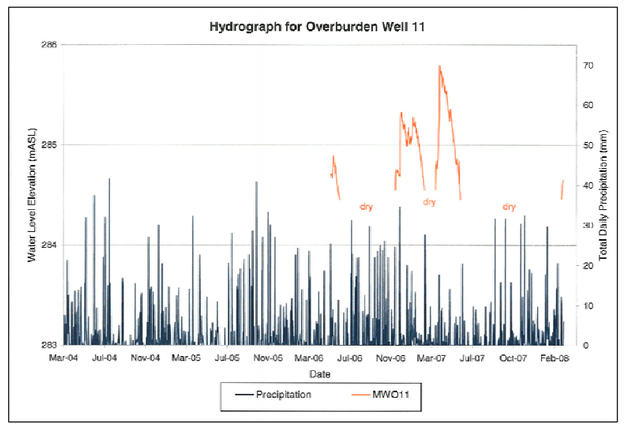
ADAPTED FROM LONG ENVIRONMENTAL CONSULTANTS INC.

LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TW14 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY







SCALE

0 50 100 200 300 400 m

1 : 10,000

St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

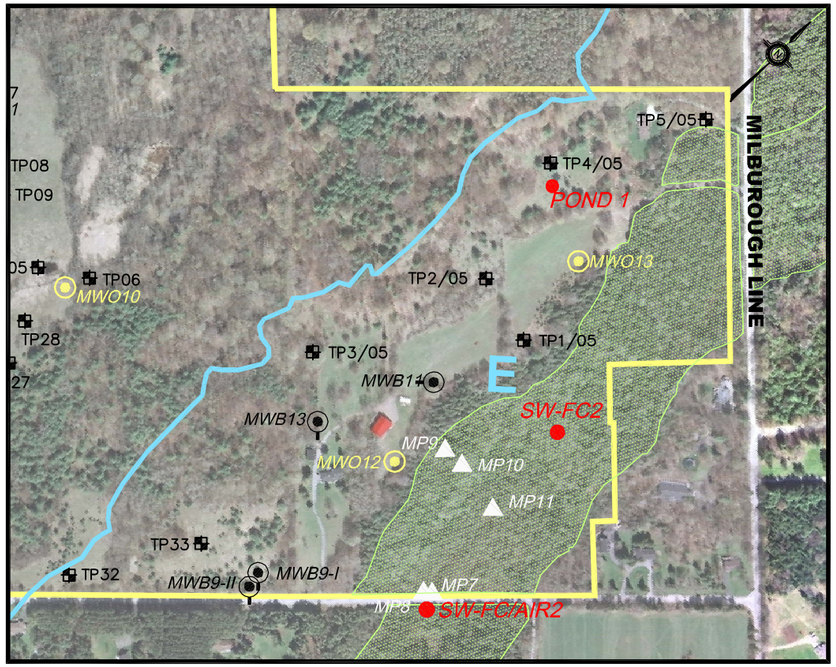
Watershed D
Overburden Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

Gartner Lee

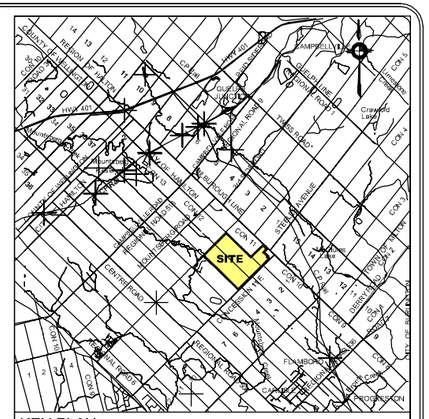
G3D-2

N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED D.dwg Layout:FIG 10 Plotted: Oct 28, 2008 @ 4:30pm by crawfordjm



Watershed E - Monitor Summary

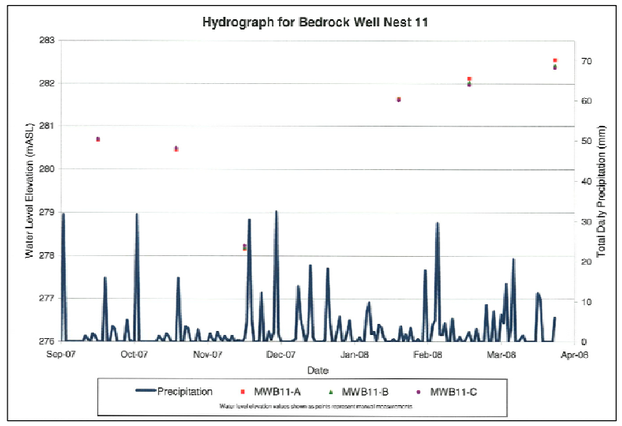
Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Monitoring Well - Bedrock				
MWB9-I	MWB9-I-A	278.60	281.80	3.50
MWB9-II	MWB9-II-B	248.97	252.17	3.50
MWB11	MWB11-A	275.50	278.54	4.03
	MWB11-B	265.39	271.48	7.90
	MWB11-C	250.38	256.47	8.28
	TW11			
MWB13	MWB13-A	276.43	281.00	6.22
	MWB13-B	258.09	262.66	6.48
	MWB13-C	250.09	254.66	6.27

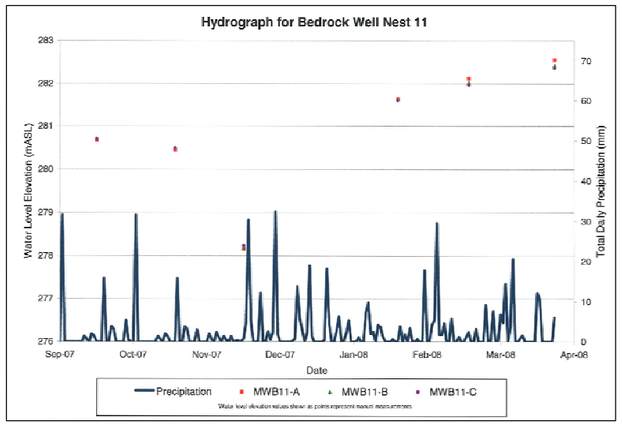


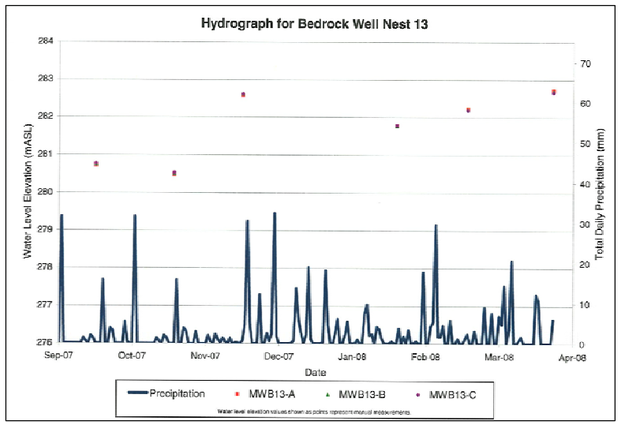
KEY PLAN
ADAPTED FROM LOVE ENVIRONMENTAL CONSULTANTS INC.

LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TW14 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY







SCALE

0 50 100 200 300 400 m

1 : 10,000

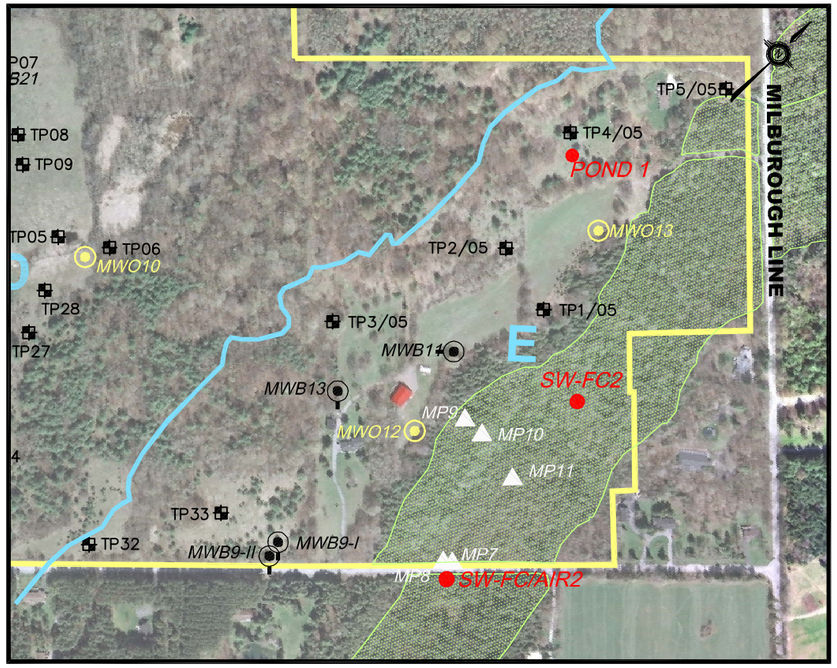
St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

Watershed E
Bedrock Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

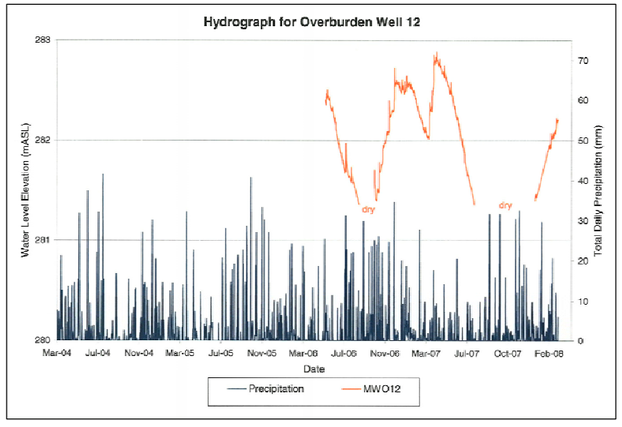
Gartner Lee G3E-1

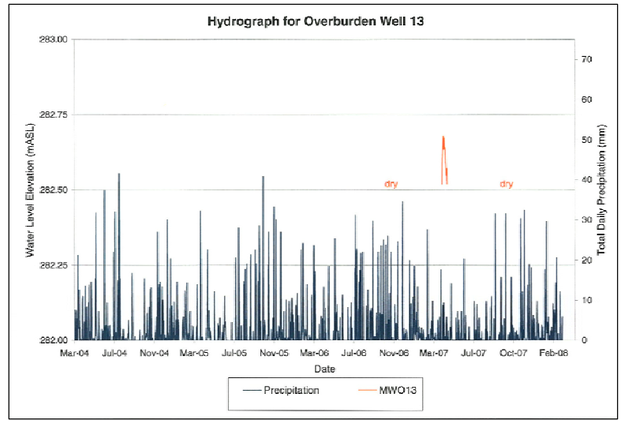
N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED E.dwg Layout:FIG 11 Plotted: Oct 29, 2008 @ 8:59am by crawfordjm

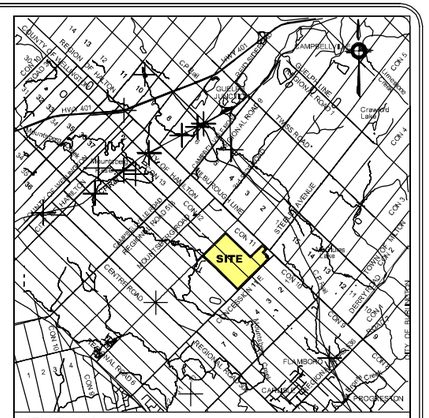


Watershed E - Monitor Summary

Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Monitoring Well - Overburden				
MWO12	MWO12	280.76	281.75	1.60
MWO13	MWO13	282.09	283.00	1.52







KEY PLAN
ADAPTED FROM LONG ENVIRONMENTAL CONSULTANTS INC.

LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TW14 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY

SCALE

0 50 100 200 300 400 m

1 : 10,000

St Marys Flamborough Quarry St Marys Cement (Canada) Inc.

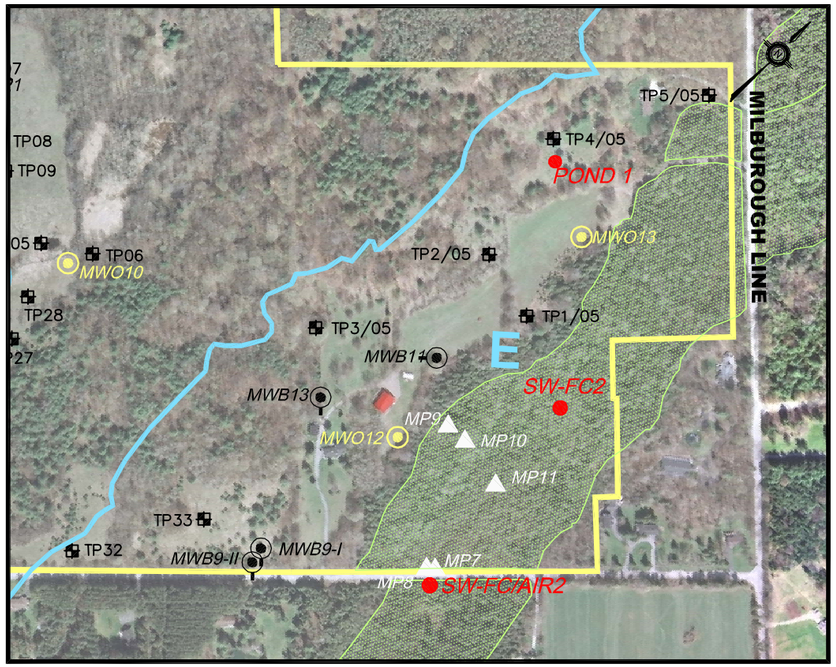
Watershed E Overburden Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

Gartner Lee

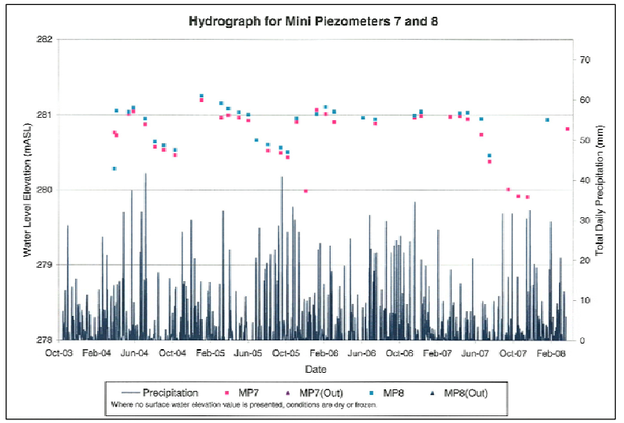
G3E-2

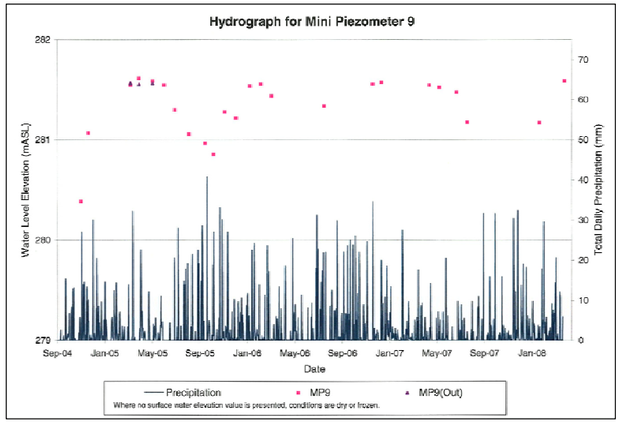
N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED E.dwg Layout: FIG 12 Plotted: Oct 29, 2008 @ 9:08am by crawfordjm

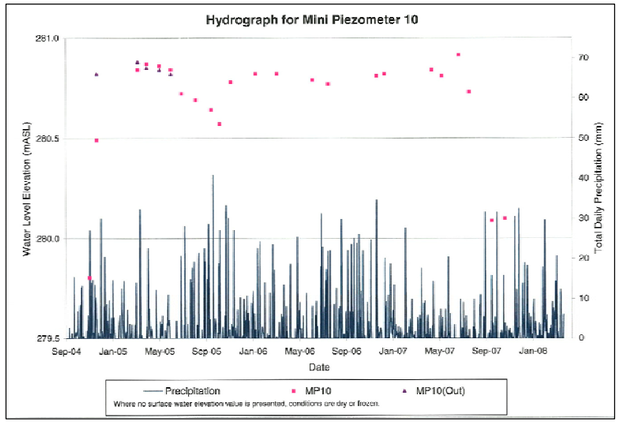


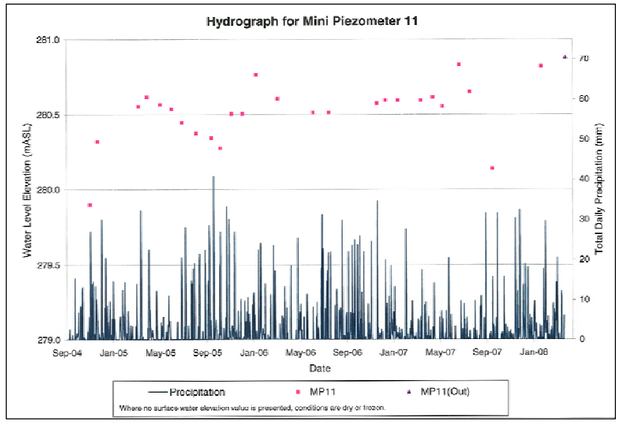
Watershed E - Monitor Summary

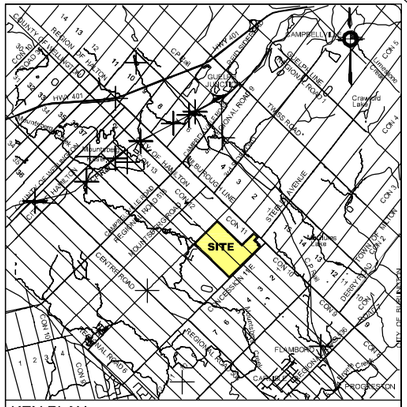
Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Piezometers				
MP7	MP7	279.06		
MP8	MP8	278.30		
MP9	MP9	280.37		
MP10	MP10	280.01		
MP11	MP11	280.06		











LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TW14 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY

SCALE

0 50 100 200 300 400 m

1 : 10,000

St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

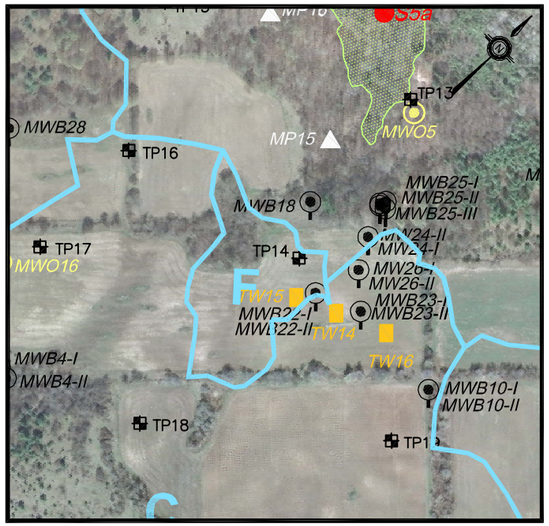
Watershed E
Piezometer Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

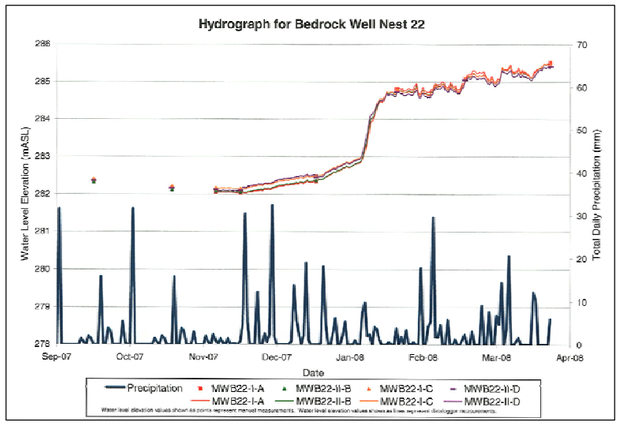
Gartner Lee

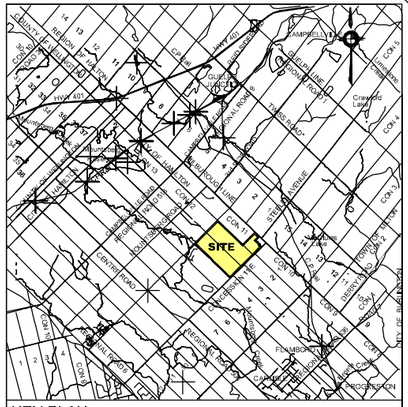
G3E-3

N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED E.dwg Layout:FIG 13 Plotted: Oct 29, 2008 @ 9:13am by crawfordjm



Watershed F - Monitor Summary				
Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Monitoring Well - Bedrock				
MWB22-I	MWB22-I-A	279.30	282.35	4.82
	MWB22-I-C	263.07	266.12	4.04
MWB22-II	MWB22-II-B	273.21	276.26	4.91
	MWB22-II-D	251.12	257.21	7.92





KEY PLAN
ADAPTED FROM LONG ENVIRONMENTAL CONSULTANTS INC.

LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TW14 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY

SCALE

0 50 100 200 300 400 m

1 : 10,000

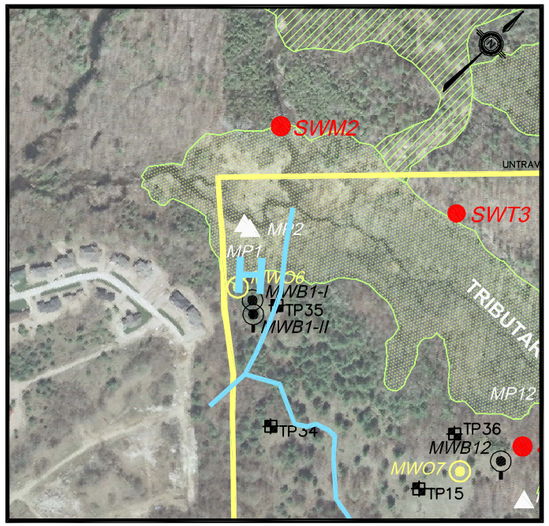
St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

Watershed F
Bedrock Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

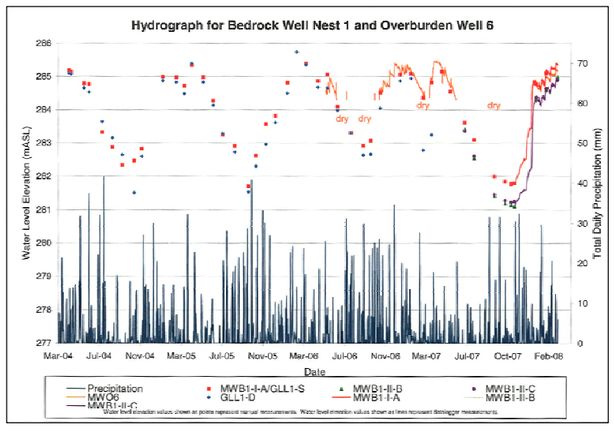
Gartner Lee

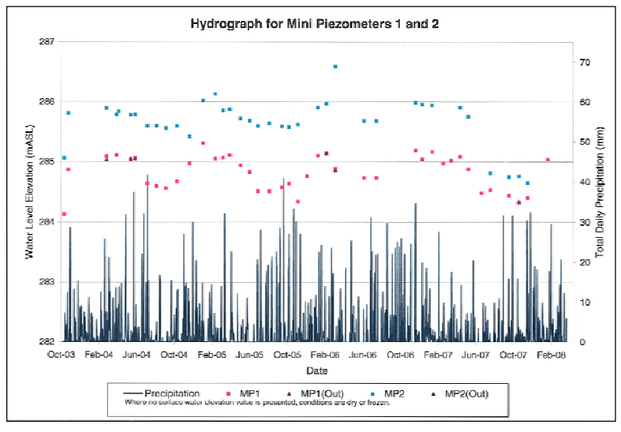
G3F-1

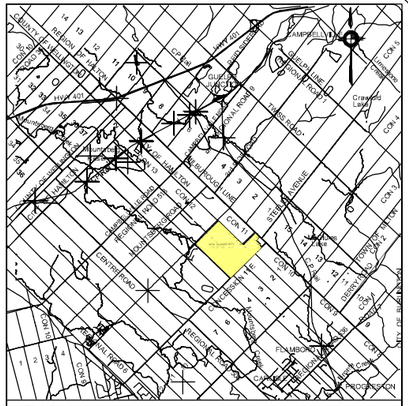


Watershed H - Monitor Summary

Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Monitoring Well - Bedrock				
MWB1-I	MWB1-I-A	278.94	282.14	3.50
MWB1-II	MWB1-II-B	265.16	268.21	4.50
	MWB1-II-C	253.17	256.22	4.93
	GLL1-D			
Monitoring Well - Overburden				
MWO6	MWO6	283.68	284.14	1.07
Piezometers				
MP1	MP1	284.31		
MP2	MP2	283.66		







LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TW14 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY

SCALE

0 50 100 200 300 400 m

1 : 10,000

St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

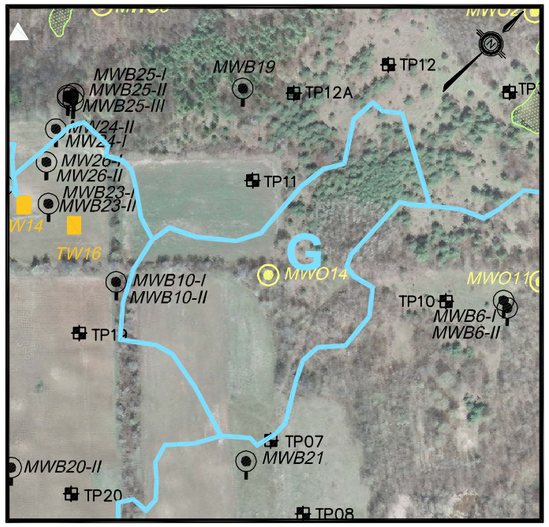
Watershed H
Bedrock, Overburden & Piezometer Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

Gartner Lee

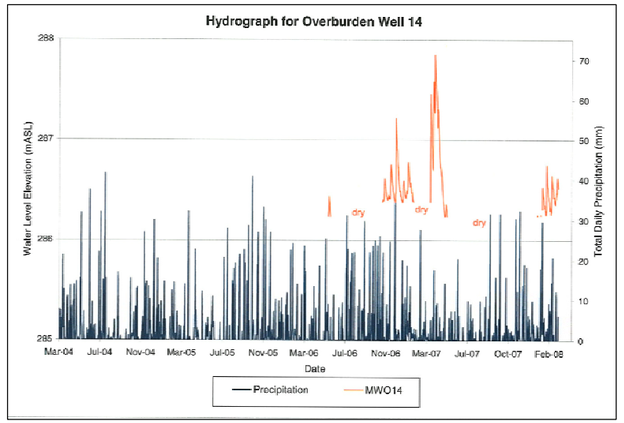
G3H-1

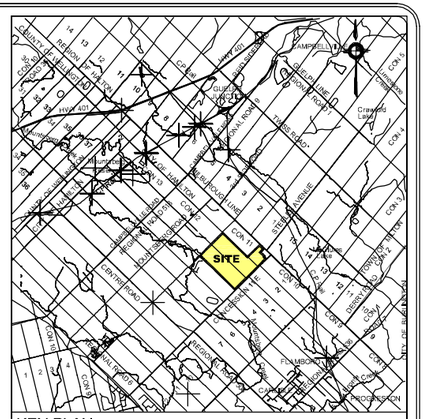
N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED H.dwg Layout:FIG 16 Plotted: Oct 29, 2008 @ 9:34am by crawfordjm



Watershed G - Monitor Summary

Location ID	Monitor ID	Bottom of Screen	Top of Screen	Ground Water Intake Length
		m ASL		m
Monitoring Well - Overburden				
MWO14	MWO14	286.16	287.06	0.61





KEY PLAN
ADAPTED FROM LOVE ENVIRONMENTAL CONSULTANTS INC.

LEGEND:

- MP14 — LOCATION OF PIEZOMETER
- MWB19 — LOCATION OF BEDROCK MONITORING WELL NEST
- MWO16 — LOCATION OF OVERBURDEN MONITORING WELL NEST
- TW14 — LOCATION OF TEST WELL
- SW-FC2 — LOCATION OF STANTEC SURFACE WATER MONITOR
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERSHED BOUNDARY

SCALE

0 50 100 200 300 400 m

1 : 10,000

St Marys Flamborough Quarry
St Marys Cement (Canada) Inc.

Watershed G
Overburden Hydrographs

Designed By:	-	Drawn By:	JMC
Checked By:	PW	Approved By:	GHF
Date Issued:	JUNE 2008	Project No.:	60699

Gartner Lee

G3G-1

N:\Projects\2006\60699\2008\Final\ACAD\hydrographs\WATERSHED G.dwg Layout:FIG 15 Plotted: Oct 29, 2008 @ 9:25am by crawfordjm

AECOM

Appendix H

Groundwater Use

H1. Water Well Record Summary

H2. Lotowater Door-to-Door Survey of Residential Wells, July 2008

H3. PTTW Information

H1. Water Well Record Summary

Appendix H1

Groundwater Use Survey

Residential Water Wells

Information on residential water use in the vicinity of the St Marys property was obtained through two sources, specifically water well records (WWR) on file with the MOE and the completion of a door-to-door survey of wells and water use. The well records were initially reviewed and the information complied with the intent of identifying well locations and construction details. This information is intended to be used to identify wells, which based on their proximity to the GRS test site, shallow well depth and low well productivity could potentially be affected during the GRS testing program.

This 'desk top survey' was followed by the door-to-door survey to verify well locations, establish the presence of any additional wells for which WWR do not exist and identify property owners that would like to have their wells monitored during the GRS testing program. The work program undertaken to collect this information is described below:

Ministry of Environment Water Well Records

Since the 1950s, well drillers are required to complete water well record (WWR) forms provided by the MOE and to submit the form for inclusion in the MOE's water well record database. This information source is available to the public and provides a useful reference for determining for the nature and extent of residential water use in a given area.

As part of this investigation copies of the individual WWR were obtained from the MOE and the well locations within a 2 km distance of the St Marys were plotted on an Ontario Base Map using the UTM co-ordinates provided in the MOE well records. Following visual examination of the plotted points, however, it was determined given the locations of some of the wells being removed from residential dwelling, that the spatial accuracy of many of the well locations was suspect.

Efforts were taken to improve on the accuracy of the well locations. This involved creating a file for each property within 1 km of the St Marys property. The file was referenced to municipal street addresses and roll numbers, and populated with a property map obtained from parcel mapping maintained by the City of Hamilton and Halton Region.

The property maps were then linked to digital aerial imagery on Google Earth software, *2008* and a screenshot of each property, showing property lines, was produced. Wells that lie within the property parcel, based on the original MOE generated well UTM co-ordinates, were then plotted on the aerial photograph screenshots. The screenshots and WWR were then added to the file.

The next step involved the careful re-examination of the individual well records to establish landmarks that could be used to refine the well locations. Specifically, many of the well records contain sketches drawn by the driller that show the location of wells. These sketches generally include spatial references such as addresses, concession numbers, distance measurements, and visual landmarks such as buildings and roads. Using the sketches on the water well records, spatial references were matched with features on the Google screenshots and a revised well location was established and plotted. The new UTM co-ordinates were then established and recorded for each well.

The final step involved transferring information contained on each WWR including the property address and roll number, known well attributes, and notes regarding the location of the well and the level of certainty regarding this location (*see notes on data accuracy*) to a survey form.

[Notes on data accuracy: The primary factor limiting the ability to accurately determine the location of water wells was the level of detail contained in the sketch included on the WWR. The level of certainty with regard to water well location is indicated on each completed survey form. For example, a "high" level of certainty was indicated in the case where the sketch included road names, the relative locations of buildings and a lot number or property address. If the MOE-determined well UTM location was coincident with this point, the level of certainty would be "very high". A "medium" level of certainty was indicated in cases where sketch details provided a relatively strong indication of the well's location (e.g., distance measurements to labelled roads) but the position was inconsistent with the MOE-determined well UTM location. A "low" level of certainty was indicated in the case that the water well record sketches contained only very rough indications of well location (e.g., un-labelled roads, distance measurements that appeared to be scratched out).]

Data contained in MOE WWR are presumed to be accurate. A column was added to each well survey form to allow for the addition of notes regarding well attributes or location, which can be added during the door-to-door survey. This may include a GPS reading of the well location obtained during the survey.

The final product was file for each property parcel, that included the WWR, the completed survey form and an aerial photograph plot of each property parcel within a 1-km distance of the St Marys showing both the MOE and the Gartner Lee generated well locations. For properties not containing known water wells, the file included a screenshot of the property and a blank survey form.

In total approximately 150 files were produced, of which approximately 100 contain one or more water wells. These files were then used as a starting point for completion of the door-to-door water use survey. The well records are provided in Appendix H1.

MOE Water Well Records Report

GLL 60699

Well Number 2800413 **Construction Date** 30-Nov-1963 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582083 **Northing (NAD83)** 4809814 **UTM Zone** 17
Positional Reliability margin of error : 100 m - 300 m **Elevation(mASL)** 284.99
Lot 015 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 3.05 **Deepest Water Found** 6.10 **Well Depth** 6.40
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.13
Pump Rate(lgpm 5.00 **Pump Time(h:m)** 2 : 0 **Depth (end of 60 min)** 6.40
Specific Capacity: 0.40 **Recommended Pump Setting (gpm) :** 20.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.13	Gravel		gravel, gravelly sand
2	2.13	6.40	Limestone		limestone

Well Number 2803492 **Construction Date** 21-Dec-1970 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582604 **Northing (NAD83)** 4810443 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 281.94
Lot 015 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 2.44 **Deepest Water Found** 11.89 **Well Depth** 11.89
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 4.88
Pump Rate(lgpm 12.00 **Pump Time(h:m)** : **Depth (end of 60 min)** 9.45
Specific Capacity: 0.50 **Recommended Pump Setting (gpm) :** 31.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	4.88	Clay Boulders	Brown	diamicton: si to sa/si matrix
2	4.88	11.89	Dolomite	Blue	limestone

Well Number 2803547 **Construction Date** 25-Mar-1971 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581574 **Northing (NAD83)** 4810303 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 292.61
Lot 002 **Concession** 01 Milton Town (Nassagaweya) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 8.23 **Deepest Water Found** 17.98 **Well Depth** 20.42
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 9.45
Pump Rate(lgpm 6.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 20.42
Specific Capacity: 0.20 **Recommended Pump Setting (gpm) :** 65.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	9.45	Clay Boulders	Brown	diamicton: si to sa/si matrix
2	9.45	20.42	Dolomite	Blue	limestone

MOE Water Well Records Report

GLL 60699

Well Number 2803861 **Construction Date** 27-Jul-1972 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582494 **Northing (NAD83)** 4810243 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 283.46
Lot 015 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 6.71 **Deepest Water Found** 9.14 **Well Depth** 9.14
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.74
Pump Rate(lgpm 3.00 **Pump Time(h:m)** 1 : 30 **Depth (end of 60 min)** 7.01
Specific Capacity: 3.00 **Recommended Pump Setting (gpm) :** 29.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.74	Clay	Brown	clay, silty clay
2	2.74	9.14	Limestone		limestone

Well Number 2803883 **Construction Date** 12-May-1972 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582514 **Northing (NAD83)** 4810323 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 283.46
Lot 015 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) **Static Level (m)** 2.44 **Deepest Water Found** 9.14 **Well Depth** 10.67
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 3.96
Pump Rate(lgpm 12.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 3.66
Specific Capacity: 3.00 **Recommended Pump Setting (gpm) :** 30.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	3.96	Sand Boulders	Brown	gravel, gravelly sand
2	3.96	10.67	Limestone	Grey	limestone

Well Number 2803905 **Construction Date** 23-Aug-1972 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582414 **Northing (NAD83)** 4810173 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 283.46
Lot 015 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 1.83 **Deepest Water Found** 5.79 **Well Depth** 7.62
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 4.27
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 2 : 0 **Depth (end of 60 min)** 1.83
Specific Capacity: 40.00 **Recommended Pump Setting (gpm) :** 20.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	4.27	Sand Stones	Brown	gravel, gravelly sand
2	4.27	7.62	Limestone	Brown	limestone

MOE Water Well Records Report

GLL 60699

Well Number 2803935 **Construction Date** 24-Oct-1972 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582634 **Northing (NAD83)** 4809283 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 277.37
Lot 014 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 2.44 **Deepest Water Found** 9.75 **Well Depth** 10.67
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.74
Pump Rate(lgpm 24.00 **Pump Time(h:m)** 1 : 30 **Depth (end of 60 min)** 4.57
Specific Capacity: 3.40 **Recommended Pump Setting (gpm) :** 25.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.30	Topsoil	Black	fill (incl topsoil, waste)
2	0.30	2.74	Sand Boulders	Brown	gravel, gravelly sand
3	2.74	10.67	Limestone	Grey	limestone

Well Number 2804222 **Construction Date** 01-May-1973 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582072 **Northing (NAD83)** 4810233 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 286.51
Lot 001 **Concession** 01 Milton Town (Nassagaweya) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 3.66 **Deepest Water Found** 15.85 **Well Depth** 16.76
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 0.91
Pump Rate(lgpm 25.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 5.18
Specific Capacity: 5.00 **Recommended Pump Setting (gpm) :** 30.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.91	Silt	Brown	silt, sandy silt, clayey silt
2	0.91	16.76	Limestone	Grey	limestone

Well Number 2804233 **Construction Date** 12-Jan-1973 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582454 **Northing (NAD83)** 4809463 **UTM Zone** 17
Positional Reliability margin of error : 300 m - 1 km **Elevation(mASL)** 281.94
Lot 015 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) **Static Level (m)** 3.35 **Deepest Water Found** 10.97 **Well Depth** 11.89
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 3.66
Pump Rate(lgpm 15.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 6.10
Specific Capacity: 1.70 **Recommended Pump Setting (gpm) :** 30.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	3.66	Clay Stones	Grey	diamicton: si to sa/si matrix
2	3.66	11.89	Limestone	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 2804240 **Construction Date** 06-Aug-1973 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582697 **Northing (NAD83)** 4809449 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 277.37
Lot 014 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) **Static Level (m)** 3.35 **Deepest Water Found** 9.45 **Well Depth** 10.67
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 4.57
Pump Rate(lgpm 6.00 **Pump Time(h:m)** 1 : 30 **Depth (end of 60 min)** 8.53
Specific Capacity: 0.30 **Recommended Pump Setting (gpm) :** 33.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.30	Topsoil	Black	fill (incl topsoil, waste)
2	0.30	4.57	Sand Stones	Brown	gravel, gravelly sand
3	4.57	10.67	Limestone	Grey	limestone

Well Number 2804808 **Construction Date** 13-Aug-1975 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581426 **Northing (NAD83)** 4810508 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 292.61
Lot 002 **Concession** 01 Milton Town (Nassagaweya) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 5.49 **Deepest Water Found** 10.97 **Well Depth** 12.80
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.74
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 7.01
Specific Capacity: 4.00 **Recommended Pump Setting (gpm) :** 40.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.74	Clay Gravel	Brown	diamicton: si to sa/si matrix
2	2.74	12.80	Limestone	Grey	limestone

Well Number 2804833 **Construction Date** 05-May-1975 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580894 **Northing (NAD83)** 4810963 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 289.56
Lot 003 **Concession** 01 Milton Town (Nassagaweya) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 2.44 **Deepest Water Found** 19.81 **Well Depth** 21.34
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 0.30
Pump Rate(lgpm 25.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 19.81
Specific Capacity: 0.40 **Recommended Pump Setting (gpm) :** 25.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.30	Topsoil	Black	fill (incl topsoil, waste)
2	0.30	3.05	Limestone	Grey	limestone
3	3.05	21.34	Limestone	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 2805043 **Construction Date** 12-Apr-1977 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582414 **Northing (NAD83)** 4810143 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 283.46
Lot 015 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 0.61 **Deepest Water Found** 7.62 **Well Depth** 9.14
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 1.22
Pump Rate(lgpm 25.00 **Pump Time(h:m)** 2 : 0 **Depth (end of 60 min)** 1.52
Specific Capacity: 8.30 **Recommended Pump Setting (gpm) :** 25.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	1.22	Sand Stones Loose	Brown	gravel, gravelly sand
2	1.22	1.83	Limestone Loose Layered	Brown	limestone
3	1.83	9.14	Limestone Hard	Grey	limestone

Well Number 2805241 **Construction Date** 16-May-1978 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582374 **Northing (NAD83)** 4810363 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 286.51
Lot 001 **Concession** 01 Milton Town (Nassagaweya) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 10.36 **Deepest Water Found** 25.60 **Well Depth** 26.82
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 22.56
Pump Rate(lgpm 17.00 **Pump Time(h:m)** 2 : 0 **Depth (end of 60 min)** 10.36
Specific Capacity: 34.00 **Recommended Pump Setting (gpm) :** 50.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	7.01	Previously Dug		fill (incl topsoil, waste)
2	7.01	22.56	Previously Drilled		fill (incl topsoil, waste)
3	22.56	26.82	Limestone	Grey	limestone

Well Number 2805488 **Construction Date** 07-Mar-1979 **Primary Water Use** Stock **Well Type** Bedrock
Easting (NAD83) 581034 **Northing (NAD83)** 4811223 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 304.80
Lot 003 **Concession** 01 Milton Town (Nassagaweya) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 12.19 **Deepest Water Found** 19.81 **Well Depth** 21.34
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 12.19
Pump Rate(lgpm **Pump Time(h:m)** : **Depth (end of 60 min)** 18.29
Specific Capacity: 0.00 **Recommended Pump Setting (gpm) :** 65.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	12.19	Previously Dug		fill (incl topsoil, waste)
2	12.19	21.34	Limestone	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 2806166 **Construction Date** 10-May-1984 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582902 **Northing (NAD83)** 4809250 **UTM Zone** 17
Positional Reliability margin of error : 10 - 30 m **Elevation(mASL)** 273.00
Lot 014 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) **Static Level (m)** 2.13 **Deepest Water Found** 9.75 **Well Depth** 10.67
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 6.71
Pump Rate(lgpm 36.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 6.71
Specific Capacity: **Recommended Pump Setting (gpm) :** 32.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.30	Topsoil Loose	Black	fill (incl topsoil, waste)
2	0.30	5.18	Clay Gravel Loose	Brown	diamicton: si to sa/si matrix
3	5.18	6.71	Sand Gravel Loose	Brown	gravel, gravelly sand
4	6.71	10.67	Limestone Hard	Grey	limestone

Well Number 2806366 **Construction Date** 20-Nov-1985 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582132 **Northing (NAD83)** 4810120 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)**
Lot 001 **Concession** 01 Milton Town (Nassagaweya) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 1.22 **Deepest Water Found** 9.14 **Well Depth** 10.97
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.44
Pump Rate(lgpm 36.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 2.74
Specific Capacity: **Recommended Pump Setting (gpm) :** 30.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.44	Clay Sandy Loose	Brown	silt, sandy silt, clayey silt
2	2.44	5.49	Limestone Layered	Grey	limestone
3	5.49	10.97	Limestone Hard	Grey	limestone

Well Number 2806394 **Construction Date** 30-Sep-1985 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580764 **Northing (NAD83)** 4811093 **UTM Zone** 17
Positional Reliability margin of error : 100 m - 300 m **Elevation(mASL)**
Lot 003 **Concession** 01 Milton Town (Nassagaweya) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 7.62 **Deepest Water Found** 14.94 **Well Depth** 15.85
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 0.00
Pump Rate(lgpm 7.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 12.80
Specific Capacity: **Recommended Pump Setting (gpm) :** 39.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	1.22	Limestone Clay Fractured	Brown	limestone
2	1.22	15.85	Limestone	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 2806681 **Construction Date** 13-Jul-1987 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582362 **Northing (NAD83)** 4810345 **UTM Zone** 17
Positional Reliability margin of error : 10 - 30 m **Elevation(mASL)** 288.00
Lot 001 **Concession** 01 Milton Town (Nassagaweya) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 4.88 **Deepest Water Found** 13.11 **Well Depth** 13.72
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.44
Pump Rate(lgpm 14.00 **Pump Time(h:m)** 2 : 0 **Depth (end of 60 min)** 11.58
Specific Capacity: **Recommended Pump Setting (gpm) :** 42.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.44	Sand Gravel Loose	Brown	gravel, gravelly sand
2	2.44	4.27	Rock Layered	Brown	rock
3	4.27	13.72	Limestone Hard	Grey	limestone

Well Number 2807310 **Construction Date** 26-Jun-1989 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582508 **Northing (NAD83)** 4810191 **UTM Zone** 17
Positional Reliability margin of error : 10 - 30 m **Elevation(mASL)** 284.00
Lot 015 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) **Static Level (m)** 6.10 **Deepest Water Found** 12.19 **Well Depth** 14.02
Top of Screen (m): **WaterKind** Unknown **Depth to Bedrock (m)** 5.49
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 2 : 0 **Depth (end of 60 min)** 9.75
Specific Capacity: **Recommended Pump Setting (gpm) :** 43.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	5.49	Boulders Gravel Sand	Brown	gravel, gravelly sand
2	5.49	14.02	Limestone Hard	Grey	limestone

Well Number 2808424 **Construction Date** 21-Mar-1996 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582634 **Northing (NAD83)** 4810453 **UTM Zone** 17
Positional Reliability margin of error : 10 - 30 m **Elevation(mASL)** 284.00
Lot 015 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 4.27 **Deepest Water Found** 11.28 **Well Depth** 12.19
Top of Screen (m): **WaterKind** Unknown **Depth to Bedrock (m)** 1.52
Pump Rate(lgpm 13.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 11.28
Specific Capacity: **Recommended Pump Setting (gpm) :** 37.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	1.52	Sand Gravel Loose	Brown	gravel, gravelly sand
2	1.52	12.19	Limestone Layered	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 2809020 **Construction Date** 15-Jul-1999 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582675 **Northing (NAD83)** 4810129 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 015 **Concession** 01 Milton Town (Nelson) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 8.53 **Deepest Water Found** 16.76 **Well Depth** 18.29
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 1.52
Pump Rate(lgpm 15.00 **Pump Time(h:m)** : 30 **Depth (end of 60 min)** 10.67
Specific Capacity: **Recommended Pump Setting (gpm) :** 55.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	1.52	Clay Sandy	Brown	silt, sandy silt, clayey silt
2	1.52	18.29	Limestone	Grey	limestone

Well Number 2809393 **Construction Date** 01-Jun-2001 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582207 **Northing (NAD83)** 4810553 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 001 **Concession** 01 Milton Town (Nassagaweya) **Halton**
Well Diameter(cm) 15.24 **Static Level (m)** 3.05 **Deepest Water Found** 18.90 **Well Depth** 18.90
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 1.52
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 1 : **Depth (end of 60 min)** 6.40
Specific Capacity: **Recommended Pump Setting (gpm) :** 55.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.61	Topsoil	Black	fill (incl topsoil, waste)
2	0.61	1.52	Clay	Brown	clay, silty clay
3	1.52	2.74	Limestone Fractured Soft		limestone
4	2.74	18.90	Limestone	Grey	limestone

Well Number 6803048 **Construction Date** 17-Jul-1958 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581233 **Northing (NAD83)** 4808644 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)** 280.11
Lot 003 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 6.10 **Deepest Water Found** 14.33 **Well Depth** 14.33
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.44
Pump Rate(lgpm 4.00 **Pump Time(h:m)** 0 : 30 **Depth (end of 60 min)** 12.19
Specific Capacity: 0.20 **Recommended Pump Setting (gpm) :**

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.44	Clay		clay, silty clay
2	2.44	14.33	Limestone		limestone

MOE Water Well Records Report

GLL 60699

Well Number 6803051 **Construction Date** 07-Jun-1955 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580470 **Northing (NAD83)** 4807959 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)** 277.37
Lot 006 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 3.05 **Deepest Water Found** 11.58 **Well Depth** 12.19
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.13
Pump Rate(lgpm 40.00 **Pump Time(h:m)** 3 : 0 **Depth (end of 60 min)** 3.05
Specific Capacity: 80.00 **Recommended Pump Setting (gpm) :**

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.13	Medium Sand Gravel Boulders		gravel, gravelly sand
2	2.13	12.19	Limestone		limestone

Well Number 6803052 **Construction Date** 01-Jul-1960 **Primary Water Use** Commercial **Well Type** Bedrock
Easting (NAD83) 580707 **Northing (NAD83)** 4807805 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)** 277.37
Lot 006 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 2.44 **Deepest Water Found** 8.23 **Well Depth** 8.84
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 0.61
Pump Rate(lgpm 10.00 **Pump Time(h:m)** 2 : 0 **Depth (end of 60 min)** 3.35
Specific Capacity: 3.30 **Recommended Pump Setting (gpm) :** 8.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.61	Topsoil Medium Sand		fill (incl topsoil, waste)
2	0.61	8.84	Limestone		limestone

Well Number 6803053 **Construction Date** 16-Jul-1962 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580704 **Northing (NAD83)** 4807807 **UTM Zone** 17
Positional Reliability margin of error : 100 m - 300 m **Elevation(mASL)** 277.37
Lot 006 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 3.05 **Deepest Water Found** 8.23 **Well Depth** 10.67
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 7.92
Pump Rate(lgpm 10.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 6.10
Specific Capacity: 1.00 **Recommended Pump Setting (gpm) :** 30.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	7.92	Topsoil Clay Boulders		fill (incl topsoil, waste)
2	7.92	10.67	Limestone	White	limestone

MOE Water Well Records Report

GLL 60699

Well Number 6803071 **Construction Date** 01-Jul-1954 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582062 **Northing (NAD83)** 4809638 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)** 285.90
Lot 001 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 4.57 **Deepest Water Found** 7.01 **Well Depth** 7.62
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.74
Pump Rate(lgpm 3.00 **Pump Time(h:m)** 3 : 0 **Depth (end of 60 min)** 7.62
Specific Capacity: 0.30 **Recommended Pump Setting (gpm) :**

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.74	Boulders		gravel, gravelly sand
2	2.74	7.62	Limestone		limestone

Well Number 6803072 **Construction Date** 14-Aug-1965 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581730 **Northing (NAD83)** 4809936 **UTM Zone** 17
Positional Reliability margin of error : 100 m - 300 m **Elevation(mASL)** 287.43
Lot 001 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 5.79 **Deepest Water Found** 10.67 **Well Depth** 11.89
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 5.49
Pump Rate(lgpm 10.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 11.89
Specific Capacity: 0.50 **Recommended Pump Setting (gpm) :** 37.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	5.49	Clay Boulders Gravel		diamicton: si to sa/si matrix
2	5.49	11.89	Limestone	Grey	limestone

Well Number 6803073 **Construction Date** 29-May-1967 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581313 **Northing (NAD83)** 4810398 **UTM Zone** 17
Positional Reliability margin of error : 100 m - 300 m **Elevation(mASL)** 291.08
Lot 001 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 0.61 **Deepest Water Found** 10.97 **Well Depth** 11.58
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 3.66
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 4.88
Specific Capacity: 1.40 **Recommended Pump Setting (gpm) :** 35.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.61	Silt		silt, sandy silt, clayey silt
2	0.61	3.66	Boulders Gravel		gravel, gravelly sand
3	3.66	10.97	Dolomite	Blue	limestone
4	10.97	11.58	Limestone	Red	limestone

MOE Water Well Records Report

GLL 60699

Well Number 6803074 **Construction Date** 30-Dec-1967 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582023 **Northing (NAD83)** 4809777 **UTM Zone** 17
Positional Reliability margin of error : 100 m - 300 m **Elevation(mASL)** 284.99
Lot 001 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 3.35 **Deepest Water Found** 11.28 **Well Depth** 11.89
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.44
Pump Rate(lgpm 7.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 11.89
Specific Capacity: 0.20 **Recommended Pump Setting (gpm) :** 37.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.44	Medium Sand Boulders		gravel, gravelly sand
2	2.44	11.89	Limestone	Grey	limestone

Well Number 6803075 **Construction Date** 08-May-1964 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580624 **Northing (NAD83)** 4808200 **UTM Zone** 17
Positional Reliability margin of error : 100 m - 300 m **Elevation(mASL)** 286.51
Lot 005 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 7.62 **Deepest Water Found** 15.24 **Well Depth** 15.85
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 0.00
Pump Rate(lgpm 10.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 7.62
Specific Capacity: 20.00 **Recommended Pump Setting (gpm) :** 30.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	15.85	Limestone		limestone

Well Number 6803085 **Construction Date** 07-May-1966 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580127 **Northing (NAD83)** 4810506 **UTM Zone** 17
Positional Reliability margin of error : 100 m - 300 m **Elevation(mASL)** 311.51
Lot 002 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 7.62 **Deepest Water Found** 16.76 **Well Depth** 20.73
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 7.62
Pump Rate(lgpm 5.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 18.29
Specific Capacity: 0.10 **Recommended Pump Setting (gpm) :** 60.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	7.62	Topsoil Clay Gravel		fill (incl topsoil, waste)
2	7.62	20.73	Limestone		limestone

MOE Water Well Records Report

GLL 60699

Well Number 6803086 **Construction Date** 14-Dec-1961 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 579573 **Northing (NAD83)** 4810481 **UTM Zone** 17
Positional Reliability margin of error : 100 m - 300 m **Elevation(mASL)** 309.37
Lot 003 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 12.70 **Static Level (m)** 13.72 **Deepest Water Found** 24.69 **Well Depth** 27.13
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 23.77
Pump Rate(lgpm 8.00 **Pump Time(h:m)** 3 : 0 **Depth (end of 60 min)** 24.38
Specific Capacity: 0.20 **Recommended Pump Setting (gpm) :** 85.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	10.97	Previously Dug		fill (incl topsoil, waste)
2	10.97	23.77	Clay Boulders		diamicton: si to sa/si matrix
3	23.77	27.13	Limestone		limestone

Well Number 6806838 **Construction Date** 19-Jan-1968 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581564 **Northing (NAD83)** 4809043 **UTM Zone** 17
Positional Reliability margin of error : 100 m - 300 m **Elevation(mASL)** 289.56
Lot 002 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 8.53 **Deepest Water Found** 14.63 **Well Depth** 15.24
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 7.01
Pump Rate(lgpm 11.00 **Pump Time(h:m)** 0 : 45 **Depth (end of 60 min)** 10.97
Specific Capacity: 1.40 **Recommended Pump Setting (gpm) :** 44.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	7.01	Medium Sand Gravel Boulders	Brown	gravel, gravelly sand
2	7.01	15.24	Limestone	Brown	limestone

Well Number 6807031 **Construction Date** 15-Feb-1969 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 579734 **Northing (NAD83)** 4810653 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 297.18
Lot 003 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** **Deepest Water Found** 28.04 **Well Depth** 28.65
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 22.25
Pump Rate(lgpm 10.00 **Pump Time(h:m)** 2 : 0 **Depth (end of 60 min)** 28.65
Specific Capacity: 0.00 **Recommended Pump Setting (gpm) :** 92.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	22.25	Clay Boulders Gravel	Grey	diamicton: si to sa/si matrix
2	22.25	23.16	Limestone		limestone
3	23.16	28.65	Limestone	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 6807112 **Construction Date** 08-Mar-1969 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581774 **Northing (NAD83)** 4809213 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 284.99
Lot 002 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 3.66 **Deepest Water Found** 12.50 **Well Depth** 13.11
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 5.49
Pump Rate(lgpm 4.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 9.14
Specific Capacity: 0.20 **Recommended Pump Setting (gpm) :** 39.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	5.49	Medium Sand Gravel Boulders	Brown	gravel, gravelly sand
2	5.49	13.11	Limestone	Brown	limestone

Well Number 6807312 **Construction Date** 16-Sep-1969 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582124 **Northing (NAD83)** 4809683 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 286.51
Lot 001 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 4.57 **Deepest Water Found** 12.19 **Well Depth** 12.80
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 0.30
Pump Rate(lgpm 6.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 12.19
Specific Capacity: 0.20 **Recommended Pump Setting (gpm) :** 40.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.30	Topsoil	Brown	fill (incl topsoil, waste)
2	0.30	12.80	Limestone	Grey	limestone

Well Number 6807802 **Construction Date** 27-Jun-1971 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582024 **Northing (NAD83)** 4809753 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 283.46
Lot 001 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) **Static Level (m)** 3.35 **Deepest Water Found** 10.67 **Well Depth** 11.58
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 3.66
Pump Rate(lgpm 10.00 **Pump Time(h:m)** 1 : 30 **Depth (end of 60 min)** 3.66
Specific Capacity: 10.00 **Recommended Pump Setting (gpm) :** 30.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	3.66	Silt Boulders	Brown	diamicton: si to sa/si matrix
2	3.66	11.58	Limestone	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 6807892 **Construction Date** 04-Sep-1971 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580274 **Northing (NAD83)** 4810083 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 284.99
Lot 003 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 4.57 **Deepest Water Found** 11.58 **Well Depth** 12.19
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 1.52
Pump Rate(lgpm 4.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 10.67
Specific Capacity: 0.20 **Recommended Pump Setting (gpm) :** 38.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	1.52	Clay Stones	Brown	diamicton: si to sa/si matrix
2	1.52	12.19	Limestone	Grey	limestone

Well Number 6807893 **Construction Date** 08-Sep-1971 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580199 **Northing (NAD83)** 4810133 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 288.04
Lot 003 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 5.79 **Deepest Water Found** 14.63 **Well Depth** 15.24
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 7.62
Pump Rate(lgpm 4.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 13.72
Specific Capacity: 0.20 **Recommended Pump Setting (gpm) :** 48.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	3.05	Clay Stones	Brown	diamicton: si to sa/si matrix
2	3.05	7.62	Clay	Grey	clay, silty clay
3	7.62	15.24	Limestone	Grey	limestone

Well Number 6807928 **Construction Date** 26-Apr-1971 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580269 **Northing (NAD83)** 4809983 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 284.68
Lot 003 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 1.22 **Deepest Water Found** 9.75 **Well Depth** 10.36
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 7.32
Pump Rate(lgpm 25.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 1.52
Specific Capacity: 25.00 **Recommended Pump Setting (gpm) :** 20.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	7.32	Clay Overburden	Brown	fill (incl topsoil, waste)
2	7.32	10.36	Limestone	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 6807929 **Construction Date** 22-Apr-1971 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580214 **Northing (NAD83)** 4809993 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 284.99
Lot 003 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 1.22 **Deepest Water Found** 13.41 **Well Depth** 14.02
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 8.23
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 6.10
Specific Capacity: 1.20 **Recommended Pump Setting (gpm) :** 20.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	4.57	Clay Overburden	Brown	fill (incl topsoil, waste)
2	4.57	8.23	Clay Stones Gravel	Brown	diamicton: si to sa/si matrix
3	8.23	14.02	Limestone	Grey	limestone

Well Number 6807930 **Construction Date** 22-Apr-1971 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580294 **Northing (NAD83)** 4810043 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 284.99
Lot 003 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) **Static Level (m)** 0.91 **Deepest Water Found** 9.75 **Well Depth** 10.67
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 5.18
Pump Rate(lgpm 40.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 1.52
Specific Capacity: 20.00 **Recommended Pump Setting (gpm) :** 20.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	5.18	Clay Boulders	Brown	diamicton: si to sa/si matrix
2	5.18	10.67	Limestone	Grey	limestone

Well Number 6807931 **Construction Date** 16-Apr-1971 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580049 **Northing (NAD83)** 4810203 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 295.66
Lot 003 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 7.62 **Deepest Water Found** 20.42 **Well Depth** 21.34
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 10.67
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 15.24
Specific Capacity: 0.80 **Recommended Pump Setting (gpm) :** 60.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	10.67	Clay Stones	Grey	diamicton: si to sa/si matrix
2	10.67	21.34	Limestone	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 6807933 **Construction Date** 13-Apr-1971 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 579934 **Northing (NAD83)** 4810263 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 304.80
Lot 003 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 13.11 **Deepest Water Found** 28.96 **Well Depth** 30.48
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 21.34
Pump Rate(lgpm 15.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 25.91
Specific Capacity: 0.40 **Recommended Pump Setting (gpm) :** 80.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	21.34	Clay Gravel Stones	Grey	diamicton: si to sa/si matrix
2	21.34	30.48	Limestone	Grey	limestone

Well Number 6807939 **Construction Date** 26-Jan-1971 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582039 **Northing (NAD83)** 4809483 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 283.46
Lot 001 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 3.05 **Deepest Water Found** 13.11 **Well Depth** 14.02
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 0.30
Pump Rate(lgpm 30.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 3.35
Specific Capacity: 30.00 **Recommended Pump Setting (gpm) :** 20.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.30	Topsoil	Brown	fill (incl topsoil, waste)
2	0.30	14.02	Limestone	Grey	limestone

Well Number 6807971 **Construction Date** 24-Aug-1971 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581774 **Northing (NAD83)** 4809473 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 286.51
Lot 001 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 5.49 **Deepest Water Found** 16.15 **Well Depth** 16.15
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.74
Pump Rate(lgpm 12.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 13.41
Specific Capacity: 0.50 **Recommended Pump Setting (gpm) :** 50.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.74	Silt Boulders	Brown	diamicton: si to sa/si matrix
2	2.74	12.19	Limestone	Grey	limestone
3	12.19	16.15	Dolomite	Blue	limestone

MOE Water Well Records Report

GLL 60699

Well Number 6808263 **Construction Date** 29-Oct-1972 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580114 **Northing (NAD83)** 4810153 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 289.56
Lot 003 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 4.57 **Deepest Water Found** 11.28 **Well Depth** 12.19
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 5.49
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 5.18
Specific Capacity: 10.00 **Recommended Pump Setting (gpm) :** 30.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	5.49	Clay Stones	Brown	diamicton: si to sa/si matrix
2	5.49	12.19	Limestone	Grey	limestone

Well Number 6808429 **Construction Date** 10-May-1973 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581724 **Northing (NAD83)** 4809221 **UTM Zone** 17
Positional Reliability margin of error : 300 m - 1 km **Elevation(mASL)** 285.90
Lot 002 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 3.05 **Deepest Water Found** 7.92 **Well Depth** 9.14
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 6.71
Pump Rate(lgpm 15.00 **Pump Time(h:m)** 1 : 30 **Depth (end of 60 min)** 4.57
Specific Capacity: 3.00 **Recommended Pump Setting (gpm) :** 27.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	6.71	Sand Boulders	Brown	gravel, gravelly sand
2	6.71	9.14	Limestone	White	limestone

Well Number 6808608 **Construction Date** 31-Aug-1973 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580854 **Northing (NAD83)** 4808208 **UTM Zone** 17
Positional Reliability margin of error : 300 m - 1 km **Elevation(mASL)** 281.94
Lot 005 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 6.71 **Deepest Water Found** 12.19 **Well Depth** 13.41
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.74
Pump Rate(lgpm 15.00 **Pump Time(h:m)** 1 : 30 **Depth (end of 60 min)** 9.75
Specific Capacity: 1.50 **Recommended Pump Setting (gpm) :** 40.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.74	Sand Boulders	Brown	gravel, gravelly sand
2	2.74	13.41	Limestone	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 6809251 **Construction Date** 17-Nov-1975 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 579986 **Northing (NAD83)** 4810143 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 292.61
Lot 003 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 9.75 **Deepest Water Found** 20.42 **Well Depth** 21.34
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 11.28
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 2 : 0 **Depth (end of 60 min)** 17.37
Specific Capacity: 0.80 **Recommended Pump Setting (gpm) :** 65.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	11.28	Clay Sandy Loose	Brown	silt, sandy silt, clayey silt
2	11.28	21.34	Limestone Hard	Grey	limestone

Well Number 6809350 **Construction Date** 22-Jan-1976 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 579648 **Northing (NAD83)** 4810553 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 311.51
Lot 003 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) **Static Level (m)** 14.94 **Deepest Water Found** 29.87 **Well Depth** 30.78
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 27.74
Pump Rate(lgpm 10.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 28.35
Specific Capacity: 0.20 **Recommended Pump Setting (gpm) :** 98.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	8.53	Clay	Brown	clay, silty clay
2	8.53	27.74	Clay Gravel Stones	Grey	diamicton: si to sa/si matrix
3	27.74	30.78	Limestone	Grey	limestone

Well Number 6809848 **Construction Date** 21-Jun-1978 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581654 **Northing (NAD83)** 4809963 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 292.61
Lot 001 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 6.10 **Deepest Water Found** 14.63 **Well Depth** 15.54
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 7.32
Pump Rate(lgpm 25.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 9.14
Specific Capacity: 2.50 **Recommended Pump Setting (gpm) :** 48.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	7.32	Clay Boulders	Brown	diamicton: si to sa/si matrix
2	7.32	15.54	Limestone		limestone

MOE Water Well Records Report

GLL 60699

Well Number 6810336 **Construction Date** 06-Dec-1981 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582254 **Northing (NAD83)** 4809263 **UTM Zone** 17
Positional Reliability margin of error : 30 m - 100 m **Elevation(mASL)** 283.46
Lot 001 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 5.49 **Deepest Water Found** 14.63 **Well Depth** 15.85
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 4.88
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 15.24
Specific Capacity: 0.60 **Recommended Pump Setting (gpm) :** 45.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	4.88	Clay Stones	Brown	diamicton: si to sa/si matrix
2	4.88	6.10	Limestone Fractured	Grey	limestone
3	6.10	15.85	Limestone	Grey	limestone

Well Number 6810873 **Construction Date** 13-Aug-1985 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581917 **Northing (NAD83)** 4809336 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 002 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 9.45 **Deepest Water Found** 18.29 **Well Depth** 18.29
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 9.45
Pump Rate(lgpm 25.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 10.97
Specific Capacity: **Recommended Pump Setting (gpm) :** 55.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	3.05	Clay Sandy Loose	Brown	silt, sandy silt, clayey silt
2	3.05	5.49	Clay Sandy Gravel	Brown	diamicton: si to sa/si matrix
3	5.49	8.84	Clay Sandy Gravel	Brown	diamicton: si to sa/si matrix
4	8.84	9.45	Sand Gravel Loose	Brown	gravel, gravelly sand
5	9.45	18.29	Limestone Hard	Grey	limestone

Well Number 6811367 **Construction Date** 27-Jul-1987 **Primary Water Use** Stock **Well Type** Bedrock
Easting (NAD83) 580373 **Northing (NAD83)** 4809070 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 004 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 10.06 **Deepest Water Found** 19.51 **Well Depth** 20.42
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 9.45
Pump Rate(lgpm 7.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 20.42
Specific Capacity: **Recommended Pump Setting (gpm) :** 65.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	9.45	Clay	Brown	clay, silty clay
2	9.45	20.42	Limestone	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 6811706 **Construction Date** 01-Jun-1989 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582397 **Northing (NAD83)** 4809375 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 001 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 5.18 **Deepest Water Found** 11.28 **Well Depth** 12.50
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 0.91
Pump Rate(lgpm 15.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 12.50
Specific Capacity: **Recommended Pump Setting (gpm) :** 35.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.91	Clay Stones	Brown	diamicton: si to sa/si matrix
2	0.91	3.05	Limestone Fractured Soft	Brown	limestone
3	3.05	7.01	Limestone Soft	Brown	limestone
4	7.01	12.50	Limestone	Grey	limestone

Well Number 6812857 **Construction Date** 22-May-1997 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580377 **Northing (NAD83)** 4811183 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 001 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 4.27 **Deepest Water Found** 21.95 **Well Depth** 24.38
Top of Screen (m): **WaterKind** Unknown **Depth to Bedrock (m)** 0.61
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 6 : 0 **Depth (end of 60 min)** 9.75
Specific Capacity: **Recommended Pump Setting (gpm) :** 70.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.61	Sand Gravel	Brown	gravel, gravelly sand
2	0.61	24.38	Limestone Hard	Grey	limestone

Well Number 6813265 **Construction Date** 08-Jan-2000 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581031 **Northing (NAD83)** 4809734 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 002 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 2.13 **Deepest Water Found** 16.76 **Well Depth** 18.29
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 3.96
Pump Rate(lgpm 30.00 **Pump Time(h:m)** 1 : **Depth (end of 60 min)** 9.14
Specific Capacity: **Recommended Pump Setting (gpm) :** 45.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.44	Clay Boulders	Brown	diamicton: si to sa/si matrix
2	2.44	3.96	Gravel Boulders	Brown	gravel, gravelly sand
3	3.96	18.29	Limestone	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 6813380 **Construction Date** 21-Sep-2000 **Primary Water Use** **Well Type** Bedrock
Easting (NAD83) 581373 **Northing (NAD83)** 4810074 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 001 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 2.44 **Deepest Water Found** 23.16 **Well Depth** 24.69
Top of Screen (m): **WaterKind** Unknown **Depth to Bedrock (m)** 0.91
Pump Rate(lgpm **Pump Time(h:m)** : **Depth (end of 60 min)** 12.19
Specific Capacity: **Recommended Pump Setting (gpm) :** 10.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	0.91	Sand Gravel Loose	Brown	gravel, gravelly sand
2	0.91	24.69	Limestone	Grey	limestone

Well Number 6813438 **Construction Date** 13-Nov-2000 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 581373 **Northing (NAD83)** 4810074 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 001 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 7.32 **Deepest Water Found** 28.65 **Well Depth** 30.48
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 1.22
Pump Rate(lgpm 25.00 **Pump Time(h:m)** 1 : **Depth (end of 60 min)** 16.76
Specific Capacity: **Recommended Pump Setting (gpm) :**

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	1.22	Clay Stones Loose	Brown	diamicton: si to sa/si matrix
2	1.22	30.48	Limestone Hard	Grey	limestone

Well Number 6813488 **Construction Date** 31-May-2001 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580592 **Northing (NAD83)** 4811042 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 001 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 8.23 **Deepest Water Found** 26.21 **Well Depth** 30.48
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.44
Pump Rate(lgpm 25.00 **Pump Time(h:m)** : **Depth (end of 60 min)** 14.63
Specific Capacity: **Recommended Pump Setting (gpm) :**

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.44	Clay Boulders Gravel	Brown	diamicton: si to sa/si matrix
2	2.44	30.48	Limestone Hard	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 6813489 **Construction Date** 01-Jun-2001 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580495 **Northing (NAD83)** 4810898 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 001 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 3.66 **Deepest Water Found** 27.13 **Well Depth** 30.48
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.13
Pump Rate(lgpm 25.00 **Pump Time(h:m)** 1 : **Depth (end of 60 min)** 11.58
Specific Capacity: **Recommended Pump Setting (gpm) :**

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.13	Clay Boulders Gravel	Brown	diamicton: si to sa/si matrix
2	2.13	30.48	Limestone Hard	Grey	limestone

Well Number 6813559 **Construction Date** 05-Nov-2001 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582306 **Northing (NAD83)** 4808606 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 002 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 7.92 **Deepest Water Found** 18.29 **Well Depth** 19.81
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 4.57
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 1 : **Depth (end of 60 min)** 13.72
Specific Capacity: **Recommended Pump Setting (gpm) :**

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	4.57	Clay Sandy Gravel	Brown	diamicton: si to sa/si matrix
2	4.57	19.81	Limestone Hard	Grey	limestone

Well Number 6813562 **Construction Date** 05-Nov-2001 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 582306 **Northing (NAD83)** 4808606 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 002 **Concession** 10 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 6.71 **Deepest Water Found** 16.76 **Well Depth** 18.29
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 3.66
Pump Rate(lgpm 20.00 **Pump Time(h:m)** 1 : **Depth (end of 60 min)** 12.19
Specific Capacity: **Recommended Pump Setting (gpm) :**

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	3.66	Clay Sandy Gravel	Brown	diamicton: si to sa/si matrix
2	3.66	18.29	Limestone Loose	Grey	limestone

MOE Water Well Records Report

GLL 60699

Well Number 6813599 **Construction Date** 17-Dec-2001 **Primary Water Use** Domestic **Well Type** Bedrock
Easting (NAD83) 580519 **Northing (NAD83)** 4811003 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 001 **Concession** 12 East Flamborough Township **Wentworth**
Well Diameter(cm) 15.24 **Static Level (m)** 7.62 **Deepest Water Found** 28.65 **Well Depth** 30.48
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 1.22
Pump Rate(lgpm 25.00 **Pump Time(h:m)** 1 : 0 **Depth (end of 60 min)** 15.24
Specific Capacity: **Recommended Pump Setting (gpm) :**

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	1.22	Gravel Clay	Brown	limestone
2	1.22	2.44	Limestone Loose Layered	Grey	limestone
3	2.44	30.48	Limestone Hard	Grey	limestone

Well Number 6813737 **Construction Date** 27-Sep-2002 **Primary Water Use** Public Supply **Well Type** Bedrock
Easting (NAD83) 580328 **Northing (NAD83)** 4809141 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 004 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 20.32 **Static Level (m)** 12.50 **Deepest Water Found** 26.21 **Well Depth** 28.35
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 4.57
Pump Rate(lgpm 120.00 **Pump Time(h:m)** 2 : **Depth (end of 60 min)** 13.11
Specific Capacity: **Recommended Pump Setting (gpm) :** 80.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	4.57	Boulders Fill	Brown	fill (incl topsoil, waste)
2	4.57	21.34	Limestone Sandstone Hard	Grey	limestone
3	21.34	22.56	Sandstone Hard	Brown	rock
4	22.56	25.91	Limestone Hard	Grey	limestone
5	25.91	28.35	Sandstone Limestone Hard	Brown	limestone

Well Number 6813738 **Construction Date** 22-Nov-2002 **Primary Water Use** Public Supply **Well Type** Bedrock
Easting (NAD83) 580358 **Northing (NAD83)** 4809042 **UTM Zone** 17
Positional Reliability unknown utm **Elevation(mASL)**
Lot 004 **Concession** 11 East Flamborough Township **Wentworth**
Well Diameter(cm) 20.32 **Static Level (m)** 10.67 **Deepest Water Found** 17.07 **Well Depth** 18.59
Top of Screen (m): **WaterKind** Fresh **Depth to Bedrock (m)** 2.44
Pump Rate(lgpm 80.00 **Pump Time(h:m)** 4 : **Depth (end of 60 min)** 13.11
Specific Capacity: **Recommended Pump Setting (gpm) :** 54.00

Well Stratigraphy

Layer	Formation Top (m)	Formation Bottom (m)	Driller's Description	Colour	Standardized Description
1	0.00	2.44	Fill Boulders	Brown	fill (incl topsoil, waste)
2	2.44	11.28	Limestone Sandstone Hard	Grey	limestone
3	11.28	11.58	Sandstone Limestone Fine Sand	Brown	limestone
4	11.58	17.07	Limestone Hard	Grey	limestone
5	17.07	18.59	Sandstone Soft	Brown	rock

H2. Lotowater Door-to-Door Survey of Residential Wells, July 2008

Appendix H2

Lotowater Well Survey Summary Report

Door-to-Door Survey

A door-to-door survey was completed to gather information on water wells and water use at residential properties within a 1 km radius of the property. The survey was completed between April 8 and April 14, 2008. The survey team included staff from Lotowater Technical Services Inc. and Gartner Lee Limited.

In preparation for the survey, and information packages was prepared for each residential address, which included a letter describing the proposed testing program, a 'fact sheet' that explained what would occur during testing, a procedure/protocol for registering a complaint, and copies of the original MOE WWR for the well(s) on the property and the well survey form noted above.

A detailed description of the survey and survey response is provided in a summary report prepared by Lotowater Technical Services Inc. (Appendix H2).

In total, 119 addresses were surveyed. At approximately 38 % of the locations visited, the property owner/primary decision maker was available and consulted. Most residents accepted the information package. Where the resident was not available, an information package was left in the mailbox. Five (5) residents indicated that they would be interested in participating in the private well monitoring. A further four (4) residents expressed an interest in participating but remained undecided at the time of the survey.

Note that the version of the Lotowater report presented in this Appendix is the secured version with the residences personal information removed. An unsecured version of the report is being retained on file.

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Date: **July 10, 2008**

Reference: **147-006**

To: **Director, Ministry of the Environment**

From: **Bill Beaton, M.Sc., P.Eng.**
Greg Padusenko, M.Sc., P.Eng.

Subject: **Door to Door Survey of Residential Wells**
Proposed Flamborough Quarry

St Marys has recently been granted a Permit to Take Water (Number 8461-7CFLG5) by the Ministry of the Environment (MOE) that will allow St Marys to carry out an aquifer test at the proposed quarry site near Mountsberg. The information collected as part of the test is intended to provide a better understanding of the groundwater and surface water resources in the area. Aquifer tests (or pumping tests) are commonly undertaken as part of groundwater studies. In this case, an on-site well (TW14) will be pumped for approximately five days and water level responses in numerous on-site monitoring wells will be recorded during the test. Water quality will also be monitored as part of the testing.

As part of the Permit to Take Water (PTTW), Condition 4.4 states the following:

At least 15 days prior to commencing the first pumping test, the Permit Holder shall submit a letter report to the Director, discussing the results of the door to door survey as they relate to the suitability of the target levels for protecting private water supply wells in the vicinity of the site. The letter report shall also be submitted to the Regional Municipality of Halton. The letter report shall include but not be limited to the following:

1. *A figure including location of on-site monitoring wells, approximate location of off-site private wells included in the door to door survey, the private wells selected for continuous monitoring and the 5-day modelled drawdown contours used to establish target levels at on-site monitoring wells.*
2. *A tabulation of the private wells indicating estimated available drawdown and identifying which private wells are to be included in the monitoring program and indicating for each private well, which on-site monitored well acts as surrogate.*
3. *For each private well included in the off property monitoring program, report on available information, (e.g. well record, field assessment, owner survey, etc.) to establish, to the extent possible, normal use performance which can be used to investigate and validate interference with normal use complaints and form the basis for deciding to substantially reduce or cease pumping during any phase of the testing.*

4. *A discussion of the suitability of the target levels at on-site monitoring wells for protecting the local water supply wells identified in the door to door survey.*
5. *Recommendations for changes to targets of on-site monitoring well, if appropriate.*

This letter report has been prepared to address condition 4.4 of the PTTW.

On-Site Monitoring Program and Trigger Levels

Approximately 55 on-site groundwater monitoring locations have been established to measure water levels prior, during and after the testing. Some of these monitoring locations consist of multi-level wells for monitoring water levels at various depths. Trigger levels have been established in 15 of the wells. The trigger levels have been established by Gartner Lee Limited (GLL) with input from the various agencies to aid in ensuring that testing does not have a detrimental impact on existing PTTW holders and residential wells in the area.

The triggers are based on the anticipated drawdown at each well as determined from a numerical model simulation produced by GLL. The steady state model includes part of the Bronte Creek watershed and was calibrated with regional and site specific water levels. For more information on the model see the attached memo to the MOE from GLL dated January 28, 2008 (**Appendix**). In general, the observed drawdown is based on pumping the production wells at 2,370,000 L/day for 5 days.

Since many of the residential wells in the vicinity of the site are completed in the upper few metres of the bedrock, shallow bedrock monitoring wells located along the perimeter of the site have been used in establishing the trigger levels. On-site monitoring wells equipped with dataloggers and located between private wells beyond the perimeter of the property and the pumping wells have been selected as sentry wells.

A map of the predicted drawdown and the monitoring wells is included in **Figure 1.**

Initial Assessment of Private Wells at Potential Risk

GLL obtained all available water well records for the area from the MOE and plotted them according to the coordinates stated on the records. The information in the water well records was tabulated and an estimate of available drawdown was calculated based on the static water level and depth to lowest producing zone or bottom of well. The available drawdown was then compared to the observed drawdown in the model and any wells potentially at risk were flagged. Wells with a low yield were also flagged. **Table 1** contains a summary of the well records with potential wells at risk being highlighted.

This provides a preliminary idea of the private wells potentially at risk. It may also be used in investigations of interference complaints during the test. However, as there are often problems with the accuracy of water well records, it was determined that a door to door survey was required to gain additional information on private wells in the area.

Private Well Monitoring Program Outreach

A survey of private wells was conducted to provide additional information to the desktop study conducted. As part of the survey and in addition to the existing monitoring program, St Marys offered to include monitoring of private wells on neighbouring properties. The program was strictly voluntary and is designed to provide residents with a record of water levels prior to, during and after the testing as well as water quality testing prior to and after the testing. As part of the process to inform and invite the residents to participate in the monitoring program a drop-in information centre was held and door to door visits were conducted as described below.

Letters were sent to the residents within 1 km of the proposed quarry site on February 29, 2008 by St Marys to invite them to attend the drop-in information centre. The drop-in information centre, located at the on-site office (515 11th Concession Road East), was open from 2 p.m. to 8 p.m. on March 18 and March 26, 2008. Staff from St Marys, GLL and Lotowater Technical Services Inc. (Lotowater) were on hand to inform people about the proposed pumping test, answer any questions they might have about the testing and to invite them to participate in the monitoring program. Orthoimagery including lot layouts, a map with predicted drawdown and diagrams of private well monitoring procedures were also on display.

A total of seven residents attended the two drop-in information sessions of which two were located outside of the 1 km area of interest. Two of the five residents who live within 1 km of the proposed quarry site originally indicated that they were interested in having their wells monitored but have since declined to participate.

Following the drop-in information sessions, a door to door survey of private wells took place on April 8, 9, 10 and 14, 2008. Staff from GLL and Lotowater visited 131 properties within 1 km of the proposed quarry site. Of the 131 lots, 12 were found to be abandoned, vacant or under new construction (leaving 119 lots surveyed). The intent of the survey was to discuss the testing program, provide information (if available) including a copy of the water well record and orthoimagery of the property and well location and invite the residents to participate in the monitoring program. It was hoped that well information would be provided by the resident and matched to existing water well records. In addition to the individual information provided, an information letter, "Understanding a Pumping Test" fact sheet and "Procedure for Resolution of Private Well Interference Complaints" were distributed. For residents not home during the survey, the information letter provided contact information and indicated that scheduled appointments could be made with St Marys' consultants if they wanted more information or would like to participate in the monitoring program. People were also encouraged to contact the MOE or the City of Hamilton if they were unsure whether or not they should participate in the monitoring program.

A total of 119 residences were surveyed, at which 45 occurred at residences where the home owner or primary decision maker was available for consultation. At the remaining 74 residences, where the home owner or primary decision maker was not available, an information package (as described above) was left behind (either in the door or in the mailbox). A total of 4 private well owners agreed to participate in private well monitoring, 36 residents did not wish to participate in the monitoring program and an additional 5 well owners indicated that they may

choose to participate but remained undecided at the time of the survey and have not to-date notified St. Marys that they would like to participate. Of the 36 residents not interested in the monitoring program 29 accepted the information package and 7 refused the package.

For the residents interested in the monitoring program, a brief interview was conducted to try to gather information on their well(s) and match it to existing water well records. The wells are currently being inspected, transducers are being installed and samples are being collected for water quality analysis.

In addition to the above work, the MOE also held a public information session on April 16, 2008 to inform the residents about the proposed testing and answer any of their concerns. During the meeting, staff from GLL and Lotowater were present to answer questions about the monitoring program and facilities were available for residents to sign up for the monitoring program. No additional residents signed up during this time or have contacted St Marys since.

A summary of the door to door survey and drop-in information session results is included in **Table 2** and shown visually in **Figure 2**. It appears that approximately four residents are interested in the monitoring program. However, upon further investigation, it has been determined that on the wells is not accessible for monitoring purposes. Also, one of the residents with two wells on their property has only granted permission to monitor one of the wells.

In general, residents were strongly opposed to the proposed quarry. Most residents that refused to participate in well monitoring held the view that co-operation would serve to assist St. Marys. Many residents also expressed concerns that monitoring would impact the quality of their well water. Several residents appeared to lack confidence that results generated would be meaningful or unbiased and felt that monitoring should be conducted by a third party.

Private Well Monitoring Program

There are a total of five wells at the three residences that have agreed to the monitoring. The next steps will proceed as follows:

1. Inspection of the well to confirm details on well construction and determine that the well is suitable for installing monitoring equipment.
2. Installation of a water level recording device (transducer/data logger) and collection of additional samples for bacteriological analysis.
3. Download of transducer data prior to the test to establish, to the extent possible, normal use performance.
4. Removal of transducer/datalogger following the testing and collection of water samples for chemical and bacteriological analysis.
5. Summary report to individual residents including summary information on well construction, the analytical results from the chemical laboratory and a graph produced from the water level measurements.

At this time, the residents willing to participate in the monitoring program have indicated that they would not like the transducers downloaded or manual measurements taken on a daily basis

during the test. It has been agreed that the dataloggers, once installed, will be downloaded prior to the test and approximately one week following the test. The download prior to the test (3 – 7 days) will provide typical water level fluctuations in the private wells under normal operating circumstances. Once prepared, these baseline hydrographs will be sent to the MOE. The baseline data from private well operating conditions will be compared to the previously established trigger levels and comment provided on the suitability of the trigger levels prior to the commencement of the test.

The results of the investigation of the five private wells are included in **Table 3**.

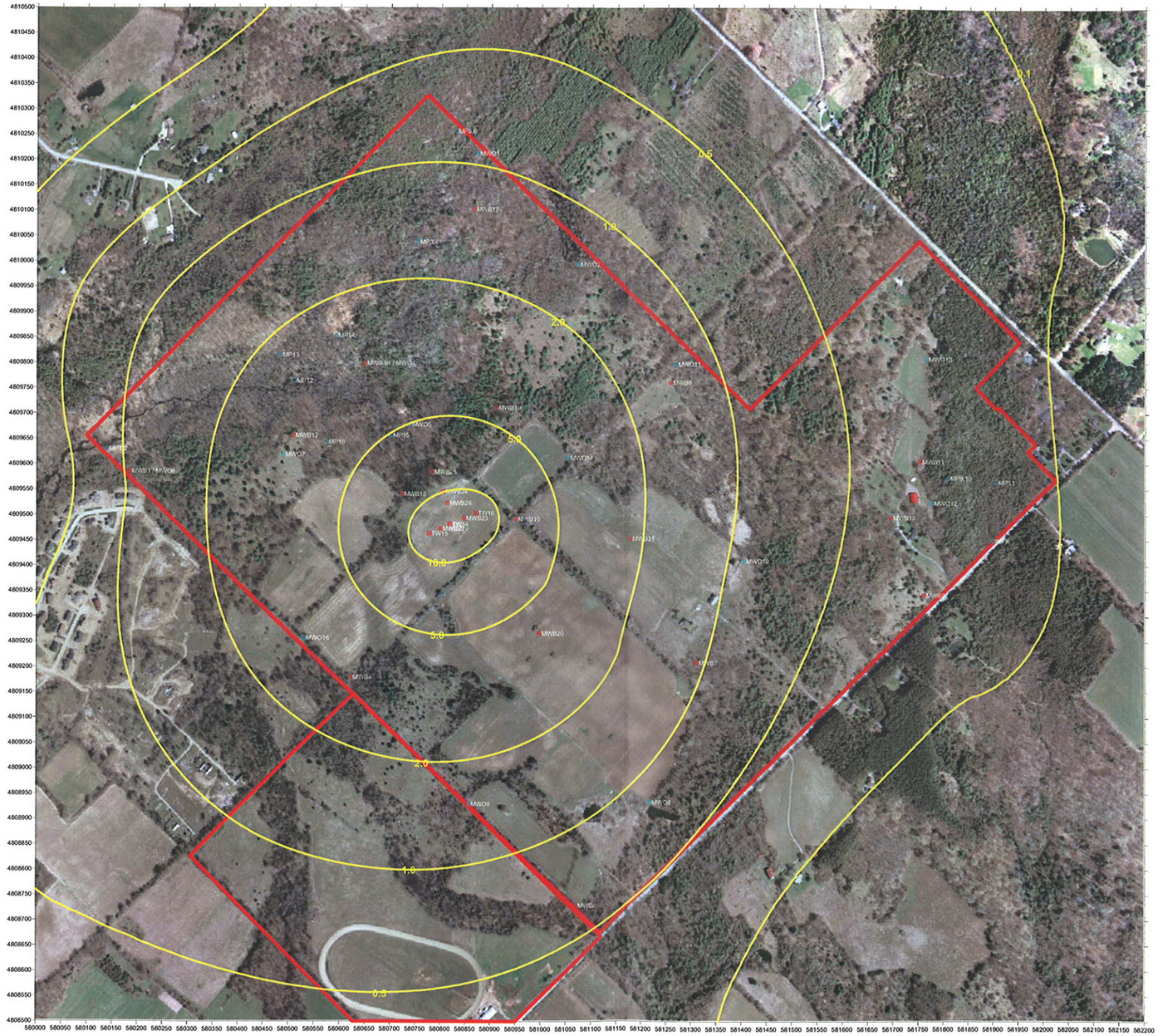
In addition to monitoring the five wells, GLL has identified on-site wells where trigger levels have been set to provide an early warning signal to private wells. It is estimated, and all the agencies have agreed that the on-site monitoring wells provide a reasonable coverage to provide an early warning signal and that the trigger levels are sufficient to protect the local water supply wells. To provide missing coverage, an additional monitoring well was installed between the test wells and Stonebrook Estates.

The on-site monitoring wells that have been assigned as surrogate wells for the private wells are included in **Table 2**. In the case of a complaint, the surrogate on-site monitoring well corresponding to the private well of concern will be reviewed as required.

The target water levels are intended to trigger a heightened awareness, and increased frequency of monitoring and data review. They should not be construed as triggering a change in the pumping rate or the premature termination of the test. Such a decision would be reached through the collective review of the monitoring data (by GLL, MOE and City of Hamilton staff) as it is being generated.

No changes to the targets of the on-site monitoring wells are recommended at this time.

FIGURE



LEGEND

- Test Well (GLL)
- Bedrock Well (GLL)
- Overburden Well (GLL)
- Mini-piezometer (GLL)
- MOE Water Well
- Applicant Owned Property

PROPOSED FLAMBOROUGH QUARRY	Figure 1
PREDICTED GROUNDWATER DRAWDOWN - ON-SITE (PROPOSED GRS WELL PUMPING)	
Project # 60699, Hydrogeological Modeling Investigation	
Gartner Lee Limited	
	Scale 1:3,500

APPENDIX

Gartner Lee Limited

memorandum

to: Ministry of the Environment, West Central Office

from: Helen Zhang

date: January 28, 2008

ref: GLL60-699

re: Drawdown Cone Prediction of the Proposed GRS Well Pumping Test

This memo is to describe the model and the modeling methods used by Gartner Lee Ltd (Gartner Lee) to predict the drawdown cone of the proposed GRS well pumping test.

I – The Model

The Gartner Lee 2005 steady state model includes part of the Bronte Creek watershed, and was calibrated with regional and site-specific time-averaged (2004 – 2005) water levels. The model has 4 layers, representing the overburden and the upper Amabel Formation (Layer 1); about 5 m thick production zone in the middle of Amabel Formation (Layer 2), the lower Amabel Formation (Layer 3), and the underlying Cabot Head shale aquitard (Layer 4).

For the purpose of this analysis, Layer 1 was changed from confined into unconfined condition, and the rest of the layers retained their original settings as confined layers. The revised model was then run for a steady state simulation, the generated flow patterns and water levels (both regional and site-specific) match with the original calibration targets reasonably well. The relatively low mass balance error (-0.42%) also indicates a converged solution.

The revised model was also run for a transient state simulation of the TW12 and TW13 pumping test conducted in November/December 2004. The MODFLOW Pumping Well package was used to simulate the pumping in TW12 (at a maximum rate of 3,273 m^3/day) and in TW13 (at a constant rate of 864 m^3/day). A mass balance check indicated that the calculated total well discharge matched the sum of pumping rates assigned as input. The temporal trends of the simulated drawdown are generally consistent with those observed during the pumping test.

A comparison of the results of the simulation and the drawdowns observed during the pumping rest revealed that the predicted drawdown and the area of the drawdown cone were much bigger in the vicinity of TW12. By the end of 7 days of pumping, the simulated water level in TW12 dropped to 237 m ASL, versus an observed level of 262 m ASL. This can be explained by checking the transmissivities assigned to the model and estimated from site-specific hydraulic tests, respectively. In the model, the cumulative transmissivity of all layers within the site area was about 90 m^2/day, with 98% of the contribution coming from layer 2. In contrast, results of the geophysical profiling and packer testing (Lotowater, 2007) and the recent slug testing (Gartner Lee, 2007) indicate that the cumulative transmissivity across the site is relatively heterogeneous,

ranging from 2 to 600 m^2/day, with a geometric mean of 80 m^2/day (S.S. Papadopulos & Associates, 2008). The cumulative transmissivity at TW12 estimated from hydraulic tests is about 500 to 600 m^2/day, and about 100 to 200 m^2/day at the GRS well area (TW14).

Although the model tends to over-predict the drawdown in high transmissivity areas such as in TW12, it is our opinion that the revised Gartner Lee 2005 model is reasonably calibrated, representing conditions at the locations of the GRS wells and in most of the site area fairly well. Therefore, in our opinion the Gartner Lee 2005 model is an appropriate model to be used to predicting the drawdown cone of the proposed GRS well pumping test.

II – Simulations of the Proposed GRS Well Pumping Scenario

Simulations have been developed to predict the drawdown cone that could be generated by pumping GRS wells (TW14, TW15 and TW16) such that pumping levels are lowered to the bottom of the Amabel Formation. According to borehole logs, the target water levels by the end of the pumping test should be at approximately 250.5 m ASL, which coincides with the bottom elevation of the model Layer 3.

There are different ways to represent pumping wells in a numerical model, and the results may differ significantly between them. This is particularly true for analyses of fractured-rock sites. The modeller is responsible for selecting the approach that is most appropriate of site conditions. With MODFLOW the two general ways to represent a pumping well are discharge-control, and drawdown-control.

With the discharge-control approach, the pumping rate is specified as input for the MODFLOW Well Package, and the water level in the simulated well is calculated as part of the analysis. It is important to note that MODFLOW calculates the average water level in each grid block. The dimensions of the grid blocks are 10 m, significantly larger than the diameters of the actual pumping wells. A correction is required to estimate the levels in the wellbores given the average groundwater level in the grid block that contains the well. In this case, the key check on the realism of the simulation is whether the calculated levels in the pumping wells and adjacent monitoring wells are close to those observed.

In the context of discharge-controlled wells, it is also important to check whether the calculated pumping rate at the end of the simulation is the same as the rate that is specified as the input to the model. When a layer of grid blocks is specified as being confined, it is assumed in the MODFLOW simulation that the groundwater level never drops below the top of the layer. For confined layers the rate at which water is withdrawn from the well is never adjusted to reflect drainage of the aquifer. When a layer of grid blocks is specified as being unconfined, or capable of converting between confined and unconfined conditions, the pumping from that layer is discontinued if the calculated groundwater level drops below the bottom of the layer. Therefore,

for unconfined layers the rate at which water is withdrawn can be reduced significantly when a model layer is predicted to be drained. When pumping is specified from an unconfined layer, it is essential to check that the final rate actually incorporated in the simulation is the rate that is specified in the input to the model.

With the drawdown-control approach, the water level in the pumping well is specified as input for the MODFLOW General Head Boundary (GHB) Package, and the pumping from each model layer required to maintain that level is calculated as part of the analysis. The MODFLOW GHB also includes input parameters to incorporate the difference between the water level in the pumping well and the average level in the grid block that contains the well. That is, a correction is built into the model to estimate the level in the wellbore given the average groundwater level in the grid block that contains the well. In this case, the key check on the realism of the simulation is whether the calculated pumping rate matches the observed pumping rate and the drawdowns at adjacent monitoring wells.

In the context of a fractured-rock site with predominantly bedding-plane controlled flow, we can simulate the effects of contrasts in the properties of model layers by specifying different control levels for different layers where seepage faces develop along the borehole when it is drained. In our experience, this is the most realistic representation of the effects of pumping in the sedimentary rocks of southern Ontario. However, both discharge-control and drawdown-control approaches were adopted for the purpose of this simulation and the results are compared and discussed in the follow sections.

Discharge-controlled Simulation – The MODFLOW Well package was used to simulate the pumping scenarios in the GRS wells. Multi-layer pumping wells are simulated by means of a vertical column of high permeability cells with pumping from the bottom of the column to take into account the vertical inter-connection between layers (Neville and Tonkin, 2004[1]). In this case, the GRS wells were set as screened in layer 2 where most of the flow comes from, and with a very high vertical hydraulic conductivity in layer 1, assuming flow from Layer 3 is negligible. The target water level drawdowns and the respective pumping rates were achieved through trial and error.

The steady-state simulation predicted a pumping rate of 1,963 m^3/day (or 300 lgpm) from each of the GRS wells, or a cumulative pumping rate of 5,892 m^3/day to achieve the target water level (251 m ASL) in the well cells. The results of a transient simulation indicated that a majority of the drawdown in wells was generated during the first day of pumping.

The discharge-controlled simulation over-predicted the pumping rates because model Layer 2 was set as confined. As discussed above, for confined layers the rate at which water is withdrawn from the well is never adjusted to reflect the drainage of the aquifer. To check the

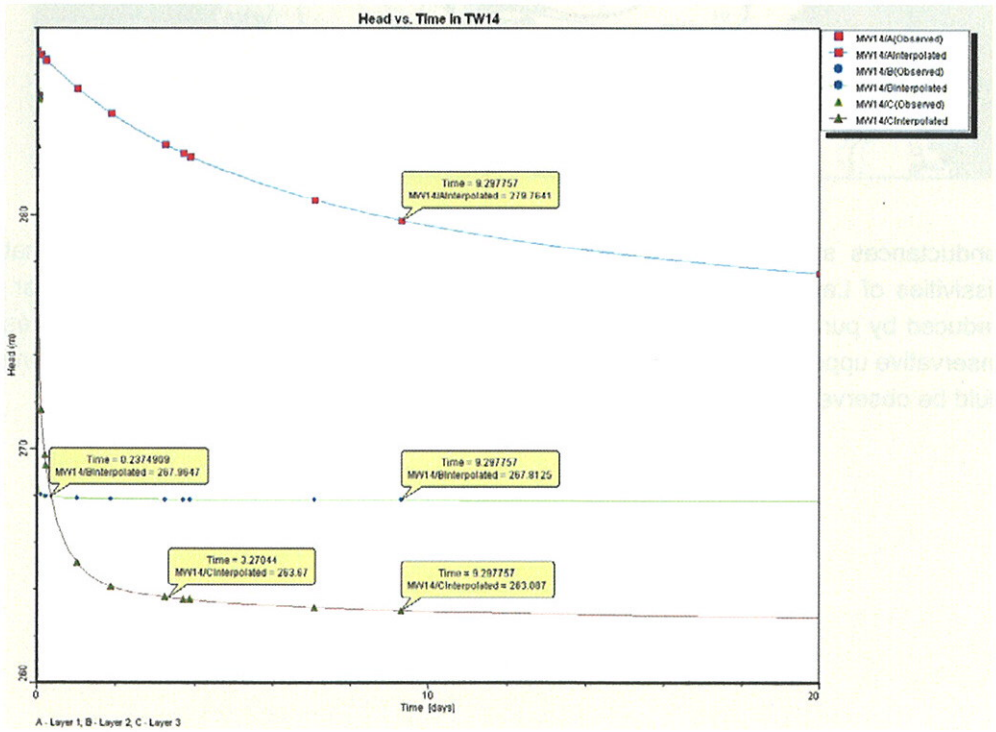
[1] *G.J. Neville and M.J. Tonkin, Modeling Multiaquifer Wells with MODFLOW, Ground Water, Vol. 42, No.6, November – December 2004, Pages 910-919.*

feasibility of the simulation results, we conducted another simulation by setting Layer 2 as convertible between confined and unconfined condition. The well cell in Layer 2 eventually went dry and the pumping rate was reduced to zero.

Drawdown-controlled Simulation – The MODFLOW GHB package was used to simulate the pumping scenarios in the GRS wells, following the approach of Neville and Tonkin (2004). GHB conditions were assigned to each of the top three layers in the grid blocks at the locations of TW14, TW15, and TW16. For each of the model layers across which the wells are open, the GHB stage was set to 0.1 m above the layer bottom to simulate a seepage face. The conductances, proportional to the transmissivity of each layer, were calculated as averages of 2.28 m^2/day (Layer 1), 214 m^2/day (Layer 2), and 0.25 m^2/day (Layer 3).

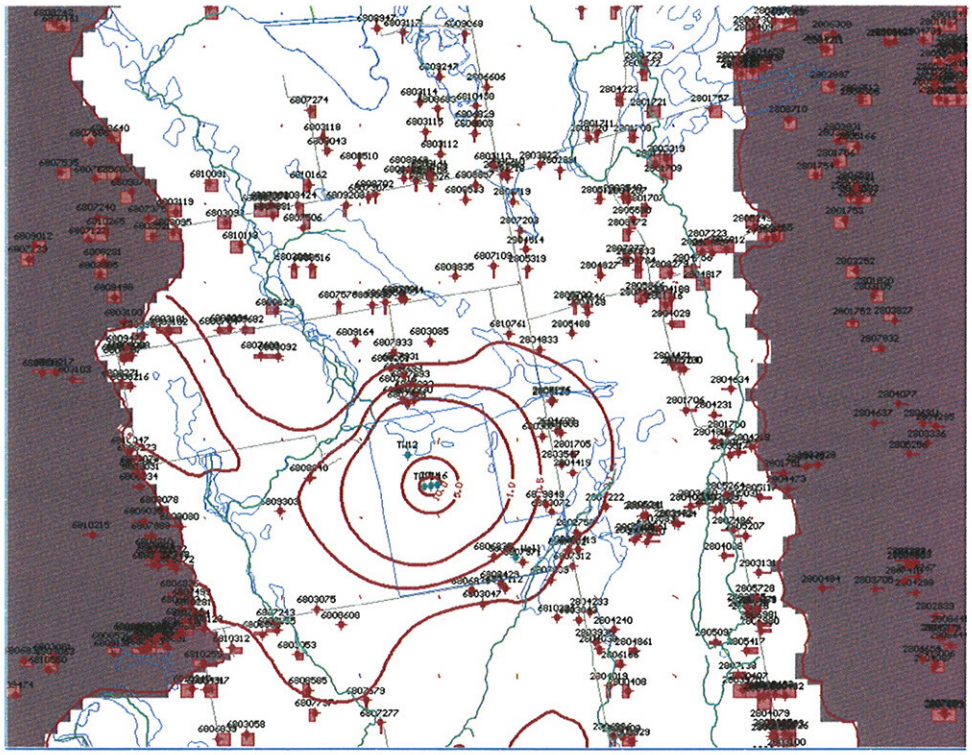
The results of a steady-state simulation predicted a cumulative pumping rate of about 2,370 m^3/day (or about 360 lgpm), which represents a maximum sustainable pumping rate from the GRS wells. The predicted water levels are at 268.1 m ASL in Layer 1 (at the layer bottom), 266.4 m ASL in Layer 2 (3.3 m above the layer bottom), and 260.7 m ASL in Layer 3 (9.7 m above the layer bottom). Transient simulation indicated that a majority of the drawdown in wells were generated during the first few days of pumping as shown in Figure 1.

Figure 1 – Predicted Head Changes in the Centre Well (TW14) During the GRS Well Pumping (Drawdown-controlled Simulation)



The predicted stabilized drawdown cone is shown in Figure 2.

Figure 2. Predicted Drawdown Area by the End of Day 7 during the GRS Well Pumping (Drawdown-controlled Simulation)



The conductances specified in the simulation are calculated with the assumption that the transmissivities of Layers 2 and 3 at the locations of the wells remained constant rather than being reduced by pumping in this simulation. This modeling approach should provide a realistic and conservative upper bound on the maximum cumulative pumping rate and the drawdown cone that would be observed during an actual test.

HZ:CJN

H3. PTTW Information

Ministry
of the
Environment

119 King Street West
12th Floor
Hamilton ON L8P 4Y7

Ministère
de
l'Environnement

119 rue King ouest
12e étage
Hamilton ON L8P 4Y7

Ontario

April 17, 2001

City of Hamilton
55 John St. N. 6th Floor
Hamilton, ON
L8R 3M8

Dear Mr. McIntyre:

RE: Amended Permit to Take Water Nº 75-P-2072

Enclosed please find amended Permit to Take Water Nº 75-P-2072 which authorizes the withdrawal of water from Carlisle Wells FDC01 and FDC02 in accordance with stated terms and conditions. This permit is valid until March 31, 2011. The permit should be kept on hand for inspection.

Please note that, as of August 8, 2000, large waterworks (in excess of 50,000 LPD) are subject to Ontario's Drinking Water Regulation (O. Reg. 459/00). You should contact the local District Office of the Ministry of the Environment to determine if this new regulation applies to the water taking covered by this permit.

Your attention is drawn to the Notice of Terms and Conditions which accompanies the permit as required under Section 100 of the Ontario Water Resources Act, R.S.O. 1990.

In particular, please take note of Condition 3 of the General Terms and Conditions (reverse side of Permit). Our main concern is that the taking of water under the authority of this permit does not interfere seriously with other water takings in existence prior to the date of this permit. If serious interference should occur, the permittee will be required to restore the affected water supply in a manner acceptable to the Ministry of the Environment or to reduce the rate and amount of taking until any serious interference is eliminated.

As well, please take note of Condition 8 of the General Terms and Conditions (reverse side of Permit) which explains the possible reduction or suspension of water takings during times of drought or water shortage.

Any change of ownership of the property for which this permit is issued should be reported promptly to the Ministry of the Environment.

It is your responsibility to ensure that any person taking water under the authority of this permit is familiar with and complies with the terms and conditions.

Yours truly,

D. Odom

Director, Section 34
Ontario Water Resources Act
R.S.O. 1990

S:\water\Ground Water\75p2072a.wpd

Ministry of the Environment
119 King Street West
12th Floor
Hamilton ON L8P 4Y7

Ministère de l'Environnement
119 rue King ouest
12e étage
Hamilton ON L8P 4Y7

Ontario

PERMIT TO TAKE WATER Nº 75-P-2072 (Amended)

Under Section 34 of The Ontario Water Resources Act, R.S.O. 1990, this permit is issued to:

City of Hamilton

whose address for all purposes pertaining to this permit is:

55 John St. N. 6th Floor Hamilton, Ontario L8R 3M8

for the taking of water in accordance with the terms and conditions set out below and on the back of this form.

TERMS AND CONDITIONS
PARTICULARS

SOURCE:	Carlisle Wells FDC01 and FDC02 (WWR #6807563 and 6801808)
LOCATION:	Lot 6, Concession 9, City of Hamilton, former Township of East Flamborough
PURPOSE:	Municipal Water Supply
PERIOD:	From date of issue to March 31, 2011 Inclusive
RATE NOT TO EXCEED:	From either or both wells: 590 LPM (130 IGPM) Subject to Special Conditions
AMOUNT NOT TO EXCEED:	From either or both wells: 851,000 LPD (187,000 IGPD) Subject to Special Conditions

SPECIAL

See Schedule "A" Attached

Dated at: **Hamilton, Ontario,** this 19th day of April 20 04

P. Odom

Director
Section 34
Ontario Water Resources Act
R.S.O. 1990

Notice of Terms and Conditions
The Ontario Water Resources Act, Section 100
R.S.O. 1990

Take notice that in issuing this Permit to Take Water, terms and conditions pertaining to the taking of water and to the results of the taking have been imposed. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may appeal the terms and conditions by giving written notice to the Director of the Ministry at the appropriate Region Office (see information sheet), and to the Environmental Review Tribunal, Suite 1201, P.O. Box 2382, 2300 Yonge Street, Toronto, Ontario M4P 1E4, within fifteen days after service of this Notice. In the event of an appeal, the terms and conditions of the Permit, as issued, would remain in effect until the appeal has been finalized.

General Terms and Conditions

These terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

1. **Permit**
This Permit shall be kept available at all times for inspection.

2. **Measurement and Reporting of Water Taking**
The Director may, from time to time, where a situation of interference or anticipated interference with water supplies exists, or in a situation requiring information on water takings for purposes of water resource inventory and planning, give written notice to the Permit holder to undertake any of the following actions.
The Permit holder shall comply with any such notice:
   (a) To establish and maintain a system for the measurement of the quantities of water taken;
   (b) To operate such a system and to record measurements of the quantities of water taken on forms provided by the Director, with such frequency or for such time periods as the Director may specify;
   (c) To return to the Director records made pursuant to clause 2 (b) at such times or with such frequency as the Director may specify;
   (d) To keep records made pursuant to clause 2 (b) available for inspection until such time as they are returned to the Director pursuant to clause 2 (c).

3. **Interference with Other Water Supplies**
The Permit holder shall immediately notify the Director of any complaint arising from the taking of water authorized by this Permit and shall report upon any action which has been taken or is proposed with regard to such complaint.

For Surface-Water Takings, the taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

For Ground-Water Takings, if the taking of water is forecast to interfere seriously, or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit holder shall take such action as will make available to those affected a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of the affected supplies, the Permit holder shall provide to those affected temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of so doing.

4. **Reporting of Changes**
The Permit holder shall report to the Director any changes of address or telephone number, or change of ownership of the property for which this Permit is issued and shall report to the Director any changes in the general conditions of water taking from those described in the Permit application within thirty days of any such change.

The Permit holder shall not assign his rights under this Permit to another person without the written consent of the Director.

5. **Expiry**
No water may be taken under authority of this Permit after the expiry date shown on the face of this Permit, unless the Permit is renewed, or after the expiry date shown on any renewal of this Permit.

6. **Liability**
This Permit does not release the permittee from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law. This Permit shall not be construed as estopping or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the permittee, its officers, employees, agents, and contractors.

7. **Transfers**
This permit does not abrogate the permit holder's responsibility to comply with all applicable legislation, including O. Reg. 285/99, which provides, among other things, that no person shall use water by transferring it out of a water basin (as defined in the Regulation) in a container having a volume greater than 20 litres. The regulation divides Ontario into three water basins, being the Great Lakes-St. Lawrence, the Nelson and Hudson Bay Basins.

8. **Water Shortages**
The Director may, during times of drought or water shortage in the locality of the taking, give notice to the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the notice to the Environmental Review Tribunal under the Ontario Water Resources Act, Section 100(3).

Permit Number: 75-P-2072
Issued to: City of Hamilton
Date of Amendment: April 17, 2001

SCHEDULE "A"

SPECIAL TERMS AND CONDITIONS

Nº1. If the taking of water under this renewal permit is forecast to interfere seriously or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to the date of the original permit, the permittee shall take such action as will make available to those affected a supply of water equivalent to their normal takings under terms and conditions that the Director, OWRA §34, deems fair or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of affected water supplies, the permittee shall provide to those affected sufficient potable, temporary water supplies to meet their normal requirements.

Nº2. Where the permittee is not already measuring the amount of water taking, a flow measuring device shall be installed prior to December 31, 2001 and the rates and amounts of water taken shall be monitored and recorded on a daily basis (or similar method acceptable to the Ministry). These flow records shall be kept available at all times for inspection by Ministry staff and submitted to the Ministry Regional Office by June 30 of each year for the previous calendar year.

Nº3. Where the Director, Transportation, Operations and Environment Department of the City of Hamilton and the Director, Section 34, Ontario Water Resources Act, R.S.O. 1990, agree in writing on a plan for the monitoring of the environmental effects of some or all of the City's water takings, including the water taking authorized under this permit, the requirements of Special Condition Nº3 will be superseded and the City shall implement the monitoring program, with reporting provisions, as detailed in that agreement.

Nº4. The permittee shall include, as part of the June 30, 2002 submission, a copy of the Engineer's Report for this facility prepared under O. Reg 459/00 (water quantity/ operational detail portion of the report).

Nº5. The Permit Holder shall ensure that the works complies with Section 52 of the Ontario Water Resources Act, R.S.O., 1990.

Nº6. Prior to taking of any water under the authorization of this Permit to Take Water, the permittee shall ensure compliance with O. Reg. 459/00 (Drinking Water Regulation).

Ministry of the Environment
119 King Street West
12th Floor
Hamilton, Ontario L8P 4Y7
Tel.: 905 521-7640
Fax: 905 521-7820

Ministère de l'Environnement
119 rue King ouest
12e étage
Hamilton, Ontario L8P 4Y7
Tél. : 905 521-7640
Téléc. : 905 521-7820

Ontario

5 May 2004

City of Hamilton
55 John St. N., 6th Floor
Hamilton, ON
L8R 3M8

Dear Mr. McIntyre:

RE: Amended Permit to Take Water Nº 95-P-2010

Enclosed please find amended Permit to Take Water Nº 95-P-2010 which authorizes the withdrawal of water from Carlisle Well #FDC03 in accordance with stated terms and conditions. This permit is valid until March 31, 2012. The permit should be kept on hand for inspection.

Your attention is drawn to the Notice of Terms and Conditions which accompanies the permit as required under Section 100 of the Ontario Water Resources Act, R.S.O. 1990.

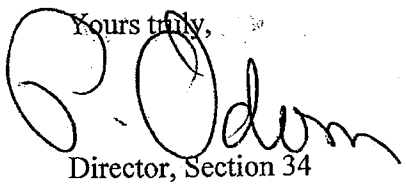
In particular, please take note of Condition 3 of the General Terms and Conditions (reverse side of Permit). Our main concern is that the taking of water under the authority of this permit does not interfere seriously with other water takings in existence prior to the date of this permit. If serious interference should occur, the permittee will be required to restore the affected water supply in a manner acceptable to the Ministry of the Environment or to reduce the rate and amount of taking until any serious interference is eliminated.

As well, please take note of Condition 8 of the General Terms and Conditions (reverse side of Permit) which explains the possible reduction or suspension of water takings during times of drought or water shortage.

Any change of ownership of the property for which this permit is issued should be reported promptly to the Ministry of the Environment.

It is your responsibility to ensure that any person taking water under the authority of this permit is familiar with and complies with the terms and conditions.

Yours truly,



Director, Section 34
Ontario Water Resources Act
R.S.O. 1990

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Ministry of the Environment
119 King Street West
12th Floor
Hamilton, Ontario L8P 4Y7
Tel.: 905 521-7640
Fax: 905 521-7820

Ministère de l'Environnement
119 rue King ouest
12e étage
Hamilton, Ontario L8P 4Y7
Tél. : 905 521-7640
Téléc. : 905 521-7820

Ontario

PERMIT TO TAKE WATER Nº 95-P-2010 (Amended)

Under Section 34 of The Ontario Water Resources Act, R.S.O. 1990, this permit is issued to:

City of Hamilton

whose address for all purposes pertaining to this permit is:

55 John St. N. 6th Floor Hamilton, Ontario L8R 3M8

for the taking of water in accordance with the terms and conditions set out below and on the back of this form.

TERMS AND CONDITIONS
PARTICULARS

SOURCE:	Carlisle Well #FDC03 (WWR#6810344) or Carlisle Well #FDC03R (tag A001134)
LOCATION:	Lot 5, Concession 9, City of Hamilton, former Township of East Flamborough
PURPOSE:	Municipal Water Supply
PERIOD:	From date of issue to March 31, 2012 Inclusive
RATE NOT TO EXCEED:	From one well at a time: 600 LPM (133 IGPM) Subject to Special Conditions
AMOUNT NOT TO EXCEED:	From one well at a time: 864,000 LPD (192,000 IGPD) Subject to Special Conditions

SPECIAL
See Schedule "A" Attached

Dated at: Hamilton, Ontario, this 7th day of May 20 04

P. Odorn

Director
Section 34
Ontario Water Resources Act
R.S.O. 1990

Notice of Terms and Conditions
The Ontario Water Resources Act, Section 100
R.S.O. 1990

Take notice that in issuing this Permit to Take Water, terms and conditions pertaining to the taking of water and to the results of the taking have been imposed. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may appeal the terms and conditions by giving written notice to the Director of the Ministry at the appropriate Region Office (see information sheet), and to the Environmental Appeal Board, Suite 502, 112 St. Clair Avenue West, Toronto, Ontario M4V 1N3, within fifteen days after service of this Notice. In the event of an appeal, the terms and conditions of the Permit, as issued, would remain in effect until the appeal has been finalized.

General Terms and Conditions

These terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

1. **Permit**
This Permit shall be kept available at all times for inspection.

2. **Measurement and Reporting of Water Taking**
The Director may, from time to time, where a situation of interference or anticipated interference with water supplies exists, or in a situation requiring information on water takings for purposes of water resource inventory and planning, give written notice to the Permit holder to undertake any of the following actions.
The Permit holder shall comply with any such notice:
   (a) To establish and maintain a system for the measurement of the quantities of water taken;
   (b) To operate such a system and to record measurements of the quantities of water taken on forms provided by the Director, with such frequency or for such time periods as the Director may specify;
   (c) To return to the Director records made pursuant to clause 2 (b) at such times or with such frequency as the Director may specify;
   (d) To keep records made pursuant to clause 2 (b) available for inspection until such time as they are returned to the Director pursuant to clause 2 (c).

3. **Interference with Other Water Supplies**
The Permit holder shall immediately notify the Director of any complaint arising from the taking of water authorized by this Permit and shall report upon any action which has been taken or is proposed with regard to such complaint.

For Surface-Water Takings, the taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

For Ground-Water Takings, if the taking of water is forecast to interfere seriously, or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit holder shall take such action as will make available to those affected a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of the affected supplies, the Permit holder shall provide to those affected temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of so doing.

4. **Reporting of Changes**
The Permit holder shall report to the Director any changes of address or telephone number, or change of ownership of the property for which this Permit is issued and shall report to the Director any changes in the general conditions of water taking from those described in the Permit application within thirty days of any such change.

The Permit holder shall not assign his rights under this Permit to another person without the written consent of the Director.

5. **Expiry**
No water may be taken under authority of this Permit after the expiry date shown on the face of this Permit, unless the Permit is renewed, or after the expiry date shown on any renewal of this Permit.

6. **Liability**
This Permit does not release the permittee from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law. This Permit shall not be construed as estopping or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the permittee, its officers, employees, agents, and contractors.

7. **Transfers**
This permit does not abrogate the permit holder's responsibility to comply with all applicable legislation, including O. Reg. 285/99, which provides, among other things, that no person shall use water by transferring it out of a water basin (as defined in the Regulation) in a container having a volume greater than 20 litres. The regulation divides Ontario into three water basins, being the Great Lakes-St. Lawrence, the Nelson and Hudson Bay Basins.

8. **Water Shortages**
The Director may, during times of drought or water shortage in the locality of the taking, give notice to the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the notice to the Environmental Appeal Board under the Ontario Water Resources Act, Section 100(3).

Permit Number: 95-P-2010
Issued to: City of Hamilton
Date of Issue: May 5, 2004

SCHEDULE "A"

SPECIAL TERMS AND CONDITIONS

Nº1. If the taking of water under this renewal permit is forecast to interfere seriously or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to the date of the original permit, the permittee shall take such action as will make available to those affected a supply of water equivalent to their normal takings under terms and conditions that the Director, OWRA §34, deems fair or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of affected water supplies, the permittee shall provide to those affected sufficient potable, temporary water supplies to meet their normal requirements.

Nº2. The Permit Holder shall ensure that the works complies with the Safe Drinking Water Act Reg. and its associated Regulations.

Nº3. The rates and amounts of water taken shall be monitored and recorded on a daily basis (or similar method acceptable to the Ministry). These flow records shall be kept available at all times for inspection by Ministry staff and submitted to the Ministry Regional Office by June 30 of each year for the previous calendar year.

Nº4. Where the Director, Transportation, Operations and Environment Department of the City of Hamilton and the Director, Section 34, Ontario Water Resources Act, R.S.O. 1990, agree in writing on a plan for the monitoring of the environmental effects of some or all of the City's water takings, including the water taking authorized under this permit, the requirements of Special Condition Nº 3 will be superseded and the City shall implement the monitoring program, with reporting provisions, as detailed in that agreement.

Ministry of the Environment
Ontario

NOTICE OF AMENDMENT OF TERMS AND CONDITIONS

In accordance with Section 100 of the ***Ontario Water Resources Act***, R.S.O. 1990, notice is hereb given of the amendment of Permit To Take Water

No. 95-P-2010

for the following reason:

Change in corporate name and address

You may, by written notice served upon me, and the Environmental Review Tribunal within fifteen days after receipt of this Notice, require a hearing by the Board.
This Notice requiring a hearing shall state:

1. The portions of the permit or each term or condition in the permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice shall also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works is located;

and the Notice should be signed and dated by the appellant.

The Notice must be served upon:

The Secretary,
Environmental Review Tribunal,
P.O. Box 2382,
2300 Yonge St., Suite 1201
Toronto, Ontario, M4P 1E4

The Director
Section 34,
Ontario Water Resources Act
Ministry of the Environment
(issuing office)

Further information on the Environmental Review Tribunal requirements for an appeal can be obtained directly from the Board by telephone at (416) 314-4600 by fax at (416) 314-4506 or website at www.ert.gov.on.ca

In the event of an appeal, the terms and conditions of the permit, as issued, would remain in effect until the appeal has been finalized.

Dated at : Hamilton, Ontario

This 7th day of May 2004

P. Odom

Director Section 34
Ontario Water Resources Act R.S.O. 1990

Ministry
of the Environment

119 King Street West
12th Floor
Hamilton ON L8P 4Y7

Ministère
de l'Environnement

119 rue King ouest
12e étage
Hamilton ON L8P 4Y7

Ontario

September 22, 2005

Mr. Dan Chauvin
Manager, Plant Capital and Planning
Water and Wastewater Division, Public Works Department
55 John Street North, 6th Floor
Hamilton, Ontario
L8R 3M8

RE: Amendment of City of Hamilton Permits to Take Water Nº 6550-6BTJ4L (Wells FDC03R & FDC04) and Nº 4150-6C4L9B (Well FDC05).

Dear Mr. Chauvin;

At the City of Hamilton's request, the Ministry of the Environment has reviewed monitoring condition 4.2 for Permits to Take Water 6550-6BTJ4L (Wells FDC03R & FDC04) and 4150-6C4L9B (Well FDC05). In understanding that monitoring wells MW2-00 and RW1 are private wells which are unavailable for monitoring, it is my decision that Condition 4.2 shall be modified to read:

"The Permit holder shall measure the static levels of the monitoring wells (CM-01-03 s/d, C1, CM-03-03 s/d, C2 s/d) on a monthly basis. Measurement shall begin prior to the commencement of this taking and shall continue for the duration of the permit".

In addition, you have requested that the "Maximum number of days taken per year" in Table A for the above Permits to Take Water be modified to address leap years. Notwithstanding that this field is numeric only, please be advised that the Ministry, as a practice, understands that where an activity is identified as occurring 365 days a year, this is to be interpreted as extending coverage to include February 29 in leap years or 366 days in those years.

This letter amends Permit to Take Water Nº 6550-6BTJ4L and 4150-6C4L9B and should be affixed to each permit. I trust that this information satisfies your concerns regarding Permit to Take Water 6550-6BTJ4L (Wells FDC03R & FDC04) and 4150-6C4L9B (Well FDC05). If you have any additional questions, feel free to contact me.

Sincerely,

Paul Odom

cc. R. Post, MOE
cc. J. Haynes, City of Hamilton

Permit expiration - Aug 31/15

Ministry of the Environment
West-Central Region
Technical Support Section
12th Floor
119 King St W
Hamilton ON L8P 4Y7
Fax: (905)521-7820
Telephone: (905) 521-7720

Ministère de l'Environnement
Direction régionale du Centre-Ouest
Secteur du Soutien Technique
12e étage
119 rue King W
Hamilton ON L8P 4Y7
Télécopieur: (905)521-7820
Téléphone : (905) 521-7720

Ontario

June 3, 2005

City of Hamilton
55 John Street North, 6th Floor
Hamilton, Ontario
L8R 3M8

RE: Lot 4, Concession 9, Geographic Township of East Flamborough, Hamilton
Lot 5, Concession 9, Geographic Township of East Flamborough, Hamilton
Permit Number 6550-6BTJ4L

Dear Sir/Madam:

Please find attached a Permit to Take Water which authorizes the withdrawal of water in accordance with the application for this Permit to Take Water, dated August 9, 2004 and signed by Dan Chauvin.

This permit expires on August 31, 2015.

Please reference Table A for the permitted rates and amounts. **Monitoring is now a requirement, please reference Sections 3 and 4 for the water taking and monitoring conditions.**

Take notice that in issuing this Permit to Take Water, terms and conditions pertaining to the taking of water and to the results of the taking have been imposed. The terms and conditions have been designed to allow for the development of water resources, while providing reasonable protection to existing water uses and users.

Yours truly,

Carl Slater

Carl Slater
West Central Region

File Storage Number: AP28 EFHA

Ministry of the Environment

Ministère de l'Environnement

Ontario

AMENDED PERMIT TO TAKE WATER
Ground Water
NUMBER 6550-6BTJ4L

Pursuant to Section 34 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

City of Hamilton
55 John Street North, 6th Floor
Hamilton, Ontario, L8R 3M8
Canada

For the water taking from: Two drilled wells

Located at: Lot 4, Concession 9, East Flamborough
Hamilton

Lot 5, Concession 9, East Flamborough
Hamilton

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment.

(d) "District Office" means the Hamilton District Office.

(e) "Permit" means this Permit to Take Water No. 6550-6BTJ4L including its Schedules, if any, issued in accordance with Section 34 of the OWRA.

(f) "Permit Holder" means City of Hamilton.

(g) "OWRA " means the *Ontario Water Resources Act*, R.S.O. 1990, c. O. 40, as amended.

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated August 9, 2004 and signed by Dan Chauvin, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections
The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act*, R.S.O. 1990, the *Pesticides Act*, R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals
The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act*, and the *Environmental Protection Act*, and any regulations made thereunder; or

(b) limit in any way the authority of the Director or a Provincial Officer to require certain steps be
taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 Expiry

This Permit expires on **August 31, 2015.** No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1.	Well FDC03R Lot: 5, Con: 9, East Flamborough	Well Drilled	Municipal	Water Supply	1500.00	24.00	2160000.00	365.00	17 582911 4806414
2.	Well FDC04	Well Drilled	Municipal	Water Supply	510.00	24.00	736000.00	365.00	17 583055 4806473
						Total Taking:	2896000.00		

3.3 The permit holder shall ensure that this taking complies with the *Safe Drinking Water Act S.O. 2002* and all pertinent regulations thereunder.

4. Monitoring

4.1 The Permit Holder shall measure and record static water levels in each production well on a monthly basis during the period of operation.

4.2 The Permit holder shall measure the static levels of the monitoring wells (CM-01-03 s/d, MW2-00, C1, CM-03-03 s/d, C2 s/d, RW 1) on a monthly basis. Measurement shall begin prior to the commencement of this taking and shall continue for the duration of the permit.

4.3 The Permit Holder shall submit records of water takings and the monitoring results as part of an annual report to be submitted to be submitted to the Director by March 31 for the previous year ending December 31 for a period of 2 years in order to determine the potential for interference. The report shall be prepared by a licensed professional Geoscientist or a Professional Engineer specializing in hydrogeology.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

5.3 If the taking of water under this permit interferes with the taking of water by other persons, the terms and conditions of the permit with regard to the amount, rate and period of taking may be altered.

6. **Director May Amend Permit**

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act*, Section 100 (3).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, as amended, provides that the Notice requiring the hearing shall state:

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This notice must be served upon:

The Secretary
Environmental Review Tribunal
2300 Yonge Street, 12th Floor
Toronto, Ontario M4P 1E4

AND

The Director, Section 34
Ontario Water Resources Act, RSO 1990,
Ministry of Environment
12th Floor
119 King St W
Hamilton ON L8P 4Y7
Fax: (905)521-7820

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by telephone at (416) 314-4600 ***by fax at (416) 314-4506*** ***by e-mail at www.ert.gov.on.ca***

This Permit cancels and replaces Permit Number 95-P-2010, issued on 1995/03/08.

Dated at Hamilton this 3 rd day of June, 2005.

Carl Slater

Carl Slater
Director, Section 34
Ontario Water Resources Act, R.S.O. 1990

Schedule A

This Schedule "A" forms part of Permit To Take Water 6550-6BTJ4L, dated June 3, 2005.

PERMIT TO TAKE WATER m. 86-P-2025 (RENEWAL)

Under Section 34 of The Ontario Water Resources Act, R.S.O. 1990, this permit is issued to:

Flamborough Springs Inc.

whose address for all purposes pertaining to this permit is:

P.O. Box 117 Waterdown, Ontario L0R 2H0

for the taking of water in accordance with the terms and conditions set out below and on the back of this form.

TERMS AND CONDITIONS
PARTICULARS

SOURCE:	One well
LOCATION:	North part Lot 10, Concession 10, City of Hamilton (formerly Township of East Flamborough)
PURPOSE:	Commercial - Bottled Water
PERIOD:	From date of issue to March 31, 2003 Inclusive.
RATE NOT TO EXCEED:	50 LPM (11 IGPM) Subject to Special Conditions.
AMOUNT NOT TO EXCEED:	50,000 LPD (11,000 IGPD) Subject to Special Conditions.

SPECIAL

See Schedule "A" Attached

Dated at: Hamilton, Ontario, this 8th day of February 20 01

Original signed by P.Odom
Director
Section 34
Ontario Water Resources Act
R.S.O. 1990

Notice of Terms and Conditions
The Ontario Water Resources Act, Section 100
R.S.O. 1990

Take notice that in issuing this Permit to Take Water, terms and conditions pertaining to the taking of water and to the results of the taking have been imposed. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.
You may appeal the terms and conditions by giving written notice to the Director of the Ministry at the appropriate Region Office (see information sheet), and to the Environmental Appeal Board, Suite 502, 112 St. Clair Avenue West, Toronto, Ontario M4V 1N3, within fifteen days after service of this Notice. In the event of an appeal, the terms and conditions of the Permit, as issued, would remain in effect until the appeal has been finalized.

General Terms and Conditions

These terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

1. **Permit**
   This Permit shall be kept available at all times for inspection.
2. **Measurement and Reporting of Water Taking**
   The Director may, from time to time, where a situation of interference or anticipated interference with water supplies exists, or in a situation requiring information on water takings for purposes of water resource inventory and planning, give written notice to the Permit holder to undertake any of the following actions.
   The Permit holder shall comply with any such notice:
   (a) To establish and maintain a system for the measurement of the quantities of water taken;
   (b) To operate such a system and to record measurements of the quantities of water taken on forms provided by the Director, with such frequency or for such time periods as the Director may specify;
   (c) To return to the Director records made pursuant to clause 2 (b) at such times or with such frequency as the Director may specify;
   (d) To keep records made pursuant to clause 2 (b) available for inspection until such time as they are returned to the Director pursuant to clause 2 (c).
3. **Interference with Other Water Supplies**
   The Permit holder shall immediately notify the Director of any complaint arising from the taking of water authorized by this Permit and shall report upon any action which has been taken or is proposed with regard to such complaint.
   For Surface-Water Takings, the taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.
   For Ground-Water Takings, if the taking of water is forecast to interfere seriously, or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit holder shall take such action as will make available to those affected a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of the affected supplies, the Permit holder shall provide to those affected temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of so doing.
4. **Reporting of Changes**
   The Permit holder shall report to the Director any changes of address or telephone number, or change of ownership of the property for which this Permit is issued and shall report to the Director any changes in the general conditions of water taking from those described in the Permit application within thirty days of any such change.
   The Permit holder shall not assign his rights under this Permit to another person without the written consent of the Director.
5. **Expiry**
   No water may be taken under authority of this Permit after the expiry date shown on the face of this Permit, unless the Permit is renewed, or after the expiry date shown on any renewal of this Permit.
6. **Liability**
   This Permit does not release the permittee from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law. This Permit shall not be construed as estopping or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the permittee, its officers, employees, agents, and contractors.
7. **Transfers**
   This permit does not abrogate the permit holder's responsibility to comply with all applicable legislation, including O. Reg. 285/99, which provides, among other things, that no person shall use water by transferring it out of a water basin (as defined in the Regulation) in a container having a volume greater than 20 litres. The regulation divides Ontario into three water basins, being the Great Lakes-St. Lawrence, the Nelson and Hudson Bay Basins.
8. **Water Shortages**
   The Director may, during times of drought or water shortage in the locality of the taking, give notice to the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the notice to the Environmental Appeal Board under the Ontario Water Resources Act, Section 100(3).

Permit Number: 86-P-2025
Issued to: Flamborough Springs Inc.
Date of Renewal: February 5, 2001

SCHEDULE "A"

SPECIAL TERMS AND CONDITIONS

m1. If the taking of water under this renewal permit is forecast to interfere seriously or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to the date of the original permit, the permittee shall take such action as will make available to those affected a supply of water equivalent to their normal takings under terms and conditions that the Director, OWRA §34, deems fair or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of affected water supplies, the permittee shall provide to those affected sufficient potable, temporary water supplies to meet their normal requirements.

m2. Any complaints received from the public with regard to the water taking shall be investigated by the permit holder in consultation with staff from the Hamilton District Office and reported to that office forthwith.

m3. The permittee shall submit to the Director within 120 days of the issuance of this permit, details of the bottling operations involved with water taking under this permit to take water to indicate compliance with O. Reg. 285/99. These details shall include:

i. Location and name of all bottling facilities to which water is delivered from this source
ii. Size of containers into which this water is processed
iii. All market locations for any containers greater than 20 L.

This document shall be signed by an officer of the company.
The permittee should be aware that the permittee is responsible for ensuring compliance with O. Reg. 285/99 by all employees and clients with respect to General Term and Condition #7.

m4. The permittee shall identify all wells within 1000 metres of this taking. As part of the submission for the next renewal, a list of those wells shall be prepared indicting current owners and use. These wells should also be located on a 1:10000 Topographical map of the area.

m5. The permittee shall record and maintain a daily record of water taking using the attached Annual Record of Water Taking form for all days in which water is taken. The permittee shall keep this form up-to-date and on-hand for inspection by Ministry officials. At the time of expiry of this Permit, in order for renewal, the permittee shall submit all completed Annual Water Takings forms to the Director by December 31 of the year preceding expiry of the Permit to Take Water.

Ontario

Ministry of the Environment

Ministère de l'Environnement

PERMIT TO TAKE WATER
Ground Water
NUMBER 2856-6N7MQK

Pursuant to Section 34 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

Flamborough Springs Inc.
PO Box 117
Waterdown, Ontario
L0R 2H0

For the water taking from: One drilled well (Well#2-WWR#6811368)

Located at: Lot 10, Concession 10, E. Flamborough
Hamilton

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment.

(d) "District Office" means the Hamilton District Office.

(e) "Permit" means this Permit to Take Water No. 2856-6N7MQK including its Schedules, if any, issued in accordance with Section 34 of the OWRA.

(f) "Permit Holder" means Flamborough Springs Inc..

(g) "OWRA " means the *Ontario Water Resources Act,* R.S.O. 1990, c. O. 40, as amended.

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated November 28, 2005 and signed by W. Ian S. Hendrie, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections
The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act*, R.S.O. 1990, the *Pesticides Act*, R.S.O. 1990, or the *Safe Drinking Water Act,* S. O. 2002.

2.2 Other Approvals
The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act*, and

the *Environmental Protection Act*, and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**

This Permit expires on **March 31, 2009**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Well #2 WWR# 6811368	Well Drilled	Bottled Water	Commercial	566	4	118,860	365	17 579692 4806474
						Total Taking:	118,860		

3.1 Notwithstanding Table A, the amount of taking shall not exceed 58,000 liters per day (LPD) from the date of issuance of the permit while the detailed monitoring program outlined in Condition 4.2 is being conducted in order to establish current ground and surface water conditions (including creek temperature monitoring) and until a satisfactory aquifer test is conducted. Following the aquifer test and until condition 3.3 is satisfied, the amount of taking shall not exceed 58,000 liters per day (LPD).

3.2 Notwithstanding Table A, the amount of taking may increase from 58,000 to 118,860 LPD for a period of up to 30 consecutive days between May 1 and August 31 2006, in order to conduct a full aquifer test as specified in condition 4.3.

3.3 Notwithstanding Table A, the amount of taking may increase from 58,000 to 118,860 LPD for the remaining duration of the permit subject to the Director providing acceptability of the findings of the aquifer test as well as concurrence with the long-term monitoring program.

4. Monitoring

4.1 The Permit Holder shall measure daily water takings using a totalizing flow meter installed at the production well. In addition, the dates, times, pumping rates and amount shall be recorded. The records shall be submitted as required under Ontario Regulation 387/04 or any superceding legislation.

4.2 Within one month of the issuance of the Permit, the permit holder or its agent shall submit to the Director for approval a revised ground and surface water monitoring program for the Ministry's review and approval. The approved monitoring plan shall be implemented within one month after receiving the approval of the Director.

4.3 In order for the Permit Holder to increase the taking to the full authorized amount of this permit, the permit holder shall conduct an aquifer test to the satisfaction of the Director. In order to do so, the Permit Holder shall submit a test plan for approval which will define the extent of impact on area ground (including neighbouring private wells with permission) and surface water levels (including any impact on the streambed upwellings). The test shall be conducted between May 1 and August 31, 2006.

4.5 The Permit Holder shall prepare a written protocol to address well interference complaints and provide the protocol to the Director and to the Manager, MOE Hamilton District Office and to the Clerk, City of Hamilton, within one month of the issuance of the Permit.

4.6 The Permit Holder shall identify the following information on an annual basis:

i. Location and name of the facilities to which the water is delivered in bulk (containers greater than 20 L) from this source.

ii. If the bulk water transported is containerized at the receiving location identified in 4.6 (i), the size of the container(s) into which the water is transferred.

iii. Total volume of the water transported in bulk in each calendar year to each remote facility.

iv. Details of any complaint(s) and the resolution.

4.7 The Permit Holder shall submit to the Director, an annual monitoring report which presents and interprets the monitoring data in Conditions 4.1 to 4.6. This report shall be prepared, signed and stamped by a licensed professional geoscientist or a licensed professional engineer specializing in hydrogeology who shall take responsibility for its accuracy. The report shall be submitted to the Director by April 30 of each calendar year and include monitoring data for the 12 month period ending December 31 of the previous year.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water

supplies of those permanently affected.

6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act*, Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, ***Environmental Bill of Rights****, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the Ontario Water Resources Act, as amended provides that the Notice requiring a hearing shall state:*

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
2300 Yonge Street, Suite 1700
Toronto, Ontario M4P 1E4

AND

The Environmental Commissioner
1075 Bay Street
6th Floor, Suite 605
Toronto, Ontario M5S 2W5

AND

The Director, Section 34
Ministry of the Environment
12th Floor
119 King St W
Hamilton ON L8P 4Y7
Fax: (905)521-7820

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by telephone at (416) 314-4600 ***by fax at (416) 314-4506*** ***by e-mail at www.ert.gov.on.ca***

This instrument is subject to Section 38 of the ***Environmental Bill of Rights*** *that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.*

Dated at Hamilton this 30th day of March, 2006.

P. Odom

Paul Odom
Director, Section 34
Ontario Water Resources Act, R.S.O. 1990

Schedule A

This Schedule "A" forms part of Permit To Take Water 2856-6N7MQK, dated March 30, 2006.

PERMIT TO TAKE WATER Nº 03-P-2045

Under Section 34 of The Ontario Water Resources Act, R.S.O. 1990, this permit is issued to:

Four Seasons Family Nudist Resort

whose address for all purposes pertaining to this permit is:

P.O. Box 9, East Flamborough, Hamilton, Ontario, L0R 1K0

for the taking of water in accordance with the terms and conditions set out below and on the back of this form.

TERMS AND CONDITIONS
PARTICULARS

SOURCE:	Two wells
LOCATION:	Lot 11, Concession 12, City of Hamilton, Geographic Township of East Flamborough
PURPOSE:	Public supply and recreation
PERIOD:	From date of issue to March 31, 2013 Inclusive
RATE NOT TO EXCEED:	Well #3: 166 LPM (36.6 IGPM) Subject to Special Conditions Well #9: 166 LPM (36.6 IGPM) Subject to Special Conditions
AMOUNT NOT TO EXCEED:	Well #3: 200,000 LPD (44,000 IGPD) Subject to Special Conditions Well #9: 200,000 LPD (44,000 IGPD) Subject to Special Conditions

SPECIAL

See Schedule "A" Attached

Dated at: Hamilton, Ontario, this 26th day of February 20 03

Original signed by P.Odom
Director
Section 34
Ontario Water Resources Act
R.S.O. 1990

Notice of Terms and Conditions
The Ontario Water Resources Act, Section 100
R.S.O. 1990

Take notice that in issuing this Permit to Take Water, terms and conditions pertaining to the taking of water and to the results of the taking have been imposed. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may appeal the terms and conditions by giving written notice to the Director of the Ministry at the appropriate Region Office (see information sheet), and to the Environmental Review Tribunal, Suite 1201, P.O. Box 2382, 2300 Yonge Street, Toronto, Ontario M4P 1E4, within fifteen days after service of this Notice. In the event of an appeal, the terms and conditions of the Permit, as issued, would remain in effect until the appeal has been finalized.

General Terms and Conditions

These terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

1. **Permit**
   This Permit shall be kept available at all times for inspection.
2. **Measurement and Reporting of Water Taking**
   The Director may, from time to time, where a situation of interference or anticipated interference with water supplies exists, or in a situation requiring information on water takings for purposes of water resource inventory and planning, give written notice to the Permit holder to undertake any of the following actions.
   The Permit holder shall comply with any such notice:
   (a) To establish and maintain a system for the measurement of the quantities of water taken;
   (b) To operate such a system and to record measurements of the quantities of water taken on forms provided by the Director, with such frequency or for such time periods as the Director may specify;
   (c) To return to the Director records made pursuant to clause 2 (b) at such times or with such frequency as the Director may specify;
   (d) To keep records made pursuant to clause 2 (b) available for inspection until such time as they are returned to the Director pursuant to clause 2 (c).
3. **Interference with Other Water Supplies**
   The Permit holder shall immediately notify the Director of any complaint arising from the taking of water authorized by this Permit and shall report upon any action which has been taken or is proposed with regard to such complaint.
   For Surface-Water Takings, the taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.
   For Ground-Water Takings, if the taking of water is forecast to interfere seriously, or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit holder shall take such action as will make available to those affected a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of the affected supplies, the Permit holder shall provide to those affected temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of so doing.
4. **Reporting of Changes**
   The Permit holder shall report to the Director any changes of address or telephone number, or change of ownership of the property for which this Permit is issued and shall report to the Director any changes in the general conditions of water taking from those described in the Permit application within thirty days of any such change.
   The Permit holder shall not assign his rights under this Permit to another person without the written consent of the Director.
5. **Expiry**
   No water may be taken under authority of this Permit after the expiry date shown on the face of this Permit, unless the Permit is renewed, or after the expiry date shown on any renewal of this Permit.
6. **Liability**
   This Permit does not release the permittee from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law. This Permit shall not be construed as estopping or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the permittee, its officers, employees, agents, and contractors.
7. **Transfers**
   This permit does not abrogate the permit holder's responsibility to comply with all applicable legislation, including O. Reg. 285/99, which provides, among other things, that no person shall use water by transferring it out of a water basin (as defined in the Regulation) in a container having a volume greater than 20 litres. The regulation divides Ontario into three water basins, being the Great Lakes-St. Lawrence, the Nelson and Hudson Bay Basins.
8. **Water Shortages**
   The Director may, during times of drought or water shortage in the locality of the taking, give notice to the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the notice to the Environmental Review Tribunal under the Ontario Water Resources Act, Section 100(3).

Permit Number: 03-P-2045
Issued to: Four Seasons Family Nudist Resort
Date of Issue: February 28, 2003

SCHEDULE "A"

SPECIAL TERMS AND CONDITIONS

№1. If the taking of water under this permit interferes with the use of water by other persons, the terms and conditions of the permit may be altered.

№2. i. The rates and amounts of water taken from each well shall be monitored by a flow measuring device.
ii. Flow records shall be made on a daily basis.
iii The flow device(s) shall be installed and operating prior to the taking of water.
iv. The flow records shall be kept available at all times for inspection by Ministry staff and submitted to the MOE Regional Office by May 31 of each year for the previous calender year as part of the submission in Special Condition №3.

№3. The permittee shall measure and record water levels in monitoring wells #1, #2, and #6 monthly. Water levels in wells #3 and #9 shall be monitored on a weekly basis. The permittee shall submit an annual report prepared by a licensed geoscientist documenting and interpreting water level impacts and compliance with rate and amounts to the Director no later than May 31 for the 12 month period ending December 31 of the previous year.

№4. Prior to the taking of water the Permit Holder shall ensure that the works complies with Section 52 of the Ontario Water Resources Act, R.S.O., 1990. Prior to taking of any water under the authorization of this Permit to Take Water, the permittee shall ensure full compliance with O. Reg. 459/00 (Drinking Water Regulation).

Ontario Ministry of the Environment

NOTICE OF TERMS AND CONDITIONS

In accordance with Section 100 of the ***Ontario Water Resources Act***, R.S.O. 1990, notice is hereby given of the issuance of Permit To Take Water

No. 03-P-2045

which contains terms and conditions pertaining to the taking of water and to the results of the taking. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may, by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, **Environmental Bill of Rights**, S.O. 1993, Chapter 28, within fifteen days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the ***Ontario Water Resources Act***, as amended provides that this Notice requiring a hearing shall state:

1. The portions of the permit or each term or condition in the permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice shall also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works is located;

and the Notice should be signed and dated by the appellant.

The Notice must be served upon:

The Secretary, Environmental Review Tribunal, P.O. Box 2382, 2300 Yonge St., Suite 1201, Toronto, Ontario, M4P 1E4
and upon
The Director, Section 34, Ontario Water Resources Act, Ministry of the Environment (issuing office)
and upon
The Environmental Commissioner, 1075 Bay St., 6th Floor, Suite 605, Toronto, Ontario, M5S 2W5

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal by telephone at (416) 314-4600 by fax at (416) 314-4506 or website at www.ert.gov.on.ca

In the event of an appeal, the terms and conditions of the permit, as issued, would remain in effect until the appeal has been finalized. This instrument is subject to Section 38 of the ***Environmental Bill of Rights***, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal for 15 days from the date of this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.

Dated at Hamilton, Ontario

This _____ day of _____ 20 _____

_____
Director Section 34
Ontario Water Resources Act R.S.O. 1990

Ministry of Environment
119 King Street West
12th Floor
Hamilton, Ontario L8P 4Y7
Tel.: 905 521-7640
Fax: 905 521-7820

Ministère de l'Environnement
119 rue King ouest
12e étage
Hamilton, Ontario L8P 4Y7
Tél. : 905 521-7640
Téléc. : 905 521-7820

Angela - Your copy

Ontario

RECEIVED JUN 2 0 2003

June 18, 2003

City of Hamilton
55 John Street N., 6th Floor
Hamilton, Ontario
L8R 3M8

Dear Ms. Marchant:

RE: Permit to Take Water Nº 03-P-2246

Enclosed please find Permit to Take Water Nº 03-P-2246 which authorizes the withdrawal of water from Freelton Well #FDF01 in accordance with stated terms and conditions. This permit is valid until March 31, 2013. The permit should be kept on hand for inspection.

Your attention is drawn to the Notice of Terms and Conditions which accompanies the permit as required under Section 100 of the Ontario Water Resources Act, R.S.O. 1990.

Please note that Permit to Take Water Nº 03-P-2246 replaces Nº 01-P-2106 since the requested increase in water taking exceeds 10% of the original authorized rate. Please find attached a Notice of Cancellation for Permit to Take Water Nº 01-P-2106.

In particular, please take note of Condition 3 of the General Terms and Conditions (reverse side of Permit). Our main concern is that the taking of water under the authority of this permit does not interfere seriously with other water takings in existence prior to the date of this permit. If serious interference should occur, the permittee will be required to restore the affected water supply in a manner acceptable to the Ministry of the Environment or to reduce the rate and amount of taking until any serious interference is eliminated.

As well, please take note of Condition 8 of the General Terms and Conditions (reverse side of Permit) which explains the possible reduction or suspension of water takings during times of drought or water shortage.

Any change of ownership of the property for which this permit is issued should be reported promptly to the Ministry of the Environment.

It is your responsibility to ensure that any person taking water under the authority of this permit is familiar with and complies with the terms and conditions.

Yours truly,

Director, Section 34
Ontario Water Resources Act
R.S.O. 1990

Ministry of Environment
119 King Street West
12th Floor
Hamilton, Ontario L8P 4Y7
Tel.: 905 521-7640
Fax: 905 521-7820

Ministère de l'Environnement
119 rue King ouest
12e étage
Hamilton, Ontario L8P 4Y7
Tél. : 905 521-7640
Téléc. : 905 521-7820

Ontario

PERMIT TO TAKE WATER Nº 03-P-2246

Under Section 34 of The Ontario Water Resources Act, R.S.O. 1990, this permit is issued to:

City of Hamilton

whose address for all purposes pertaining to this permit is:

55 John Street N., 6th Floor, Hamilton, Ontario, L8R 3M8

for the taking of water in accordance with the terms and conditions set out below and on the back of this form.

TERMS AND CONDITIONS
PARTICULARS

SOURCE: Freelton Well #FDF01

LOCATION: Lot 13, Concession 10, City of Hamilton, Geographic Township of East Flamborough

PURPOSE: Municipal Water Supply

PERIOD: From date of issue to March 31, 2013 Inclusive

RATE NOT TO EXCEED: 610 LPM (134 IGPM) Subject to Special Conditions

AMOUNT NOT TO EXCEED: 878,000 LPD (193,000 IGPD) Subject to Special Conditions

SPECIAL
See Schedule "A" Attached

Dated at: **Hamilton, Ontario,** this 18th day of June 2003

P. Odom

Director
Section 34
Ontario Water Resources Act
R.S.O. 1990

The Ontario Water Resources Act, Section 100
R.S.O. 1990

Take notice that in issuing this Permit to Take Water, terms and conditions pertaining to the taking of water and to the results of the taking have been imposed. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may appeal the terms and conditions by giving written notice to the Director of the Ministry at the appropriate Region Office (see information sheet), and to the Environmental Review Tribunal, Suite 1201, P.O. Box 2382, 2300 Yonge Street, Toronto, Ontario M4P 1E4, within fifteen days after service of this Notice. In the event of an appeal, the terms and conditions of the Permit, as issued, would remain in effect until the appeal has been finalized.

General Terms and Conditions

These terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

1. **Permit**
   This Permit shall be kept available at all times for inspection.

2. **Measurement and Reporting of Water Taking**
   The Director may, from time to time, where a situation of interference or anticipated interference with water supplies exists, or in a situation requiring information on water takings for purposes of water resource inventory and planning, give written notice to the Permit holder to undertake any of the following actions.
   The Permit holder shall comply with any such notice:
   (a) To establish and maintain a system for the measurement of the quantities of water taken;
   (b) To operate such a system and to record measurements of the quantities of water taken on forms provided by the Director, with such frequency or for such time periods as the Director may specify;
   (c) To return to the Director records made pursuant to clause 2 (b) at such times or with such frequency as the Director may specify;
   (d) To keep records made pursuant to clause 2 (b) available for inspection until such time as they are returned to the Director pursuant to clause 2 (c).

3. **Interference with Other Water Supplies**
   The Permit holder shall immediately notify the Director of any complaint arising from the taking of water authorized by this Permit and shall report upon any action which has been taken or is proposed with regard to such complaint.

   For Surface-Water Takings, the taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

   For Ground-Water Takings, if the taking of water is forecast to interfere seriously, or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit holder shall take such action as will make available to those affected a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of the affected supplies, the Permit holder shall provide to those affected temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of so doing.

4. **Reporting of Changes**
   The Permit holder shall report to the Director any changes of address or telephone number, or change of ownership of the property for which this Permit is issued and shall report to the Director any changes in the general conditions of water taking from those described in the Permit application within thirty days of any such change.

   The Permit holder shall not assign his rights under this Permit to another person without the written consent of the Director.

5. **Expiry**
   No water may be taken under authority of this Permit after the expiry date shown on the face of this Permit, unless the Permit is renewed, or after the expiry date shown on any renewal of this Permit.

6. **Liability**
   This Permit does not release the permittee from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law. This Permit shall not be construed as estopping or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the permittee, its officers, employees, agents, and contractors.

7. **Transfers**
   This permit does not abrogate the permit holder's responsibility to comply with all applicable legislation, including O. Reg. 285/99, which provides, among other things, that no person shall use water by transferring it out of a water basin (as defined in the Regulation) in a container having a volume greater than 20 litres. The regulation divides Ontario into three water basins, being the Great Lakes-St. Lawrence, the Nelson and Hudson Bay Basins.

8. **Water Shortages**
   The Director may, during times of drought or water shortage in the locality of the taking, give notice to the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the notice to the Environmental Review Tribunal under the Ontario Water Resources Act, Section 100(3).

Permit Number: 03-P-2246
Issued to: City of Hamilton
Date of Issue: June 18, 2003

SCHEDULE "A"

SPECIAL TERMS AND CONDITIONS

№1. A flow measuring device shall be installed and the rates and amounts of water taken shall be monitored and recorded on a daily basis (or similar method acceptable to the Ministry). These flow record shall be kept available at all times for inspection by Ministry staff and submitted to the Ministry Regional Office by June 30 of each year for the previous calendar year.

№2. Continuous measurements (at intervals of 15 minutes or less) of water levels shall be made in the monitor DP03-01 commencing within one month of the date this condition comes into force until November 1, 2004 except for the period from November 1, 2003 to March 31, 2004,

№3. A water level gauge shall be established and maintained at Bronte Creek, adjacent to DP03-01 and measurements of water levels shall be made on a weekly basis during the same period that measurements are required for DP03-01.

№4. Measurements of water levels in monitoring wells FM01-03, FDF01-02, FDF02-03 shall be made on a weekly basis during the same period that measurements are required for DP03-01.

№5. Records of operating times shall be kept for both FDF01 and FDF02 during the period that measurements are required for DP03-01.

№6. The data gathered through the monitoring required under the previous clauses 2 through 5 shall be submitted to the Director by November 30, 2004 along with an evaluation of the effect of the water taking from FDF01 and FDF02 on the baseflow in Bronte Creek and recommendations with respect to ongoing monitoring.

№7. Where the Director, Transportation, Operations and Environment Department of the City of Hamilton and the Director, Section 34, Ontario Water Resources Act, R.S.O. 1990, agree in writing on a plan for the monitoring of the environmental effects of some or all of the City's water takings, including the water taking authorized under this permit, the requirements of Special Condition №1 will be superseded and the City shall implement the monitoring program, with reporting provisions, as detailed in that agreement.

№8. Prior to the taking of water the Permit Holder shall ensure that the works complies with the Safe Drinking Water Act, 2002. Prior to taking of any water under the authorization of this Permit to Take Water, the permittee shall ensure full compliance with O. Reg. 170/03.

Ontario

Ministry of the Environment

NOTICE OF TERMS AND CONDITIONS

In accordance with Section 100 of the ***Ontario Water Resources Act***, R.S.O. 1990, notice is hereby given of the issuance of Permit To Take Water

No. 03-P-2246

which contains terms and conditions pertaining to the taking of water and to the results of the taking. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may, by written notice served upon me and the Environmental Review Tribunal within fifteen days after receipt of this Notice, require a hearing by the Tribunal.
This Notice requiring a hearing shall state:

1. The portions of the permit or each term or condition in the permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice shall also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works is located;

The Notice should be signed and dated by the appellant.

The Notice must be served upon:

The Secretary,
Environmental Review Tribunal,
P.O. Box 2382,
2300 Yonge St., Suite 1201
Toronto, Ontario, M4P 1E4

The Director,
Section 34,
Ontario Water Resources Act
Ministry of the Environment
(issuing office)

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal by telephone at (416) 314-4600 by fax at (416) 314-4506 or website at www.ert.gov.on.ca

In the event of an appeal, the terms and conditions of the permit, as issued, would remain in effect until the appeal has been finalized.

Dated at Hamilton, Ontario

This 12 day of June 2003

Director Section 34
Ontario Water Resources Act R.S.O. 1990

Ontario

Ministry of the Environment

NOTICE OF CANCELLATION

In accordance with Section 100 of the ***Ontario Water Resources Act***, R.S.O. 1990, notice is hereby given of the cancellation of Permit To Take Water

No. 01-P-2106

for the following reason:

Due to the requested increase in water taking exceeds 10% of the original authorized rate.

You may, by written notice served upon me, the Environmental Review Tribunal within fifteen days after receipt of this Notice, require a hearing by the Tribunal. The Notice requiring a hearing shall state:

1. The portions of the permit or each term or condition in the permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice shall also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works is located;

and the Notice should be signed and dated by the appellant.

The Notice must be served upon:

The Secretary, Environmental Review Tribunal, P.O. Box 2382, 2300 Yonge St., Suite 1201 Toronto, Ontario, M4P 1E4	The Director Section34, OntarioWater Resources Act Ministry of the Environment (issuing office)

Further information on the Environmental Review Tribunal requirements for an appeal can be obtained directly from the Tribunal by telephone at (416) 314-4600 by fax at (416) 314-4506 or website at www.ert.gov.on.ca

In the event of an appeal, the terms and conditions of the permit, as issued, would remain in effect until the appeal has been finalized.

Dated at : Hamilton, Ontario

this 17 day of January 2013

P. Pidoon

Director Section 34
Ontario Water Resources Act R.S.O. 1990

Ministry of the Environment

119 King Street West
12th Floor
Hamilton ON L8P 4Y7

Ministère de l'Environnement

119 rue King ouest
12e étage
Hamilton ON L8P 4Y7

Ontario

April 17, 2001

City of Hamilton
55 John St. N. 6th Floor
Hamilton, ON
L8R 3M8

Dear Mr. McIntrye:

RE: Amended Permit to Take Water Nº 99-P-2042

Enclosed please find amended Permit to Take Water Nº 99-P-2042 which authorizes the withdrawal of water from Freelton Well # FDF02 in accordance with stated terms and conditions. This permit is valid until March 31, 2009. The permit should be kept on hand for inspection.

Please note that, as of August 8, 2000, large waterworks (in excess of 50,000 LPD) are subject to Ontario's Drinking Water Regulation (O. Reg. 459/00). You should contact the local District Office of the Ministry of the Environment to determine if this new regulation applies to the water taking covered by this permit.

Your attention is drawn to the Notice of Terms and Conditions which accompanies the permit as required under Section 100 of the Ontario Water Resources Act, R.S.O. 1990.

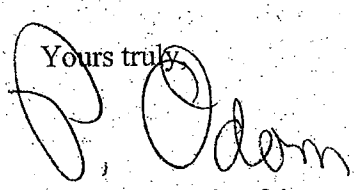
In particular, please take note of Condition 3 of the General Terms and Conditions (reverse side of Permit). Our main concern is that the taking of water under the authority of this permit does not interfere seriously with other water takings in existence prior to the date of this permit. If serious interference should occur, the permittee will be required to restore the affected water supply in a manner acceptable to the Ministry of the Environment or to reduce the rate and amount of taking until any serious interference is eliminated.

As well, please take note of Condition 8 of the General Terms and Conditions (reverse side of Permit) which explains the possible reduction or suspension of water takings during times of drought or water shortage.

Any change of ownership of the property for which this permit is issued should be reported promptly to the Ministry of the Environment.

It is your responsibility to ensure that any person taking water under the authority of this permit is familiar with and complies with the terms and conditions.

Yours truly,



Director, Section 34
Ontario Water Resources Act
R.S.O. 1990

S:\water\Ground Water\99p2042a.wpd

Ministry of the Environment
119 King Street West
12th Floor
Hamilton ON L8P 4Y7

Ministère de l'Environnement
119 rue King ouest
12e étage
Hamilton ON L8P 4Y7

Ontario

PERMIT TO TAKE WATER Nº 99-P-2042 (Amended)

Under Section 34 of The Ontario Water Resources Act, R.S.O. 1990, this permit is issued to:

City of Hamilton

whose address for all purposes pertaining to this permit is:

55 John Street N. 6th Floor Hamilton, Ontario L8R 3M8

for the taking of water in accordance with the terms and conditions set out below and on the back of this form.

TERMS AND CONDITIONS

PARTICULARS

SOURCE:	Freelton well #FDF02 (WWR#6809934)
LOCATION:	Lot 13, Concession 10, City of Hamilton, former Township of East Flamborough
PURPOSE:	Municipal Water Supply
PERIOD:	From date of issue to March 31, 2009 Inclusive
RATE NOT TO EXCEED:	680 LPM (150 IGPM) Subject to Special Conditions
AMOUNT NOT TO EXCEED:	982,000 LPD (216,000 IGPD) Subject to Special Conditions

SPECIAL

See Schedule "A" Attached

Dated at: **Hamilton, Ontario,** this 19th day of April 20 01

P. Odom

Director
Section 34
Ontario Water Resources Act
R.S.O. 1990

Notice of Terms and Conditions
The Ontario Water Resources Act, Section 100
R.S.O. 1990

Take notice that in issuing this Permit to Take Water, terms and conditions pertaining to the taking of water and to the results of the taking have been imposed. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may appeal the terms and conditions by giving written notice to the Director of the Ministry at the appropriate Region Office (see information sheet), and to the Environmental Review Tribunal, Suite 1201, P.O. Box 2382, 2300 Yonge Street, Toronto, Ontario M4P 1E4, within fifteen days after service of this Notice. In the event of an appeal, the terms and conditions of the Permit, as issued, would remain in effect until the appeal has been finalized.

General Terms and Conditions

These terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

1. **Permit**
This Permit shall be kept available at all times for inspection.

2. **Measurement and Reporting of Water Taking**
The Director may, from time to time, where a situation of interference or anticipated interference with water supplies exists, or in a situation requiring information on water takings for purposes of water resource inventory and planning, give written notice to the Permit holder to undertake any of the following actions.
The Permit holder shall comply with any such notice:
   (a) To establish and maintain a system for the measurement of the quantities of water taken;
   (b) To operate such a system and to record measurements of the quantities of water taken on forms provided by the Director, with such frequency or for such time periods as the Director may specify;
   (c) To return to the Director records made pursuant to clause 2 (b) at such times or with such frequency as the Director may specify;
   (d) To keep records made pursuant to clause 2 (b) available for inspection until such time as they are returned to the Director pursuant to clause 2 (c).

3. **Interference with Other Water Supplies**
The Permit holder shall immediately notify the Director of any complaint arising from the taking of water authorized by this Permit and shall report upon any action which has been taken or is proposed with regard to such complaint.

For Surface-Water Takings, the taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

For Ground-Water Takings, if the taking of water is forecast to interfere seriously, or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit holder shall take such action as will make available to those affected a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of the affected supplies, the Permit holder shall provide to those affected temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of so doing.

4. **Reporting of Changes**
The Permit holder shall report to the Director any changes of address or telephone number, or change of ownership of the property for which this Permit is issued and shall report to the Director any changes in the general conditions of water taking from those described in the Permit application within thirty days of any such change.

The Permit holder shall not assign his rights under this Permit to another person without the written consent of the Director.

5. **Expiry**
No water may be taken under authority of this Permit after the expiry date shown on the face of this Permit, unless the Permit is renewed, or after the expiry date shown on any renewal of this Permit.

6. **Liability**
This Permit does not release the permittee from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law. This Permit shall not be construed as estopping or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the permittee, its officers, employees, agents, and contractors.

7. **Transfers**
This permit does not abrogate the permit holder's responsibility to comply with all applicable legislation, including O. Reg. 285/99, which provides, among other things, that no person shall use water by transferring it out of a water basin (as defined in the Regulation) in a container having a volume greater than 20 litres. The regulation divides Ontario into three water basins, being the Great Lakes-St. Lawrence, the Nelson and Hudson Bay Basins.

8. **Water Shortages**
The Director may, during times of drought or water shortage in the locality of the taking, give notice to the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the notice to the Environmental Review Tribunal under the Ontario Water Resources Act, Section 100(3).

Permit Number: 99-P-2042
Issued to: City of Hamilton
Date of Amendment: April 17, 2001

SCHEDULE "A"

SPECIAL TERMS AND CONDITIONS

№1. If the taking of water under this renewal permit is forecast to interfere seriously or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to the date of the original permit, the permittee shall take such action as will make available to those affected a supply of water equivalent to their normal takings under terms and conditions that the Director, OWRA §34, deems fair or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of affected water supplies, the permittee shall provide to those affected sufficient potable, temporary water supplies to meet their normal requirements.

№2. Where the permittee is not already measuring the amount of water taking, a flow measuring device shall be installed prior to December 31, 2001 and the rates and amounts of water taken shall be monitored and recorded on a daily basis (or similar method acceptable to the Ministry). These flow records shall be kept available at all times for inspection by Ministry staff and submitted to the Ministry Regional Office by June 30 of each year for the previous calendar year.

№3 Where the Director, Transportation, Operations and Environment Department of the City of Hamilton and the Director, Section 34, Ontario Water Resources Act, R.S.O. 1990, agree in writing on a plan for the monitoring of the environmental effects of some or all of the City's water takings, including the water taking authorized under this permit, the requirements of Special Condition №3 will be superseded and the City shall implement the monitoring program, with reporting provisions, as detailed in that agreement.

№4 The permittee shall include, as part of the June 30, 2002 submission, a copy of the Engineer's Report for this facility prepared under O. Reg 459/00 (water quantity/ operational detail portion of the report).

№5. The Permit Holder shall ensure that the works complies with Section 52 of the Ontario Water Resources Act, R.S.O., 1990.

№6. Prior to taking of any water under the authorization of this Permit to Take Water, the permittee shall ensure compliance with O. Reg. 459/00 (Drinking Water Regulation).

Ontario

Ministry of the Environment

NOTICE OF TERMS AND CONDITIONS

In accordance with Section 100 of the ***Ontario Water Resources Act***, R.S.O. 1990, notice is hereby given of the amendment of Permit To Take Water

No.**99-P-2042**

Reason for amendment: *Change in corporate name and address.*

which contains terms and conditions pertaining to the taking of water and to the results of the taking. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may, by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, **Environmental Bill of Rights**, S.O. 1993, Chapter 28, within fifteen days after receipt of this Notice, require a hearing by the Board. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the ***Ontario Water Resources Act***, as amended provides that this Notice requiring a hearing shall state:

1. The portions of the permit or each term or condition in the permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice shall also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works is located;

and the Notice should be signed and dated by the appellant.

The Notice must be served upon:

The Secretary,
Environmental Review Tribunal,
P.O. Box 2382,
2300 Yonge St., Suite 1201
Toronto, Ontario, M4P 1E4

The Director,
Section 34,
Ontario Water Resources Act
Ministry of the Environment
(issuing office)

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Board by telephone at (416) 314-4600 by fax at (416) 314-4506 or website at www.ert.gov.on.ca

In the event of an appeal, the terms and conditions of the permit, as issued, would remain in effect until the appeal has been finalized. This instrument is subject to Section 38 of the ***Environmental Bill of Rights***, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal for 15 days from the date of this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.

Dated at Hamilton, Ontario

This 19th day of April 20 04

P. Odom

Director Section 34
Ontario Water Resources Act R.S.O. 1990

Ministry
of the
Environment

119 King Street West
12th Floor
Hamilton ON L8P 4Y7

Ministère
de
l'Environnement

119 rue King ouest
12e étage
Hamilton ON L8P 4Y7

Ontario

Mr. Jeff McIntyre, Water Quality Technologist
Waste and Water Division
Regional Municipality of Hamilton-Wentworth
Regional Environment Department
35 King Street East, Main Floor
Hamilton, Ontario,
L8N 4A9

NOTICE OF CANCELLATION OF PERMIT TO TAKE WATER

In accordance with Section 100 of the Ontario Water Resources Act, notice is hereby given of the cancellation of Permit to Take Water No.79-P-2066 for the following reason:

Permit replaced with Permit to Take Water No. 99-P-2042. Permit No. 79-P-2066 was originally issued to another owner (Wilden Estates).

The cancellation of this permit may be appealed by written notice to both the undersigned and the Environmental Appeal Board within fifteen days of the date of this notice.

Date: July 13/99

P. Odom
Director, Sector 34
Ontario Water Resources Act
R.S.O. 1990

Environmental Appeal Board,
P.O. Box 2382,
2300 Yonge St. Suite 1201
Toronto, Ontario
M4P 1E4

PERMIT TO TAKE WATER Nº 02-P-2034

Under Section 34 of The Ontario Water Resources Act, R.S.O. 1990, this permit is issued to:

Kaneff Properties Ltd. (o/a Carlisle Golf & Country Club

whose address for all purposes pertaining to this permit is:

1300 Central Parkway West, Mississauga, Ontario L5C 4G8

for the taking of water in accordance with the terms and conditions set out below and on the back of this form.

TERMS AND CONDITIONS

PARTICULARS

SOURCE:	1. One pond formed by a dam on a tributary of Bronte Creek known locally as Flamboro Creek 2 One dugout pond
LOCATION:	Lots 2 and 3, Concession 9, City of Hamilton, formerly Township of East Flamborough
PURPOSE:	Irrigation of Golf Course
PERIOD:	Annually between March 15 and October 31 from date of issue to October 31, 2006 Inclusive
RATE NOT TO EXCEED:	From the on-stream pond 1930 LPM (425 IGPM) Subject to Special Conditions From the dugout pond 3180 LPM (700 IGPM) Subject to Special Conditions
AMOUNT NOT TO EXCEED:	From the on-stream pond 455,000 LPD (100,000 IGPD) Subject to Special Conditions From the dugout pond 3,500,000 LPD (770,000 IGPD) Subject to Special Conditions

SPECIAL

See Schedule "A" Attached

Dated at: Hamilton, Ontario, **this** 16th **day of** May **20** 02

Original signed by P.Odom
Director
Section 34
Ontario Water Resources Act
R.S.O. 1990

Notice of Terms and Conditions
The Ontario Water Resources Act, Section 100
R.S.O. 1990

Take notice that in issuing this Permit to Take Water, terms and conditions pertaining to the taking of water and to the results of the taking have been imposed. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may appeal the terms and conditions by giving written notice to the Director of the Ministry at the appropriate Region Office (see information sheet), and to the Environmental Review Tribunal, Suite 502, 112 St. Clair Avenue West, Toronto, Ontario M4V 1N3, within fifteen days after service of this Notice. In the event of an appeal, the terms and conditions of the Permit, as issued, would remain in effect until the appeal has been finalized.

General Terms and Conditions

These terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

1. **Permit**
   This Permit shall be kept available at all times for inspection.
2. **Measurement and Reporting of Water Taking**
   The Director may, from time to time, where a situation of interference or anticipated interference with water supplies exists, or in a situation requiring information on water takings for purposes of water resource inventory and planning, give written notice to the Permit holder to undertake any of the following actions.
   The Permit holder shall comply with any such notice:
   (a) To establish and maintain a system for the measurement of the quantities of water taken;
   (b) To operate such a system and to record measurements of the quantities of water taken on forms provided by the Director, with such frequency or for such time periods as the Director may specify;
   (c) To return to the Director records made pursuant to clause 2 (b) at such times or with such frequency as the Director may specify;
   (d) To keep records made pursuant to clause 2 (b) available for inspection until such time as they are returned to the Director pursuant to clause 2 (c).
3. **Interference with Other Water Supplies**
   The Permit holder shall immediately notify the Director of any complaint arising from the taking of water authorized by this Permit and shall report upon any action which has been taken or is proposed with regard to such complaint.
   For Surface-Water Takings, the taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.
   For Ground-Water Takings, if the taking of water is forecast to interfere seriously, or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit holder shall take such action as will make available to those affected a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of the affected supplies, the Permit holder shall provide to those affected temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of so doing.
4. **Reporting of Changes**
   The Permit holder shall report to the Director any changes of address or telephone number, or change of ownership of the property for which this Permit is issued and shall report to the Director any changes in the general conditions of water taking from those described in the Permit application within thirty days of any such change.
   The Permit holder shall not assign his rights under this Permit to another person without the written consent of the Director.
5. **Expiry**
   No water may be taken under authority of this Permit after the expiry date shown on the face of this Permit, unless the Permit is renewed, or after the expiry date shown on any renewal of this Permit.
6. **Liability**
   This Permit does not release the permittee from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law. This Permit shall not be construed as estopping or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the permittee, its officers, employees, agents, and contractors.
7. **Transfers**
   This permit does not abrogate the permit holder's responsibility to comply with all applicable legislation, including O. Reg. 285/99, which provides, among other things, that no person shall use water by transferring it out of a water basin (as defined in the Regulation) in a container having a volume greater than 20 litres. The regulation divides Ontario into three water basins, being the Great Lakes-St. Lawrence, the Nelson and Hudson Bay Basins.
8. **Water Shortages**
   The Director may, during times of drought or water shortage in the locality of the taking, give notice to the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the notice to the Environmental Review Tribunal under the Ontario Water Resources Act, Section 100(3).

Permit Number: 02-P-2034
Issued to: Kaneff Properties Ltd. (o/a Carlisle Golf and Country Club
Date of Issue: May 16, 2002

SCHEDULE "A"

SPECIAL TERMS AND CONDITIONS

№1. If the taking of water under this permit interferes with the use of water by other persons, the terms and conditions of the permit may be altered.

№2 The on-stream pond (Source #1) is to be used and operated in such a manner as to avoid water quality degradation and downstream impact in the receiving waters.

№3 The construction of any obstruction to the natural flow of Flamboro Creek is prohibited without the authorization of the District Offices of the Ministry of Environment and the Ministry of Natural Resources as well as authorization of Conservation Halton.

№4 During periods of high flows (spring freshet or major rainfall events), water shall be discharged over the 8 foot long stop logs at the permittee's dam on Flamboro Creek. Stop logs should be removed in order to provide the necessary capacity for high flows to prevent over-topping of the earth dam. These logs should be removed prior to an expected rainfall event so that outflow capacity exists before the runoff occurs. When stop logs have to be removed, they are to be removed one at a time to prevent sudden discharges from the dam which may aggravate flooding and erosion downstream. (in accordance with the Dam Operating Plan (Section 4.1 of the HRCA Report, 1998))

№5 A suitably designed , sized and calibrated V-notch weir shall be installed prior to the 2002 irrigation season downstream of the dam and shall be clearly marked at the 5 and 25 IGPM discharge rates, to facilitate visual confirmation of the discharge rates (See Special Conditions № 6 & 7).

№6 During periods of natural stream water shortage when surplus water (defined as the water which is stored above elevation 256.55 metres) is available in the pond and the water level in the pond drops below the elevation of the stop logs, water will be discharged through the permittee's dam on Flamboro Creek at a minimum rate of 25 Igpm by means of the 6 inch valve. Flows will be monitored using a V notch weir located immediately downstream of the dam. Water below elevation 256.55 metres is reserved for fisheries protection in the pond and is not considered surplus. (Dam Operating Plan (Section 4.1 of the HRCA Report, 1998))

№7 During dry periods (natural low stream flows) when the water elevation in the on-stream pond is at or below 256.55 metres, water will be discharged through the permittee's dam on Flamboro Creek at a minimum rate of 5 Igpm. This will maintain a permanent pool of water for the protection of the fish population and maintain downstream habitats. No water may be pumped to the irrigation system from the on-line pond in this case.(in accordance with the Dam Operating Plan (Section 4.1 of the HRCA Report, 1998))

№8. During the irrigation season, the Permittee shall be responsible for daily inspection and maintenance of the dam and associated outlet structures to ensure that they are operating properly and that the appropriate discharge rate is being met per Special Conditions №6 & 7.

№9. For the water taken from the on-stream pond, the rates, total number of hours of pumping and the total volume of water taken shall be recorded on a daily basis, monitored by a flow measuring device.

№10. For the water taken for irrigation, the permit holder shall record the sources supplying the irrigation system (on-stream pond, dugout pond or both), the rates and pumps in operation, total number of hours of pumping, portions of the course irrigated and the total volume of water taken on a daily basis during the irrigation season. The irrigation pumps shall be monitored by a flow measuring device.

№11. The records required in Special Conditions № 9 & 10 shall be kept available at all times for inspection by Ministry staff. The Permittee shall submit to the Director, an annual monitoring report which presents and interprets the daily pumping data (in spreadsheet format), as well as complete accounts of the circumstances and resolution of any complaints received. The report shall be submitted to the Director by March 31 of each year and shall include the monitoring data for the 12 month period ending December 31 of the previous year.

№12. As part of the submission required March 31, 2003 under Special Condition №11, the permittee shall include a report containing details of the irrigation system (pump(s), distribution and sprinklers). The report shall also identify what measures are being undertaken for water conservation including but not limited to:

- efficiency audit of the irrigation system
- Measures to naturalize additional areas of the property
- details of irrigation requirement calculations
- potential for recirculation and use of stormwater

№13. Prior to the taking of water under this permit, the Permittee shall ensure that any and all applicable permits or authorizations are obtained from Federal and Provincial Agencies having legislative mandates in water resources management.

№14. This permit.does not exempt the permittee from the requirements of other legislation, such as the Lakes and Rivers Improvement Act and the Fisheries Act. The permittee is advised to consult with the local offices of the Department of Fisheries and Oceans, the Ministry of Natural Resources, the Ministry of Agriculture and Food and the Niagara. Escarpment Commission as well as Conservation Halton to determine their requirements.

№15. Where a discrepancy arises in the above Special Terms and Conditions, the permittee shall consult the document "Flamboro Creek Instream Flow Study" report of the Halton Region Conservation Authority, 1998, which is appended in its entirety as Appendix A.

Ontario Ministry of the Environment

NOTICE OF TERMS AND CONDITIONS

In accordance with Section 100 of the ***Ontario Water Resources Act***, R.S.O. 1990, notice is hereby given of the issuance of Permit To Take Water

No.02-P-2034

which contains terms and conditions pertaining to the taking of water and to the results of the taking. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may, by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, **Environmental Bill of Rights**, S.O. 1993, Chapter 28, within fifteen days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the ***Ontario Water Resources Act***, as amended provides that this Notice requiring a hearing shall state:

1. The portions of the permit or each term or condition in the permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice shall also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works is located;

and the Notice should be signed and dated by the appellant.

The Notice must be served upon:
The Secretary, Environmental Review Tribunal, P.O. Box 2382, 2300 Yonge St., Suite 1201, Toronto, Ontario, M4P 1E4
and upon
The Director, Section 34, Ontario Water Resources Act, Ministry of the Environment (issuing office)
and upon
The Environmental Commissioner, 1075 Bay St., 6th Floor, Suite 605, Toronto, Ontario, M5S 2W5

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal by telephone at (416) 314-4600 by fax at (416) 314-4506 or website at www.ert.gov.on.ca

In the event of an appeal, the terms and conditions of the permit, as issued, would remain in effect until the appeal has been finalized. This instrument is subject to Section 38 of the ***Environmental Bill of Rights***, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal for 15 days from the date of this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.

Dated at Hamilton, Ontario

This _____ day of _____ 20_____

_____
Director Section 34
Ontario Water Resources Act R.S.O. 1990

Ontario

Ministry of the Environment

Ministère de l'Environnement

PERMIT TO TAKE WATER
Surface and Ground Water
NUMBER 8436-6YSM5W

Pursuant to Section 34 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

Kaneff Properties Limited
523 Carlisle Rd.
P.O. Box 30
Carlisle, Ontario
L0R 1H0

For the water taking from: One pond formed by a dam on Flamboro Creek and one dugout pond.

Located at: Lot 2 and 3, Concession 9, East Flamborough
Hamilton

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment.

(d) "District Office" means the Hamilton District Office.

(e) "Permit" means this Permit to Take Water No. 8436-6YSM5W including its Schedules, if any, issued in accordance with Section 34 of the OWRA.

(f) "Permit Holder" means Kaneff Properties Limited.

(g) "OWRA " means the *Ontario Water Resources Act,* R.S.O. 1990, c. O. 40, as amended.

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated January 18, 2007 and signed by Joe Allen, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections
The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act* , R.S.O. 1990, the *Pesticides Act* , R.S.O. 1990, or the *Safe Drinking Water Act,* S. O. 2002.

2.2 Other Approvals
The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act* , and the *Environmental Protection Act* , and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**

This Permit expires on **February 28, 2016**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	One pond formed by a dam on Flamboro Creek	Pond Online	Golf Course Irrigation	Commercial	1,930	5	455,000	230	17 583845 4806678
2	Dugout Pond	Pond Dugout	Golf Course Irrigation	Commercial	3,180	16	3,500,000	230	17 583915 4806752
						Total Taking:	3,955,000		

3.3 Water taking under the authorization of this Permit shall only occur between March 1 and October 31 of each year from date of issue to Februry 28, 2016.

3.4 During periods of high flows (spring freshet or major rainfall events), water shall be discharged through the spillway at the Permit Holder's dam on Flamboro Creek. Stop logs should be removed in order to provide the necessary capacity for high flows to prevent over-topping of the earth dam. These logs should be removed prior to an expected rainfall event so that outflow capacity exists before the runoff occurs. When stop logs have to be removed, they are to be removed one at a time to prevent sudden discharges from the dam which may aggravate flooding and erosion downstream (in accordance with the Dam Operating Plan (Section 4.1 of the HRCA Report , 1998)).

3.5 During periods of natural stream water shortage when surplus water (defined as the water which is stored above elevation 256.55 m) is available in the pond and the water levels in the pond drops below the elevation of the stop logs, water will be discharged through the Permit Holder's dam on Flamboro Creek at a minimum rate of 25 IGPM by means of the 6 inch valve. Flows shall be monitored using a V-notch weir located immediately downstream of the dam. Water below elevation 256.55 m is reserved for fisheries protection in the pond and is not considered surplus (in accordance with the Dam Operating Plan (Section 4.1 of the HRCA Report , 1998)).

3.6 During dry periods (natural low stream flows) when the water elevation in the on-stream pond is at or below 256.55 metres, water will be discharged through the Permit Holder dam on Flamboro Creek at a minimum rate of 5 IGPM. This will maintain a permanent pool of water for the protection of the fish population and maintain downstream habitats. No water may be pumped to the irrigation system from the on-line pond in this case.(in accordance with the Dam operating Plan (Section 4.1 of the HRCA Report, 1998)).

3.7 Where a discrepancy arises in the above Terms and Conditions, the Permit Holder shall consult the document "Flamboro Creek Instream Flow Study" report of the Halton Region Conservation Authority 1998, which is appended in its entirety as Appendix A or shall seek clarification from

the Halton Region Conservation Authority prior to proceeding.

3.8 At such time that flows are present in the watercourse upstream of the pond, the taking of water into storage shall be carried out in such a manner that water quality in the stream below the point of taking is not adversely affected through a change in temperature and/or nutrient level and that streamflow is not stopped or is not reduced below a rate necessary to satisfy both downstream uses of water and the natural functions of the stream or watercourse.

4. Monitoring

4.1 In addition to the requirements imposed by section 9 of O. Reg. 387/04, and as authorized by subsection 34(6) of the *Ontario Water Resources Act* , the Permit Holder shall do the following: maintain a record of all water takings that includes the date, times, rates and total measured amounts of water pumped per day for each day that water is taken under the authorization of this Permit; keep a seperate record for each source listed in Table A; keep all required records current and available at or near the site of the taking; and produce those records for the inspection of a Provincial Officer immediately upon his or her request.

4.2 During the irrigation season, the Permit Holder shall be responsible for daily inspections and maintanence of the dam and associated outlet structures to ensure that they are operating properly and that the discharge is occuring at the appropriate rate on a daily basis, monitored by a flow measuring device. The Permit Holder shall document the operation and maintenance of the impoundment structure on a daily basis and keep this information current and on hand for inspection by a Provincial Officer.

4.3 In addition to the reporting requirements under condition 4.1, the Permit Holder shall have an annual report prepared by a Qualified Person which shall discuss water taking and operation of the Flamboro Creek impoundment and the impact of this operation on the hydrology of the creek. This report shall be done for each of the 2007 and 2008 irrigation seasons and submitted to the Director prior to the start of the following year's irrigation season. A copy of these reports shall be provided under separate cover to the Halton Region Conservation Authority.

5. Impacts of the Water Taking

5.1 Notification
The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Surface-Water Takings
The taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

For Groundwater Takings
If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act* , Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, ***Environmental Bill of Rights****, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the Ontario Water Resources Act, as amended provides that the Notice requiring a hearing shall state:*

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
2300 Yonge Street, Suite 1700
Toronto, Ontario M4P 1E4

AND

The Environmental Commissioner
1075 Bay Street
6th Floor, Suite 605
Toronto, Ontario M5S 2W5

AND

The Director, Section 34
Ministry of the Environment
12th Floor
119 King St W
Hamilton ON L8P 4Y7
Fax: (905)521-7820

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by telephone at (416) 314-4600 ***by fax at (416) 314-4506*** ***by e-mail at www.ert.gov.on.ca***

This instrument is subject to Section 38 of the ***Environmental Bill of Rights*** *that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.*

Dated at Hamilton this 12th day of June, 2007.

P. Odom

Paul Odom
Director, Section 34
Ontario Water Resources Act , R.S.O. 1990

Schedule A

This Schedule "A" forms part of Permit To Take Water 8436-6YSM5W, dated June 12, 2007.

PERMIT TO TAKE WATER Nº 03-P-2249

Under Section 34 of The Ontario Water Resources Act, R.S.O. 1990, this permit is issued to:

Sierra Lane (2000) Developments Inc.

whose address for all purposes pertaining to this permit is:

130 Adelaide Street West, Suite 2500, Toronto, Ontario, M5H 2M2

for the taking of water in accordance with the terms and conditions set out below and on the back of this form.

TERMS AND CONDITIONS
PARTICULARS

SOURCE:	Two wells (TW-1 and TW-2)
LOCATION:	Lot 4, Concession 12, City of Hamilton, Geographic Township of East Flamborough
PURPOSE:	Communal Water Supply
PERIOD:	From date of issue to March 31, 2013 Inclusive
RATE NOT TO EXCEED:	From either well: 909 LPM (200 IGPM) Subject to Special Conditions
AMOUNT NOT TO EXCEED:	From either well: 1,309,000 LPD (288,000 IGPD) Subject to Special Conditions

SPECIAL

See Schedule "A" Attached

Dated at: Hamilton, Ontario, this 12th day of June 20 03

Original signed by P.Odom
Director
Section 34
Ontario Water Resources Act
R.S.O. 1990

Notice of Terms and Conditions
The Ontario Water Resources Act, Section 100
R.S.O. 1990

Take notice that in issuing this Permit to Take Water, terms and conditions pertaining to the taking of water and to the results of the taking have been imposed. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may appeal the terms and conditions by giving written notice to the Director of the Ministry at the appropriate Region Office (see information sheet), and to the Environmental Review Tribunal, Suite 1201, P.O. Box 2382, 2300 Yonge Street, Toronto, Ontario M4P 1E4, within fifteen days after service of this Notice. In the event of an appeal, the terms and conditions of the Permit, as issued, would remain in effect until the appeal has been finalized.

General Terms and Conditions

These terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

1. **Permit**
   This Permit shall be kept available at all times for inspection.
2. **Measurement and Reporting of Water Taking**
   The Director may, from time to time, where a situation of interference or anticipated interference with water supplies exists, or in a situation requiring information on water takings for purposes of water resource inventory and planning, give written notice to the Permit holder to undertake any of the following actions.
   The Permit holder shall comply with any such notice:
   (a) To establish and maintain a system for the measurement of the quantities of water taken;
   (b) To operate such a system and to record measurements of the quantities of water taken on forms provided by the Director, with such frequency or for such time periods as the Director may specify;
   (c) To return to the Director records made pursuant to clause 2 (b) at such times or with such frequency as the Director may specify;
   (d) To keep records made pursuant to clause 2 (b) available for inspection until such time as they are returned to the Director pursuant to clause 2 (c).
3. **Interference with Other Water Supplies**
   The Permit holder shall immediately notify the Director of any complaint arising from the taking of water authorized by this Permit and shall report upon any action which has been taken or is proposed with regard to such complaint.
   For Surface-Water Takings, the taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.
   For Ground-Water Takings, if the taking of water is forecast to interfere seriously, or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit holder shall take such action as will make available to those affected a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of the affected supplies, the Permit holder shall provide to those affected temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of so doing.
4. **Reporting of Changes**
   The Permit holder shall report to the Director any changes of address or telephone number, or change of ownership of the property for which this Permit is issued and shall report to the Director any changes in the general conditions of water taking from those described in the Permit application within thirty days of any such change.
   The Permit holder shall not assign his rights under this Permit to another person without the written consent of the Director.
5. **Expiry**
   No water may be taken under authority of this Permit after the expiry date shown on the face of this Permit, unless the Permit is renewed, or after the expiry date shown on any renewal of this Permit.
6. **Liability**
   This Permit does not release the permittee from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law. This Permit shall not be construed as estopping or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the permittee, its officers, employees, agents, and contractors.
7. **Transfers**
   This permit does not abrogate the permit holder's responsibility to comply with all applicable legislation, including O. Reg. 285/99, which provides, among other things, that no person shall use water by transferring it out of a water basin (as defined in the Regulation) in a container having a volume greater than 20 litres. The regulation divides Ontario into three water basins, being the Great Lakes-St. Lawrence, the Nelson and Hudson Bay Basins.
8. **Water Shortages**
   The Director may, during times of drought or water shortage in the locality of the taking, give notice to the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the notice to the Environmental Review Tribunal under the Ontario Water Resources Act, Section 100(3).

Permit Number: 03-P-2249
Issued to: Sierra Lane (2000) Developments Inc.
Date of Issue: June 12, 2003

SCHEDULE "A"

SPECIAL TERMS AND CONDITIONS

№1. i. The rates and amounts of water taken from each source shall be monitored by a flow measuring device.
ii. Flow records shall be made on a daily basis.
iii The flow device(s) shall be installed and operating prior to the taking of water.
iv. The flow records shall be kept available at all times for inspection by Ministry staff and submitted to the MOE Regional Office by March 31 of each year for the previous calender year.

№2. Water levels in Wells TW-1, TW-2, and MW-4 shall be monitored on a continuous basis (intervals of 15 minutes or less) for a two year period following the first water taking under this permit. Data from the monitoring shall be interpreted by a professional Geoscientist or Engineer specializing in hydrogeology and submitted to the Director, as part of the March 31 submission following the end of the monitoring period.

№3. Prior to the taking of water the Permit Holder shall ensure that the works complies with the Safe Water Drinking Act, 2002.

№4. Prior to taking of any water under the authorization of this Permit to Take Water, the permittee shall ensure full compliance with O. Reg. 170/03.

Ontario Ministry of the Environment

NOTICE OF TERMS AND CONDITIONS

In accordance with Section 100 of the ***Ontario Water Resources Act***, R.S.O. 1990, notice is hereby given of the issuance of Permit To Take Water

No. 03-P-2249

which contains terms and conditions pertaining to the taking of water and to the results of the taking. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may, by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, **Environmental Bill of Rights**, S.O. 1993, Chapter 28, within fifteen days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the ***Ontario Water Resources Act***, as amended provides that this Notice requiring a hearing shall state:

1. The portions of the permit or each term or condition in the permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice shall also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works is located;

and the Notice should be signed and dated by the appellant.

The Notice must be served upon:

The Secretary, Environmental Review Tribunal, P.O. Box 2382, 2300 Yonge St., Suite 1201, Toronto, Ontario, M4P 1E4
and upon
The Director, Section 34, Ontario Water Resources Act, Ministry of the Environment (issuing office)
and upon
The Environmental Commissioner, 1075 Bay St., 6th Floor, Suite 605, Toronto, Ontario, M5S 2W5

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal by telephone at (416) 314-4600 by fax at (416) 314-4506 or website at www.ert.gov.on.ca

In the event of an appeal, the terms and conditions of the permit, as issued, would remain in effect until the appeal has been finalized. This instrument is subject to Section 38 of the ***Environmental Bill of Rights***, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal for 15 days from the date of this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.

Dated at Hamilton, Ontario

This _____ day of _____ 20_____

_____
Director Section 34
Ontario Water Resources Act R.S.O. 1990

Appendix I

Water Quality

I1. 2004 Pumping Tests Water Quality Results

Appendix I1

Groundwater Quality Sampling

Groundwater and surface water sampling has been conducted on a number of occasions, either as part of a pumping test (November/December 2004) or following well installation.

Sampling During 2004 Pumping Test

Groundwater samples were collected from the two test wells TW12 and TW13, monitoring wells GLL7-I, GLL9-I, GLL1-II, GLL2-II, GLL4-II, GLL6-II, and GLL9-II and two residential wells during the pumping test completed in November/December 2004.

The initial sampling event, which involved the deep and shallow monitoring wells, occurred on November 19, 2004. Test wells TW12 was sampled on November 28, 2004 (18:00), December 2, 2004 (15:30, about midway through the test) and at the end of the test on December 6 (11:45). Test wells TW13 was sampled on November 28, 2004 (15:30), December 2, 2004 (17:00, about midway through the test) and at the end of the test on December 4 (15:00). The samples from the private residential wells MOE #6813488 and 6809848 were collected on November 27 and December 6, 2004.

Surface water samples were collected from Mountsberg Creek and Flamboro Creek on November 27, December 4 and from Mountsberg Creek, only, on December 6, 2004.

The samples were submitted to PSC Analytical Services for analysis of major and minor ions and metals. The chemistry data are present in Appendix I1.

Groundwater samples in the PSC laboratory report are referenced to street address. These addresses have been obscured to maintain confidentiality and substituted with the MOE Water Well ID Number. The locations can be cross-referenced to well location in Figure 3.15.

The surface water samples in the PSC laboratory report are referred to as:

a) North Creek (Tributary A of Mountsberg Creek);
b) SW Mountsberg (Mountsberg Creek at Staff Gauge SWMC);
c) TW13 stream (Flamboro Creek at station SWFC);
d) Culvert South (Flamboro Creek at station SWFC); and,
e) Stream North (Tributary A of Mountsberg Creek).

Repeat samples were also collected [16-II, which is a replicate sample from GLL4-S, TW13 (repeat) and North Creek (repeat)] for quality control purposes.

Gartner Lee

Table I1-1-1 Summary of Groundwater Chemistry 2004
St Marys Cement Inc.
Flamborough, Ontario

						Deep Monitoring Wells			Shallow Monitoring Wells							
	Units	Ontario Drinking Water Standards		Provincial Water Quality Objectives		GLL9-I	GLL9-I repeat	GLL7-I	GLL9-II	GLL7-II	GLL1-II	GLL2-II	GLL6-II	GLL8-II	GLL4-II	GLL16-II (GLL4-II)
						19-Nov-04	19-Nov-04	19-Nov-04	19-Nov-04	19-Nov-04	19-Nov-04	19-Nov-04	19-Nov-04	19-Nov-04	19-Nov-04	19-Nov-04
General Parameters																
Conductivity (umhos/cm)-SM 2510B	us/cm					668	668	792.0	548	518	630	635	560	556	532	534
DOC	(mg/L)					1.5	0.9	0.4	1.9	1.6	1.3	2.7	0.6	0.4	0.6	0.6
TDS	(mg/L)					490	488	597	342	300	399	405	347	295	295	292
Hardness (as CaCO3)-SM2340B	(mg/L)					404.1	399.2	395.7	285.8	288.1	347.9	340	315.6	301.8	311.7	303.3
pH (at 20 degrees C)- SM 4500B	Unitless	6.5 - 8.5	OG			8.08	7.99	8.16	8.09	8.19	8.25	8.25	7.88	8.00	7.90	7.90
Anions																
Bromide	(mg/L)					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloride	(mg/L)	250	AO			7	7.1	28.6	10.6	4.6	30.3	42.9	21.3	11.1	5.7	5.7
Fluoride	(mg/L)	1.5	MAC			0.1	0.1	0.3	0.2	0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1
Nitrate as N	(mg/L)	10	MAC			<0.2	<0.2	<0.2	0.3	3.7	<0.2	<0.2	<0.2	**15.4**	**10.5**	**10.3**
Nitrite as N	(mg/L)	1	MAC			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ammonium (NH3-N)	(mg/L)					<0.03	<0.03	0.33	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Phosphate-P (ortho)	(mg/L)					<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Alkalinity (CaCO3)- SM 2320B	(mg/L)	30 - 500	OG			248	251	252	304	287	331	306	300	249	283	283
Bicarbonate Alkalinity (HCO3)	(mg/L)					300	304	305	368	348	401	371	363	301	343	343
Sulphate	(mg/L)	500	AO			183	181	230	35.3	18.6	40.2	45.6	32	22.8	13.1	13.1
Metals / Major Ions																
Aluminum	(mg/L)	0.1	OG	0.075	Interim	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.022	<0.005	<0.005	<0.005	<0.005
Antimony	(mg/L)			0.02	Interim	0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	(mg/L)	0.025	IMAC	0.005	Interim	**0.029**	**0.029**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Barium	(mg/L)	1	MAC			0.047	0.047	0.019	0.028	0.140	0.037	0.060	0.020	0.047	0.007	0.007
Beryllium	(mg/L)			1.1		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	(mg/L)					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	(mg/L)	5	IMAC	0.2	Interim	0.026	0.026	**0.206**	0.016	0.019	0.007	0.009	0.008	0.017	<0.0005	0.007
Cadmium	(mg/L)	0.005	MAC	0.0005	Interim	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	(mg/L)					116	115	120	70	67.4	86.8	85	76	85.5	72.8	71.5
Chromium	(mg/L)	0.05	MAC			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	(mg/L)			0.0009		**0.0012**	**0.0012**	<0.0001	0.0002	0.0007	<0.0001	0.0001	<0.0001	0.0002	<0.0001	<0.0001
Copper	(mg/L)	1	AO	0.005	Interim	<0.0005	<0.0005	<0.0005	0.0005	0.0013	0.0012	<0.0005	<0.0005	<0.0005	<0.0005	0.0006
Iron	(mg/L)	0.3	AO	0.3		0.16	0.17	0.20	<0.03	0.05	0.03	**0.35**	<0.03	<0.03	<0.03	<0.03
Lead	(mg/L)	0.01	MAC	0.005	Interim	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Magnesium	(mg/L)					27.3	27.0	23.3	27.0	29.0	31.8	31.0	30.5	21.4	31.5	30.3
Manganese	(mg/L)	0.05	AO			0.016	0.016	0.021	0.029	0.047	0.011	**0.095**	<0.005	<0.005	<0.005	<0.005
Molybdenum	(mg/L)			0.04	Interim	0.002	0.002	<0.001	0.006	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Nickel	(mg/L)			0.025		0.002	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus	(mg/L)			0.03	Interim	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium	(mg/L)					1.3	1.2	4.9	0.8	4.8	0.5	1.0	0.5	3.4	0.2	0.2
Selenium	(mg/L)			0.1		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	(mg/L)					2.66	2.63	3.05	3.03	2.09	3.50	3.08	2.62	3.29	1.77	1.70
Silver	(mg/L)			0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium	(mg/L)	200	AO			5.5	5.4	38.5	15.8	3.0	10.9	15.4	6.9	1.7	1.3	1.2
Strontium	(mg/L)					1.83	1.8	4.65	0.203	0.05	0.131	0.143	0.087	0.124	0.046	0.045
Tin	(mg/L)					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	(mg/L)					<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium	(mg/L)			0.006	Interim	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	(mg/L)	5	AO	0.02	Interim	0.008	0.006	<0.005	0.008	0.008	0.019	<0.005	0.008	0.011	0.008	0.007

Notes
Bold - concentration exceeds Provincial Water Quality Objective.
Highlighted - concentration exceeds Ontario Drinking Water Standard.

Summary of Abbreviations
Ontario Drinking Water Standards
MAC - Maximum Acceptable Concentration
IMAC - Interim Maximum Acceptable Concentration
AO - Aesthetic Objective
OG - Operational Guideline

R
L -
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Table I1-1-2 Summary of Groundwater Chemistry 2004
St Marys Cement Inc.
Flamborough, Ontario

						Residential Wells					
	Units	Ontario Drinking Water Standards		Provincial Water Quality Objectives		6813488	6813488	6813488 (Repeat)	6809848	6809848 (Duplicate)	6809848
						27-Nov-04	6-Dec-04	6-Dec-04	27-Nov-04	27-Nov-04	6-Dec-04
General Parameters											
Conductivity (umhos/cm)-SM 2510B	**us/cm**					600.0	623.2	617.9	860		942.9
DOC	**(mg/L)**					0.9	0.4	0.4	0.67	0.83	0.8
TDS	**(mg/L)**					390.0	312.0	309	560	560	465
Hardness (as CaCO3)-SM2340B	**(mg/L)**					300.0	301.7	299.3	350		365.5
pH (at 20 degrees C)- SM 4500B	**Unitless**	6.5 - 8.5	OG			7.99	8.07	8.08	8.13		8.03
Anions											
Bromide	**(mg/L)**					<0.5	<0.5	<0.5	<0.5		<0.5
Chloride	**(mg/L)**	250	AO			7.2	10.3	9.9	57		69.3
Fluoride	**(mg/L)**	1.5	MAC			0.1	0.1	<0.1	0.14		0.1
Nitrate as N	**(mg/L)**	10	MAC			1.30	1.70	1.7	1.7		1.5
Nitrite as N	**(mg/L)**	1	MAC			<0.01	<0.2	<0.2	<0.01	<0.01	<0.2
Ammonium (NH3-N)	**(mg/L)**					<0.03	<0.03	<0.03	<0.03		<0.03
Phosphate-P (ortho)	**(mg/L)**					<0.5	<1	<1	<1		<0.5
Alkalinity (CaCO3)- SM 2320B	**(mg/L)**	30 - 500	OG			300.0	295.0	293	340		343
Bicarbonate Alkalinity (HCO3)	**(mg/L)**					290.0	357.0	355	330		416
Sulphate	**(mg/L)**	500	AO			16.0	14.3	14.1	23		26
Metals / Major Ions											
Aluminum	**(mg/L)**	0.1	OG	0.075	Interim	<0.010	<0.005	<0.005	<0.010	<0.010	<0.005
Antimony	**(mg/L)**			0.02	Interim	<0.002	<0.0005	<0.0005	<0.002	<0.002	<0.0005
Arsenic	**(mg/L)**	0.025	IMAC	0.005	Interim	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Barium	**(mg/L)**	1	MAC			0.024	0.022	0.022	0.023	0.023	0.024
Beryllium	**(mg/L)**			1.1		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	**(mg/L)**					<0.002	<0.001	<0.001	<0.002	<0.002	<0.001
Boron	**(mg/L)**	5	IMAC	0.2	Interim	0.0060	0.0140	0.014	0.009	<0.005	0.008
Cadmium	**(mg/L)**	0.005	MAC	0.0005	Interim	0.00009	<0.0001	<0.0001	0.00008	<0.00007	<0.0001
Calcium	**(mg/L)**					78.0	79.8	78.9	89		92.6
Chromium	**(mg/L)**	0.05	MAC			<0.002	<0.005	<0.001	<0.002	<0.002	<0.001
Cobalt	**(mg/L)**			0.0009		<0.0005	<0.0001	<0.0001	<0.0005	<0.0005	<0.0001
Copper	**(mg/L)**	1	AO	0.005	Interim	0.0180	0.0298	0.0289	0.012	0.015	0.0406
Iron	**(mg/L)**	0.3	AO	0.3		<0.010	<0.03	<0.03	0.01		<0.03
Lead	**(mg/L)**	0.01	MAC	0.005	Interim	0.0014	0.0007	0.0007	0.0006	0.0006	0.0006
Magnesium	**(mg/L)**					25.0	24.8	24.8	31		32.6
Manganese	**(mg/L)**	0.05	AO			<0.002	<0.005	<0.005	<0.002	<0.002	<0.005
Molybdenum	**(mg/L)**			0.04	Interim	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001
Nickel	**(mg/L)**			0.025		0.0030	<0.001	<0.001	<0.002	<0.002	<0.001
Phosphorus	**(mg/L)**			0.03	Interim	0.08	<0.05	<0.05	0.09		<0.05
Potassium	**(mg/L)**					2.7	1.9	2	1.3		0.6
Selenium	**(mg/L)**			0.1		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	**(mg/L)**					3.10	3.03	3.12	3		2.98
Silver	**(mg/L)**			0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium	**(mg/L)**	200	AO			3.3	3.6	3.6	30		38.4
Strontium	**(mg/L)**					0.083	0.076	0.076	0.09	0.088	0.089
Tin	**(mg/L)**					0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	**(mg/L)**					0.0010	<0.005	<0.005	0.001	<0.001	<0.005
Vanadium	**(mg/L)**			0.006	Interim	<0.002	0.0008	0.0008	0.0008	<0.002	0.0007
Zinc	**(mg/L)**	5	AO	0.02	Interim	0.110	0.057	0.057	0.026	0.027	0.026

Notes
Bold - concentration exceeds Provincial Water Quality Objective.
Highlighted - concentration exceeds Ontario Drinking Water Standard.

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Table I1-1-3 Summary of Groundwater Chemistry 2004 Pumping Test
St Marys Cement Inc.
Flamborough, Ontario

	Units	Ontario Drinking Water Standards		Provincial Water Quality Objectives		TW12	TW12	TW12 (repeat)	TW12	TW13	TW13 (repeat)	TW13	TW13
						28-Nov-04	1-Dec-02	1-Dec-02	1-Dec-06	28-Nov-04	28-Nov-04	1-Dec-02	1-Dec-04
General Parameters													
Conductivity (umhos/cm)	**us/cm**					704.7	704.4	687.1	698.2	644.6	653.0	634.8	646.1
DOC	**(mg/L)**					0.6	<0.2	<0.2	0.3	0.9	0.6	<0.2	<0.2
TDS	**(mg/L)**					363	362	355	356	328	333	321	326
Hardness (as CaCO3)	**(mg/L)**					307.4	305.7	292.1	306.8	299.4	299.7	299	308.3
pH (at 20 degrees C)- SM4500B	**Unitless**	6.5 - 8.5	OG			8.08	7.98	7.96	7.99	8.09	8.16	7.96	8.07
Anions													
Bromide	**(mg/L)**					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloride	**(mg/L)**	250	AO			13.1	16.7	16.4	18.4	13.5	14.3	13.2	12.7
Fluoride	**(mg/L)**	1.5	MAC			0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nitrate as N	**(mg/L)**	10	MAC			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrite as N	**(mg/L)**	1	MAC			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ammonium (NH3-N)	**(mg/L)**					0.04	0.04	0.06	0.03	<0.03	<0.03	<0.03	<0.03
Phosphate-P (ortho)	**(mg/L)**					<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (HCO3)	**(mg/L)**					293	295	291	293	328	332	327	330
Alkalinity (CaCO3)- SM 2320B	**(mg/L)**	30 - 500	OG			242	244	241	242	271	274	270	273
Sulphate	**(mg/L)**	500	AO			89.6	83.7	83.8	76.7	43.8	46.3	39.2	39.6
Metals / Major Ions													
Aluminum	**(mg/L)**	0.1	OG	0.075	Interim	0.014	0.007	0.005	<0.005	**0.132**	**0.143**	**<0.005**	**<0.005**
Antimony	**(mg/L)**			0.02	Interim	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	0.0005	0.0007	0.0006
Arsenic	**(mg/L)**	0.025	IMAC	0.005	Interim	0.003	0.003	0.003	0.003	<0.002	<0.002	<0.002	<0.002
Barium	**(mg/L)**	1	MAC			0.058	0.060	0.057	0.063	0.042	0.042	0.042	0.042
Beryllium	**(mg/L)**			1.1		<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0005
Bismuth	**(mg/L)**					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	**(mg/L)**	5	IMAC	0.2	Interim	0.031	0.022	0.021	0.022	0.023	0.021	0.016	0.017
Cadmium	**(mg/L)**	0.005	MAC	0.0005	Interim	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	**(mg/L)**					81.2	78.8	75.2	78.7	74.9	74.4	72.9	74.7
Chromium	**(mg/L)**	0.05	MAC			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	**(mg/L)**			0.0009		0.0001	0.0001	0.0001	0.0001	0.0004	0.0004	0.0004	0.0005
Copper	**(mg/L)**	1	AO	0.005	Interim	0.0008	<0.0005	<0.0005	<0.0005	0.004	0.0039	0.0024	0.0024
Iron	**(mg/L)**	0.3	AO	0.3		**0.39**	**0.31**	**0.30**	**0.30**	0.11	0.10	<0.03	<0.03
Lead	**(mg/L)**	0.01	MAC	0.005	Interim	<0.0005	<0.0005	<0.0005	<0.0005	0.0019	0.0018	0.0012	0.0012
Magnesium	**(mg/L)**					25.3	26.4	25.3	26.8	27.3	27.6	28.4	29.5
Manganese	**(mg/L)**	0.05	AO			0.013	0.012	0.011	0.012	0.008	0.008	<0.005	<0.005
Molybdenum	**(mg/L)**			0.04	Interim	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001
Nickel	**(mg/L)**			0.025		<0.001	<0.001	<0.001	<0.001	0.003	0.003	<0.001	<0.001
Phosphorus	**(mg/L)**			0.03	Interim	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium	**(mg/L)**					1.1	1.1	1.0	1.1	0.8	0.8	0.8	0.8
Selenium	**(mg/L)**			0.1		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	**(mg/L)**					4.11	4.66	4.47	4.86	2.69	2.72	2.69	2.81
Silver	**(mg/L)**			0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium	**(mg/L)**	200	AO			7.8	8.5	8.2	9.3	5.0	5.0	4.8	4.9
Strontium	**(mg/L)**					0.96	1.05	1.00	1.02	0.253	0.256	0.266	0.267
Tin	**(mg/L)**					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	**(mg/L)**					<0.005	<0.005	<0.005	<0.005	0.005	0.010	<0.005	<0.005
Vanadium	**(mg/L)**			0.006	Interim	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	0.0006	<0.0005	<0005
Zinc	**(mg/L)**	5	AO	0.02	Interim	0.01	0.007	0.007	0.006	**0.05**	**0.049**	**0.044**	**0.049**

Notes
Bold - concentration exceeds Provincial Water Quality Objective.
Highlighted - concentration exceeds Ontario Drinking Water Standard.

Summary of Abbreviations
Ontario Drinking Water Standards
MAC - Maximum Acceptable Concentration
IMAC - Interim Maximum Acceptable Concentration
AO - Aesthetic Objective
OG - Operational Guideline

Gartner Lee

Table I1-1-4 Summary of Surface Water Chemistry 2004 Pumping Test
St Marys Cement Inc.
Flamborough, Ontario

						Tributary A Mountsberg Creek			Mountsberg Creek at SWMC	Flamboro Creek at SWFC		
	Units	Ontario Drinking Water Standards		Provincial Water Quality Objectives		North Creek	North Creek (repeat)	Stream North	SW (Mountsberg)	TW13 Stream	Culvert South	Culvert South (Repeat)
						27-Nov-04	27-Nov-04	6-Dec-04	27-Nov-04	27-Nov-04	4-Dec-04	4-Dec-04
General Parameters												
Conductivity (umhos/cm)	us/cm					559.7	565.9	712.3	585.6	664.9	651.9	663.3
DOC	(mg/L)					7.4	7.5	0.6	7.1	5.1	<0.2	<0.2
TDS	(mg/L)					364	368	361	381	432	328	332
Hardness (as CaCO3)	(mg/L)					221.3	225.2	319.7	232.3	288.4	313.8	324.8
pH (at 20 degrees C)- SM4500B	Unitless	6.5 - 8.5	OG			8.25	8.25	8.05	8.35	8.19	8.06	7.97
Anions												
Bromide	(mg/L)					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloride	(mg/L)	250	AO			37.6	37.7	18.6	37.9	24.9	13.0	12.8
Fluoride	(mg/L)	1.5	MAC			0.1	0.1	0.2	0.1	0.1	0.1	0.1
Nitrate as N	(mg/L)	10	MAC			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrite as N	(mg/L)	1	MAC			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ammonium (NH3-N)	(mg/L)					0.04	0.03	0.03	<0.03	<0.03	<0.03	<0.03
Phosphate-P (ortho)	(mg/L)					<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (HCO3)	(mg/L)					213	215	293	217	290	328	329
Alkalinity (CaCO3)- SM 2320B	(mg/L)	30 - 500	OG			177	178	242	180	240	271	272
Sulphate	(mg/L)	500	AO			45.1	45.1	76.3	51.9	57.8	40.0	39.8
Metals / Major Ions												
Aluminum	(mg/L)	0.1	OG	0.075	Interim	0.019	0.018	0.145	0.015	0.006	<0.005	0.007
Antimony	(mg/L)			0.02	Interim	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	0.0007
Arsenic	(mg/L)	0.025	IMAC	0.005	Interim	<0.002	<0.002	<0.004	<0.002	<0.002	<0.002	<0.002
Barium	(mg/L)	1	MAC			0.031	0.030	0.066	0.030	0.040	0.043	0.044
Beryllium	(mg/L)			1.1		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	(mg/L)					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	(mg/L)	5	IMAC	0.2	Interim	0.013	0.013	0.023	0.012	0.010	0.018	0.019
Cadmium	(mg/L)	0.005	MAC	0.0005	Interim	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	(mg/L)					50.0	50.5	81.9	52.1	70.3	76	78.8
Chromium	(mg/L)	0.05	MAC			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	(mg/L)			0.0009		<0.0001	<0.0001	0.0003	<0.0001	0.0002	0.0005	0.0005
Copper	(mg/L)	1	AO	0.005	Interim	0.0009	0.0009	<0.0005	0.0007	0.0005	0.0014	0.0015
Iron	(mg/L)	0.3	AO	0.3		0.03	0.05	0.59	0.05	0.28	<0.03	<0.03
Lead	(mg/L)	0.01	MAC	0.005	Interim	<0.0005	<0.0005	0.0009	<0.0005	<0.0005	0.0010	0.0011
Magnesium	(mg/L)					23.4	24.0	27.9	24.8	27.4	30.1	31.0
Manganese	(mg/L)	0.05	AO			0.021	0.021	0.022	0.020	**0.468**	<0.005	<0.005
Molybdenum	(mg/L)			0.04	Interim	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Nickel	(mg/L)			0.025		<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus	(mg/L)			0.03	Interim	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium	(mg/L)					1.4	1.6	1.2	1.5	0.6	0.9	0.9
Selenium	(mg/L)			0.1		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	(mg/L)					0.89	0.89	5.22	1.03	3.05	2.86	2.93
Silver	(mg/L)			0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium	(mg/L)	200	AO			15.3	15.7	9.9	15.8	11.2	5.2	5.3
Strontium	(mg/L)					0.1	0.1	1.05	0.123	0.071	0.271	0.288
Tin	(mg/L)					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	(mg/L)					<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium	(mg/L)			0.006	Interim	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	(mg/L)	5	AO	0.02	Interim	0.012	0.012	0.023	0.011	0.006	0.045	0.048

Notes
Bold - concentration exceeds Provincial Water Quality Objective.
Highlighted - concentration exceeds Ontario Drinking Water Standard.

Summary of Abbreviations
Ontario Drinking Water Standards
MAC - Maximum Acceptable Concentration
IMAC - Interim Maximum Acceptable Concentration
AO - Aesthetic Objective
OG - Operational Guideline

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I2. 2006 Overburden Water Quality Results

Appendix I2

2006 Overburden Sampling Event

Following the installation and development of the overburden wells in April 2006, wells, which had adequately recovered from development and had a sufficient level of water, were sampled on May 12, 2006. Of 16 monitors, 11 monitors were sampled and five monitors were dry at the time of sampling. These included: MWO1-I-A, MWO1-I-B, MWO1-II-C, MWO2, MWO4, MWO5, MWO6, MWO8, MWO10, MWO11 and MWO12. The locations of the overburden wells are shown in Figure 2.1.

Prior to sampling, the water level in each well was measured and the well was then purged to remove stagnant water and any sediment that may have accumulated in the well since development. The stagnant water removed from each well was collected in calibrated containers, and the volume removed was recorded and compared to the known well volume. Samples of the water were collected for analysis of field pH, electrical conductivity and temperature to assess the effectiveness of the purging effort. In addition, the colour, turbidity and odour of the well water was recorded. The stagnant water was considered removed, and the well ready to be sampled when at least 3 well volumes had been removed and the indicator parameters (field pH, electrical conductivity and temperature) had stabilized to within ±15% over two successive purge volumes.

Samples were collected upon recovery of the water level, using the dedicated Waterra inertial lift pumps. The samples for metals analysis were filtered in the field using disposable, in-line, cellulose-based membrane filter cartridges with a pore size of 0.45 microns, attached directly to the Waterra assemblage. After each bottle was filled, the groundwater samples were placed in coolers filled with ice and submitted for chemical analysis.

Samples were submitted under Chain of Custody to Accutest Laboratories Ltd. in Ottawa, Ontario for analysis of Total Dissolved Solids (TDS), conductivity, metals, major ions and Total Organic Carbon (TOC). The chemistry data are present in Appendix I2.

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: **Gartner Lee Ltd. (STCS)**
20 Corporate Park Drive, Suite 103
St. Catharines, ON
L2S 3W2
Attention: **P.J. Mauro**

Niagara Report: N6-0468
Report Number: 2609965
Date: 2006-05-24
Date Submitted: 2006-05-16
Project: 60-394
P.O. Number:

Chain of Custody Number: **42376**

CURRENT NOMENCLATURE — MW010 | DUPLICATE | MW012 | MW08 | MW011

	LAB ID:	463160	463161	463162	463163	463164	GUIDELINE		
	Sample Date:	2006-05-12	2006-05-12	2006-05-12	2006-05-12	2006-05-12			
	Sample ID:	GLL 06-10	GLL 06-20	GLL 06-12	GLL 06-08	GLL 06-11	ODWSOG		
PARAMETER	**UNITS**	**MDL**					**TYPE**	**LIMIT**	**UNITS**
Chloride	mg/L	1	5	21	9	21	14	AO	250	mg/L
Conductivity	uS/cm	5	484	721	611	720	691			
N-NH3 (Ammonia)	mg/L	0.02	0.08	0.07	0.04	0.08	0.05			
N-NO2 (Nitrite)	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.10	<0.10	24.3	0.29	23.9	0.50	MAC	10.0	mg/L
Sulphate	mg/L	1	22	16	20	16	8	AO	500	mg/L
TDS (COND - CALC)	mg/L	5	315	469	397	468	449	AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.05	0.43	<0.05	0.21	0.16	0.31			
Total Organic Carbon	mg/L	0.5	4.7	1.2	1.7	1.0	1.4			
Total Phosphorus	mg/L	0.01	0.67	0.24	1.68	0.40	0.04			
Calcium	mg/L	1	58	112	76	111	73			
Magnesium	mg/L	1	29	21	32	21	51			
Potassium	mg/L	1	<1	2	<1	2	<1			
Sodium	mg/L	2	<2	3	12	3	4	AO	20	mg/L
Aluminum	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	OG	0.1	mg/L
Antimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	IMAC	0.006	mg/L
Arsenic	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	IMAC	0.025	mg/L
Barium	mg/L	0.01	<0.01	0.02	0.01	0.02	<0.01	MAC	1.0	mg/L
Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Boron	mg/L	0.01	<0.01	0.01	0.01	0.01	<0.01	IMAC	5.0	mg/L
Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	MAC	0.005	mg/L
Chromium	mg/L	0.001	0.001	0.001	0.001	0.001	0.002	MAC	0.05	mg/L
Cobalt	mg/L	0.0002	0.0006	<0.0002	<0.0002	<0.0002	<0.0002			
Copper	mg/L	0.001	0.030	0.049	0.028	0.047	0.029	AO	1.0	mg/L
Iron	mg/L	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	AO	0.3	mg/L
Lead	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	MAC	0.01	mg/L
Manganese	mg/L	0.01	0.13	<0.01	0.02	<0.01	0.04	AO	0.05	mg/L
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	MAC	0.001	mg/L
Molybdenum	mg/L	0.005	0.008	<0.005	<0.005	<0.005	<0.005			
Nickel	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005			

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

APPROVAL: _____
Ewan McRobbie
Inorganic Lab Supervisor

Client: **Gartner Lee Ltd. (STCS)**
20 Corporate Park Drive, Suite 103
St. Catharines, ON
L2S 3W2
Attention: **P.J. Mauro**

Niagara Report: N6-0468
Report Number: 2609965
Date: 2006-05-24
Date Submitted: 2006-05-16
Project: 60-394
P.O. Number:
Chain of Custody Number: 42376
Matrix: Groundwater

CURRENT NOMENCLATURE | MW011 | DUPLICATE | MW012 | MW08 | MW011

	LAB ID:	463160	463161	463162	463163	463164	GUIDELINE		
	Sample Date:	2006-05-12	2006-05-12	2006-05-12	2006-05-12	2006-05-12			
	Sample ID:	GLL 06-10	GLL 06-20	GLL 06-12	GLL 06-08	GLL 06-11	ODWSOG		
PARAMETER	**UNITS**	**MDL**					**TYPE**	**LIMIT**	**UNITS**
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	MAC	0.01	mg/L
Silicon	mg/L	0.1	2.7	2.7	3.0	2.7	2.2			
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Strontium	mg/L	0.001	0.058	0.153	0.079	0.157	0.077			
Thallium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Titanium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
Vanadium	mg/L	0.001	0.002	0.001	0.002	0.002	0.003			
Zinc	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	AO	5.0	mg/L

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration
Comment:

APPROVAL: _____
Ewan McRobbie
Inorganic Lab Supervisor

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Gartner Lee Ltd. (STCS)
20 Corporate Park Drive, Suite 103
St. Catharines, ON
L2S 3W2
Attention: P.J. Mauro

Chain of Custody Number: 42376

Niagara Report: N6-0468
Report Number: 2609965
Date: 2006-05-24
Date Submitted: 2006-05-16
Project: 60-394
P.O. Number:
Matrix: Groundwater

CURRENT NOMENCLATURE

			MW01-1-B	MW01-1-A	MW02	MW01-11-C	MW04	
		LAB ID:	463165	463166	463167	463168	463169	**GUIDELINE**
		Sample Date:	2006-05-12	2006-05-12	2006-05-12	2006-05-12	2006-05-12	
		Sample ID:	GLL 06-01-II	GLL 06-01-III	GLL 06-02	GLL 06-01-1	GLL 06-04	ODWSOG
PARAMETER	**UNITS**	**MDL**						**TYPE** / **LIMIT** / **UNITS**
Chloride	mg/L	1	39	38	77	67	26	AO / 250 / mg/L
Conductivity	uS/cm	5	770	875	883	859	1600	
N-NH3 (Ammonia)	mg/L	0.02	0.05	0.36	0.48	0.04	0.23	
N-NO2 (Nitrite)	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	MAC / 1.0 / mg/L
N-NO3 (Nitrate)	mg/L	0.10	<0.10	<0.10	<0.10	0.10	0.41	MAC / 10.0 / mg/L
Sulphate	mg/L	1	48	62	28	49	3	AO / 500 / mg/L
TDS (COND - CALC)	mg/L	5	501	569	574	558	1040	AO / 500 / mg/L
Total Kjeldahl Nitrogen	mg/L	0.05	0.34	0.74	0.95	0.31	1.91	
Total Organic Carbon	mg/L	0.5	1.2	3.3	5.6	1.4	116	
Total Phosphorus	mg/L	0.01	0.03	0.04	0.13	0.05	0.06	
Calcium	mg/L	1	88	81	77	82	208	
Magnesium	mg/L	1	35	39	51	48	87	
Potassium	mg/L	1	1	2	3	2	4	
Sodium	mg/L	2	25	52	27	22	30	AO / 20 / mg/L
Aluminum	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.02	OG / 0.1 / mg/L
Antimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	IMAC / 0.006 / mg/L
Arsenic	mg/L	0.001	<0.001	<0.001	0.005	0.001	0.018	IMAC / 0.025 / mg/L
Barium	mg/L	0.01	0.06	0.04	0.07	0.07	0.15	MAC / 1.0 / mg/L
Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron	mg/L	0.01	0.01	0.02	0.04	0.04	0.05	IMAC / 5.0 / mg/L
Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	MAC / 0.005 / mg/L
Chromium	mg/L	0.001	0.002	0.003	0.006	0.004	0.006	MAC / 0.05 / mg/L
Cobalt	mg/L	0.0002	0.0003	0.0005	0.0052	0.0011	0.0104	
Copper	mg/L	0.001	0.025	0.045	0.022	0.033	0.018	AO / 1.0 / mg/L
Iron	mg/L	0.03	<0.03	<0.03	<0.03	<0.03	32.4	AO / 0.3 / mg/L
Lead	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	MAC / 0.01 / mg/L
Manganese	mg/L	0.01	0.54	1.25	1.89	0.08	4.96	AO / 0.05 / mg/L
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	MAC / 0.001 / mg/L
Molybdenum	mg/L	0.005	<0.005	0.005	0.015	<0.005	<0.005	
Nickel	mg/L	0.005	<0.005	<0.005	0.006	<0.005	0.011	

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

APPROVAL: _____
Ewan McRobbie
Inorganic Lab Supervisor

Client: **Gartner Lee Ltd. (STCS)**
20 Corporate Park Drive, Suite 103
St. Catharines, ON
L2S 3W2
Attention: **P.J. Mauro**

Niagara Report: N6-0468
Report Number: 2609965
Date: 2006-05-24
Date Submitted: 2006-05-16
Project: 60-394
P.O. Number:
Matrix: Groundwater

Chain of Custody Number: 42376

CURRENT NOMENCLATURE

			LAB ID:	463165	463166	463167	463168	463169	GUIDELINE		
			Sample Date:	2006-05-12	2006-05-12	2006-05-12	2006-05-12	2006-05-12			
			Sample ID:	GLL 06-01-II (MW01-1-B)	GLL 06-01-III (MW01-1-A)	GLL 06-02 (MW02)	GLL 06-01-1 (MW01-11-C)	GLL 06-04 (MW04)	ODWSOG		
PARAMETER	**UNITS**	**MDL**							**TYPE**	**LIMIT**	**UNITS**
Selenium	mg/L	0.001		<0.001	<0.001	0.001	<0.001	<0.001	MAC	0.01	mg/L
Silicon	mg/L	0.1		3.5	3.5	3.9	3.9	8.6			
Silver	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Strontium	mg/L	0.001		0.149	0.133	0.171	0.231	0.219			
Thallium	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Titanium	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01			
Vanadium	mg/L	0.001		0.002	0.002	0.008	0.002	0.013			
Zinc	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	AO	5.0	mg/L

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

APPROVAL: _____
Ewan McRobbie
Inorganic Lab Supervisor

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: **Gartner Lee Ltd. (STCS)**
20 Corporate Park Drive, Suite 103
St. Catharines, ON
L2S 3W2
Attention: **P.J. Mauro**

Chain of Custody Number: **42375**

Niagara Report: N6-0469
Report Number: 2609966
Date: 2006-05-24
Date Submitted: 2006-05-16

Project: 60-394

P.O. Number:
Matrix: Groundwater

CURRENT NOMENCLATURE | MW05 | MW06

			LAB ID:	463170	463171				GUIDELINE		
			Sample Date:	2006-05-12	2006-05-12						
			Sample ID:	GLL 06-05	GLL 06-06				ODWSOG		
PARAMETER	**UNITS**	**MDL**							**TYPE**	**LIMIT**	**UNITS**
Chloride	mg/L	1		15	14				AO	250	mg/L
Conductivity	uS/cm	5		813	712						
N-NH3 (Ammonia)	mg/L	0.02		0.11	0.05						
N-NO2 (Nitrite)	mg/L	0.10		<0.10	<0.10				MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.10		0.15	<0.10				MAC	10.0	mg/L
Sulphate	mg/L	1		67	15				AO	500	mg/L
TDS (COND - CALC)	mg/L	5		528	463				AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.05		0.43	0.72						
Total Organic Carbon	mg/L	0.5		3.4	12.5						
Total Phosphorus	mg/L	0.01		0.04	0.11						
Calcium	mg/L	1		69	84						
Magnesium	mg/L	1		33	43						
Potassium	mg/L	1		2	<1						
Sodium	mg/L	2		66	8				AO	20	mg/L
Aluminum	mg/L	0.01		<0.01	<0.01				OG	0.1	mg/L
Antimony	mg/L	0.001		<0.001	<0.001				IMAC	0.006	mg/L
Arsenic	mg/L	0.001		<0.001	0.003				IMAC	0.025	mg/L
Barium	mg/L	0.01		0.03	0.04				MAC	1.0	mg/L
Beryllium	mg/L	0.001		<0.001	<0.001						
Boron	mg/L	0.01		0.02	0.03				IMAC	5.0	mg/L
Cadmium	mg/L	0.0001		<0.0001	<0.0001				MAC	0.005	mg/L
Chromium	mg/L	0.001		0.002	0.003				MAC	0.05	mg/L
Cobalt	mg/L	0.0002		0.0010	0.0020						
Copper	mg/L	0.001		0.031	0.015				AO	1.0	mg/L
Iron	mg/L	0.03		<0.03	0.27				AO	0.3	mg/L
Lead	mg/L	0.001		<0.001	<0.001				MAC	0.01	mg/L
Manganese	mg/L	0.01		0.51	0.95				AO	0.05	mg/L
Mercury	mg/L	0.0001		<0.0001	<0.0001				MAC	0.001	mg/L
Molybdenum	mg/L	0.005		0.011	<0.005						
Nickel	mg/L	0.005		<0.005	0.006						

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

APPROVAL: _____
Ewan McRobbie
Inorganic Lab Supervisor

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: **Gartner Lee Ltd. (STCS)**
20 Corporate Park Drive, Suite 103
St. Catharines, ON
L2S 3W2
Attention: **P.J. Mauro**

Niagara Report: N6-0469
Report Number: 2609966
Date: 2006-05-24
Date Submitted: 2006-05-16

Project: 60-394

P.O. Number:
Matrix: Groundwater

Chain of Custody Number: **42375**

CURRENT NOMENCLATURE | MW05 | MW06

			LAB ID:	463170	463171				GUIDELINE		
			Sample Date:	2006-05-12	2006-05-12						
			Sample ID:	GLL 06-05	GLL 06-06				ODWSOG		
PARAMETER	**UNITS**	**MDL**							**TYPE**	**LIMIT**	**UNITS**
Selenium	mg/L	0.001		<0.001	<0.001				MAC	0.01	mg/L
Silicon	mg/L	0.1		3.7	4.4						
Silver	mg/L	0.0001		<0.0001	<0.0001						
Strontium	mg/L	0.001		0.096	0.141						
Thallium	mg/L	0.0001		<0.0001	<0.0001						
Titanium	mg/L	0.01		<0.01	<0.01						
Vanadium	mg/L	0.001		0.004	0.005						
Zinc	mg/L	0.01		<0.01	<0.01				AO	5.0	mg/L

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

APPROVAL: _____
Ewan McRobbie
Inorganic Lab Supervisor

I3. July/August 2007 Water Quality Results

Appendix I3

July/August 2007 Sampling Event

Following well installation each of the newly completed bedrock monitoring wells was purged of a minimum of three wellbore volumes to remove any water and sediment introduced during well installation and to improve hydraulic performance. The analytical results for this sampling event are provided in Appendix I3.

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB1		
				Monitor ID and Date		
				MWB1-I-A	MWB1-II-B	MWB1-II-C
				3-Aug-2007	3-Aug-2007	3-Aug-2007
INORGANICS						
pH	pH Units	N/A	---	7.74	7.81	7.5
Electrical Conductivity	uS/cm	1.0	---	660	624	1720
Total Dissolved Solids	mg/L	10	---	392	370	1440
Turbidity	NTU	1	---	5	1	ND
Chloride	mg/L	1.0	---	19.2	21.5	83.6
Sulphate	mg/L	1.0	---	34.6	39.1	645
Alkalinity	mgCaCO3/L	10	---	304	268	213
Calcium	mg/L	1.0	---	80.3	71.8	236
Magnesium	mg/L	1.0	---	32	29.1	39.4
Sodium	mg/L	1.0	20	10.9	10.7	97.6
Potassium	mg/L	1.0	---	ND	1.1	8.1
Ammonia as N *	mg/L	0.05	---	ND	0.07	0.64
Nitrate as N	mg/L	0.01	10.0	0.09	0.01	ND
Nitrite as N	mg/L	0.2	1.0	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.62	0.16	0.06
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.62	0.23	0.7
Fluoride	mg/L	0.05	1.5	0.11	0.12	0.27
Bromide	mg/L	0.2	---	ND	ND	0.91
Cyanide, Free	mg/L	0.01	---	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	ND	3	2
Total Coliforms (MF)	CFU/100ml	1	1	18	14	24
BTEX						
Benzene	mg/L	0.001	0.005	---	---	---
Toluene	mg/L	0.01	---	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---	---
m & p - Xylene	mg/L	0.01	---	---	---	---
o - Xylene	mg/L	0.01	---	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---	---
METALS						
Arsenic	mg/L	0.001	0.025	ND	0.002	0.014
Barium	mg/L	0.010	1.0	0.03	0.082	0.015
Boron	mg/L	0.010	5.0	ND	0.011	0.206
Cadmium	mg/L	0.001	0.005	ND	ND	ND
Chromium	mg/L	0.001	0.05	0.004	0.003	0.006
Iron	mg/L	0.010	---	ND	ND	0.495
Lead	mg/L	0.001	0.01	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND
Zinc	mg/L	0.010	---	0.019	0.07	0.012
Mercury	mg/L	0.0001	0.001	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND	0.003
Uranium	mg/L	0.001	0.02	ND	0.001	0.005

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB3	
				Monitor ID and Date	
				MWB3-A	MWB3-B
				3-Aug-2007	3-Aug-2007
INORGANICS					
pH	pH Units	N/A	---	7.82	7.71
Electrical Conductivity	uS/cm	1.0	---	638	587
Total Dissolved Solids	mg/L	10	---	384	362
Turbidity	NTU	1	---	6	ND
Chloride	mg/L	1.0	---	17.5	12.4
Sulphate	mg/L	1.0	---	43.9	53.6
Alkalinity	mgCaCO3/L	10	---	289	250
Calcium	mg/L	1.0	---	77.7	74.5
Magnesium	mg/L	1.0	---	30.8	27.9
Sodium	mg/L	1.0	20	12.5	7
Potassium	mg/L	1.0	---	1.1	1.1
Ammonia as N *	mg/L	0.05	---	ND	ND
Nitrate as N	mg/L	0.01	10.0	0.07	ND
Nitrite as N	mg/L	0.2	1.0	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.98	0.17
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.98	0.17
Fluoride	mg/L	0.05	1.5	0.13	0.11
Bromide	mg/L	0.2	---	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND
Escherichia coli	CFU/100ml	1	1	2	1
Total Coliforms (MF)	CFU/100ml	1	1	320	83
BTEX					
Benzene	mg/L	0.001	0.005	---	---
Toluene	mg/L	0.01	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---
m & p - Xylene	mg/L	0.01	---	---	---
o - Xylene	mg/L	0.01	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---
METALS					
Arsenic	mg/L	0.001	0.025	0.001	0.002
Barium	mg/L	0.010	1.0	0.065	0.032
Boron	mg/L	0.010	5.0	0.017	0.016
Cadmium	mg/L	0.001	0.005	ND	ND
Chromium	mg/L	0.001	0.05	0.003	0.003
Iron	mg/L	0.010	---	0.558	ND
Lead	mg/L	0.001	0.01	ND	ND
Nickel	mg/L	0.010	---	ND	ND
Zinc	mg/L	0.010	---	ND	ND
Mercury	mg/L	0.0001	0.001	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND
Uranium	mg/L	0.001	0.02	0.001	0.002

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB4		
				Monitor ID and Date		
				MWB4-I-A	MWB4-II-B	MWB4-II-C
				2-Aug-2007	2-Aug-2007	2-Aug-2007
INORGANICS						
pH	pH Units	N/A	---	7.61	7.69	7.85
Electrical Conductivity	uS/cm	1.0	---	603	605	572
Total Dissolved Solids	mg/L	10	---	338	360	366
Turbidity	NTU	1	---	2	1	5
Chloride	mg/L	1.0	---	7.3	9.5	5.1
Sulphate	mg/L	1.0	---	10.5	25.4	58.9
Alkalinity	mgCaCO3/L	10	---	283	236	243
Calcium	mg/L	1.0	---	73.2	74.4	74.4
Magnesium	mg/L	1.0	---	1.3	9	9
Sodium	mg/L	1.0	20	35.1	27.5	25.8
Potassium	mg/L	1.0	---	ND	ND	ND
Ammonia as N *	mg/L	0.05	---	ND	ND	0.07
Nitrate as N	mg/L	0.01	10.0	6.17	11.9	0.04
Nitrite as N	mg/L	0.2	1.0	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.47	0.28	0.21
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.47	0.28	0.28
Fluoride	mg/L	0.05	1.5	0.06	0.07	0.09
Bromide	mg/L	0.2	---	ND	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	ND	9	ND
Total Coliforms (MF)	CFU/100ml	1	1	16	329	52
BTEX						
Benzene	mg/L	0.001	0.005	---	---	---
Toluene	mg/L	0.01	---	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---	---
m & p - Xylene	mg/L	0.01	---	---	---	---
o - Xylene	mg/L	0.01	---	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---	---
METALS						
Arsenic	mg/L	0.001	0.025	0.001	0.002	0.003
Barium	mg/L	0.010	1.0	ND	0.013	0.051
Boron	mg/L	0.010	5.0	ND	0.012	0.01
Cadmium	mg/L	0.001	0.005	ND	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND	ND
Iron	mg/L	0.010	---	ND	ND	ND
Lead	mg/L	0.001	0.01	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND
Zinc	mg/L	0.010	---	0.011	ND	ND
Mercury	mg/L	0.0001	0.001	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND	ND
Uranium	mg/L	0.001	0.02	ND	0.002	0.001

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB6		
				Monitor ID and Date		
				MWB6-I-A	MWB6-II-B	MWB6-II-C
				2-Aug-2007	2-Aug-2007	2-Aug-2007
INORGANICS						
pH	pH Units	N/A	---	7.96	7.9	7.97
Electrical Conductivity	uS/cm	1.0	---	597	622	589
Total Dissolved Solids	mg/L	10	---	310	342	328
Turbidity	NTU	1	---	7	ND	2
Chloride	mg/L	1.0	---	12.7	21.6	17.8
Sulphate	mg/L	1.0	---	23.8	44.3	42.4
Alkalinity	mgCaCO3/L	10	---	297	273	251
Calcium	mg/L	1.0	---	74	78.6	73.7
Magnesium	mg/L	1.0	---	5.2	8.6	6.9
Sodium	mg/L	1.0	20	31.8	29.9	28.4
Potassium	mg/L	1.0	---	ND	ND	ND
Ammonia as N *	mg/L	0.05	---	0.07	0.07	0.06
Nitrate as N	mg/L	0.01	10.0	0.09	0.12	ND
Nitrite as N	mg/L	0.2	1.0	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.19	0.14	0.13
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.26	0.21	0.19
Fluoride	mg/L	0.05	1.5	0.06	0.07	0.08
Bromide	mg/L	0.2	---	ND	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	<1	1	<1
Total Coliforms (MF)	CFU/100ml	1	1	15	34	9
BTEX						
Benzene	mg/L	0.001	0.005	---	---	---
Toluene	mg/L	0.01	---	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---	---
m & p - Xylene	mg/L	0.01	---	---	---	---
o - Xylene	mg/L	0.01	---	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---	---
METALS						
Arsenic	mg/L	0.001	0.025	0.002	0.005	0.006
Barium	mg/L	0.010	1.0	0.016	0.028	0.076
Boron	mg/L	0.010	5.0	0.014	0.011	ND
Cadmium	mg/L	0.001	0.005	ND	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND	ND
Iron	mg/L	0.010	---	ND	ND	0.223
Lead	mg/L	0.001	0.01	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND
Zinc	mg/L	0.010	---	0.01	0.013	ND
Mercury	mg/L	0.0001	0.001	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND	ND
Uranium	mg/L	0.001	0.02	ND	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB7		
				Monitor ID and Date		
				MWB7-I-A	MWB7-II-B	MWB7-II-C
				2-Aug-2007	2-Aug-2007	2-Aug-2007
INORGANICS						
pH	pH Units	N/A	---	7.8	7.83	7.94
Electrical Conductivity	uS/cm	1.0	---	562	562	984
Total Dissolved Solids	mg/L	10	---	292	314	672
Turbidity	NTU	1	---	10	3	1
Chloride	mg/L	1.0	---	2.4	5.8	41.8
Sulphate	mg/L	1.0	---	10.8	36.6	254
Alkalinity	mgCaCO3/L	10	---	295	254	226
Calcium	mg/L	1.0	---	66.2	72.8	131
Magnesium	mg/L	1.0	---	1.8	4.5	38.2
Sodium	mg/L	1.0	20	34.9	26.7	27.7
Potassium	mg/L	1.0	---	ND	1.6	5.7
Ammonia as N *	mg/L	0.05	---	0.09	0.07	0.39
Nitrate as N	mg/L	0.01	10.0	0.95	2.88	ND
Nitrite as N	mg/L	0.2	1.0	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.41	0.13	0.05
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.5	0.2	0.44
Fluoride	mg/L	0.05	1.5	0.07	0.07	0.23
Bromide	mg/L	0.2	---	ND	ND	0.4
Cyanide, Free	mg/L	0.01	---	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	ND	1	<1
Total Coliforms (MF)	CFU/100ml	1	1	34	38	11
BTEX						
Benzene	mg/L	0.001	0.005	---	---	---
Toluene	mg/L	0.01	---	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---	---
m & p - Xylene	mg/L	0.01	---	---	---	---
o - Xylene	mg/L	0.01	---	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---	---
METALS						
Arsenic	mg/L	0.001	0.025	0.001	0.002	0.004
Barium	mg/L	0.010	1.0	ND	0.023	ND
Boron	mg/L	0.010	5.0	ND	0.014	0.143
Cadmium	mg/L	0.001	0.005	ND	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND	ND
Iron	mg/L	0.010	---	ND	ND	0.032
Lead	mg/L	0.001	0.01	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND
Zinc	mg/L	0.010	---	0.013	0.028	ND
Mercury	mg/L	0.0001	0.001	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND	ND
Uranium	mg/L	0.001	0.02	ND	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB8		
				Monitor ID and Date		
				MWB8-I-A	MWB8-II-B	MWB8-II-C
				2-Aug-2007	2-Aug-2007	2-Aug-2007
INORGANICS						
pH	pH Units	N/A	---	7.64	7.73	8.07
Electrical Conductivity	uS/cm	1.0	---	584	604	625
Total Dissolved Solids	mg/L	10	---	376	326	384
Turbidity	NTU	1	---	8	ND	ND
Chloride	mg/L	1.0	---	13.8	12.6	13.4
Sulphate	mg/L	1.0	---	20.2	26.5	51.7
Alkalinity	mgCaCO3/L	10	---	217	233	227
Calcium	mg/L	1.0	---	80.8	82.3	87.4
Magnesium	mg/L	1.0	---	2.2	2.3	2.3
Sodium	mg/L	1.0	20	21.6	24.2	26.7
Potassium	mg/L	1.0	---	4.7	1.2	ND
Ammonia as N *	mg/L	0.05	---	ND	ND	ND
Nitrate as N	mg/L	0.01	10.0	12.5	11.6	8.1
Nitrite as N	mg/L	0.2	1.0	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.77	0.17	0.13
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.77	0.17	0.13
Fluoride	mg/L	0.05	1.5	0.08	0.06	0.07
Bromide	mg/L	0.2	---	ND	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	ND	ND	ND
Total Coliforms (MF)	CFU/100ml	1	1	4	38	ND
BTEX						
Benzene	mg/L	0.001	0.005	---	---	---
Toluene	mg/L	0.01	---	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---	---
m & p - Xylene	mg/L	0.01	---	---	---	---
o - Xylene	mg/L	0.01	---	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---	---
METALS						
Arsenic	mg/L	0.001	0.025	0.002	0.001	0.002
Barium	mg/L	0.010	1.0	0.038	0.031	0.034
Boron	mg/L	0.010	5.0	0.02	0.011	ND
Cadmium	mg/L	0.001	0.005	ND	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND	ND
Iron	mg/L	0.010	---	ND	ND	ND
Lead	mg/L	0.001	0.01	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND
Zinc	mg/L	0.010	---	0.01	0.019	0.027
Mercury	mg/L	0.0001	0.001	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND	ND
Uranium	mg/L	0.001	0.02	ND	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB9	
				Monitor ID and Date	
				MWB9-I-A	MWB9-II-B
				9-Aug-2007	9-Aug-2007
INORGANICS					
pH	pH Units	N/A	---	7.62	7.55
Electrical Conductivity	uS/cm	1.0	---	575	755
Total Dissolved Solids	mg/L	10	---	314	480
Turbidity	NTU	1	---	8	1
Chloride	mg/L	1.0	---	8.4	8.4
Sulphate	mg/L	1.0	---	21.7	146
Alkalinity	mgCaCO3/L	10	---	286	236
Calcium	mg/L	1.0	---	71.1	110
Magnesium	mg/L	1.0	---	29.3	27.4
Sodium	mg/L	1.0	20	4	7.9
Potassium	mg/L	1.0	---	ND	1.7
Ammonia as N *	mg/L	0.05	---	0.13	0.07
Nitrate as N	mg/L	0.01	10.0	0.14	ND
Nitrite as N	mg/L	0.2	1.0	ND	ND
Organic Nitrogen *	mg/L	0.05	---	1.2	0.17
Total Kjeldahl Nitrogen *	mg/L	0.05	---	1.33	0.24
Fluoride	mg/L	0.05	1.5	0.07	0.11
Bromide	mg/L	0.2	---	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND
Escherichia coli	CFU/100ml	1	1	ND	ND
Total Coliforms (MF)	CFU/100ml	1	1	108	5
BTEX					
Benzene	mg/L	0.001	0.005	---	---
Toluene	mg/L	0.01	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---
m & p - Xylene	mg/L	0.01	---	---	---
o - Xylene	mg/L	0.01	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---
METALS					
Arsenic	mg/L	0.001	0.025	ND	0.025
Barium	mg/L	0.010	1.0	0.013	0.033
Boron	mg/L	0.010	5.0	ND	0.034
Cadmium	mg/L	0.001	0.005	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND
Iron	mg/L	0.010	---	ND	0.096
Lead	mg/L	0.001	0.01	ND	ND
Nickel	mg/L	0.010	---	ND	ND
Zinc	mg/L	0.010	---	ND	ND
Mercury	mg/L	0.0001	0.001	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND
Uranium	mg/L	0.001	0.02	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB10			
				Monitor ID and Date			
				MWB10-I-A	MWB10-I-B	MWB10-I-C	MWB10-II-D
				1-Aug-2007	1-Aug-2007	1-Aug-2007	28-Aug-2007
INORGANICS							
pH	pH Units	N/A	---	7.86	7.7	8.11	7.44
Electrical Conductivity	uS/cm	1.0	---	583	549	580	983
Total Dissolved Solids	mg/L	10	---	334	286	330	610
Turbidity	NTU	1	---	ND	ND	ND	4.4
Chloride	mg/L	1.0	---	5.6	4.2	5.8	34.8
Sulphate	mg/L	1.0	---	55.8	40.1	54.1	239
Alkalinity	mgCaCO3/L	10	---	252	253	251	240
Calcium	mg/L	1.0	---	76.3	70.7	74.8	128
Magnesium	mg/L	1.0	---	3.4	2.5	3.3	28.1
Sodium	mg/L	1.0	20	26.1	25.8	25.9	40.9
Potassium	mg/L	1.0	---	ND	ND	ND	3.26
Ammonia as N *	mg/L	0.05	---	ND	ND	ND	0.18
Nitrate as N	mg/L	0.01	10.0	0.06	0.03	0.41	ND
Nitrite as N	mg/L	0.2	1.0	ND	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.23	0.22	0.24	ND
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.23	0.22	0.24	0.21
Fluoride	mg/L	0.05	1.5	0.11	0.09	0.1	0.19
Bromide	mg/L	0.2	---	ND	ND	ND	0.31
Cyanide, Free	mg/L	0.01	---	ND	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	ND	2	ND	ND
Total Coliforms (MF)	CFU/100ml	1	1	14	98	88	110
BTEX							
Benzene	mg/L	0.001	0.005	ND	ND	ND	---
Toluene	mg/L	0.01	---	ND	ND	ND	---
Ethylbenzene	mg/L	0.001	0.0024	ND	ND	ND	---
m & p - Xylene	mg/L	0.01	---	ND	ND	ND	---
o - Xylene	mg/L	0.01	---	ND	ND	ND	---
Xylenes (Total)	mg/L	0.01	0.30	ND	ND	ND	---
METALS							
Arsenic	mg/L	0.001	0.025	0.004	0.002	0.003	0.196
Barium	mg/L	0.010	1.0	0.08	0.079	0.074	0.056
Boron	mg/L	0.010	5.0	ND	ND	0.011	0.086
Cadmium	mg/L	0.001	0.005	ND	ND	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND	ND	0.001
Iron	mg/L	0.010	---	ND	ND	ND	ND
Lead	mg/L	0.001	0.01	ND	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND	ND
Zinc	mg/L	0.010	---	0.012	0.014	0.017	ND
Mercury	mg/L	0.0001	0.001	ND	ND	ND	ND
Antimony	mg/L	0.001	0.006	0.002	0.001	0.001	0.004
Selenium	mg/L	0.001	0.01	ND	ND	ND	ND
Uranium	mg/L	0.001	0.02	ND	ND	ND	0.002

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB11		
				Monitor ID and Date		
				MWB11-A	MWB11-B	MWB11-C
				2-Aug-2007	2-Aug-2007	2-Aug-2007
INORGANICS						
pH	pH Units	N/A	---	8	7.91	8.26
Electrical Conductivity	uS/cm	1.0	---	585	576	570
Total Dissolved Solids	mg/L	10	---	316	318	314
Turbidity	NTU	1	---	2	1	ND
Chloride	mg/L	1.0	---	10.8	9	7.9
Sulphate	mg/L	1.0	---	24.4	35.7	31.1
Alkalinity	mgCaCO3/L	10	---	286	268	276
Calcium	mg/L	1.0	---	71.9	72.2	69.7
Magnesium	mg/L	1.0	---	4.6	4.1	3.3
Sodium	mg/L	1.0	20	30.7	30.1	29
Potassium	mg/L	1.0	---	ND	ND	ND
Ammonia as N *	mg/L	0.05	---	ND	ND	ND
Nitrate as N	mg/L	0.01	10.0	0.11	0.05	0.06
Nitrite as N	mg/L	0.2	1.0	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.28	0.2	0.19
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.28	0.2	0.19
Fluoride	mg/L	0.05	1.5	0.07	0.09	0.06
Bromide	mg/L	0.2	---	ND	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	7	ND	ND
Total Coliforms (MF)	CFU/100ml	1	1	62	12	ND
BTEX						
Benzene	mg/L	0.001	0.005	---	---	---
Toluene	mg/L	0.01	---	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---	---
m & p - Xylene	mg/L	0.01	---	---	---	---
o - Xylene	mg/L	0.01	---	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---	---
METALS						
Arsenic	mg/L	0.001	0.025	0.001	0.001	0.001
Barium	mg/L	0.010	1.0	0.01	0.018	0.02
Boron	mg/L	0.010	5.0	ND	ND	ND
Cadmium	mg/L	0.001	0.005	ND	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND	ND
Iron	mg/L	0.010	---	ND	ND	ND
Lead	mg/L	0.001	0.01	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND
Zinc	mg/L	0.010	---	ND	0.017	0.021
Mercury	mg/L	0.0001	0.001	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND	ND
Uranium	mg/L	0.001	0.02	ND	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB12		
				Monitor ID and Date		
				MWB12-A	MWB12-B	MWB12-C
				1-Aug-2007	1-Aug-2007	1-Aug-2007
INORGANICS						
pH	pH Units	N/A	---	8.01	7.81	7.78
Electrical Conductivity	uS/cm	1.0	---	582	616	541
Total Dissolved Solids	mg/L	10	---	324	354	290
Turbidity	NTU	1	---	ND	ND	1
Chloride	mg/L	1.0	---	9.6	18.7	6.3
Sulphate	mg/L	1.0	---	47.4	61.9	38.3
Alkalinity	mgCaCO3/L	10	---	257	242	250
Calcium	mg/L	1.0	---	74.5	76.1	67.6
Magnesium	mg/L	1.0	---	9.6	10.1	5
Sodium	mg/L	1.0	20	26.1	28.1	25.1
Potassium	mg/L	1.0	---	1.3	1.1	1
Ammonia as N *	mg/L	0.05	---	0.07	ND	ND
Nitrate as N	mg/L	0.01	10.0	ND	ND	ND
Nitrite as N	mg/L	0.2	1.0	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.2	0.21	0.22
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.27	0.21	0.22
Fluoride	mg/L	0.05	1.5	0.1	0.1	0.1
Bromide	mg/L	0.2	---	ND	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	5	ND	ND
Total Coliforms (MF)	CFU/100ml	1	1	245	87	17
BTEX						
Benzene	mg/L	0.001	0.005	---	---	---
Toluene	mg/L	0.01	---	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---	---
m & p - Xylene	mg/L	0.01	---	---	---	---
o - Xylene	mg/L	0.01	---	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---	---
METALS						
Arsenic	mg/L	0.001	0.025	0.003	0.002	0.003
Barium	mg/L	0.010	1.0	0.038	0.045	0.087
Boron	mg/L	0.010	5.0	0.013	0.016	0.011
Cadmium	mg/L	0.001	0.005	ND	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND	ND
Iron	mg/L	0.010	---	0.561	0.085	0.33
Lead	mg/L	0.001	0.01	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND
Zinc	mg/L	0.010	---	0.015	0.01	0.016
Mercury	mg/L	0.0001	0.001	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND	ND
Uranium	mg/L	0.001	0.02	0.002	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB13		
				Monitor ID and Date		
				MWB13-A	MWB13-B	MWB13-C
				7-Aug-2007	7-Aug-2007	7-Aug-2007
INORGANICS						
pH	pH Units	N/A	---	7.43	7.67	7.59
Electrical Conductivity	uS/cm	1.0	---	582	585	577
Total Dissolved Solids	mg/L	10	---	308	300	302
Turbidity	NTU	1	---	ND	2	2
Chloride	mg/L	1.0	---	11.8	11	10.3
Sulphate	mg/L	1.0	---	28.6	31.4	39.7
Alkalinity	mgCaCO3/L	10	---	281	285	270
Calcium	mg/L	1.0	---	67.2	73	72.7
Magnesium	mg/L	1.0	---	29.4	31.3	29.8
Sodium	mg/L	1.0	20	6.3	4.5	4.5
Potassium	mg/L	1.0	---	ND	ND	ND
Ammonia as N *	mg/L	0.05	---	0.08	0.05	0.05
Nitrate as N	mg/L	0.01	10.0	0.02	0.07	ND
Nitrite as N	mg/L	0.2	1.0	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.38	0.14	0.35
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.46	0.19	0.4
Fluoride	mg/L	0.05	1.5	0.07	0.07	0.07
Bromide	mg/L	0.2	---	ND	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	1	1	ND
Total Coliforms (MF)	CFU/100ml	1	1	161	14	43
BTEX						
Benzene	mg/L	0.001	0.005	---	---	---
Toluene	mg/L	0.01	---	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---	---
m & p - Xylene	mg/L	0.01	---	---	---	---
o - Xylene	mg/L	0.01	---	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---	---
METALS						
Arsenic	mg/L	0.001	0.025	ND	ND	0.001
Barium	mg/L	0.010	1.0	ND	0.016	0.017
Boron	mg/L	0.010	5.0	ND	ND	ND
Cadmium	mg/L	0.001	0.005	ND	ND	ND
Chromium	mg/L	0.001	0.05	0.005	0.005	0.005
Iron	mg/L	0.010	---	4.25	ND	0.383
Lead	mg/L	0.001	0.01	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND
Zinc	mg/L	0.010	---	ND	0.014	ND
Mercury	mg/L	0.0001	0.001	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND	ND
Uranium	mg/L	0.001	0.02	ND	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB17	
				Monitor ID and Date	
				MWB17-A	MWB17-B
				9-Aug-2007	9-Aug-2007
INORGANICS					
pH	pH Units	N/A	---	7.72	7.67
Electrical Conductivity	uS/cm	1.0	---	698	894
Total Dissolved Solids	mg/L	10	---	380	572
Turbidity	NTU	1	---	4	2
Chloride	mg/L	1.0	---	15	33.6
Sulphate	mg/L	1.0	---	32.2	172
Alkalinity	mgCaCO3/L	10	---	322	223
Calcium	mg/L	1.0	---	83	106
Magnesium	mg/L	1.0	---	37	27.5
Sodium	mg/L	1.0	20	8.8	36.2
Potassium	mg/L	1.0	---	ND	5.7
Ammonia as N *	mg/L	0.05	---	0.15	0.17
Nitrate as N	mg/L	0.01	10.0	0.09	ND
Nitrite as N	mg/L	0.2	1.0	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.41	0.28
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.56	0.45
Fluoride	mg/L	0.05	1.5	0.09	0.2
Bromide	mg/L	0.2	---	ND	0.3
Cyanide, Free	mg/L	0.01	---	ND	ND
Escherichia coli	CFU/100ml	1	1	ND	ND
Total Coliforms (MF)	CFU/100ml	1	1	240	32
BTEX					
Benzene	mg/L	0.001	0.005	---	---
Toluene	mg/L	0.01	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---
m & p - Xylene	mg/L	0.01	---	---	---
o - Xylene	mg/L	0.01	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---
METALS					
Arsenic	mg/L	0.001	0.025	ND	0.003
Barium	mg/L	0.010	1.0	0.032	0.014
Boron	mg/L	0.010	5.0	ND	0.133
Cadmium	mg/L	0.001	0.005	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND
Iron	mg/L	0.010	---	ND	0.082
Lead	mg/L	0.001	0.01	ND	ND
Nickel	mg/L	0.010	---	ND	ND
Zinc	mg/L	0.010	---	0.059	ND
Mercury	mg/L	0.0001	0.001	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND
Uranium	mg/L	0.001	0.02	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB18	
				Monitor ID and Date	
				MWB18-A	MWB18-B
				7-Aug-2007	9-Aug-2007
INORGANICS					
pH	pH Units	N/A	---	7.59	7.9
Electrical Conductivity	uS/cm	1.0	---	560	525
Total Dissolved Solids	mg/L	10	---	282	310
Turbidity	NTU	1	---	1	ND
Chloride	mg/L	1.0	---	3.1	2.9
Sulphate	mg/L	1.0	---	35.8	40.5
Alkalinity	mgCaCO3/L	10	---	272	234
Calcium	mg/L	1.0	---	70.1	68.7
Magnesium	mg/L	1.0	---	25.7	24.6
Sodium	mg/L	1.0	20	9	3.7
Potassium	mg/L	1.0	---	ND	ND
Ammonia as N *	mg/L	0.05	---	0.08	0.06
Nitrate as N	mg/L	0.01	10.0	ND	ND
Nitrite as N	mg/L	0.2	1.0	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.61	0.1
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.69	0.16
Fluoride	mg/L	0.05	1.5	0.09	0.1
Bromide	mg/L	0.2	---	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND
Escherichia coli	CFU/100ml	1	1	9	1
Total Coliforms (MF)	CFU/100ml	1	1	111	161
BTEX					
Benzene	mg/L	0.001	0.005	---	---
Toluene	mg/L	0.01	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---
m & p - Xylene	mg/L	0.01	---	---	---
o - Xylene	mg/L	0.01	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---
METALS					
Arsenic	mg/L	0.001	0.025	0.003	0.001
Barium	mg/L	0.010	1.0	0.05	0.062
Boron	mg/L	0.010	5.0	ND	0.014
Cadmium	mg/L	0.001	0.005	ND	ND
Chromium	mg/L	0.001	0.05	0.004	ND
Iron	mg/L	0.010	---	0.101	ND
Lead	mg/L	0.001	0.01	ND	ND
Nickel	mg/L	0.010	---	ND	ND
Zinc	mg/L	0.010	---	0.018	0.012
Mercury	mg/L	0.0001	0.001	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND
Uranium	mg/L	0.001	0.02	0.001	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB19	
				Monitor ID and Date	
				MWB19-A	MWB19-B
				3-Aug-2007	3-Aug-2007
INORGANICS					
pH	pH Units	N/A	---	7.79	7.81
Electrical Conductivity	uS/cm	1.0	---	570	558
Total Dissolved Solids	mg/L	10	---	310	322
Turbidity	NTU	1	---	ND	ND
Chloride	mg/L	1.0	---	4.99	6.27
Sulphate	mg/L	1.0	---	23.8	34.1
Alkalinity	mgCaCO3/L	10	---	288	268
Calcium	mg/L	1.0	---	70.2	70.4
Magnesium	mg/L	1.0	---	30.6	29.2
Sodium	mg/L	1.0	20	3.1	2.6
Potassium	mg/L	1.0	---	ND	ND
Ammonia as N *	mg/L	0.05	---	ND	0.05
Nitrate as N	mg/L	0.01	10.0	0.23	ND
Nitrite as N	mg/L	0.2	1.0	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.19	ND
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.19	0.08
Fluoride	mg/L	0.05	1.5	0.07	0.07
Bromide	mg/L	0.2	---	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND
Escherichia coli	CFU/100ml	1	1	ND	ND
Total Coliforms (MF)	CFU/100ml	1	1	23	19
BTEX					
Benzene	mg/L	0.001	0.005	---	---
Toluene	mg/L	0.01	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---
m & p - Xylene	mg/L	0.01	---	---	---
o - Xylene	mg/L	0.01	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---
METALS					
Arsenic	mg/L	0.001	0.025	ND	ND
Barium	mg/L	0.010	1.0	0.017	0.035
Boron	mg/L	0.010	5.0	ND	ND
Cadmium	mg/L	0.001	0.005	ND	ND
Chromium	mg/L	0.001	0.05	0.002	0.002
Iron	mg/L	0.010	---	ND	ND
Lead	mg/L	0.001	0.01	ND	ND
Nickel	mg/L	0.010	---	ND	ND
Zinc	mg/L	0.010	---	0.011	0.012
Mercury	mg/L	0.0001	0.001	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND
Uranium	mg/L	0.001	0.02	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB20		
				Monitor ID and Date		
				MWB20-I-A	MWB20-II-B	MWB20-II-C
				7-Aug-2007	7-Aug-2007	7-Aug-2007
INORGANICS						
pH	pH Units	N/A	---	7.28	7.91	7.52
Electrical Conductivity	uS/cm	1.0	---	567	625	597
Total Dissolved Solids	mg/L	10	---	320	376	342
Turbidity	NTU	1	---	ND	11	ND
Chloride	mg/L	1.0	---	18.5	12.2	8.8
Sulphate	mg/L	1.0	---	35.8	44.8	52.3
Alkalinity	mgCaCO3/L	10	---	209	242	244
Calcium	mg/L	1.0	---	74.6	76.8	82.1
Magnesium	mg/L	1.0	---	23.2	25	27.6
Sodium	mg/L	1.0	20	8	9.5	2.9
Potassium	mg/L	1.0	---	ND	ND	ND
Ammonia as N *	mg/L	0.05	---	0.23	0.07	ND
Nitrate as N	mg/L	0.01	10.0	6.48	7.64	5
Nitrite as N	mg/L	0.2	1.0	0.68	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.27	0.24	0.2
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.5	0.31	0.2
Fluoride	mg/L	0.05	1.5	0.09	0.09	0.09
Bromide	mg/L	0.2	---	ND	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	8	11	ND
Total Coliforms (MF)	CFU/100ml	1	1	328	331	31
BTEX						
Benzene	mg/L	0.001	0.005	---	---	---
Toluene	mg/L	0.01	---	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---	---
m & p - Xylene	mg/L	0.01	---	---	---	---
o - Xylene	mg/L	0.01	---	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---	---
METALS						
Arsenic	mg/L	0.001	0.025	ND	0.006	ND
Barium	mg/L	0.010	1.0	ND	0.036	0.05
Boron	mg/L	0.010	5.0	ND	0.013	ND
Cadmium	mg/L	0.001	0.005	ND	ND	ND
Chromium	mg/L	0.001	0.05	0.007	0.007	0.006
Iron	mg/L	0.010	---	ND	ND	ND
Lead	mg/L	0.001	0.01	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND
Zinc	mg/L	0.010	---	ND	ND	0.015
Mercury	mg/L	0.0001	0.001	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND	ND
Uranium	mg/L	0.001	0.02	0.002	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB21	
				Monitor ID and Date	
				MWB21-A	MWB21-B
				3-Aug-2007	3-Aug-2007
INORGANICS					
pH	pH Units	N/A	---	7.89	7.87
Electrical Conductivity	uS/cm	1.0	---	562	651
Total Dissolved Solids	mg/L	10	---	254	434
Turbidity	NTU	1	---	ND	ND
Chloride	mg/L	1.0	---	6.57	8.87
Sulphate	mg/L	1.0	---	38.8	106
Alkalinity	mgCaCO3/L	10	---	259	239
Calcium	mg/L	1.0	---	72.9	90.6
Magnesium	mg/L	1.0	---	26.7	27.5
Sodium	mg/L	1.0	20	4.9	7.3
Potassium	mg/L	1.0	---	ND	1.2
Ammonia as N *	mg/L	0.05	---	ND	0.06
Nitrate as N	mg/L	0.01	10.0	3.08	0.01
Nitrite as N	mg/L	0.2	1.0	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.2	0.05
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.2	0.11
Fluoride	mg/L	0.05	1.5	0.07	0.12
Bromide	mg/L	0.2	---	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND
Escherichia coli	CFU/100ml	1	1	ND	ND
Total Coliforms (MF)	CFU/100ml	1	1	7	9
BTEX					
Benzene	mg/L	0.001	0.005	---	---
Toluene	mg/L	0.01	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---
m & p - Xylene	mg/L	0.01	---	---	---
o - Xylene	mg/L	0.01	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---
METALS					
Arsenic	mg/L	0.001	0.025	0.003	0.008
Barium	mg/L	0.010	1.0	0.025	0.031
Boron	mg/L	0.010	5.0	0.013	0.021
Cadmium	mg/L	0.001	0.005	ND	ND
Chromium	mg/L	0.001	0.05	0.002	0.002
Iron	mg/L	0.010	---	ND	0.047
Lead	mg/L	0.001	0.01	ND	ND
Nickel	mg/L	0.010	---	ND	ND
Zinc	mg/L	0.010	---	0.019	ND
Mercury	mg/L	0.0001	0.001	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND
Uranium	mg/L	0.001	0.02	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB22			
				Monitor ID and Date			
				MWB22-I-A	MWB22-I-C	MWB22-II-B	MWB22-II-D
				1-Aug-2007	1-Aug-2007	1-Aug-2007	1-Aug-2007
INORGANICS							
pH	pH Units	N/A	---	7.86	8.3	8.2	7.92
Electrical Conductivity	uS/cm	1.0	---	629	595	603	592
Total Dissolved Solids	mg/L	10	---	338	338	342	346
Turbidity	NTU	1	---	ND	2	ND	ND
Chloride	mg/L	1.0	---	15	6.5	11.3	6.1
Sulphate	mg/L	1.0	---	21	56.6	27.3	65.7
Alkalinity	mgCaCO3/L	10	---	228	254	253	243
Calcium	mg/L	1.0	---	78.8	76.1	75.1	80.9
Magnesium	mg/L	1.0	---	5.9	4.4	2.8	5.9
Sodium	mg/L	1.0	20	25.1	27.5	27.6	23.5
Potassium	mg/L	1.0	---	ND	ND	ND	1.4
Ammonia as N *	mg/L	0.05	---	ND	ND	ND	0.06
Nitrate as N	mg/L	0.01	10.0	17.1	0.32	8.64	0.06
Nitrite as N	mg/L	0.2	1.0	ND	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.11	0.25	0.11	0.09
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.11	0.25	0.11	0.15
Fluoride	mg/L	0.05	1.5	0.07	0.16	0.07	0.13
Bromide	mg/L	0.2	---	ND	ND	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	ND	ND	ND	ND
Total Coliforms (MF)	CFU/100ml	1	1	21	ND	23	17
BTEX							
Benzene	mg/L	0.001	0.005	ND	ND	ND	ND
Toluene	mg/L	0.01	---	ND	ND	ND	ND
Ethylbenzene	mg/L	0.001	0.0024	ND	ND	ND	ND
m & p - Xylene	mg/L	0.01	---	ND	ND	ND	ND
o - Xylene	mg/L	0.01	---	ND	ND	ND	ND
Xylenes (Total)	mg/L	0.01	0.30	ND	ND	ND	ND
METALS							
Arsenic	mg/L	0.001	0.025	0.001	0.002	0.001	0.014
Barium	mg/L	0.010	1.0	0.031	0.074	0.023	0.036
Boron	mg/L	0.010	5.0	ND	0.012	ND	0.02
Cadmium	mg/L	0.001	0.005	ND	ND	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND	ND	ND
Iron	mg/L	0.010	---	ND	ND	ND	ND
Lead	mg/L	0.001	0.01	ND	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND	ND
Zinc	mg/L	0.010	---	ND	0.016	0.017	0.013
Mercury	mg/L	0.0001	0.001	ND	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND	ND	ND
Uranium	mg/L	0.001	0.02	ND	ND	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB23		
				Monitor ID and Date		
				MWB23-I-A	MWB23-II-B	MWB23-II-C
				31-Jul-2007	1-Aug-2007	1-Aug-2007
INORGANICS						
pH	pH Units	N/A	---	8.1	8.33	8.02
Electrical Conductivity	uS/cm	1.0	---	629	589	625
Total Dissolved Solids	mg/L	10	---	392	312	368
Turbidity	NTU	1	---	4	ND	ND
Chloride	mg/L	1.0	---	14.5	10.4	9.6
Sulphate	mg/L	1.0	---	22.2	35	69.1
Alkalinity	mgCaCO3/L	10	---	221	260	251
Calcium	mg/L	1.0	---	80	77.9	88.9
Magnesium	mg/L	1.0	---	6.9	3.7	4
Sodium	mg/L	1.0	20	24.4	25.8	25.5
Potassium	mg/L	1.0	---	ND	ND	ND
Ammonia as N *	mg/L	0.05	---	ND	ND	ND
Nitrate as N	mg/L	0.01	10.0	18.4	5.08	1.71
Nitrite as N	mg/L	0.2	1.0	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	1.35	0.2	0.16
Total Kjeldahl Nitrogen *	mg/L	0.05	---	1.35	0.2	0.16
Fluoride	mg/L	0.05	1.5	0.1	0.08	0.09
Bromide	mg/L	0.2	---	ND	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	2	ND	1
Total Coliforms (MF)	CFU/100ml	1	1	41	38	51
BTEX						
Benzene	mg/L	0.001	0.005	ND	ND	ND
Toluene	mg/L	0.01	---	ND	ND	ND
Ethylbenzene	mg/L	0.001	0.0024	ND	ND	ND
m & p - Xylene	mg/L	0.01	---	ND	ND	ND
o - Xylene	mg/L	0.01	---	ND	ND	ND
Xylenes (Total)	mg/L	0.01	0.30	ND	ND	ND
METALS						
Arsenic	mg/L	0.001	0.025	0.002	0.001	0.002
Barium	mg/L	0.010	1.0	0.015	0.018	0.021
Boron	mg/L	0.010	5.0	0.014	ND	0.011
Cadmium	mg/L	0.001	0.005	ND	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND	ND
Iron	mg/L	0.010	---	ND	ND	ND
Lead	mg/L	0.001	0.01	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND
Zinc	mg/L	0.010	---	ND	ND	0.011
Mercury	mg/L	0.0001	0.001	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND	ND
Uranium	mg/L	0.001	0.02	0.001	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB24			
				Monitor ID and Date			
				MWB24-I-A	MWB24-I-B	MWB24-II-C	MWB24-II-D
				2-Aug-2007	2-Aug-2007	28-Aug-2007	28-Aug-2007
INORGANICS							
pH	pH Units	N/A	---	---	7.51	7.42	7.42
Electrical Conductivity	uS/cm	1.0	---	---	614	610	1270
Total Dissolved Solids	mg/L	10	---	---	354	282	786
Turbidity	NTU	1	---	---	6	ND	1.6
Chloride	mg/L	1.0	---	---	7.3	9.96	59.9
Sulphate	mg/L	1.0	---	---	32.7	42.6	368
Alkalinity	mgCaCO3/L	10	---	---	282	267	224
Calcium	mg/L	1.0	---	---	78.5	77.5	149
Magnesium	mg/L	1.0	---	---	4.5	29.6	31.2
Sodium	mg/L	1.0	20	---	31.8	6	72.1
Potassium	mg/L	1.0	---	---	1.3	0.96	6.71
Ammonia as N *	mg/L	0.05	---	---	ND	0.06	0.65
Nitrate as N	mg/L	0.01	10.0	---	3.41	0.45	ND
Nitrite as N	mg/L	0.2	1.0	---	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	---	0.37	0.28	0.1
Total Kjeldahl Nitrogen *	mg/L	0.05	---	---	0.37	0.34	0.75
Fluoride	mg/L	0.05	1.5	---	0.07	0.1	0.25
Bromide	mg/L	0.2	---	---	ND	ND	0.57
Cyanide, Free	mg/L	0.01	---	---	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	---	ND	6	ND
Total Coliforms (MF)	CFU/100ml	1	1	---	48	166	28
BTEX							
Benzene	mg/L	0.001	0.005	---	---	---	---
Toluene	mg/L	0.01	---	---	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---	---	---
m & p - Xylene	mg/L	0.01	---	---	---	---	---
o - Xylene	mg/L	0.01	---	---	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---	---	---
METALS							
Arsenic	mg/L	0.001	0.025	---	0.001	ND	0.086
Barium	mg/L	0.010	1.0	---	ND	0.047	0.036
Boron	mg/L	0.010	5.0	---	0.013	0.01	0.218
Cadmium	mg/L	0.001	0.005	---	ND	ND	ND
Chromium	mg/L	0.001	0.05	---	ND	ND	0.002
Iron	mg/L	0.010	---	---	ND	ND	ND
Lead	mg/L	0.001	0.01	---	ND	ND	ND
Nickel	mg/L	0.010	---	---	ND	ND	ND
Zinc	mg/L	0.010	---	---	0.02	0.067	0.015
Mercury	mg/L	0.0001	0.001	---	ND	ND	ND
Antimony	mg/L	0.001	0.006	---	ND	ND	ND
Selenium	mg/L	0.001	0.01	---	ND	ND	0.001
Uranium	mg/L	0.001	0.02	---	ND	0.003	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB25			
				Monitor ID and Date			
				MWB25-I-A	MWB25-II-B	MWB25-III-C	MWB25-III-D
				1-Aug-2007	1-Aug-2007	28-Aug-2007	28-Aug-2007
INORGANICS							
pH	pH Units	N/A	---	8.19	8.23	7.71	7.49
Electrical Conductivity	uS/cm	1.0	---	603	622	637	992
Total Dissolved Solids	mg/L	10	---	318	336	320	622
Turbidity	NTU	1	---	8	3	8	7
Chloride	mg/L	1.0	---	9	8.5	8.49	40.5
Sulphate	mg/L	1.0	---	28.1	35.3	42.5	225
Alkalinity	mgCaCO3/L	10	---	294	290	297	240
Calcium	mg/L	1.0	---	75.4	79.8	79.5	118
Magnesium	mg/L	1.0	---	3.5	3.5	32.9	32.7
Sodium	mg/L	1.0	20	30.5	30.6	7.28	46.1
Potassium	mg/L	1.0	---	ND	1.1	0.67	3.03
Ammonia as N *	mg/L	0.05	---	ND	ND	0.22	0.47
Nitrate as N	mg/L	0.01	10.0	1.42	0.36	0.24	ND
Nitrite as N	mg/L	0.2	1.0	ND	ND	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.3	0.4	3.34	0.32
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.3	0.4	3.56	0.79
Fluoride	mg/L	0.05	1.5	0.07	0.07	0.09	0.13
Bromide	mg/L	0.2	---	ND	ND	ND	0.38
Cyanide, Free	mg/L	0.01	---	ND	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	ND	ND	11	ND
Total Coliforms (MF)	CFU/100ml	1	1	ND	3	171	31
BTEX							
Benzene	mg/L	0.001	0.005	---	---	---	---
Toluene	mg/L	0.01	---	---	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---	---	---
m & p - Xylene	mg/L	0.01	---	---	---	---	---
o - Xylene	mg/L	0.01	---	---	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---	---	---
METALS							
Arsenic	mg/L	0.001	0.025	0.001	0.002	ND	0.009
Barium	mg/L	0.010	1.0	0.011	0.036	0.05	0.04
Boron	mg/L	0.010	5.0	ND	ND	ND	0.095
Cadmium	mg/L	0.001	0.005	ND	ND	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND	ND	ND
Iron	mg/L	0.010	---	ND	ND	ND	ND
Lead	mg/L	0.001	0.01	ND	ND	ND	ND
Nickel	mg/L	0.010	---	ND	ND	ND	ND
Zinc	mg/L	0.010	---	0.03	0.07	0.025	0.039
Mercury	mg/L	0.0001	0.001	ND	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND	0.001
Selenium	mg/L	0.001	0.01	ND	ND	ND	ND
Uranium	mg/L	0.001	0.02	ND	0.001	0.001	0.001

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MWB26			
				Monitor ID and Date			
				MWB26-I-A	MWB26-I-B	MWB26-II-C	MWB26-II-D
				2-Aug-2007	2-Aug-2007	2-Aug-2007	2-Aug-2007
INORGANICS							
pH	pH Units	N/A	---	---	7.68	7.76	7.56
Electrical Conductivity	uS/cm	1.0	---	---	595	624	957
Total Dissolved Solids	mg/L	10	---	---	352	352	670
Turbidity	NTU	1	---	---	2	ND	ND
Chloride	mg/L	1.0	---	---	10.7	9.8	39.4
Sulphate	mg/L	1.0	---	---	23.6	36.5	234
Alkalinity	mgCaCO3/L	10	---	---	227	289	245
Calcium	mg/L	1.0	---	---	73.1	82.1	122
Magnesium	mg/L	1.0	---	---	5.1	3.2	35.6
Sodium	mg/L	1.0	20	---	26.5	30.3	32.9
Potassium	mg/L	1.0	---	---	ND	1	2.5
Ammonia as N *	mg/L	0.05	---	---	0.09	0.06	0.13
Nitrate as N	mg/L	0.01	10.0	---	10.9	0.01	0.24
Nitrite as N	mg/L	0.2	1.0	---	0.38	ND	ND
Organic Nitrogen *	mg/L	0.05	---	---	0.2	0.14	0.15
Total Kjeldahl Nitrogen *	mg/L	0.05	---	---	0.29	0.2	0.28
Fluoride	mg/L	0.05	1.5	---	0.08	0.08	0.14
Bromide	mg/L	0.2	---	---	ND	ND	0.3
Cyanide, Free	mg/L	0.01	---	---	ND	ND	ND
Escherichia coli	CFU/100ml	1	1	---	ND	ND	<1
Total Coliforms (MF)	CFU/100ml	1	1	---	320	49	81
BTEX							
Benzene	mg/L	0.001	0.005	---	---	ND	ND
Toluene	mg/L	0.01	---	---	---	ND	ND
Ethylbenzene	mg/L	0.001	0.0024	---	---	ND	ND
m & p - Xylene	mg/L	0.01	---	---	---	ND	ND
o - Xylene	mg/L	0.01	---	---	---	ND	ND
Xylenes (Total)	mg/L	0.01	0.30	---	---	ND	ND
METALS							
Arsenic	mg/L	0.001	0.025	---	ND	0.001	0.016
Barium	mg/L	0.010	1.0	---	0.019	0.105	0.045
Boron	mg/L	0.010	5.0	---	ND	ND	0.068
Cadmium	mg/L	0.001	0.005	---	ND	ND	ND
Chromium	mg/L	0.001	0.05	---	ND	ND	ND
Iron	mg/L	0.010	---	---	ND	ND	ND
Lead	mg/L	0.001	0.01	---	ND	0.004	ND
Nickel	mg/L	0.010	---	---	ND	ND	ND
Zinc	mg/L	0.010	---	---	0.014	0.169	0.019
Mercury	mg/L	0.0001	0.001	---	ND	ND	ND
Antimony	mg/L	0.001	0.006	---	ND	ND	0.001
Selenium	mg/L	0.001	0.01	---	ND	ND	ND
Uranium	mg/L	0.001	0.02	---	ND	0.003	0.001

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	Well Nest MW27	
				Monitor ID and Date	
				MWB27-I-A	MWB27-II-B
				9-Aug-2007	9-Aug-2007
INORGANICS					
pH	pH Units	N/A	---	7.64	7.87
Electrical Conductivity	uS/cm	1.0	---	733	597
Total Dissolved Solids	mg/L	10	---	406	348
Turbidity	NTU	1	---	1	1
Chloride	mg/L	1.0	---	19.6	7.4
Sulphate	mg/L	1.0	---	30.7	37.8
Alkalinity	mgCaCO3/L	10	---	305	259
Calcium	mg/L	1.0	---	82.5	79.3
Magnesium	mg/L	1.0	---	27	27.6
Sodium	mg/L	1.0	20	17.8	2.7
Potassium	mg/L	1.0	---	24.5	1.2
Ammonia as N *	mg/L	0.05	---	0.07	0.06
Nitrate as N	mg/L	0.01	10.0	4.13	2.86
Nitrite as N	mg/L	0.2	1.0	ND	ND
Organic Nitrogen *	mg/L	0.05	---	0.2	0.07
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.27	0.13
Fluoride	mg/L	0.05	1.5	0.09	0.09
Bromide	mg/L	0.2	---	ND	ND
Cyanide, Free	mg/L	0.01	---	ND	ND
Escherichia coli	CFU/100ml	1	1	ND	ND
Total Coliforms (MF)	CFU/100ml	1	1	41	14
BTEX					
Benzene	mg/L	0.001	0.005	---	---
Toluene	mg/L	0.01	---	---	---
Ethylbenzene	mg/L	0.001	0.0024	---	---
m & p - Xylene	mg/L	0.01	---	---	---
o - Xylene	mg/L	0.01	---	---	---
Xylenes (Total)	mg/L	0.01	0.30	---	---
METALS					
Arsenic	mg/L	0.001	0.025	ND	ND
Barium	mg/L	0.010	1.0	0.037	0.035
Boron	mg/L	0.010	5.0	0.028	ND
Cadmium	mg/L	0.001	0.005	ND	ND
Chromium	mg/L	0.001	0.05	ND	ND
Iron	mg/L	0.010	---	ND	ND
Lead	mg/L	0.001	0.01	ND	ND
Nickel	mg/L	0.010	---	ND	ND
Zinc	mg/L	0.010	---	0.075	0.013
Mercury	mg/L	0.0001	0.001	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND
Selenium	mg/L	0.001	0.01	ND	ND
Uranium	mg/L	0.001	0.02	ND	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	TW14
				Date
				1-Aug-2007
INORGANICS				
pH	pH Units	N/A	---	8.12
Electrical Conductivity	uS/cm	1.0	---	581
Total Dissolved Solids	mg/L	10	---	332
Turbidity	NTU	1	---	2
Chloride	mg/L	1.0	---	14.7
Sulphate	mg/L	1.0	---	17.3
Alkalinity	mgCaCO3/L	10	---	204
Calcium	mg/L	1.0	---	75
Magnesium	mg/L	1.0	---	2.1
Sodium	mg/L	1.0	20	22.3
Potassium	mg/L	1.0	---	ND
Ammonia as N *	mg/L	0.05	---	ND
Nitrate as N	mg/L	0.01	10.0	16.5
Nitrite as N	mg/L	0.2	1.0	ND
Organic Nitrogen *	mg/L	0.05	---	0.06
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.06
Fluoride	mg/L	0.05	1.5	0.08
Bromide	mg/L	0.2	---	ND
Cyanide, Free	mg/L	0.01	---	ND
Escherichia coli	CFU/100ml	1	1	ND
Total Coliforms (MF)	CFU/100ml	1	1	ND
BTEX				
Benzene	mg/L	0.001	0.005	ND
Toluene	mg/L	0.01	---	ND
Ethylbenzene	mg/L	0.001	0.0024	ND
m & p - Xylene	mg/L	0.01	---	ND
o - Xylene	mg/L	0.01	---	ND
Xylenes (Total)	mg/L	0.01	0.30	ND
METALS				
Arsenic	mg/L	0.001	0.025	0.001
Barium	mg/L	0.010	1.0	0.034
Boron	mg/L	0.010	5.0	ND
Cadmium	mg/L	0.001	0.005	ND
Chromium	mg/L	0.001	0.05	ND
Iron	mg/L	0.010	---	ND
Lead	mg/L	0.001	0.01	ND
Nickel	mg/L	0.010	---	ND
Zinc	mg/L	0.010	---	0.012
Mercury	mg/L	0.0001	0.001	ND
Antimony	mg/L	0.001	0.006	ND
Selenium	mg/L	0.001	0.01	ND
Uranium	mg/L	0.001	0.02	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	TW15
				Date
				1-Aug-2007
INORGANICS				
pH	pH Units	N/A	---	8.15
Electrical Conductivity	uS/cm	1.0	---	607
Total Dissolved Solids	mg/L	10	---	364
Turbidity	NTU	1	---	5
Chloride	mg/L	1.0	---	9.9
Sulphate	mg/L	1.0	---	49.5
Alkalinity	mgCaCO3/L	10	---	236
Calcium	mg/L	1.0	---	79.6
Magnesium	mg/L	1.0	---	4.4
Sodium	mg/L	1.0	20	25
Potassium	mg/L	1.0	---	1.1
Ammonia as N *	mg/L	0.05	---	ND
Nitrate as N	mg/L	0.01	10.0	5.43
Nitrite as N	mg/L	0.2	1.0	ND
Organic Nitrogen *	mg/L	0.05	---	0.26
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.26
Fluoride	mg/L	0.05	1.5	1
Bromide	mg/L	0.2	---	ND
Cyanide, Free	mg/L	0.01	---	ND
Escherichia coli	CFU/100ml	1	1	ND
Total Coliforms (MF)	CFU/100ml	1	1	4
BTEX				
Benzene	mg/L	0.001	0.005	ND
Toluene	mg/L	0.01	---	ND
Ethylbenzene	mg/L	0.001	0.0024	ND
m & p - Xylene	mg/L	0.01	---	ND
o - Xylene	mg/L	0.01	---	ND
Xylenes (Total)	mg/L	0.01	0.30	ND
METALS				
Arsenic	mg/L	0.001	0.025	0.002
Barium	mg/L	0.010	1.0	0.037
Boron	mg/L	0.010	5.0	0.013
Cadmium	mg/L	0.001	0.005	ND
Chromium	mg/L	0.001	0.05	ND
Iron	mg/L	0.010	---	0.014
Lead	mg/L	0.001	0.01	ND
Nickel	mg/L	0.010	---	ND
Zinc	mg/L	0.010	---	ND
Mercury	mg/L	0.0001	0.001	ND
Antimony	mg/L	0.001	0.006	ND
Selenium	mg/L	0.001	0.01	ND
Uranium	mg/L	0.001	0.02	ND

ND = Not detected

Mountsberg Quarry Property, Groundwater Chemistry Analysis by Well Nest - July/August 2007

Gartner Lee

Parameter	Units	Method Detection Limit	Guideline/ Standard	TW16
				Date
				1-Aug-2007
INORGANICS				
pH	pH Units	N/A	---	7.81
Electrical Conductivity	uS/cm	1.0	---	410
Total Dissolved Solids	mg/L	10	---	262
Turbidity	NTU	1	---	ND
Chloride	mg/L	1.0	---	11.3
Sulphate	mg/L	1.0	---	35
Alkalinity	mgCaCO3/L	10	---	113
Calcium	mg/L	1.0	---	41.1
Magnesium	mg/L	1.0	---	2.8
Sodium	mg/L	1.0	20	20.3
Potassium	mg/L	1.0	---	1.1
Ammonia as N *	mg/L	0.05	---	ND
Nitrate as N	mg/L	0.01	10.0	12.1
Nitrite as N	mg/L	0.2	1.0	ND
Organic Nitrogen *	mg/L	0.05	---	0.15
Total Kjeldahl Nitrogen *	mg/L	0.05	---	0.15
Fluoride	mg/L	0.05	1.5	0.13
Bromide	mg/L	0.2	---	ND
Cyanide, Free	mg/L	0.01	---	ND
Escherichia coli	CFU/100ml	1	1	ND
Total Coliforms (MF)	CFU/100ml	1	1	7
BTEX				
Benzene	mg/L	0.001	0.005	ND
Toluene	mg/L	0.01	---	ND
Ethylbenzene	mg/L	0.001	0.0024	ND
m & p - Xylene	mg/L	0.01	---	ND
o - Xylene	mg/L	0.01	---	ND
Xylenes (Total)	mg/L	0.01	0.30	ND
METALS				
Arsenic	mg/L	0.001	0.025	0.002
Barium	mg/L	0.010	1.0	0.027
Boron	mg/L	0.010	5.0	0.013
Cadmium	mg/L	0.001	0.005	ND
Chromium	mg/L	0.001	0.05	0.011
Iron	mg/L	0.010	---	ND
Lead	mg/L	0.001	0.01	ND
Nickel	mg/L	0.010	---	ND
Zinc	mg/L	0.010	---	ND
Mercury	mg/L	0.0001	0.001	ND
Antimony	mg/L	0.001	0.006	ND
Selenium	mg/L	0.001	0.01	ND
Uranium	mg/L	0.001	0.02	ND

ND = Not detected

I4. August 2007 Re-sampling of Test Wells and Surface Water Quality Results

Appendix I4

August 2007 Re-sampling of Test Wells and Surface Water

The three test wells (TW14, TW15 and TW15) were re-sampled in August 2007 to establish the likely water level concentrations during performance of the pumping test. This work involved pumping the individual wells at a flow rate of 2 L/s for a period of two hours. TW14 and TW15 were pumped concurrently in the morning and then TW16 was pumped in the afternoon. Field measurements of pH, conductivity, turbidity, temperature and TDS were collected at 15-minute intervals throughout the well purging. Samples were collected from each of the wells upon commencement and at the end of pumping.

Surface water samples were also collected at the proposed point of discharge in Tributary A of Mountsberg Creek, about 500 m northwest of the test wells, during re-sampling of the three test wells. This was to provide preliminary water quality data to establish background conditions.

Samples were analyzed for total cations and total metals by AGAT laboratories. The analytical results are presented in Appendix I4.

Gartner Lee

Table I1-4 : Analytical Results for Mountsberg Test Well Resampling - Aug 10, 2007
Agat Laboratories

Parameter	PWQO	Units	ODWS	Units	TW14				TW15						TW16				Creek			
					T=o		T=e		T=o		T=e				T=o		T=e		T=o		T=e	
					Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Dup Dissolved	Total	Dup Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
Total Cations																						
Calcium					69.8	75.8	73.9	78.7	80	85.1	76.3	76.3	83.6	83.1	37.7	317	60	70.5	15.3	19.4	16.5	18.2
Magnesium					24.8	27.3	25.7	27.8	23.5	25.3	23.3	23.2	25.5	25.3	4.97	120	22.2	24.5	18.5	22	19.2	21.6
Sodium					2.09	2.3	3.41	4.2	5.75	6.21	5.27	5.26	5.74	5.73	2.92	3.17	3.00	3.19	20.2	23.1	21.1	23.5
Potassium					0.87	0.91	0.85	1.07	1.12	1.23	1.09	1.05	1	1.17	1.69	1.72	1.27	1.32	1.03	1.52	0.89	1.33
Total Metals																						
Arsenic	0.005[b]	mg/L	0.025[a]	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	***0.016***	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Antimony	0.02	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium					0.085	0.073	0.082	0.075	0.08	0.074	0.077	0.083	0.078	0.083	0.041	0.125	0.051	0.055	0.016	0.027	0.016	0.017
Boron	0.2	mg/L	5[a]	mg/L	<0.010	<0.01	0.011	0.012	0.019	0.018	0.018	0.017	0.016	0.016	0.01	0.05	0.012	0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	0.0002	mg/L	0.005	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	***0.0003***	<0.0001	<0.0001
Chromium	0.0089	mg/L	0.05	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.006	***0.016***	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Iron	0.3	mg/L			<0.010	0.032	<0.010	<0.01	<0.01	***0.414***	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	***0.507***	<0.01	0.116
Lead	0.005	mg/L	0.01	mg/L	<0.001	0.003	<0.001	0.002	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	*0.005*	<0.001	<0.001	<0.001	0.003	<0.001	<0.001
Nickel	0.025	mg/L			<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Selenium	0.1	mg/L	0.01	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Uranium	0.005	mg/L	0.1	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc	0.02[b]	mg/L			***0.038***	***0.031***	***0.035***	***0.03***	***0.03***	***0.03***	***0.026***	***0.035***	0.02	0.015	0.013	***0.056***	***0.021***	0.008	***0.03***	***0.137***	0.018	***0.031***

Notes:
*ODWS - Ontario Drinking Water Standards - all standards are Maximum Acceptable Concentrations unless other wise stated. [a] - Interim Maximum Acceptable Concentration
*PWQO - Provincial Water Quality Objectives, [b] - interim PWQO
Bold and Italics denote results that exceed the PWQO standards

I5. March 2008 Monitoring Well Nest MWB28 Water Quality Results

Appendix I5

March 2008 Sampling of Monitoring Well Nest MWB28

Well nest MWB28 was installed at the MOE's request along the western property boundary between the proposed GRS test site and the two Stonebrook Estates communal wells. These wells were sampled for general chemistry, microbiology parameters, dissolved metals and BTEX on April 1, 2008 following their installation. Analysis was completed by AGAT Laboratories. The analytical results are provided in Appendix I5.

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Certificate of Analysis

AGAT WORK ORDER: 08H266496
PROJECT NO: 60701

CLIENT NAME: GARTNER LEE LIMITED

ATTENTION TO: Peter-James Mauro

(P & T) - BTEX - Water

DATE SAMPLED: Apr 01, 2008 | DATE RECEIVED: Apr 01, 2008 | DATE REPORTED: Apr 11, 2008 | SAMPLE TYPE: Water

	Unit	G / S	RDL	MWB 28A 928047	MWB 28B 928104	MWB 50 928119	Trip Blank 928140
Benzene	µg/L	5	0.04	<0.04	<0.04	<0.04	<0.04
Toluene	µg/L		0.04	<0.04	<0.04	<0.04	<0.04
Ethylbenzene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
m & p - Xylene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10
o - Xylene	µg/L		0.04	<0.04	<0.04	<0.04	<0.04
Xylenes (Total)	µg/L	300	0.04	<0.04	<0.04	<0.04	<0.04

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to SDWA - Schedule 24

928047 Results relate only to the items tested.
Surrogate Recovery for Toluene-d8: 104%
Surrogate Recovery for 4-Bromofluorobenzene:102 %

928104 Results relate only to the items tested.
Surrogate Recovery for Toluene-d8: 103%
Surrogate Recovery for 4-Bromofluorobenzene: 103%

928119 Results relate only to the items tested.
Surrogate Recovery for Toluene-d8: 103%
Surrogate Recovery for 4-Bromofluorobenzene: 101%

928140 Results relate only to the items tested.
Surrogate Recovery for Toluene-d8: 104%
Surrogate Recovery for 4-Bromofluorobenzene: 102%

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 08H266496
PROJECT NO: 60701

CLIENT NAME: GARTNER LEE LIMITED

ATTENTION TO: Peter-James Mauro

Dissolved Metals (GW)

DATE SAMPLED: Apr 01, 2008 | DATE RECEIVED: Apr 01, 2008 | DATE REPORTED: Apr 11, 2008 | SAMPLE TYPE: Water

	Unit	G / S	RDL	MWB 28A 928047	MWB 28B 928104	MWB 50 928119
Arsenic	mg/L	0.025	0.001	<0.001	<0.001	<0.001
Barium	mg/L	1.0	0.010	<0.010	0.014	0.014
Boron	mg/L	5.0	0.010	<0.010	0.011	0.010
Cadmium	mg/L	0.005	0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.05	0.001	0.001	0.001	0.001
Iron	mg/L		0.010	<0.010	<0.010	<0.010
Lead	mg/L	0.010	0.001	<0.001	<0.001	<0.001
Nickel	mg/L		0.010	<0.010	<0.010	<0.010
Zinc	mg/L		0.010	0.021	0.024	0.019
Mercury	mg/L	0.001	0.0001	<0.0001	<0.0001	<0.0001
Antimony	mg/L	0.006	0.001	<0.001	<0.001	<0.001
Selenium	mg/L	0.01	0.001	<0.001	<0.001	<0.001
Uranium	mg/L	0.02	0.001	<0.001	<0.001	<0.001

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to SDWA -Schedule 23

Certified By: Jonby Takeuchi

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Certificate of Analysis

AGAT WORK ORDER: 08H266496
PROJECT NO: 60701

CLIENT NAME: GARTNER LEE LIMITED

ATTENTION TO: Peter-James Mauro

General Chemistry & Microbiology Parameters (GW)

DATE SAMPLED: Apr 01, 2008 | DATE RECEIVED: Apr 01, 2008 | DATE REPORTED: Apr 11, 2008 | SAMPLE TYPE: Water

	Unit	G / S	RDL	MWB 28A 928047	MWB 28B 928104	MWB 50 928119
pH	pH Units		N/A	8.37	8.33	8.29
Electrical Conductivity	uS/cm		1.0	497	536	533
Total Dissolved Solids	mg/L		10	286	294	314
Turbidity	NTU		1	<1	2.1	2.1
Chloride	mg/L		0.10	11.5	7.28	7.27
Sulphate	mg/L		0.10	13.5	27.0	27.1
Alkalinity (as CaCO3)	mg /L		5	190	235	239
Calcium	mg/L		0.05	64.0	70.1	70.8
Magnesium	mg/L		0.05	20.8	23.8	23.8
Sodium	mg/L	20	0.05	1.16	2.03	2.05
Potassium	mg/L		0.05	0.36	0.57	0.42
Ammonia as N	mg/L		0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L	10.0	0.05	12.2	5.17	5.23
Nitrite as N	mg/L	1.0	0.05	<0.05	<0.05	<0.05
Organic Nitrogen	mg/L		0.05	<0.05	<0.05	<0.05
Total Kjeldahl Nitrogen	mg/L		0.05	<0.05	<0.05	<0.05
Fluoride	mg/L	1.5	0.05	0.07	0.07	0.06
Bromide	mg/L		0.05	<0.05	<0.05	<0.05
Cyanide, Free	mg/L	200	0.01	<0.01	<0.01	<0.01
Escherichia coli	CFU/100ml	1	1	<1	<1	<1
Total Coliforms (MF)	CFU/100ml	1	1	60	21	16
% Difference Cation/Anion				3.0	2.4	2.9

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to SDWA -Schedule 23
928047-928119 NH3, organic N and TKN analyses were performed at our Montreal laboratory.

Certified By: Jordy Takewell

I6. July 2008 Phase 1 Pumping Test Water Quality Results

Appendix I6

July 2008 Sampling – Phase I Pumping Test Water Quality

As part of the site investigations required in order to submit an application under the Ontario *Aggregate Resources Act*, groundwater testing is being undertaken at the site. A Permit to Take Water [PTTW] was issued by the Ontario Ministry of the Environment on July 8, 2008 (Permit No. 8461-7CFLG5; Appendix A) for the most recent testing, consisting of a three-phase pumping test. Phase 1 of the test was carried out between July 21 and July 29, 2008 in accordance with the requirements of the PTTW, including the required pre-test monitoring starting on July 14, and post-test monitoring continuing until August 5.

The purpose of this report is to address the specific reporting requirements of the PTTW, detailed in Condition 4.22 (Reporting) of the PTTW.

The findings of the Phase I Pumping Test has been submitted to the MOE[1]. Our August 2008 report should be referred to for a detailed discussion of the results of the Phase 1 Pumping Test. Tables I6-1 to I6-5 provide a summary of the water quality results. Section 5.1 of the report is briefly summarized below describing the scope of the groundwater quality samples collected.

The water quality sampling program involved sampling of each of the target monitoring wells prior to the initiation of the pumping test, sampling of the discharge from the pumping well (TW14) at a frequency of 24-hours, and sampling of a subset of wells for analysis of PCBs and copper.

Specifically, samples collected from monitoring wells MWB21, MWB7 and MWB10 were analyzed for PCBs prior to the start up of the pumping test and at the end of the test. Samples collected from monitoring wells MWB10 and MWB21 were submitted for analysis of copper at the same frequency.

Discharge water samples were also submitted for analysis of a suite of routine inorganic parameters, bacteriological analysis plus PCB's and copper.

1. *Gartner Lee Limited, 2008: Phase 1 Pumping Test Report PTTW #8461-7CFLG5 – Condition 4.22, GLL 60-702, August 2008.*

Table I6-1: Pre-Phase I Pumping Test
General Groundwater Chemistry, July 2008

Parameter	Units	ODWS		RDL	Bedrock Wells										
					TW15			MWB1				MWB4			
					TW15-A	TW15-B	TW15-C	MWB1-I-A	MWB1-II-B	MWB1-II-C	MWB95-A Duplicate of MWB1-II-C	MWB4-I-A	MWB4-II-B	MWB4-II-C	MWB6-I-A
					A	A	A	A	A	A	A	A	A	A/R/CABOT	A
					17-Jul-08	17-Jul-08	17-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	17-Jul-08	16-Jul-08	17-Jul-08
General Chemistry															
pH, field	no units	6.5 - 8.5	OG	-	7.22	7.31	7.37	7.09	7.28	7.10	-	7.12	7.12	7.27	7.16
pH, lab	no units	6.5 - 8.5	OG	-	8.40	8.33	8.30	8.12	8.15	7.75	7.86	8.19	8.27	8.14	8.06
Conductivity, field	uS/cm			2	643	586	603	645	632	2,490	-	455	545	632	576
Conductivity, lab	uS/cm			-	601	575	637	644	643	2,540	2,520	423	590	602	572
Temperature, field	degrees C	15	AO	-	10.1	9.9	9.0	11.5	9.2	9.5	-	10.5	8.9	9.47	10.2
Total Dissolved Solids (TDS)		500	AO	20	384	338	422	404	444	**2,220**	**2,250**	224	360	380	334
Turbidity	NTU	5[a]	AO	0.5	2.2	1.7	0.9	**6.8**	0.9	1.9	2.4	4.3	0.6	**5.4**	1.6
Major and Minor Ions															
Alkalinity	mg/L	30-500	OG	5	251	279	266	310	299	200	221	233	253	250	303
Calcium	mg/L			0.05	87.6	71.9	99.5	94.0	92.0	534	525	59.2	84.7	98.4	78.4
Magnesium	mg/L			0.05	28.4	26.3	30.8	35.8	33.6	52.4	52.6	28.4	31.5	30.4	34.7
Sodium	mg/L	200[b]	AO	0.05	10.1	28.8	7.37	9.26	11.1	67.4	67.6	0.67	2.69	5.14	4.78
Potassium	mg/L			0.05	0.99	1.18	1.20	0.33	1.24	8.87	8.94	0.33	0.50	0.89	0.56
Chloride	mg/L	250	AO	0.10	12.5	5.48	11.0	18.5	23.1	69.4	71.0	1.95	9.52	7.05	12.1
Sulphate	mg/L	500[c]	AO	0.10	24.4	38.0	70.4	36.2	41.1	**1,390**	**1,370**	5.76	14.4	79.0	21.3
Fluoride	mg/L	1.5[d]	MAC	0.05	0.05	0.06	0.06	0.09	0.11	0.20	0.20	0.07	<0.05	0.10	<0.05
Bromide	mg/L			0.05	<0.05	<0.05	0.05	<0.05	<0.05	0.55	0.55	<0.05	<0.05	<0.05	<0.05
Nutrients and other Constituents															
Nitrate as N	mg/L	10.0[e]	MAC	0.05	**10.5**	0.58	1.50	0.06	<0.05	<0.05	<0.05	2.07	**11.9**	<0.05	0.10
Nitrite as N	mg/L	1.0[e]	MAC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L			0.02	N/A	0.04	N/A	N/A	N/A	N/A	N/A	<0.02	N/A	N/A	<0.02
Cyanide, free	mg/L	0.2	MAC	0.002	0.007	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	0.004
Metals															
Arsenic	mg/L	0.025	IMAC	0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.004	0.004	<0.003	<0.003	<0.003	<0.003
Barium	mg/L	1	MAC	0.002	0.053	0.064	0.085	0.028	0.091	0.014	0.015	0.009	0.022	0.078	0.020
Boron	mg/L	5	IMAC	0.010	0.012	<0.010	0.013	<0.010	0.018	0.191	0.196	<0.010	<0.010	0.013	<0.010
Cadmium	mg/L	0.005	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.05	MAC	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.004	0.005	<0.003	<0.003	<0.003	<0.003
Copper	mg/L	1	AO	0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Iron	mg/L	0.3	AO	0.010	0.023	0.243	<0.010	<0.010	0.189	**0.501**	**0.516**	0.012	<0.010	0.176	0.029
Lead	mg/L	0.01[f]	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L			0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zinc	mg/L	5	AO	0.005	0.041	0.021	0.017	0.023	0.037	<0.005	0.051	0.017	0.023	0.005	0.046
Mercury	mg/L	0.001	MAC	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Microbiological Analysis															
Escherichia coli	CFU/100mL	not detectable	MAC	1	**CGEC**	**CGEC**	<1	**CGEC**	<1	<1	<1	**2**	<1	<1	<1
Fecal Coliform	CFU/100mL			1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Coliforms	CFU/100mL	not detectable	MAC	1	**CGTC**	**CGTC**	<1	**CGTC**	**17**	<1	<1	**CGTC**	<1	**CGTC**	<1
Fecal Streptococcus	CFU/100mL			1	<1	74	<1	<1	<1	<1	<1	<1	<1	<1	<1

Table I6-1: Pre-Phase I Pumping Test
General Groundwater Chemistry, July 2008

Parameter	Units	ODWS		RDL	Bedrock Wells									
					MWB6		MWB7				MWB8			
					MWB6-II-B	MWB6-II-C	MWB7-I-A	MWB7-II-B	MWB7-II-C	MWB90-A Duplicate of MW7-II-C	MWB8-I-A	MWB8-II-B	MWB8-II-C	MWB10-I-A
					A	A	A	A	A/R/CABOT	A/R/CABOT	A	A	A	A
					17-Jul-08	17-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	16-Jul-08
General Chemistry														
pH, field	no units	6.5 - 8.5	OG	-	7.17	6.90	7.06	7.10	7.03	-	7.10	7.05	7.09	7.13
pH, lab	no units	6.5 - 8.5	OG	-	8.10	8.11	8.03	**8.54**	7.89	8.29	8.38	8.36	8.38	8.40
Conductivity, field	uS/cm			2	671	632	489	518	969	-	477	535	580	524
Conductivity, lab	uS/cm			-	624	596	521	563	1080	1090	580	587	639	591
Temperature, field	degrees C	15	AO	-	9.0	9.1	11.3	10.0	9.3	-	11.3	9.6	9.4	9.0
Total Dissolved Solids (TDS)		500	AO	20	408	378	322	378	**794**	**792**	354	400	448	374
Turbidity	NTU	5[a]	AO	0.5	0.6	0.8	3.0	2.6	1	0.9	**5.3**	<0.5	<0.5	<0.5
Major and Minor Ions														
Alkalinity	mg/L	30-500	OG	5	288	290	268	270	243	254	230	235	255	263
Calcium	mg/L			0.05	87.1	83.3	62.3	76.7	136	138	82.5	79.5	86.1	101
Magnesium	mg/L			0.05	34.3	32.2	32.9	28.5	29.7	29.9	21.0	23.8	27.5	26.1
Sodium	mg/L	200[b]	AO	0.05	8.5	7.56	1.86	3.14	43.3	43.8	1.60	1.66	2.14	1.96
Potassium	mg/L			0.05	0.74	0.79	0.86	2.33	5.31	5.40	2.38	1.84	0.73	0.56
Chloride	mg/L	250	AO	0.10	21.1	17.5	2.88	6.16	52.4	54.0	13.1	13.4	13.6	8.32
Sulphate	mg/L	500[c]	AO	0.10	37.4	43.0	14.7	30.4	276	276	17.1	23.2	56.8	21.6
Fluoride	mg/L	1.5[d]	MAC	0.05	0.05	<0.05	0.06	0.05	0.17	0.17	0.06	0.05	0.06	0.08
Bromide	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	0.43	0.45	<0.05	<0.05	<0.05	<0.05
Nutrients and other Constituents														
Nitrate as N	mg/L	10.0[e]	MAC	0.05	0.20	<0.05	2.06	3.22	<0.05	<0.05	**11.5**	**11.8**	8.05	9.01
Nitrite as N	mg/L	1.0[e]	MAC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L			0.02	N/A	N/A	<0.02	N/A	N/A	N/A	<0.02	N/A	N/A	N/A
Cyanide, free	mg/L	0.2	MAC	0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Metals														
Arsenic	mg/L	0.025	IMAC	0.003	<0.003	0.006	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Barium	mg/L	1	MAC	0.002	0.050	0.105	0.005	0.025	0.011	0.011	0.033	0.032	0.037	0.034
Boron	mg/L	5	IMAC	0.010	<0.010	<0.010	0.014	0.015	0.167	0.182	0.018	0.012	0.011	0.013
Cadmium	mg/L	0.005	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.05	MAC	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Copper	mg/L	1	AO	0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<0.002
Iron	mg/L	0.3	AO	0.010	0.089	**0.758**	<0.010	<0.010	0.212	0.214	<0.010	0.088	<0.010	<0.010
Lead	mg/L	0.01[f]	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L			0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zinc	mg/L	5	AO	0.005	0.033	0.006	0.009	0.052	<0.005	0.013	0.009	0.042	0.037	0.018
Mercury	mg/L	0.001	MAC	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Microbiological Analysis														
Escherichia coli	CFU/100mL	not detectable	MAC	1	<1	<1	<1	<1	<1	<1	**2**	<1	<1	<1
Fecal Coliform	CFU/100mL			1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Coliforms	CFU/100mL	not detectable	MAC	1	<1	<1	**CGTC**	**CGTC**	<1	<1	**26**	<1	<1	<1
Fecal Streptococcus	CFU/100mL			1	<1	<1	2	<1	<1	<1	144	<1	<1	<1

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Table I6-1: Pre-Phase I Pumping Test
General Groundwater Chemistry, July 2008

Parameter	Units	ODWS		RDL	Bedrock Wells										
					MWB10			MWB12			MWB18		MWB19		
					MWB92-A Duplicate of MWB10-I-A	MWB10-I-B	MWB10-I-C	MWB12-A	MWB12-B	MWB12-C	MWB18-A	MWB18-B	MWB19-A	MWB19-B	MWB20-I-A
					A	A	A	A	A	A	A	A	A	A	A
					16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	17-Jul-08	17-Jul-08	17-Jul-08	17-Jul-08	15-Jul-08
General Chemistry															
pH, field	no units	6.5 - 8.5	OG	-	-	7.13	7.16	7.26	7.27	7.40	7.19	7.14	6.99	7.09	7.21
pH, lab	no units	6.5 - 8.5	OG	-	8.42	8.45	8.44	8.06	8.13	8.19	8.14	8.14	8.05	8.15	8.48
Conductivity, field	uS/cm			2	-	524	516	555	647	506	497	480	503	504	590
Conductivity, lab	uS/cm			-	590	603	578	560	643	505	552	541	547	567	492
Temperature, field	degrees C	15	AO	-	-	9.0	9.1	8.7	9.2	9.7	9.5	8.9	9.0	8.0	11.2
Total Dissolved Solids (TDS)		500	AO	20	368	376	352	324	404	294	338	334	322	340	340
Turbidity	NTU	5[a]	AO	0.5	<0.5	0.5	0.6	1.1	2.4	1.6	1.3	<0.5	0.7	0.5	1.4
Major and Minor Ions															
Alkalinity	mg/L	30-500	OG	5	280	269	293	280	262	247	288	245	289	297	207
Calcium	mg/L			0.05	100	98.8	95.2	85.8	96.0	79.2	83.6	80.8	78.2	82.2	64.5
Magnesium	mg/L			0.05	26.0	30.8	31.5	28.8	32.6	28.0	30.0	28.4	32.8	33.8	19.7
Sodium	mg/L	200[b]	AO	0.05	2.05	1.62	2.68	8.03	11.3	3.97	2.84	3.77	2.31	2.72	5.93
Potassium	mg/L			0.05	0.61	0.76	0.99	0.97	1.20	0.93	0.55	0.77	0.34	0.70	0.12
Chloride	mg/L	250	AO	0.10	8.13	8.94	5.39	8.52	17.8	3.9	5.38	5.04	5.87	7.13	17.2
Sulphate	mg/L	500[c]	AO	0.10	21.6	25.5	47.7	38.9	70.4	38.2	31.4	49.2	17.0	29.1	17.6
Fluoride	mg/L	1.5[d]	MAC	0.05	0.08	0.07	0.09	0.09	0.11	0.11	0.05	0.07	<0.05	<0.05	0.06
Bromide	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nutrients and other Constituents															
Nitrate as N	mg/L	10.0[e]	MAC	0.05	8.78	10	0.16	1.06	<0.05	0.06	<0.05	<0.05	0.95	<0.05	8.15
Nitrite as N	mg/L	1.0[e]	MAC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L			0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cyanide, free	mg/L	0.2	MAC	0.002	<0.002	<0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Metals															
Arsenic	mg/L	0.025	IMAC	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.004	0.006	<0.003	<0.003	<0.003	<0.003
Barium	mg/L	1	MAC	0.002	0.034	0.052	0.100	0.044	0.06	0.128	0.077	0.088	0.015	0.075	0.011
Boron	mg/L	5	IMAC	0.010	0.013	0.011	0.010	<0.010	0.017	0.011	<0.010	<0.010	<0.010	<0.010	0.011
Cadmium	mg/L	0.005	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.05	MAC	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Copper	mg/L	1	AO	0.002	0.004	<0.002	<0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Iron	mg/L	0.3	AO	0.010	0.083	0.01	0.049	0.173	**0.485**	**0.504**	**0.867**	0.134	<0.010	0.024	<0.010
Lead	mg/L	0.01[f]	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L			0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zinc	mg/L	5	AO	0.005	0.029	0.015	0.173	0.015	0.005	0.011	0.052	0.008	0.008	0.022	0.017
Mercury	mg/L	0.001	MAC	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Microbiological Analysis															
Escherichia coli	CFU/100mL	not detectable	MAC	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Fecal Coliform	CFU/100mL			1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Coliforms	CFU/100mL	not detectable	MAC	1	**900**	**6**	<1	**14**	**4**	<1	<1	<1	**70**	<1	**CGTC**
Fecal Streptococcus	CFU/100mL			1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1

Table I6-1: Pre-Phase I Pumping Test
General Groundwater Chemistry, July 2008

Parameter	Units	ODWS		RDL	Bedrock Wells									
					MWB20		MWB21		MWB91-B	MWB22				
					MWB20-II-B	MWB20-II-C	MWB21-A	MWB21-B	Duplicate of MWB21-B	MWB22-I-A	MWB22-I-C	MWB22-II-B	MWB22-II-D	MWB23-I-A
					A	A	A	A	A	A	A	A	A	A
					15-Jul-08	15-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08
General Chemistry														
pH, field	no units	6.5 - 8.5	OG	-	7.17	7.12	7.0	7.30	-	7.19	7.14	7.10	7.08	7.15
pH, lab	no units	6.5 - 8.5	OG	-	8.45	8.38	8.23	8.26	8.27	8.29	8.10	8.11	8.21	8.41
Conductivity, field	uS/cm			2	540	550	590	710	-	537	530	534	651	508
Conductivity, lab	uS/cm			-	617	610	558	662	661	598	589	611	705	573
Temperature, field	degrees C	15	AO	-	11.3	11.5	11.6	10.1	-	9.9	10.0	10.7	9.4	9.9
Total Dissolved Solids (TDS)		500	AO	20	438	438	354	456	444	366	346	360	462	346
Turbidity	NTU	5[a]	AO	0.5	0.6	<0.5	0.6	0.9	0.7	1.4	**7.8**	0.8	1.1	**13**
Major and Minor Ions														
Alkalinity	mg/L	30-500	OG	5	243	264	268	269	271	231	288	264	259	230
Calcium	mg/L			0.05	84.0	84.0	87.6	112	113	98.9	90.0	95.4	115	94.9
Magnesium	mg/L			0.05	27.5	27.5	30.9	31.5	31.5	28.0	29.8	31.6	30.3	26.4
Sodium	mg/L	200[b]	AO	0.05	2.86	3.23	2.32	6.73	6.84	2.22	11.6	2.43	15.2	2.67
Potassium	mg/L			0.05	0.73	0.81	0.68	1.32	1.36	0.67	0.95	0.83	1.71	0.69
Chloride	mg/L	250	AO	0.10	12.4	9.45	5.84	9.42	9.36	13.4	7.71	11.6	18.5	15.5
Sulphate	mg/L	500[c]	AO	0.10	43.8	54.7	31.8	110	111	19.5	39.3	27.8	129	19.5
Fluoride	mg/L	1.5[d]	MAC	0.05	0.06	0.05	0.08	0.09	0.10	0.07	0.09	0.07	0.14	0.07
Bromide	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	0.12	0.05
Nutrients and other Constituents														
Nitrate as N	mg/L	10.0[e]	MAC	0.05	8.52	4.32	3.48	<0.05	<0.05	**15.0**	0.65	9.62	0.12	**11.8**
Nitrite as N	mg/L	1.0[e]	MAC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L			0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.61
Cyanide, free	mg/L	0.2	MAC	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Metals														
Arsenic	mg/L	0.025	IMAC	0.003	<0.003	<0.003	<0.003	0.007	0.007	<0.003	<0.003	<0.003	0.016	<0.003
Barium	mg/L	1	MAC	0.002	0.038	0.053	0.030	0.036	0.036	0.040	0.096	0.027	0.019	0.019
Boron	mg/L	5	IMAC	0.010	0.018	0.015	0.010	0.020	0.021	<0.010	<0.010	<0.010	0.040	0.013
Cadmium	mg/L	0.005	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.05	MAC	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Copper	mg/L	1	AO	0.002	N/A	N/A	0.002	<0.002	<0.002	N/A	N/A	N/A	N/A	<0.002
Iron	mg/L	0.3	AO	0.010	<0.010	<0.010	<0.010	0.146	0.133	0.013	0.040	<0.010	0.260	0.010
Lead	mg/L	0.01[f]	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L			0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.004	<0.003
Zinc	mg/L	5	AO	0.005	0.033	0.032	0.035	0.005	0.006	0.011	0.028	0.018	0.013	0.008
Mercury	mg/L	0.001	MAC	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Microbiological Analysis														
Escherichia coli	CFU/100mL	not detectable	MAC	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Fecal Coliform	CFU/100mL			1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Coliforms	CFU/100mL	not detectable	MAC	1	<1	<1	**CGTC**	**8**	**6**	**CGTC**	**30**	**CGTC**	**1**	**CGTC**
Fecal Streptococcus	CFU/100mL			1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Table I6-1: Pre-Phase I Pumping Test
General Groundwater Chemistry, July 2008

Parameter	Units	ODWS		RDL	Bedrock Wells								
					MWB23			MWB24					
					MWB98-A				MWB96-A				
					Duplicate of MWB23-I-A	MWB23-II-B	MWB23-II-C	MWB24-I-A	Duplicate of MWB24-I-A	MWB24-I-B	MWB24-II-C	MWB24-II-D	MWB25-I-A
					A	A	A	A	A	A	A	A/R	A
					16-Jul-08	16-Jul-08	16-Jul-08	17-Jul-08	17-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	15-Jul-08
General Chemistry													
pH, field	no units	6.5 - 8.5	OG	-	-	7.11	7.20	7.14	-	7.28	7.24	7.27	7.44
pH, lab	no units	6.5 - 8.5	OG	-	8.43	8.04	8.15	8.16	7.80	8.34	8.32	8.26	8.48
Conductivity, field	uS/cm			2	-	540	650	680	-	685	629	1,280	609
Conductivity, lab	uS/cm			-	573	605	632	769	862	635	593	1,170	613
Temperature, field	degrees C	15	AO	-	-	9.9	9.6	**15.5**	-	11.5	11.3	11.0	8.4
Total Dissolved Solids (TDS)		500	AO	20	370	404	398	**542**	**530**	416	366	**838**	376
Turbidity	NTU	5[a]	AO	0.5	**10**	<0.5	1.2	0.9	1.3	1.4	0.8	1.0	0.7
Major and Minor Ions													
Alkalinity	mg/L	30-500	OG	5	237	293	270	276	251	300	296	245	338
Calcium	mg/L			0.05	85.4	97.3	106	114	119	96.4	90.3	174	76.9
Magnesium	mg/L			0.05	23.7	32.4	30.6	36.5	36.3	35.1	31.4	33.2	35.6
Sodium	mg/L	200[b]	AO	0.05	2.46	2.95	4.26	9.04	24.0	2.88	3.40	61.8	2.42
Potassium	mg/L			0.05	0.50	0.90	1.24	0.76	0.78	1.00	0.96	6.03	1.47
Chloride	mg/L	250	AO	0.10	15.5	10.2	9.26	57.3	54.2	17.6	10.1	48.6	5.35
Sulphate	mg/L	500[c]	AO	0.10	19.5	35.5	67.2	54.5	111	27.2	37.0	346	21.7
Fluoride	mg/L	1.5[d]	MAC	0.05	0.08	0.08	0.10	<0.05	0.05	0.07	0.08	0.25	<0.05
Bromide	mg/L			0.05	0.06	<0.05	<0.05	0.65	0.63	0.15	<0.05	0.42	<0.05
Nutrients and other Constituents													
Nitrate as N	mg/L	10.0[e]	MAC	0.05	**11.9**	4.21	1.11	4.92	4.30	4.13	1.03	<0.05	1.28
Nitrite as N	mg/L	1.0[e]	MAC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L			0.02	0.69	N/A	N/A	<0.02	<0.02	N/A	N/A	N/A	N/A
Cyanide, free	mg/L	0.2	MAC	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Metals													
Arsenic	mg/L	0.025	IMAC	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**0.062**	<0.003
Barium	mg/L	1	MAC	0.002	0.019	0.033	0.070	0.024	0.024	0.012	0.044	0.034	0.013
Boron	mg/L	5	IMAC	0.010	0.012	<0.010	0.013	0.012	0.011	0.011	0.012	0.190	0.011
Cadmium	mg/L	0.005	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.05	MAC	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Copper	mg/L	1	AO	0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Iron	mg/L	0.3	AO	0.010	0.023	<0.010	0.071	0.033	<0.010	0.016	<0.010	**0.707**	0.015
Lead	mg/L	0.01[f]	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L			0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zinc	mg/L	5	AO	0.005	0.016	0.025	0.009	0.017	0.022	0.043	0.066	0.012	0.026
Mercury	mg/L	0.001	MAC	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Microbiological Analysis													
Escherichia coli	CFU/100mL	not detectable	MAC	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Fecal Coliform	CFU/100mL			1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Coliforms	CFU/100mL	not detectable	MAC	1	**CGTC**	<1	<1	<1	<1	<1	**14**	<1	**9**
Fecal Streptococcus	CFU/100mL			1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Table I6-1: Pre-Phase I Pumping Test
General Groundwater Chemistry, July 2008

Parameter	Units	ODWS		RDL	Bedrock Wells									
					MWB25			MWB26				MWB28		
					MWB25-II-B	MWB25-III-C	MWB25-III-D	MWB26-I-A	MWB26-I-B	MWB26-II-C	MWB26-II-D	MWB28-A	MWB28-B	MWO1-I-A
					A	A	A/R	A	A	A	A/R	A	A	
					15-Jul-08	15-Jul-08	15-Jul-08	17-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	17-Jul-08	17-Jul-08	15-Jul-08
General Chemistry														
pH, field	no units	6.5 - 8.5	OG	-	7.14	7.19	7.13	6.92	7.31	7.17	7.27	7.41	7.22	7.12
pH, lab	no units	6.5 - 8.5	OG	-	8.40	8.47	8.42	8.44	8.32	8.35	8.11	8.27	8.09	8.29
Conductivity, field	uS/cm			2	622	623	716	604	623	666	927	487	563	838
Conductivity, lab	uS/cm			-	626	636	731	573	595	621	842	479	549	812
Temperature, field	degrees C	15	AO	-	8.8	9.2	8.9	**16.1**	11.0	10.4	10.5	9.2	9.25	**16.6**
Total Dissolved Solids (TDS)		500	AO	20	408	408	**522**	368	364	384	**594**	288	334	**518**
Turbidity	NTU	5[a]	AO	0.5	1.8	4.9	2.5	1.5	1.4	0.8	1.4	0.6	0.7	**15**
Major and Minor Ions														
Alkalinity	mg/L	30-500	OG	5	327	306	251	184	228	314	246	202	248	383
Calcium	mg/L			0.05	82.7	85.8	99.0	81.3	89.9	96.7	137	71.8	83.1	98.2
Magnesium	mg/L			0.05	32.8	33.8	28.8	25.9	29.5	32.8	31.8	23.3	28.0	37.9
Sodium	mg/L	200[b]	AO	0.05	4.37	4.91	16.8	2.23	2.53	3.99	20.7	1.13	2.44	18.2
Potassium	mg/L			0.05	0.96	0.69	1.89	1.05	1.09	0.93	2.51	0.36	0.55	1.21
Chloride	mg/L	250	AO	0.10	10.6	10.8	16.1	15.8	14.7	11.1	20.6	9.75	7.76	32.2
Sulphate	mg/L	500[c]	AO	0.10	36.3	36.4	129	16.8	21.8	38.7	192	13.4	25.3	40.1
Fluoride	mg/L	1.5[d]	MAC	0.05	0.05	<0.05	0.09	0.06	0.09	0.07	0.17	0.05	0.05	<0.05
Bromide	mg/L			0.05	<0.05	<0.05	0.13	0.05	0.06	<0.05	0.19	<0.05	<0.05	<0.05
Nutrients and other Constituents														
Nitrate as N	mg/L	10.0[e]	MAC	0.05	0.31	0.21	<0.05	**21.9**	**14.8**	0.10	0.07	9.06	4.68	0.06
Nitrite as N	mg/L	1.0[e]	MAC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L			0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.35
Cyanide, free	mg/L	0.2	MAC	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Metals														
Arsenic	mg/L	0.025	IMAC	0.003	<0.003	<0.003	0.008	<0.003	<0.003	<0.003	**0.043**	<0.003	<0.003	<0.003
Barium	mg/L	1	MAC	0.002	0.038	0.033	0.046	0.049	0.031	0.108	0.027	0.008	0.025	0.085
Boron	mg/L	5	IMAC	0.010	0.010	0.011	0.050	<0.010	<0.010	0.011	0.067	<0.010	0.011	0.018
Cadmium	mg/L	0.005	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.05	MAC	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.004
Copper	mg/L	1	AO	0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Iron	mg/L	0.3	AO	0.010	0.111	0.028	0.154	<0.010	0.015	**0.319**	**0.599**	<0.010	<0.010	0.014
Lead	mg/L	0.01[f]	MAC	0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L			0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zinc	mg/L	5	AO	0.005	0.101	0.058	0.015	0.036	0.043	0.081	0.016	0.017	0.025	0.012
Mercury	mg/L	0.001	MAC	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Microbiological Analysis														
Escherichia coli	CFU/100mL	not detectable	MAC	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Fecal Coliform	CFU/100mL			1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Coliforms	CFU/100mL	not detectable	MAC	1	**CGTC**	**CGTC**	<1	<1	<1	<1	**9**	<1	<1	**2,200**
Fecal Streptococcus	CFU/100mL			1	<1	<1	<1	<1	<1	<1	<1	<1	<1	10

Table I6-1: Pre-Phase I Pumping Test
General Groundwater Chemistry, July 2008

Parameter	Units	ODWS		RDL	Overburden Wells					
					MW01					
					MWO1-I-B	MWO1-II-C	MWO2	MWO5	MWO8	MWO12
					15-Jul-08	16-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	17-Jul-08
General Chemistry										
pH, field	no units	6.5 - 8.5	OG	-	7.09	7.13	7.23	7.69	7.03	7.34
pH, lab	no units	6.5 - 8.5	OG	-	7.93	8.25	8.38	8.46	8.42	8.27
Conductivity, field	uS/cm			2	780	822	693	673	526	583
Conductivity, lab	uS/cm			-	744	770	672	713	540	597
Temperature, field	degrees C	15	AO	-	12.4	13.0	**15.7**	13.5	**15.3**	17.2
Total Dissolved Solids (TDS)		500	AO	20	480	450	448	406	338	350
Turbidity	NTU	5[a]	AO	0.5	**39**	**30**	2.6	**17**	3.5	1.8
Major and Minor Ions										
Alkalinity	mg/L	30-500	OG	5	300	322	291	357	265	318
Calcium	mg/L			0.05	82.1	98.6	79.1	67.5	87.9	82.9
Magnesium	mg/L			0.05	32.5	43.4	33.1	31.3	18.1	35.3
Sodium	mg/L	200[b]	AO	0.05	19.6	20.5	9.72	43.3	1.54	6.09
Potassium	mg/L			0.05	1.23	1.52	0.81	1.45	1.04	0.50
Chloride	mg/L	250	AO	0.10	43.0	41.2	23.3	5.05	4.51	9.60
Sulphate	mg/L	500[c]	AO	0.10	49.2	53.3	45.5	47.4	6.42	21.7
Fluoride	mg/L	1.5[d]	MAC	0.05	0.05	0.18	0.06	0.08	<0.05	0.05
Bromide	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nutrients and other Constituents										
Nitrate as N	mg/L	10.0[e]	MAC	0.05	<0.05	0.50	0.15	0.20	4.89	0.25
Nitrite as N	mg/L	1.0[e]	MAC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L			0.02	<0.02	0.04	0.47	0.68	<0.02	1.52
Cyanide, free	mg/L	0.2	MAC	0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002
Metals										
Arsenic	mg/L	0.025	IMAC	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Barium	mg/L	1	MAC	0.002	0.090	0.058	0.086	0.031	0.018	0.025
Boron	mg/L	5	IMAC	0.010	0.015	0.016	0.022	0.016	0.022	0.015
Cadmium	mg/L	0.005	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.05	MAC	0.003	<0.003	0.004	<0.003	<0.003	<0.003	<0.003
Copper	mg/L	1	AO	0.002	N/A	N/A	N/A	N/A	N/A	N/A
Iron	mg/L	0.3	AO	0.010	0.084	0.049	<0.010	0.156	0.011	0.032
Lead	mg/L	0.01[f]	MAC	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L			0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zinc	mg/L	5	AO	0.005	<0.005	0.009	0.013	0.021	0.016	0.043
Mercury	mg/L	0.001	MAC	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Microbiological Analysis										
Escherichia coli	CFU/100mL	not detectable	MAC	1	<1	<1	<1	<1	<1	**CGEC**
Fecal Coliform	CFU/100mL			1	<1	<1	<1	<1	<1	5
Total Coliforms	CFU/100mL	not detectable	MAC	1	**4**	<1	**CGTC**	**CGTC**	**300**	**CGTC**
Fecal Streptococcus	CFU/100mL			1	96	<1	30	20	120	12,000

Notes:

ODWS = Ontario Drinking Water Standards (Ministry of the Environment, 2006).
OG = Operational Guideline.
AO = Aesthetic Objective.
MAC = Maximum Allowable Concentration.
IMAC = Interim Allowable Concentration.
Blank cells indicate no ODWS exists.
- denotes data not provided/collected/calculated.
N/A = not applicable, not included under initial analyte list.
RDL = Reported Detection Limit.
Bold and shaded indicates an exceedance of the ODWS.
CGTC = Confluent Growth Total Coliform. Indicates the bacteria present other than Escherichia coli, fecal coliform or fecal streptococcus were too numerous to count.
CGEC = Confluent Growth E. Coli. Indicates that the Escherichia coli were too numerous to count.
NTU - Nephelometric Turbidity Units.

[a] *Applicable for all waters at the point of consumption.*

[b] *The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.*

[c] *When sulphate levels exceed 500 mg/L, water may have a laxative effect on some people.*

[d] *Where fluoride is added to drinking water, it is recommended that the concentration be adjusted to 0.5 to 0.8 mg/L the optimum level for control of tooth decay. Where supplies contain naturally occurring fluoride at levels higher than 1.5 mg/L but less than 2.4 mg/L the Ministry of Health and Long Term Care recommends an approach through local boards of health to raise public and professional awareness to control excessive exposure to fluoride from other sources.*

[e] *Where both nitrate and nitrite are present, the total of the two should not exceed 10 mg/L (as nitrogen).*

[f] *This standard applies to water at the point of consumption. Since lead is a component in some plumbing systems, first flush water may contain higher concentrations of lead than water that has been flushed for five minutes.*

Gartner Lee

Table I6-2: Summary of Pre-test Monitoring Well Chemistry

Volatile Organic Compounds and Polycyclic Biphenyls

GLL 60702

Parameter	Units	ODWS		RDL	Bedrock Wells												
					TW15			MWB1				MWB4			MWB6		
					TW15-A	TW15-B	TW15-C	MWB1-I-A	MWB1-II-B	MWB1-II-C	MWB95-A Duplicate of MWB1-II-C	MWB4-I-A	MWB4-II-B	MWB4-II-C	MWB6-I-A	MWB6-II-B	MWB6-II-C
					17-Jul-08	17-Jul-08	17-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	17-Jul-08	16-Jul-08	17-Jul-08	17-Jul-08	17-Jul-08
Volatile Organic Compounds (VOCs)																	
Chloromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Vinyl Chloride	µg/L	2	MAC	0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Acetone	µg/L			0.50	<0.50	<0.50	**12**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1 Dichloroethene	µg/L	14	MAC	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methylene Chloride (Dichloromethane)	µg/L	50	MAC	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans- 1,2-dichloroethylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L			0.90	<0.90	**3.4**	**250**	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
cis- 1,2-Dichloroethylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2 - Dichloroethane	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzene	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L	50	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,3-Dichloropropene	ug/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1,2-Trichloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	24	AO	0.20	<0.20	<0.20	**17**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Hexanone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dibromochloromethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Tetrachloroethene	µg/L	30	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,1,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	µg/L	2.4	AO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L	300	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromoform	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Styrene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L	300	AO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L	5	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L	200	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2,4-Trichlorobenzene	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (Cis + Trans)	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Xylenes (Total)	µg/L	300	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Polycyclic Biphenyls (PCBs)																	
PCBs	ug/L	0.003	IMAC	0.20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

Wells highlighted in green denotes Sentinel Monitoring Wells and Assigned Trigger Drawdown Wells

ODWS = Ontario Drinking Water Standards (Ministry of the Environment, 2006).

OG = Operational Guideline.

AO = Aesthetic Objective.

MAC = Maximum Allowable Concentration.

IMAC = Interim Allowable Concentration.

Blank cells indicate no ODWS exists.

N/A = Not applicable, not included under initial analyte list.

RDL = Reported Detection Limit.

Bold denotes a detected concentration above RDL.

Shaded indcates an exceedance of the ODWS.

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Table I6-2: Summary of Pre-test Monitoring Well Chemistry

Volatile Organic Compounds and Polycyclic Biphenyls

GLL 60702

Parameter	Units	ODWS		RDL	Bedrock Wells										
					MWB7				MWB8			MWB10			
					MWB7-I-A	MWB7-II-B	MWB7-II-C	MWB90-A Duplicate of MW7-II-C	MWB8-I-A	MWB8-II-B	MWB8-II-C	MWB10-I-A	MWB92-A Duplicate of MWB10-I-A	MWB10-I-B	MWB10-I-C
					15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08
Volatile Organic Compounds (VOCs)															
Chloromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Vinyl Chloride	µg/L	2	MAC	0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Acetone	µg/L			0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1 Dichloroethene	µg/L	14	MAC	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methylene Chloride (Dichloromethane)	µg/L	50	MAC	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans- 1,2-dichloroethylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L			0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
cis- 1,2-Dichloroethylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2 - Dichloroethane	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzene	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L	50	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,3-Dichloropropene	ug/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1,2-Trichloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	24	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Hexanone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dibromochloromethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Tetrachloroethene	µg/L	30	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,1,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	µg/L	2.4	AO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L	300	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromoform	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Styrene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L	300	AO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L	5	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L	200	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2,4-Trichlorobenzene	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (Cis + Trans)	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Xylenes (Total)	µg/L	300	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Polycyclic Biphenyls (PCBs)															
PCBs	ug/L	0.003	IMAC	0.20	<0.2	<0.2	<0.2	<0.2	N/A	N/A	N/A	<0.2	<0.2	<0.2	<0.2

Notes:

Wells highligted in green denotes Sentinel Monitoring Wells and Assigned Trigger Drawdown Wells

ODWS = Ontario Drinking Water Standards (Ministry of the Environment, 2006).

OG = Operational Guideline.

AO = Aesthetic Objective.

MAC = Maximum Allowable Concentration.

IMAC = Interim Allowable Concentration.

Blank cells indicate no ODWS exists.

N/A = Not applicable, not included under initial analyte list.

RDL = Reported Detection Limit.

Bold denotes a detected concentration above RDL.

Shaded indcates an exceedance of the ODWS.

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Table I6-2: Summary of Pre-test Monitoring Well Chemistry

Volatile Organic Compounds and Polycyclic Biphenyls

GLL 60702

Parameter	Units	ODWS		RDL	Bedrock Wells												
					MWB12			MWB18		MWB19		MWB20			MWB21		
					MWB12-A	MWB12-B	MWB12-C	MWB18-A	MWB18-B	MWB19-A	MWB19-B	MWB20-I-A	MWB20-II-B	MWB20-II-C	MWB21-A	MWB21-B	MWB91-B Duplicate of MWB21-B
					16-Jul-08	16-Jul-08	16-Jul-08	17-Jul-08	17-Jul-08	17-Jul-08	17-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08
Volatile Organic Compounds (VOCs)																	
Chloromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Vinyl Chloride	µg/L	2	MAC	0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Acetone	µg/L			0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1 Dichloroethene	µg/L	14	MAC	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methylene Chloride (Dichloromethane)	µg/L	50	MAC	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans- 1,2-dichloroethylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L			0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
cis- 1,2-Dichloroethylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2 - Dichloroethane	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzene	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L	50	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,3-Dichloropropene	ug/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1,2-Trichloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	24	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Hexanone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dibromochloromethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Tetrachloroethene	µg/L	30	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,1,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	µg/L	2.4	AO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L	300	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromoform	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Styrene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L	300	AO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L	5	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L	200	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2,4-Trichlorobenzene	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (Cis + Trans)	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Xylenes (Total)	µg/L	300	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Polycyclic Biphenyls (PCBs)																	
PCBs	ug/L	0.003	IMAC	0.20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<0.2	<0.2	<0.2

Notes:

Wells highligted in green denotes Sentinel Monitoring Wells and Assigned Trigger Drawdown Wells

ODWS = Ontario Drinking Water Standards (Ministry of the Environment, 2006).

OG = Operational Guideline.

AO = Aesthetic Objective.

MAC = Maximum Allowable Concentration.

IMAC = Interim Allowable Concentration.

Blank cells indicate no ODWS exists.

N/A = Not applicable, not included under initial analyte list.

RDL = Reported Detection Limit.

Bold denotes a detected concentration above RDL.

Shaded indcates an exceedance of the ODWS.

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Table I6-2: Summary of Pre-test Monitoring Well Chemistry

Volatile Organic Compounds and Polycyclic Biphenyls

GLL 60702

Parameter	Units	ODWS		RDL	Bedrock Wells											
					MWB22				MWB23				MWB24			
					MWB22-I-A	MWB22-I-C	MWB22-II-C	MWB22-II-D	MWB23-I-A	MWB98-A Duplicate of MWB23-I-A	MWB23-II-B	MWB23-II-C	MWB24-I-A	MWB96-A Duplicate of MWB24-I-A	MWB24-I-B	MWB24-II-C
					16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	17-Jul-08	17-Jul-08	16-Jul-08	16-Jul-08
Volatile Organic Compounds (VOCs)																
Chloromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Vinyl Chloride	µg/L	2	MAC	0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Acetone	µg/L			0.50	<0.50	**3**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1 Dichloroethene	µg/L	14	MAC	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methylene Chloride (Dichloromethane)	µg/L	50	MAC	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans- 1,2-dichloroethylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L			0.90	<0.90	**27**	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
cis- 1,2-Dichloroethylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2 - Dichloroethane	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzene	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L	50	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,3-Dichloropropene	ug/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1,2-Trichloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	24	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Hexanone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dibromochloromethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Tetrachloroethene	µg/L	30	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,1,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	µg/L	2.4	AO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L	300	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromoform	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Styrene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L	300	AO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L	5	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L	200	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2,4-Trichlorobenzene	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (Cis + Trans)	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Xylenes (Total)	µg/L	300	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Polycyclic Biphenyls (PCBs)																
PCBs	ug/L	0.003	IMAC	0.20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

Wells highligted in green denotes Sentinel Monitoring Wells and Assigned Trigger Drawdown Wells

ODWS = Ontario Drinking Water Standards (Ministry of the Environment, 2006).

OG = Operational Guideline.

AO = Aesthetic Objective.

MAC = Maximum Allowable Concentration.

IMAC = Interim Allowable Concentration.

Blank cells indicate no ODWS exists.

N/A = Not applicable, not included under initial analyte list.

RDL = Reported Detection Limit.

Bold denotes a detected concentration above RDL.

Shaded indcates an exceedance of the ODWS.

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Parameter	Units	ODWS		RDL	MWB24-II-D 16-Jul-08
Volatile Organic Compounds (VOCs)					
Chloromethane	µg/L			0.40	<0.40
Vinyl Chloride	µg/L	2	MAC	0.17	<0.17
Bromomethane	µg/L			0.20	<0.20
Chloroethane	µg/L			0.20	<0.20
Trichlorofluoromethane	µg/L			0.40	<0.40
Acetone	µg/L			0.50	<0.50
1,1 Dichloroethene	µg/L	14	MAC	0.30	<0.30
Methylene Chloride (Dichloromethane)	µg/L	50	MAC	0.30	<0.30
trans- 1,2-dichloroethylene	µg/L			0.20	<0.20
Methyl tert-butyl ether	µg/L			0.20	<0.20
1,1-Dichloroethane	µg/L			0.30	<0.30
Methyl Ethyl Ketone	µg/L			0.90	<0.90
cis- 1,2-Dichloroethylene	µg/L			0.20	<0.20
Chloroform	µg/L			0.20	<0.20
1,2 - Dichloroethane	µg/L	5	MAC	0.20	<0.20
1,1,1-Trichloroethane	µg/L			0.30	<0.30
Carbon Tetrachloride	µg/L	5	MAC	0.20	<0.20
Benzene	µg/L	5	MAC	0.20	<0.20
1,2-Dichloropropane	µg/L			0.20	<0.20
Trichloroethylene	µg/L	50	MAC	0.20	<0.20
Bromodichloromethane	µg/L			0.20	<0.20
cis-1,3-Dichloropropene	ug/L			0.20	<0.20
Methyl Isobutyl Ketone	µg/L			0.30	<0.30
trans-1,3-Dichloropropene	µg/L			0.30	<0.30
1,1,2-Trichloroethane	µg/L			0.20	<0.20
Toluene	µg/L	24	AO	0.20	<0.20
2-Hexanone	µg/L			0.30	<0.30
Dibromochloromethane	µg/L			0.10	<0.10
Ethylene Dibromide	µg/L			0.20	<0.20
Tetrachloroethene	µg/L	30	MAC	0.10	<0.10
1,1,1,2-Tetrachloroethane	µg/L			0.10	<0.10
Chlorobenzene	µg/L			0.10	<0.10
Ethylbenzene	µg/L	2.4	AO	0.10	<0.10
m & p-Xylene	µg/L	300	AO	0.20	<0.20
Bromoform	µg/L			0.10	<0.10
Styrene	µg/L			0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L			0.10	<0.10
o-Xylene	µg/L	300	AO	0.10	<0.10
1,3-Dichlorobenzene	µg/L			0.10	<0.10
1,4-Dichlorobenzene	µg/L	5	MAC	0.10	<0.10
1,2-Dichlorobenzene	µg/L	200	MAC	0.10	<0.10
1,2,4-Trichlorobenzene	µg/L			0.30	<0.30
1,3-Dichloropropene (Cis + Trans)	µg/L			0.30	<0.30
Xylenes (Total)	µg/L	300	AO	0.20	<0.20
Total Polycyclic Biphenyls (PCBs)					
PCBs	ug/L	0.003	IMAC	0.20	N/A

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Table I6-2: Summary of Pre-test Monitoring Well Chemistry

Volatile Organic Compounds and Polycyclic Biphenyls

GLL 60702

Parameter	Units	ODWS		RDL	Bedrock Wells									
					MWB25				MWB26				MWB28	
					MWB25-I-A	MWB25-II-B	MWB25-III-C	MWB25-III-D	MWB26-I-A	MWB26-I-B	MWB26-II-C	MWB26-II-D	MWB28-A	MWB28-B
					15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	17-Jul-08	16-Jul-08	16-Jul-08	16-Jul-08	17-Jul-08	17-Jul-08
Volatile Organic Compounds (VOCs)														
Chloromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Vinyl Chloride	µg/L	2	MAC	0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Acetone	µg/L			0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1 Dichloroethene	µg/L	14	MAC	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methylene Chloride (Dichloromethane)	µg/L	50	MAC	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans- 1,2-dichloroethylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L			0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
cis- 1,2-Dichloroethylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2 - Dichloroethane	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzene	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L	50	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,3-Dichloropropene	ug/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1,2-Trichloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	24	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Hexanone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dibromochloromethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Tetrachloroethene	µg/L	30	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,1,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	µg/L	2.4	AO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L	300	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromoform	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Styrene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L	300	AO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L	5	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L	200	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2,4-Trichlorobenzene	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (Cis + Trans)	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Xylenes (Total)	µg/L	300	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Polycyclic Biphenyls (PCBs)														
PCBs	ug/L	0.003	IMAC	0.20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

Wells highligted in green denotes Sentinel Monitoring Wells and Assigned Trigger Drawdown Wells

ODWS = Ontario Drinking Water Standards (Ministry of the Environment, 2006).

OG = Operational Guideline.

AO = Aesthetic Objective.

MAC = Maximum Allowable Concentration.

IMAC = Interim Allowable Concentration.

Blank cells indicate no ODWS exists.

N/A = Not applicable, not included under initial analyte list.

RDL = Reported Detection Limit.

Bold denotes a detected concentration above RDL.

Shaded indcates an exceedance of the ODWS.

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Table I6-2: Summary of Pre-test Monitoring Well Chemistry

Volatile Organic Compounds and Polycyclic Biphenyls

GLL 60702

Parameter	Units	ODWS		RDL	Overburden Wells						
					MW01						
					MW01-I-A	MW01-I-B	MW01-II-C	MW02	MW05	MW08	MW012
					15-Jul-08	15-Jul-08	16-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	17-Jul-08
Volatile Organic Compounds (VOCs)											
Chloromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Vinyl Chloride	µg/L	2	MAC	0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Acetone	µg/L			0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1 Dichloroethene	µg/L	14	MAC	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methylene Chloride (Dichloromethane)	µg/L	50	MAC	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans- 1,2-dichloroethylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L			0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
cis- 1,2-Dichloroethylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2 - Dichloroethane	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzene	µg/L	5	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L	50	MAC	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,3-Dichloropropene	ug/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1,2-Trichloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	24	AO	0.20	**0.32**	**0.47**	<0.20	**0.28**	<0.20	<0.20	<0.20
2-Hexanone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dibromochloromethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Tetrachloroethene	µg/L	30	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,1,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	µg/L	2.4	AO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L	300	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromoform	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Styrene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L	300	AO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L	5	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L	200	MAC	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2,4-Trichlorobenzene	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (Cis + Trans)	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Xylenes (Total)	µg/L	300	AO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Polycyclic Biphenyls (PCBs)											
PCBs	ug/L	0.003	IMAC	0.20	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

Wells highligted in green denotes Sentinel Monitoring Wells and Assigned Trigger Drawdown Wells

ODWS = Ontario Drinking Water Standards (Ministry of the Environment, 2006).

OG = Operational Guideline.

AO = Aesthetic Objective.

MAC = Maximum Allowable Concentration.

IMAC = Interim Allowable Concentration.

Blank cells indicate no ODWS exists.

N/A = Not applicable, not included under initial analyte list.

RDL = Reported Detection Limit.

Bold denotes a detected concentration above RDL.

Shaded indcates an exceedance of the ODWS.

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Table I6-3: Summary of Discharge Water Chemistry

General Chemistry, Major and Minor Ions, Nutrients and Other Constituents, Metals

GLL 60702

Parameter	Units	PWQO		RDL	TW 14	TW 14	TW 14	TW 14	TW 14	TW 14	TW 14	TW 14	TW 14
					18-Jul-08 Baseline	22-Jul-08 15:30	23-Jul-08 15:30	24-Jul-08 15:30	25-Jul-08 10:00	26-Jul-08 08:30	27-Jul-08 08:30	28-Jul-08 13:00	29-Jul-08 09:30
General Chemistry													
pH, field	no units	6.5-8.5	PWQO	-	6.99	-	7.26	7.21	7.25	7.28	7.29	7.28	7.36
pH, lab	no units	6.5-8.5	PWQO	-	8.31	8.28	8.20	7.99	8.29	8.32	8.19	8.19	8.16
Conductivity, field	uS/cm			2	649	-	569	560	561	563	567	562	569
Conductivity, lab	uS/cm			-	611	601	603	595	597	601	603	599	600
Temperature, field	degrees C			-	11.35	-	10.7	11.5	11.4	11.0	11.1	11.9	11.1
Total Dissolved Solids (TDS)				20	386	380	380	372	382	382	378	376	380
Turbidity	NTU			0.5	1.8	0.7	0.7	0.8	0.8	0.7	0.7	<0.5	0.5
Major and Minor Ions													
Alkalinity	mg/L			5	289	285	262	270	257	278	266	252	268
Calcium	mg/L			0.05	87.2	87.2	86.5	85.9	86.2	86.4	85.5	88.7	88.6
Magnesium	mg/L			0.05	29.9	29.1	28.6	28.5	28.6	28.6	28.6	29.4	29.3
Sodium	mg/L			0.05	4.38	4.86	4.89	4.83	4.84	4.98	4.98	5.2	5.15
Potassium	mg/L			0.05	0.99	1.08	1.07	1.06	1.06	1.07	1.08	1.12	1.12
Chloride	mg/L			0.1	10.3	9.85	9.7	8.74	8.64	8.77	9.25	8.83	8.85
Sulphate	mg/L			0.1	48.1	54.3	55.8	55.6	55.7	57.6	57.9	57.6	57.8
Fluoride	mg/L			0.05	0.10	0.07	0.07	<0.05	0.05	0.07	0.06	0.1	0.1
Bromide	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nutrients and Other Constituents													
Nitrate as N	mg/L			0.05	2.38	2.13	2.16	2.09	2.06	2.00	2.05	1.97	1.95
Nitrite as N	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Unionized Ammonia	mg/L	0.02	PWQO[a]	-	0.00004	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Cyanide, free	mg/L	0.005	PWQO	0.002	<0.002	<0.002	**0.016**	**0.016**	<0.002	<0.002	<0.002	<0.002	<0.002
Metals													
Arsenic	mg/L	0.1	PWQO[b]	0.003	<0.003	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.007
Barium	mg/L			0.002	0.088	0.08	0.08	0.076	0.073	0.073	0.074	0.073	0.072
Boron	mg/L	0.2	IPWQO	0.01	0.013	0.015	0.016	0.015	0.017	0.017	0.017	0.017	0.018
Cadmium	mg/L	0.0002	PWQO[b]	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.0089	PWQO	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Copper	mg/L	0.005	PWQO[b]	0.002	N/A	<0.002	0.002	0.002	0.003	<0.002	<0.002	N/A	N/A
Iron	mg/L	0.3	PWQO	0.01	0.095	0.171	0.191	0.116	0.106	0.114	0.077	0.106	0.108
Lead	mg/L	0.005	PWQO[b]	0.001	0.003	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001
Nickel	mg/L	0.025	PWQO	0.003	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003
Zinc	mg/L	0.03	PWQO[b]	0.005	**0.056**	**0.037**	**0.098**	**0.052**	**0.039**	**0.032**	**0.035**	0.034	**0.037**
Mercury	mg/L	0.0002	PWQO	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Microbiological Analysis													
Escherichia coli	CFU/100mL	100 E. coli/ 100 L[c]		1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Fecal Coliform	CFU/100mL	100 counts/ 100 mL[d]		1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Coliforms	CFU/100mL	1000 counts/100 mL[d]		1	<1	6	20	[e]	[e]	<1	<1	7	6
Fecal Streptococcus	CFU/100mL			1	<1	<1	1	<1	1	<1	<1	<1	<1

Notes:

PWQO = Provincial Water Quality Objectives, Ministry of the Environment, Revised 1999.
IPWQO = Interim Provincial Water Quality Objective.
Blank cells indicate no PWQO or IPWQO exist.
- denotes data not provided/collected/calculated.
N/A = Not applicable, not included under initial analyte list.
RDL = Reported Detection Limit.
Bold and Shaded indicates concentration exceeds applicable PWQO/IPWQO.
NTU - Nephelometric Turbidity Units.

[a] *Un-ionized Ammonia concentration was calculated using the formula presented in the PWQO document. Where the total ammonia concentration was less than the Reported Detection Limit (RDL), a value equal to the RDL was employed to calculate the un-ionized ammonia concentration.*
[B] *Where a PWQO and IPWQO exist, the existing approved PWQO is presented.*
[c] *Objective based on a geometric mean of at least 5 samples.*
[d] *As of May 1, 1994 the MOE base all new compliance, enforcement and monitoring activities on the E. Coli test.*
Former objectives for Fecal Coliform and total coliform are provided for reference to historical data if applicable.
[e] *Total coliform samples submitted to AGAT Laboratories, however were not analyzed as a result of lab error.*

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Table I6-4: Summary of Discharge Water Chemistry

Volatile Organic Compounds and Polycyclic Biphenyls
GLL 60702

Parameter	Units	PWQO		RDL	TW 14	TW 14	TW 14	TW 14	TW 14	TW 14	TW 14	TW 14	TW 14
					18-Jul-08 Baseline	22-Jul-08 15:30	23-Jul-2008 15:30	24-Jul-2008 15:30	25-Jul-08 10:00	26-Jul-08 08:30	27-Jul-08 08:30	28-Jul-08 13:00	29-Jul-08 09:30
Volatile Organic Compounds (VOCs)													
Chloromethane	µg/L	700	IPWQO	0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Vinyl Chloride	µg/L	400	IPWQO	0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L	0.9	IPWQO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroethane	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L			0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Acetone	µg/L			0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1 Dichloroethene	µg/L	40	IPWQO	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methylene Chloride	µg/L	100	IPWQO	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans- 1,2-dichloroethylene	µg/L	200	IPWQO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L	200	IPWQO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L	200	IPWQO	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L	400	IPWQO	0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
cis- 1,2-Dichloroethylene	µg/L	200	IPWQO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2 - Dichloroethane	µg/L	100	IPWQO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzene	µg/L	100	IPWQO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L	0.7	IPWQO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L	20	IPWQO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L	200	IPWQO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,3-Dichloropropene	ug/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	µg/L	7	IPWQO	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1,2-Trichloroethane	µg/L	800	IPWQO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	0.8	IPWQO	0.20	**1.3**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Hexanone	µg/L			0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dibromochloromethane	µg/L	40	IPWQO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L	5	IPWQO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Tetrachloroethene	µg/L	50	IPWQO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,1,2-Tetrachloroethane	µg/L	70	IPWQO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L	15	PWQO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethyl benzene	µg/L	8	IPWQO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L	2	IPWQO	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromoform	µg/L	60	IPWQO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Styrene	µg/L	4	IPWQO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L	40	IPWQO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L	2.5	PWQO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L	4	PWQO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L	2.5	PWQO	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2,4-Trichlorobenzene	µg/L	0.5	PWQO	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (Cis + Trans)	µg/L	7	IPWQO	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Xylenes (Total)	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Polycyclic Biphenyls (PCBs)													
PCBs	ug/L	0.001	PWQO	0.20	N/A	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Notes:

PWQO = Provincial Water Quality Objectives, Ministry of the Environment, Revised 1999.
IPWQO = Interim Provincial Water Quality Objective.
Blank cells indicate no PWQO or IPWQO exist.
N/A = Not applicable, not included under initial analyte list.
RDL = Reported Detection Limit.
Bold denotes a detected concentration above RDL.
Shading denotes an exceedance of the applicable PWQO/IPWQO.

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Table I6-5: Summary of Post-test Monitoring Well Chemistry

Metals and Polycyclic Bi-Phenyls

GLL 60702

Parameter	Units	ODWS		RDL	Bedrock Wells									Overburden Well
					MWB7			MWB10				MWB21		
					MWB7-I-A	MWB7-II-B	MWB7-II-C	MWB10-I-A	MWB10-I-B	MWB10-I-C	MWB10-II-D	MWB21-A	MWB21-B	MWO10
					14-Aug-08	14-Aug-08	14-Aug-08	14-Aug-08	14-Aug-08	14-Aug-08	14-Aug-08	14-Aug-08	14-Aug-08	14-Aug-08
Metals														
Copper	mg/L	1	AO	0.002	N/A	N/A	N/A	0.004	0.003	<0.003	0.004	0.004	0.003	N/A
Total Polycyclic Biphenyls (PCBs)														
PCBs	ug/L	0.003	IMAC	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Notes:

Wells highlighted in green denotes Sentinel Monitoring Wells and Assigned Trigger Drawdown Wells

ODWS = Ontario Drinking Water Standards (Ministry of the Environment, 2006).

AO = Aesthetic Objective.

IMAC = Interim Allowable Concentration.

N/A = not applicable, not included under initial analyte list.

RDL = Reported Detection Limit.

Bold and shaded indicates an exceedance of the ODWS.

Appendix J

GRS Technology - Supporting Documentation

Appendix J

Literature Review of Artificial Recharge Systems

1. Artificial Recharge Systems

1.1 Background

Artificial Recharge Systems are engineered systems in which water in put on or into the ground (recharge) for infiltration and subsequent movement to the underlying groundwater or put into wells for direct injection into a selected aquifer. Artificial Recharge Systems are inherently multi-disciplined, as they incorporate into their design the geology, ecology, hydrology, geochemistry and the social aspects of their planned use into the engineered design.

Artificial recharge can occur through a variety of methods. Passive infiltration methods such as open recharge wells, gravel filled trenches, or buried drains use gravity to allow downward migration (infiltration) of water from within the wells or trench to drain into an aquifer system. Indirect recharge of water through surface water features (ponds, lakes, etc) can also be used as passive systems. A common example of this practice is using infiltration lagoons or ponds for stormwater management.

Active systems such as injection wells, which pump water under pressure directly into an aquifer, are also commonplace. This practice is particularly common to site remediation projects worldwide where contaminated groundwater is removed from the ground, treated to an acceptable condition, and returned to the ground (i.e., pump and treat system).

1.2 How Does an Artificial Recharge System Function

An artificial recharge system increases the rate at which water infiltrates into the ground. This creates a localized recharge under and adjacent the artificial recharge system which artificially raises the level of the water table.

In cases where this system is used to mitigate a drawdown in the water table, the recharge location is typically constructed between the source of the drawdown, and the protected feature(s), thereby maintaining water levels which would otherwise be depressed or drawn down. As the recharge of groundwater occurs, it reduces the hydraulic gradient between the recharge area and the protected area. The amount of hydraulic gradient is what governs the rate at which groundwater moves. Therefore, by preventing a downward hydraulic gradient from developing as a result of a depression or drawdown in the aquifer, areas down-gradient of the recharge feature are protected from a loss of groundwater.

Conversely, the up-gradient side of a recharge area (between the recharge feature and the source of the drawdown) would have a steeper hydraulic gradient. This results in a potential draw of water from the recharge area. Therefore, the placement of a recharge feature is important. The further a recharge area is located away from the source of the drawdown, the lower the hydraulic gradient between these two features will be. If the recharge area is placed too close to the source of the drawdown, then the hydraulic gradient and therefore, the rate of groundwater flow, would be larger, causing much of the recharged water to be re-circulated between the source of the drawdown and the recharge area. A solution to this design challenge is to utilize low permeability barriers between a recharge system and the source of drawdown (i.e., site area limitations).

1.3 Common Types of Artificial Recharge Systems

As outlined in Section 1.1, there are various methods for artificially recharging water into the ground, depending on the designed purpose of the recharge system, the local geology, and size of a subject site. Typically, systems range from passive systems which increase the infiltration of water into the ground, to active systems which pump water directly into an aquifer.

Common examples of passive systems are recharge wells, gravel-filled trenches, infiltration lagoons, stormwater management ponds, etc. Passive systems store water until it infiltrates through the bottom of the structure into the groundwater system. These structures may be engineered to increase the rate of infiltration into the ground by increasing the permeability of the underlying soil or bedrock by removing low permeable soils (confining layers) or creating increased fractures in bedrock (by blasting). Passive systems using recharge wells or trenches are also commonly used to mitigate water table drawdown in areas where there is a high water table. Road construction dewatering programs as well as rock quarry dewatering both require excavations into the ground. Groundwater recharge systems are a common mitigation technique in these areas to prevent adverse impacts to adjacent features in these environments. A groundwater recharge system (GRS) has already been designed and approved for use at Dufferin Aggregates' Milton Quarry. Discharge of surplus water from a quarry is commonly used in Ontario to supplement the supply of water to surrounding seasonal and permanent seeps and wetlands.

Active recharge systems typically involve pressure-injection wells, which pump water into the ground. These systems can be more effective in recharging water into the ground, especially where there are deeper aquifer systems. Using injection wells may also return the abstracted water quicker to the aquifer system, thereby resulting in a minimal change in water temperature and chemistry as well as minimizing the rate of loss of water through evaporation which may occur from the water surface in many passive systems. Injection wells are utilized for a wide variety of projects, from returning abstracted water back to an aquifer system, to the injection of water to pressurize an aquifer to facilitate the removal of another substance such as oil and gas. Injection wells are common mitigation techniques to offset aquifer dewatering or to return contaminated water after it has been abstracted from the ground and treated. While active systems can be more effective by delivering more water to the recharge area, an obvious challenge to an active system is that they are inherently more intricate, and therefore, more costly and difficult to maintain as compared to a passive system.

1.4 Recharge Trenches

A recharge trench is an engineered construction which allows for water to be recharged into the ground through infiltration. Recharge trenches are commonly used to mitigate impacts to the groundwater level where withdrawal of the groundwater has resulted in a drawdown of water levels in the shallow groundwater system. A recharge trench is an excavation into the ground, ideally into the underlying aquifer. For a recharge trench to be most effective, the aquifer targeted for recharge of the water should be close to surface, where a trench can be excavated into it. This increases the total surface area of contact between the trench and the aquifer by reducing the thickness of the unsaturated zone which recharged water must pass through.

Recharge trenches are commonly used for a variety of projects worldwide to artificially input or recharge water into the ground, such as storage of stormwater in an aquifer system, mitigation of surface water features during road construction dewatering, mitigation adjacent aggregate operations (pits and quarries) or for the recharge of treated water at remediation sites (after treatment).

1.5 Recharge Wells

Whereas a pumping well removes water from the ground, a recharge well puts water back into the ground. Recharge wells are commonly used to direct surplus water from the surface (quarry sump) back into the groundwater system for mitigation purposes, regardless of the depth of the aquifer. Injection wells allow for the recharge of water into an underlying aquifer system which may have a lower permeability unit over top (aquitard). Recharge wells are also common in site remediation by removing contaminated water from the ground, treating the water to acceptable guidelines and returning the water to the ground.

Recharge wells are used to mitigate water level drawdown around areas which may be dewatered by returning removed groundwater back into the ground in between dewatered areas and areas that are to be protected.

A significant advantage to a recharge well system over a trench system is that there is less impact on the surficial natural environment during the construction of the well-based system. A trench system involves excavating a continuous trench (and typically a pathway or road for maintenance of the system) whereas a well system involves individual wells drilled at a spacing that results in less temporary (during construction) and permanent adverse impact on the surficial natural environment. Particularly when there is limited space to construct a GRS or where the system is in close proximity to areas that are to be protected from adverse effects, a well-based system is often preferred.

2. Artificial Recharge Systems in the Aggregate Industry

2.1 Why Use Artificial Recharge Systems in the Aggregate Industry

Extraction of bedrock resources for aggregate from below the water table requires a dry quarry floor for blasting and extraction operations. To facilitate a dry quarry floor, water is pumped out of the excavation. As a result of this removal of water, groundwater levels adjacent the quarry are lowered, producing a drawdown cone around the quarry. This drawdown feature may be localized or widespread, depending on the characteristics of the bedrock which is being dewatered. A significant drawdown cone has the potential to adversely affect a surrounding aquifer system, neighbouring water wells, and surface water features (wetlands, streams, etc.) which are connected to the aquifer system. A recharge feature, such as a recharge well or trench, allows extracted water to infiltrate back into the groundwater system. The recharge of groundwater through the GRS creates a recharge mound, raising water levels under and around the recharge system. The mound acts as a buffer between an area of drawdown, such as dewatering a quarry which has created a drawdown cone, and water levels on the opposite side of the recharge feature. Groundwater levels effect the direction of groundwater flow though the prevailing hydraulic gradient, therefore, a groundwater mound created using a recharge system would prevent depressed groundwater levels caused by dewatering a quarry from altering surrounding groundwater levels and direction of groundwater flow on the opposite site of the recharge feature.

2.2 Effectiveness in Maintaining Water Levels

The effectiveness in maintaining water levels or mitigating adverse drawdown effects is dependent on the proximity of the recharge feature to the area of drawdown, as well as the amount of extracted water which is returned through the recharge system.

Recharge trenches have been found to be an effective technology in maintaining water levels upgradient of the recharge system, partly reversing or eliminating drawdown effects as a result of dewatering (Cliff & Smart, 1998; Huxley et al. 2004; Huxley et al. 2006; Goodwin et al. 2007). Results are especially effective when recharge systems are sited close to the surface water feature they were designed to protect (Huxley et al. 2004).

In some testing, discharge water to recharge trenches was lost to overflow (i.e., more water was discharged to the trench than the capacity of the trench to infiltrate into the ground). To increase the efficiency of a recharge trench, discharge volumes should be spread over a larger area where infiltration could occur, or increase the hydraulic gradient between the water level in the trench and the groundwater level (i.e., by deepening the trench) (Huxley et al. 2004; Huxley et al. 2006; Goodwin et al. 2007). Literature recommends that a water balance is an effective tool in determining the recharge capacity of the recharge structure to ensure that the structure is sized appropriately (Huxley et al. 2004).

Recharge wells and injection wells have been used extensively throughout the world for Aquifer Storage Recharge (ASR), for Groundwater Recharge Systems (GRS), and for the deep disposal of waste water

mainly in the oil and gas industry. Recharge wells (ASR) allow for stormwater to be stored in groundwater aquifers for later use, whereas GRS systems are primarily designed to mitigate for reduced groundwater levels. Pump and treat systems used for the remediation of contaminated groundwater is also a common use.

A study at the Eversley Quarry in Hampshire, UK, utilized a well injection system to mitigate quarry drawdown from an adjacent residential development and municipal supply well (Goodwin et al. 2007). The system was found to be an effective control of drawdown induced by quarry dewatering. Further, the well-based system was found to be more effective than an open trench system, where high concentrations of dissolved metals such as iron would otherwise precipitate out of solution and clog the base and sides of the trench.

As noted earlier, Dufferin Aggregates' Milton Quarry in Southern Ontario has already been approved to implement a GRS system to mitigate reduced groundwater levels surrounding this quarry and minimize or eliminate associated potential adverse effects on the groundwater system.

In experiments where only a portion of the extracted water is returned through the recharge system (i.e., where removal of groundwater is greater than water returned), water levels were found to increase, although not to pre-pumping levels. In these experiments, the amount of recharge was limited by the size of the recharge system, which could not put the same amount of water back into groundwater than what was being extracted, although water levels were found to increase quickly in the area of the recharge system, reducing the amount of water level drawdown caused by the pumping (Huxley et al. 2004; Huxley et al. 2006; Goodwin et al. 2007). The experiments also recommend that the recharge system be sited further from the area of drawdown and closer to the natural feature it is protecting.

2.3 Water Quality in Recharge to Aquifer

The common concerns regarding recharge systems are the effects on water quality and the decreased capacity of the system to recharge water back into the ground by clogging up fractures and pore space as a result of sediments (fines), micro-organisms (bacteria) or precipitates (oxidation of groundwater) (Huxley et al. 2004; Corcoran et al. 2005; Goodwin et al. 2007). These water quality issues are dependent on three factors:

a) sediment in the water can be a result of sediment in the extracted groundwater or may be picked up in the handling process (i.e., from the quarry floor);

b) the growth of micro-organisms is a result of the groundwater chemistry (presence of phosphates) and the temperature of the discharge water; and

c) oxidation of the groundwater resulting in precipitation of certain parameters such as iron or calcium is a result of the pH and temperature of the water as well as high concentrations of the precipitating agent (i.e., groundwater with low pH and high iron will precipitate when exposed to the atmosphere).

2.3.1 Sediment Control

Siltation of recharge wells may decrease their infiltration capacity over time. Siltation prevention requires maintenance of the system to remove the silt layer. It is best prevented by minimizing the silt content in the water. This is accomplished by utilizing silt ponds prior to discharge or by separating the clean water pumped from the quarry sump from quarry runoff which may accumulate fine material from the quarry floor (Goodwin et al. 2007).

Some experimental trench-based GRS systems found that there was a minor degree of siltation, particularly for those which were most affected by erosion (Goodwin et al. 2007). It should be noted that this was in recharge trenches which were constructed into overburden and not bedrock. It was recommended to use side slopes which are as steep as possible to minimize erosion of the sides and by minimizing the silt content in the water discharged into the trench.

2.3.2 Oxidation of Groundwater

When groundwater which has high concentrations of dissolved metals such as iron or calcium, and low pH, is exposed to the atmosphere, oxidation of the water may result in the precipitation of these minerals out of solution, which leads to clogging of the base and sides of a recharge trench (Goodwin et al. 2007). In these cases, recharge wells were used to inject extracted water back into the ground, thereby eliminating exposure to the atmosphere and oxidation of the water.

2.3.3 Microbial Growth

Microbial growth (algal growth) or fouling is another common issue which may decrease the capacity of recharge structures (most commonly injection wells) over time. Algal growth was noted in some cases where there is organic material in the groundwater and an increase in temperature to support the growth (Corcoran et al. 2005; Goodwin et al. 2007). To ensure that microbial growth does not decrease infiltration capacity, periodic observation and maintenance is required.

There is a potential for significant temperature differences between the recharged water and the receiving groundwater. Changes up to 10 degrees C between recharge water from quarries and the receiving groundwater have been recorded which affect both the oxidation rate in water (rate of chemical reactions) as well as bacterial or algal growth. Reducing the time extracted water is exposed on the surface by recharging the water quickly will limit these temperature changes. As noted above, a well-based GRS has the ability to be designed to more effectively limit oxidation and therefore microbial growth in the water managed by the system.

3. Summary of Artificial Recharge Systems

Artificial recharge of groundwater is a common worldwide practice used to mitigate groundwater level impacts by artificially raising water levels. There are a variety of Artificial Recharge Systems used, depending on the reason for the recharge. In mitigating water level drawdown, both passive recharge wells and trenches or pressurized injection wells have been utilized with great success. Although some cases reported some water quality issues depending on local geology and groundwater chemistry, these issues can be mitigated or eliminated with proper recharge system design and maintenance.

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Appendix K

S.S. Papadopulos & Associates, Correction of the Simulated Water Level in a Pumping Well, October 2008

S. S. PAPADOPULOS & ASSOCIATES, INC.
Environmental & Water-Resource Consultants

Memorandum

Date: October 6, 2008

From: Christopher J. Neville

To: File

SSPA Project: 1078

Subject: Correction of the simulated water level in a pumping well
SSP1087_Memo_Correction of the simulated water level in a pumping well_20081006.doc

1. Introduction

Estimates of the actual water level in a pumping well must be developed when predictions of the performance of proposed pumping alternatives are required. Estimates of the actual water level in a pumping well are also useful when considering drawdowns in pumping wells during model calibration. Analytical and numerical groundwater analyses generally do not yield estimates of the actual water level in a pumping well. Rather, the analyses yield only estimates of the head losses that occur in the formation in the vicinity of a pumping well. The calculated head losses in the formation must be supplemented by estimates of the additional head losses that are particular to pumping wells. In this note we present a systematic approach for estimating the water level in a pumping well given the drawdown calculated with an analytical or numerical groundwater model. The same corrections are applied for extraction and injection.

These notes are divided into seven main sections:

- General methodology;
- Correction for convergent head losses that occur within the grid block that contains the well;
- Accounting for additional head losses across a zone of altered material that surrounds the well;
- Accounting for additional head losses due to partial penetration;
- Nonlinear flow losses within the well itself;
- Example analyses; and
- References.

2. General methodology

The corrections required to estimate the actual pumping levels from model-calculated level are shown schematically in Figure 1. The total drawdown in a pumping well is the sum of the four components:

$$s_w = s_f + \Delta h_1 + \Delta h_2 + \Delta h_3 \qquad (1)$$

The quantity s_f denotes the head losses that occur in the formation. These losses correspond to the drawdowns that are calculated using a numerical or analytical simulation.

The term Δh_1 denotes the additional head losses that occur in a numerical simulation. In numerical models, the water level calculated for a grid block that contains a well represents the average water level in that block. The quantity Δh_1 represents the additional head losses that occur as flow converges towards the wellbore.

The term Δh_2 denotes the additional head losses that occur across a zone of altered material that surrounds the well. This term can also account for additional losses that occur if the well does not penetrate the full thickness of an aquifer.

The term Δh_3 denotes the additional nonlinear head losses that within the pumping well itself.

The processes that give rise to the additional well losses in pumping wells are established relatively quickly. Therefore, the corrections can be applied for either transient or steady conditions.

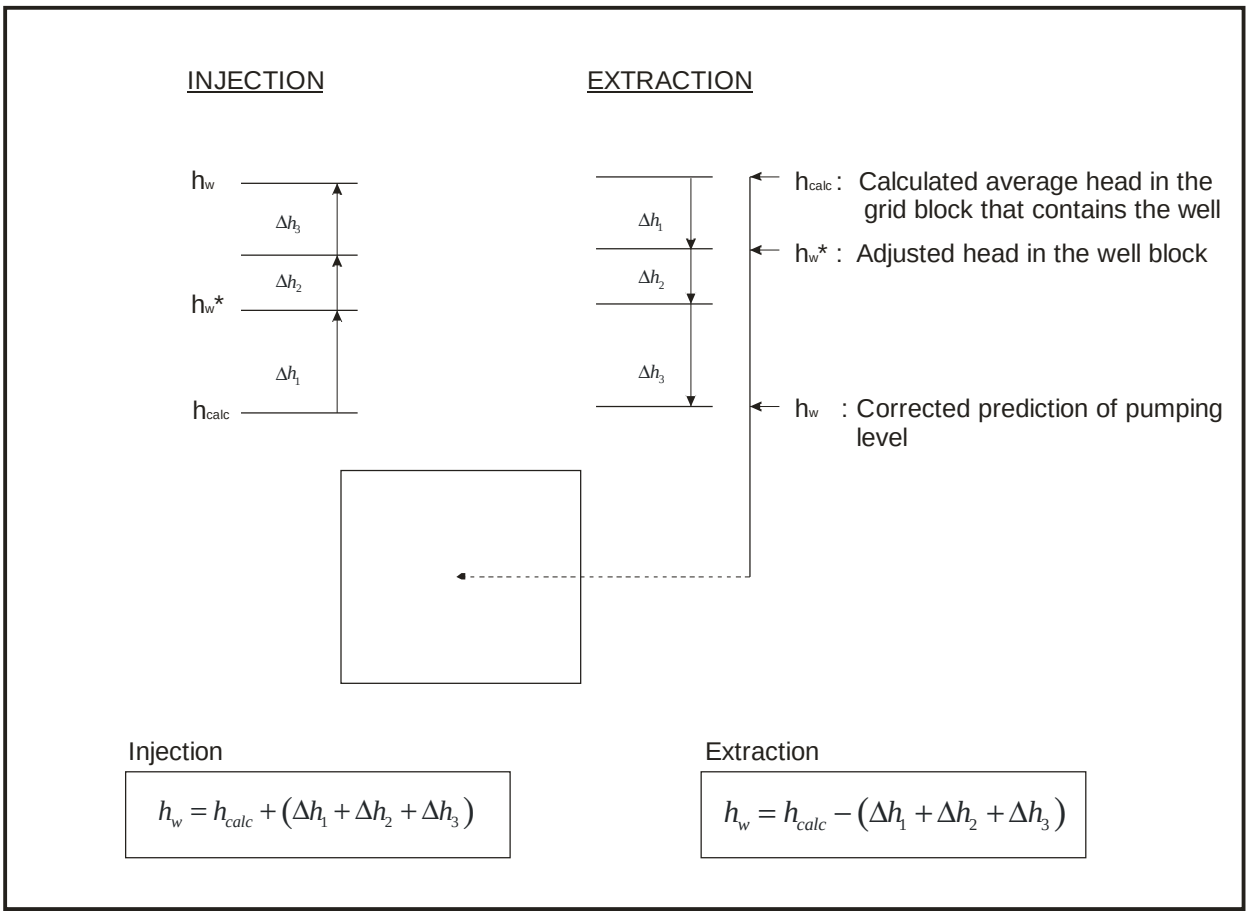

Figure 1. General procedure for estimating the actual water level in a pumping well

3. Correction for convergent head losses that occur within the grid block that contains the well (Δh_1)

The additional head losses that occur between the average level in the grid block and the wellbore are estimated with the Thiem solution:

$$\Delta h_1 = \frac{Q}{2\pi T} \ln\left\{\frac{r_e}{r_w}\right\} \tag{2}$$

where:

Q = pumping rate from the grid block;
T = transmissivity of the grid block;
r_w = radius of the well; and
r_e = "effective" wellblock radius.

Several expressions have been developed to estimate the effective wellblock radius. Herbert and Rushton (1966) and Prickett (1967) derived a simple expression that can be used as a first approximation:

$$r_e = \frac{\Delta x}{EXP\left\{\frac{\pi}{2}\right\}} = 0.208\,\Delta x \tag{3}$$

where Δx is the grid spacing. Equation (3) is strictly applicable for square grid blocks and isotropic horizontal hydraulic conductivity. Peaceman (1983) provides a more general formula that is applicable to rectangular blocks and anisotropic hydraulic conductivity:

$$r_e = 0.28\,\frac{[(K_y/K_x)^{1/2}(\Delta x)^2 + (K_x/K_y)^{1/2}(\Delta y)^2]^{1/2}}{(K_y/K_x)^{1/4} + (K_x/K_y)^{1/4}} \tag{4}$$

For a square grid with isotropic hydraulic conductivity, Peaceman's expression reduces to:

$$r_e = 0.198\,\Delta x$$

which is very close to Equation (3).

4. Additional head losses across a zone of altered material surrounding the well (Δh_2)

During the drilling, installation, and development of a well it is almost inevitable that the properties of the formation adjacent to the well are altered. The zone of altered material surrounding a well is referred to as the *skin*. The additional head losses across the skin zone are shown schematically in Figure 2.

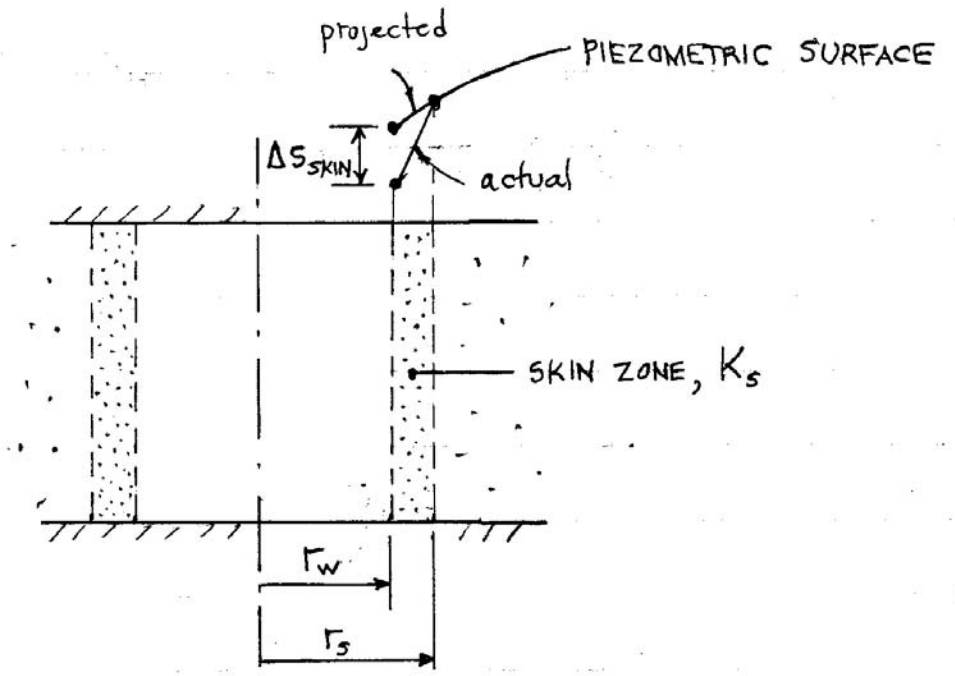

Figure 2. Conceptual model for well skin

The additional head losses across the skin zone are estimated with an approach described in Ramey (1982):

$$\Delta h_2 = \frac{Q}{4\pi T} 2S_w \tag{5}$$

where S_w is the dimensionless skin loss coefficient.

The skin loss coefficient is generally regarded as a curve-fitting parameter. However, an expression does exist for calculating it from fundamental quantities (Hawkins, 1956):

$$S_w = \left(\frac{K}{K_{skin}} - 1 \right) \ln \left\{ \frac{r_{skin}}{r_w} \right\} \qquad (6)$$

where K is the hydraulic conductivity of the formation, K_{skin} is the hydraulic conductivity of the skin, and r_{skin} is the radius of the skin.

The skin may be more or less permeable than the formation. If the hydraulic conductivity of the skin is lower, which we expect to generally be the case, then S_w is positive (petroleum engineers call this *positive skin*). If the hydraulic conductivity of the skin is higher than the formation, then S_w is negative (*negative skin*).

It is always preferable to estimate parameters from first-principles. However, in practice we do not know either the radius or the hydraulic conductivity of the skin. If we have data from a step test and from a constant-rate pumping test, we can constrain the value of S_w. Example analyses are presented in later section of these notes. However, we are generally limited to making educated guesses of the likely magnitude of S_w.

Skin factors for a range of conditions are shown in Figures 3 and 4. As shown in Figure 3, for positive skin factors the values of S_w are not nearly as sensitive to the value of the skin radius r_s as they are to the hydraulic conductivity of the skin. As a first approximation, we suggest assuming:

$$S_w \cong \frac{K}{K_{skin}} \qquad (7)$$

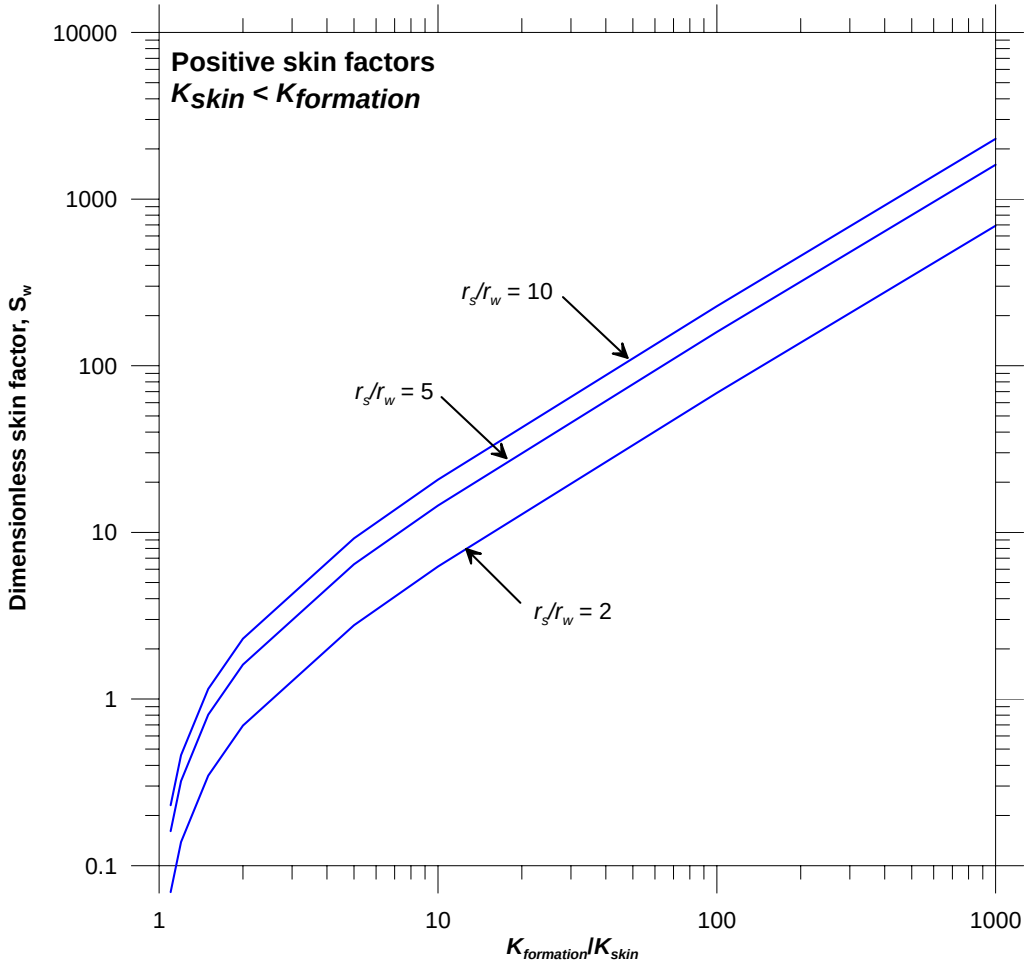

Figure 3. Positive skin factors

As shown in Figure 4, for negative skin factors the values of S_w are nearly a constant for a wide range of conditions and values of r_s. The values of the negative skin factors are close to 1.0 until the conductivity of the skin approaches that of the formation, in which case the skin losses can be ignored. Therefore, as a first approximation when a negative skin is suggested, we suggest assuming:

$$S_w \cong -1.0 \tag{8}$$

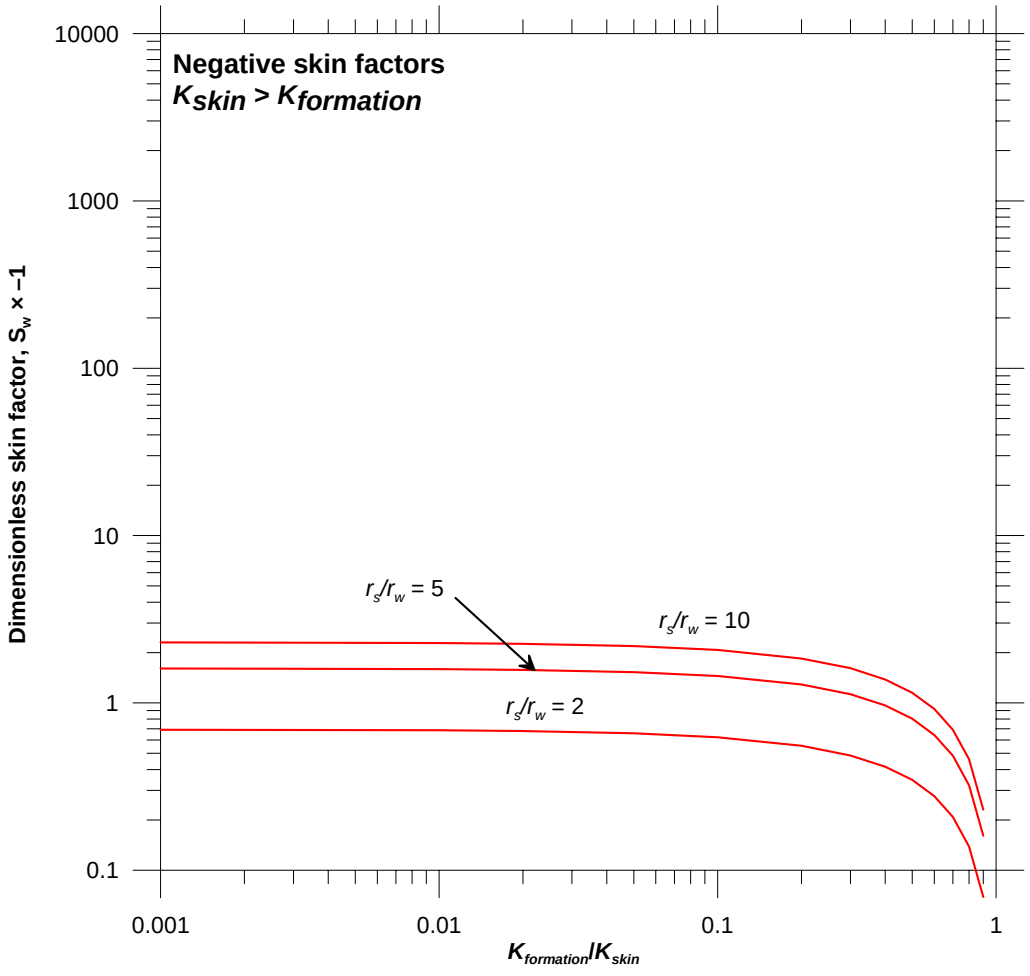

Figure 4. Negative skin factors

5. Accounting for additional head losses due to partial penetrating

Additional head losses occur when a pumping well does not penetrate the full thickness of an aquifer. If the aquifer is modeled with a single layer, it is possible to account for these additional losses without a correction of the "raw" model results. The conceptual model of a partially penetrating well is shown in Figure 5.

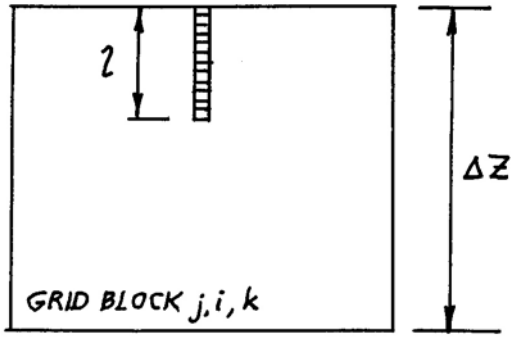

Figure 5. Conceptual model for a partially penetrating well

The additional head losses caused by partial penetration may be modeled as an additional skin loss:

$$\Delta h_2 = \Delta h_{2\ skin} + \Delta h_{2\ pp} \tag{9}$$

where $\Delta h_{2\ skin}$ is the head loss for a skin zone developed previously and $\Delta h_{2\ pp}$ is the additional head loss due to partial penetration.

Several approaches have been developed to estimate the additional head losses due to partial penetration. Brons and Marting (1961) developed a simple approach that in our experience closely approximates results obtained with more elaborate calculations:

$$\Delta h_{2\,pp} = \frac{Q}{2\pi T}\left(\frac{b-l}{l}\right)\left[\ln\left\{\frac{b}{r_w}\right\} - G\left(\frac{l}{b}\right)\right] \tag{10}$$

where:

b = aquifer thickness;
l = length of well screen; and
$G\left(l/b\right)$ = function tabulated in Brons and Marting (1961).

For a MODFLOW simulation, b corresponds to the thickness of the grid block that contains the well, ΔZ, and l corresponds to the length of the well in that grid block.

Brons and Marting (1961) tabulated a few values of the function G. Bradbury and Rothschild (1985) used regression to develop the following functional form:

$$G\left(l/b\right) \cong 2.948 - 7.363\left(\frac{l}{b}\right) + 11.447\left(\frac{l}{b}\right)^2 - 4.675\left(\frac{l}{b}\right)^3 \qquad (11)$$

As shown in Figure 6, results obtained with the regression of Bradbury and Rothschild (1985) match closely the values tabulated in Brons and Marting (1961).

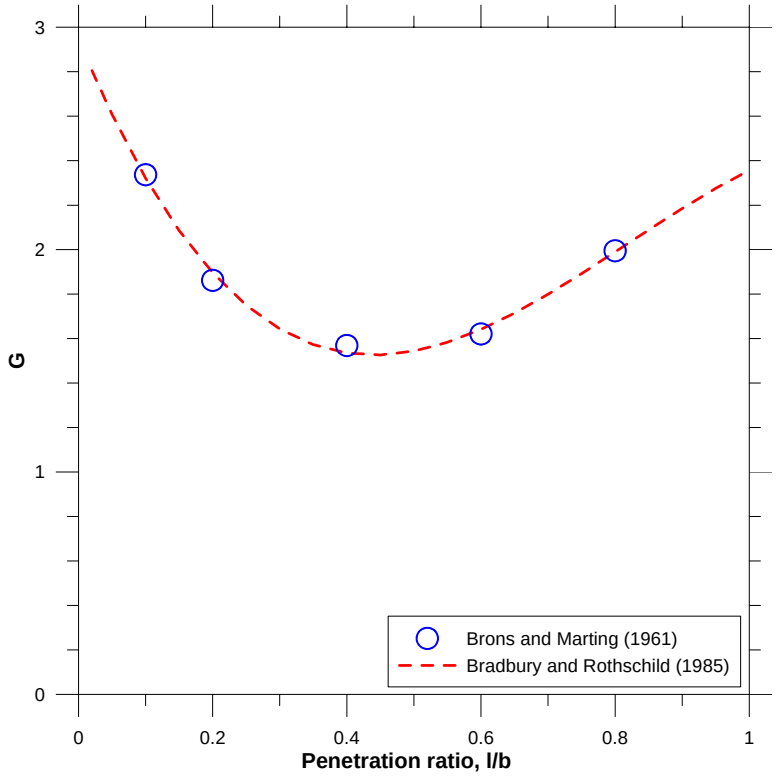

Figure 6. Values of the Brons-Marting function G for partially penetrating wells

6. Head losses due to nonlinear flow within the well itself (Δh_3)

All additional head losses associated with flow processes in the well itself may be estimated using an approach introduced in Jacob (1947) and generalized by Rorabaugh (1953):

$$\Delta h_3 = C\,Q^p \qquad (12)$$

where:

C = nonlinear well loss coefficient; and
p = well loss exponent.

As a first approximation, we recommend following the approach of Jacob (1947) and assuming $p = 2$.

The most reliable estimates of the well loss coefficient C are derived from the results of step tests, in particular with the Hantush-Bierschenk analysis. Example analyses are included in the next section of these notes.

In the absence of site-specific data we recommend that the general guidance provided by Walton (1962; p. 27) be used to assign preliminary values.

First-cut values of *C*

Condition of well	C (sec^2/ft^5)	C (day^2/ft^5)	C (sec^2/m^5)
Properly designed and develop	$C < 5$	$C < 6.7\times10^{-10}$	$C < 1900$
Mild deterioration	$C < 10$	$C < 1.3\times10^{-9}$	$C < 3800$

7. Example analyses

In 2005, Cambodia Construction & Engineering Co., Ltd. installed and tested a new production well for the town on Kandieng Reay in southern Cambodia (Cambodia Construction & Engineering Co., Ltd., 2005). Both a step test and a constant-rate pumping test were conducted, with water levels measured only in the pumping well. In the following analyses we will analyze the data collected during pumping to estimate the magnitudes of the components of the drawdown. Because the results of a step test are also available, we show how the data from the step test can be used to constrain the values of the nonlinear well loss coefficient.

The well was installed using mud rotary drilling. The well has a casing and screen radius of 0.075 m, and a gravel pack radius of 0.15 m. The diameter of the pilot hole was 0.150 m, and the borehole was reamed to its final diameter.

The key vertical dimensions are listed below:

- Top and bottom of aquifer: 18.5 to 44.5 m below ground surface;
- Top and bottom of gravel pack: 17 to 50 m below ground surface; and
- Top and bottom of well screen: 23 to 43 m below ground surface.

The indications of the top and bottom of the aquifer must be treated cautiously; it has been reported elsewhere in the study area that the aquifer contains clay lamina, and that the aquifer may extend to depths in excess of 200 m below ground surface.

Results of the step testing

The sequence for the step test is listed below.

Step	Duration (minutes)	Pumping rate (m^3/hr)
1	90	10.8
2	90	15.5
3	90	20.2
4	90	30.2

The data collected during the step testing are plotted in Figure 7. With the exception of the last step, it appears that the drawdown stabilized by the end of each of the 90-minute steps.

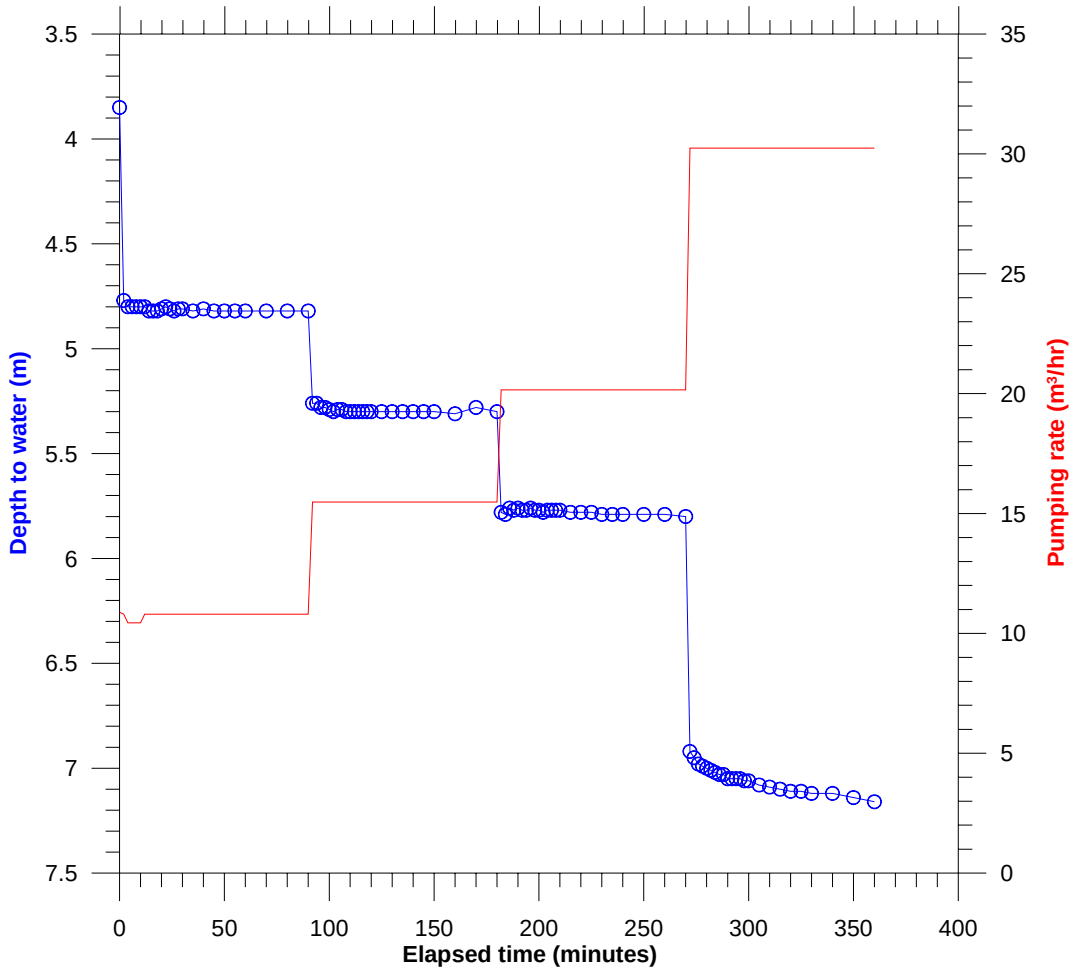

Figure 7. Kandieng Reay well #1, Results of step test

Constant-rate pumping test

Since the drawdown did not stabilize by the end of the fourth step, a reduced rate was specified for the constant-rate portion of the testing. The well was pumped at a constant rate of 25.2 m^3/hr for 2760 minutes (46 hours). The drawdowns in the pumping well during the period of constant-rate testing are plotted in Figure 8. We see from the plot that the major portion of the drawdown is established almost immediately after the start of the test.

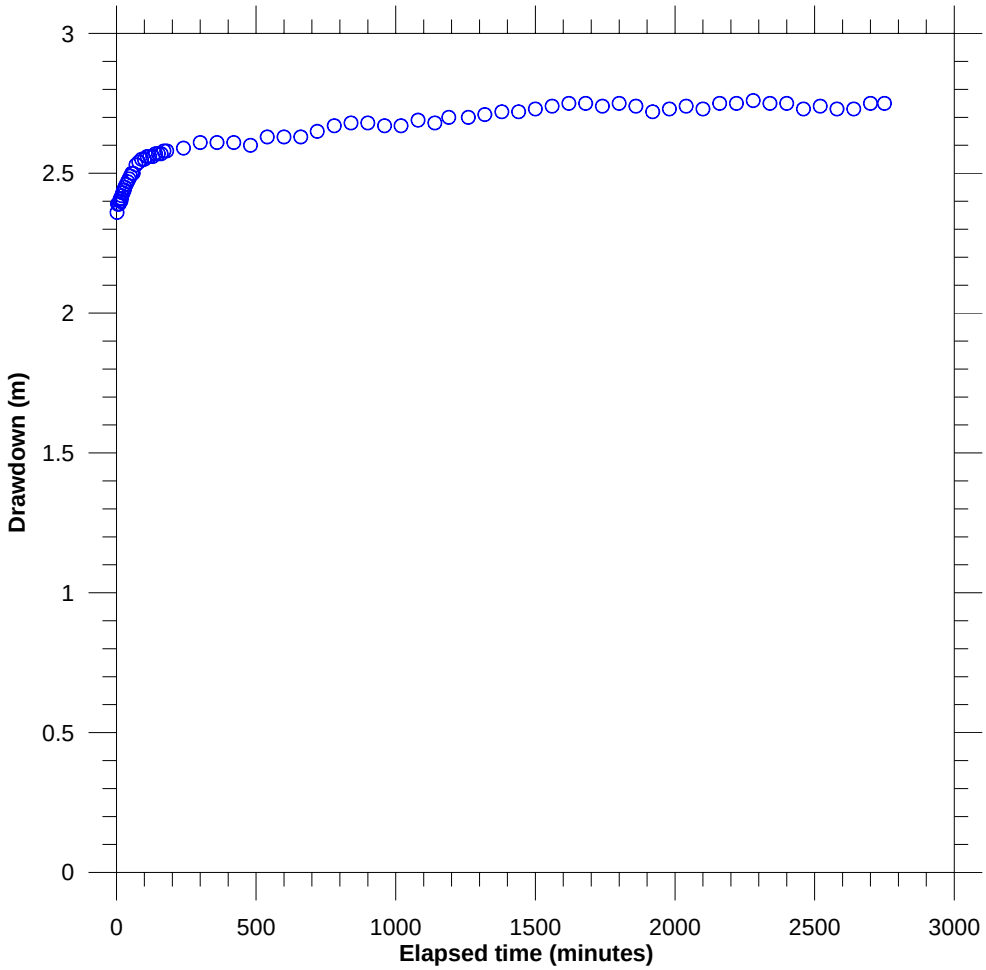

Figure 8. Kandieng Reay well #1, Results of constant-rate pumping test

Preliminary interpretation of the constant-rate pumping test

A semi-log plot of the pumping well drawdowns is shown in Figure 9. The data approximate closely a straight line. A Cooper-Jacob straight-line analysis yields the following parameters:

Transmissivity, $T = 773$ m^2/day; and
Storage coefficient, $S = 1.9\times10^{-14}$.

We note immediately that the storage coefficient is implausible. Typically storage coefficients for confined sand and gravel aquifers are in the range of 10^{-5} to 10^{-3}. The value obtained here is about 9 orders-of-magnitude lower. This suggests that our preliminary analysis does not account for all of the processes occurring during this test.

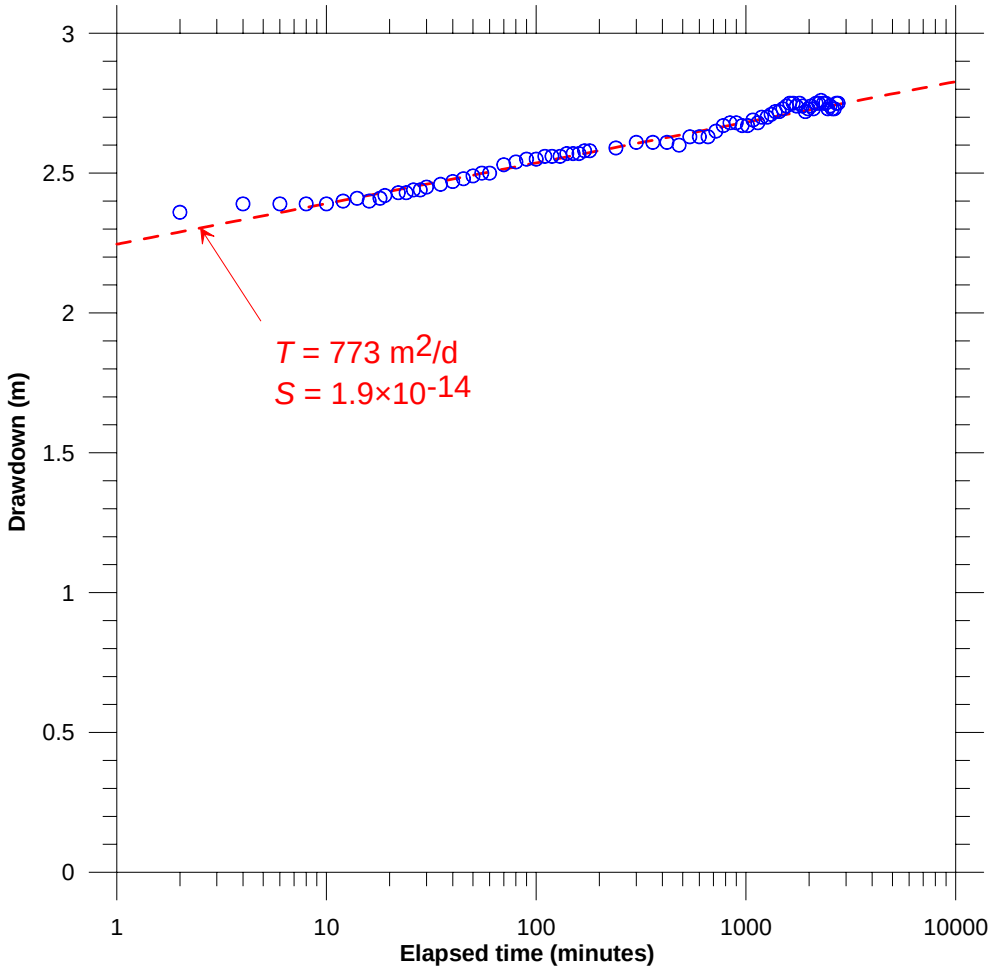

Figure 9. Kandieng Reay well #1, Cooper-Jacob straight-line analysis #1

Assessment of well losses

We can use the results from the step testing to assess whether well losses may be significant. We invoke the Jacob (1947) model for well losses:

$$s_w = BQ + CQ^2$$

which can be re-written as:

$$\frac{s_w}{Q} = B + CQ$$

For each step of the test we plot the stabilized specific drawdown (s_w/Q) against the pumping rate Q. The resulting Hantush-Bierschenk plot is shown in Figure 10. As shown in the figure, the slope is positive, indicating that there are nonlinear wells losses. From the plot we estimate the parameters:

Linear well loss coefficient, B = 0.082 m/(m^3/hr); and
Nonlinear well loss coefficient, $C = 7.286\times10^{-4}$ m/(m^3/hr)^2.

During the constant-rate pumping test, the average pumping rate was 25.2 m^3/hr. Using the parameters estimated from the Hantush-Bierschenk plot, we estimate the components of the drawdown:

$$BQ = \left(0.082 \text{ m/(m}^3\text{/hr)}\right)\times\left(25.2 \text{ m}^3\text{/hr}\right) = 2.07 \text{ m}$$

and

$$CQ^2 = \left(7.286\times10^{-4} \text{ m/(m}^3\text{/hr)}^2\right)\times\left(25.2 \text{ m}^3\text{/hr}\right)^2 = 0.46 \text{ m}$$

This quick calculation suggests that the nonlinear well losses represent about 20% of the total drawdown in the pumping well. It is not possible to tell from this analysis how much of the linear well losses BQ arise in the formation, occur across a skin zone, or are due to partial penetration.

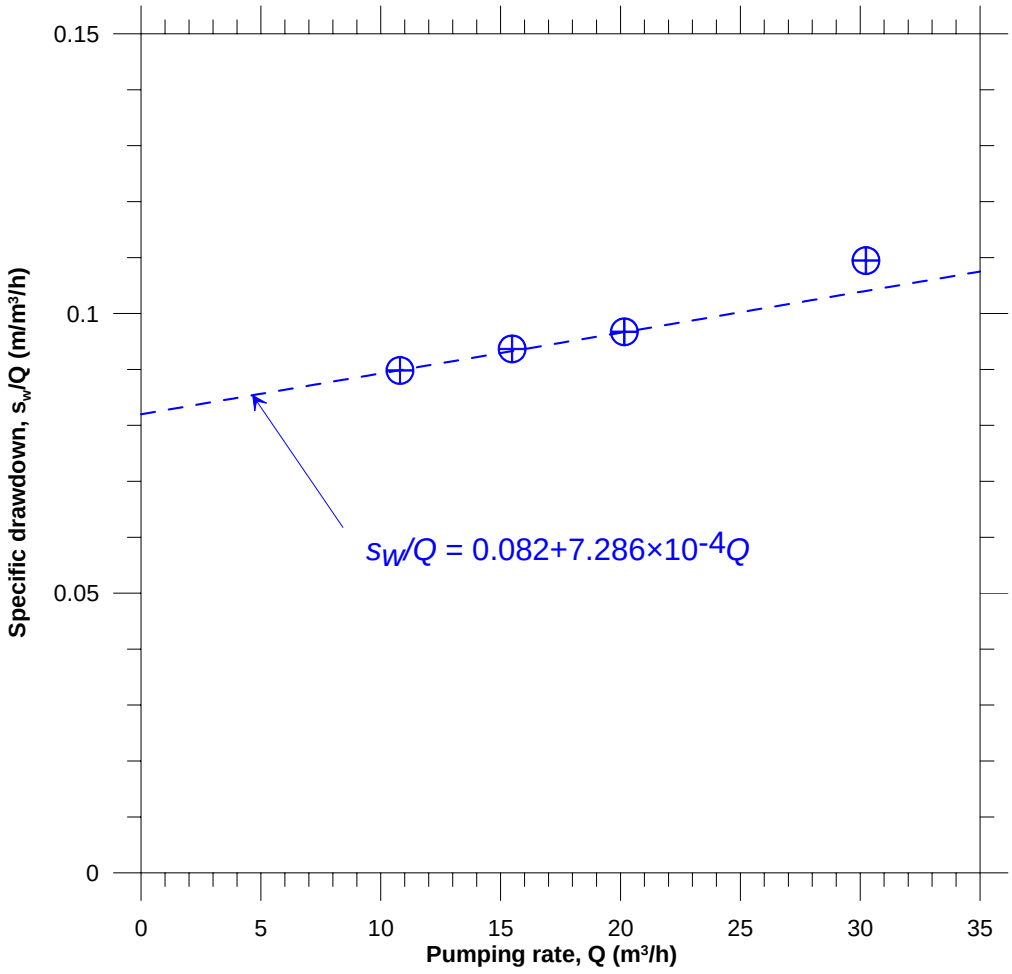

Figure 10. Kandieng Reay well #1, Hantush-Bierschenk plot

Revised interpretation of the constant-rate pumping test

A revised semi-log analysis of the pumping well drawdowns is shown in Figure 11. The analysis differs from the preliminary analysis by incorporating the nonlinear well losses CQ^2:

The well loss coefficient is established from the Hantush-Bierschenk plot and is converted to time units of minutes as follows:

$$C = 7.286\times10^{-4}\ \frac{\text{m}}{\left(\text{m}^3/\text{hr}\right)^2}\left|\frac{60\ \text{min}}{\text{hr}}\right|^2 = 2.623\frac{\text{m}}{\left(\text{m}^3/\text{min}\right)^2}$$

A Cooper-Jacob straight-line analysis yields the same transmissivity but a different storage coefficient:

- Transmissivity, T = 773 m^2/day; and
- Storage coefficient, $S = 3.7\times10^{-11}$.

Although the storage coefficient is larger than for the preliminary analysis, it is still implausibly small. This suggests that head losses in the formation and nonlinear well losses are still not sufficient to explain the total drawdown observed in the pumping well.

The fact that the estimated transmissivity is the same for both the preliminary and revised analyses is an important result. In the Jacob (1947) model, the additional nonlinear well losses are assumed to be established immediately. This is consistent with the data: the first observed drawdown (after 2 minutes) is already about 2.4 m. If all we are interested in is an estimate of the transmissivity, we could have stopped with the preliminary Cooper-Jacob analysis. However, our analysis here is not complete because our objective is to understand the different components of the drawdown, and thereby be able to make predictions of future well performance, perhaps at different pumping rates or for longer periods of time.

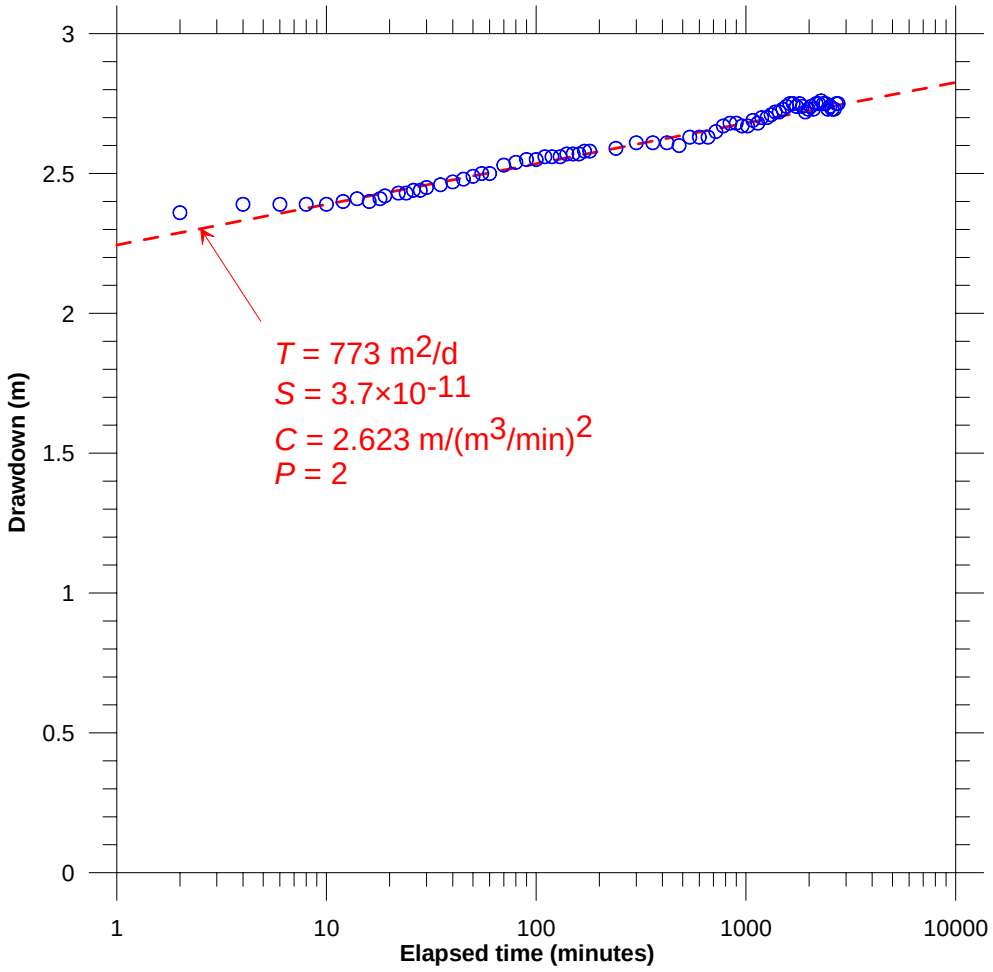

Figure 11. Kandieng Reay well #1, Cooper-Jacob straight-line analysis #2

Interpretation of the constant-rate pumping test: Cooper-Jacob analysis #3

For our third Cooper-Jacob analysis we incorporate both nonlinear losses and skin losses:

$$\Delta s_w = CQ^2 + 2S_w \frac{Q}{4\pi T}$$

Prior to executing the analysis, it is important to note that we cannot estimate the skin loss coefficient S_w and the storage coefficient S independently. This is demonstrated by expanding the expression for the total drawdown:

$$s_w = \frac{Q}{4\pi T}\left[-0.5772 - \ln\left\{\frac{r^2 S}{4Tt}\right\}\right] + CQ^2 + 2S_w \frac{Q}{4\pi T}$$

Expanding yields:

$$s_w = \frac{Q}{4\pi T}\left[-0.5772 - \ln\left\{\frac{r^2 S}{4Tt}\right\} + 2S_w\right] + CQ^2$$

$$= \frac{Q}{4\pi T}\left[-0.5772 - \ln\left\{\frac{r^2 S \times EXP\{-2S_w\}}{4Tt}\right\}\right] + CQ^2$$

The expanded Cooper-Jacob solution reveals that we can only estimate the lumped quantity $S \times EXP\{-2S_w\}$.

For our third analysis we assume a storage coefficient $S = 10^{-4}$, and retain the nonlinear well loss coefficient C from the Hantush-Bierschenk analysis.

The semi-log analysis is shown in Figure 12. A Cooper-Jacob straight-line analysis yields the following parameters:

- Transmissivity, $T = 773$ m^2/day; and
- Skin loss coefficient, $S_w = 7.4$.

The fitted skin loss coefficient may include the lumped effects of invasion of the formation by drilling mud, and additional converging flow losses to a partially penetrating well screen.

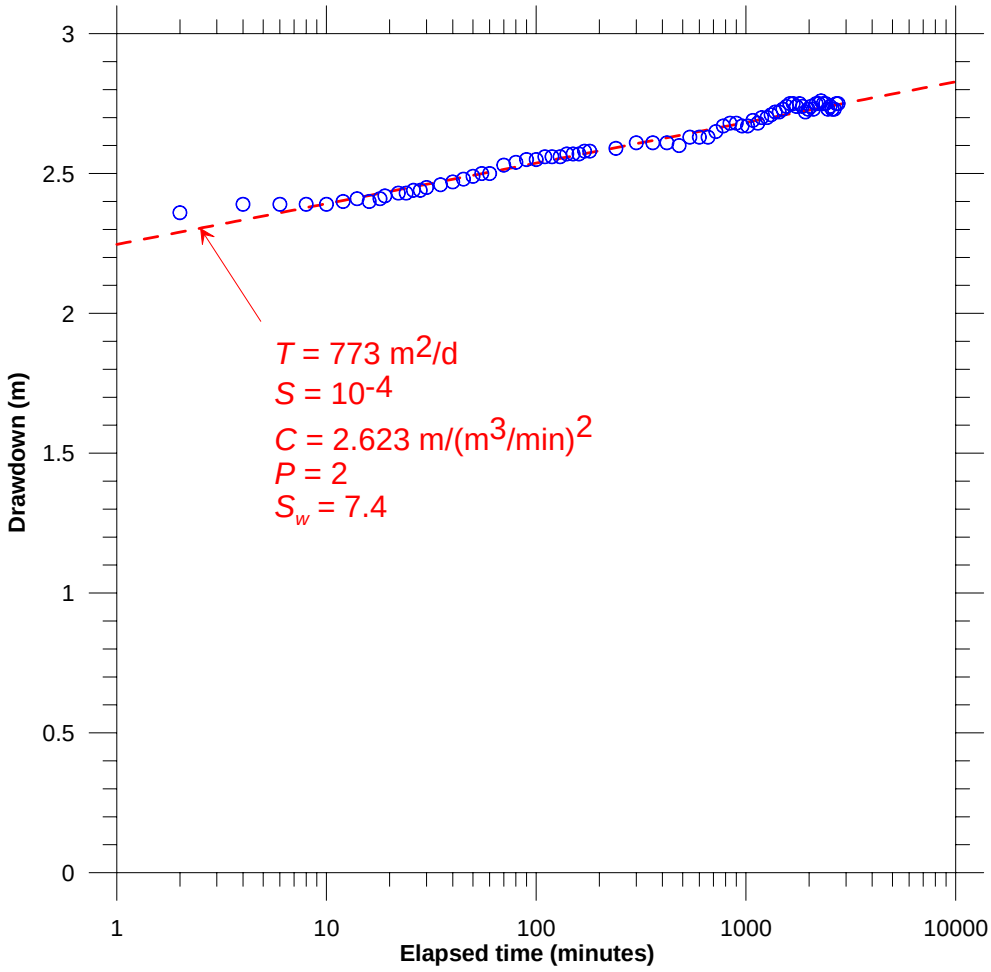

Figure 12. Kandieng Reay well #1, Cooper-Jacob straight-line analysis #3

Final check

As a final check on our analysis, we use our final set of parameters estimated from the analysis of the constant-rate pumping test to predict the results from the step test. The results plotted in Figure 13 suggest that we can obtain an excellent match to the three intermediate steps.

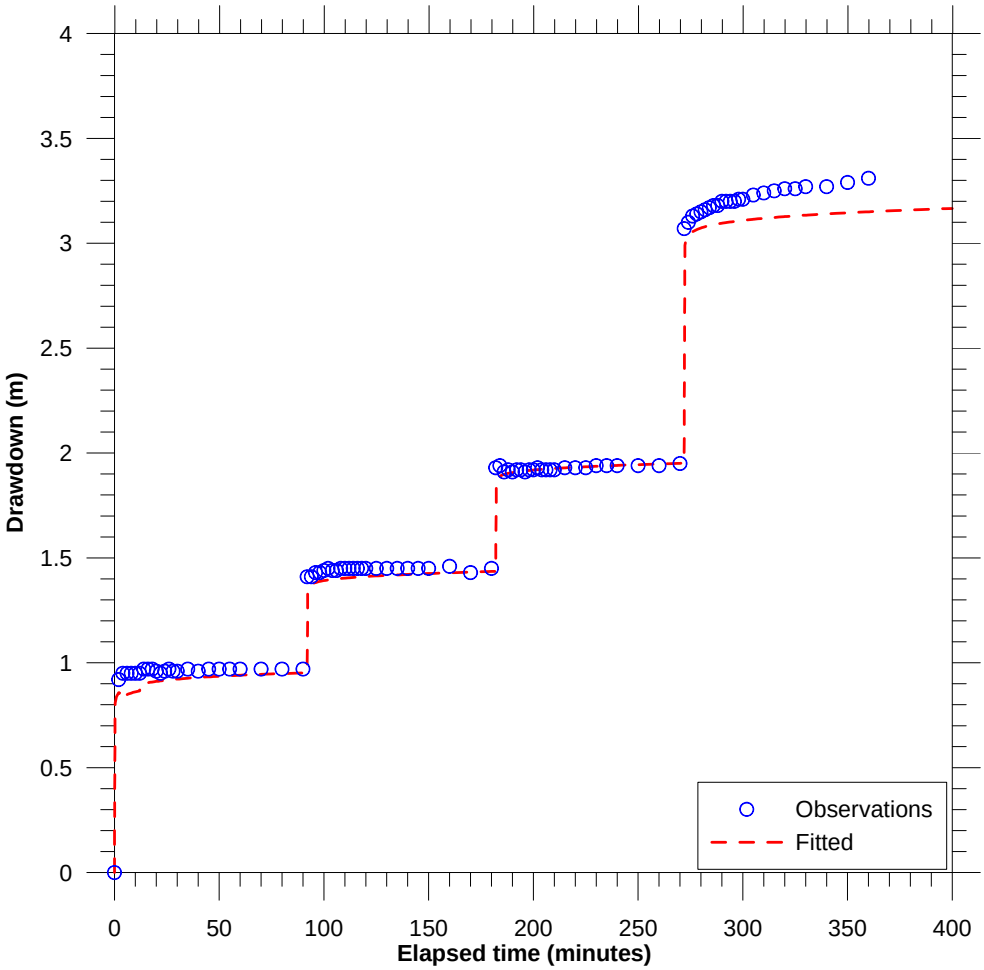

Figure 13. Kandieng Reay well #1, Match to step test data

Simulation of the Kandieng Reay pumping test with a numerical model

Our objective in preparing this technical note is to present a systematic approach for estimating the water level in a pumping well given the drawdown calculated with an analytical or numerical groundwater model. The final step in our analysis will be to demonstrate how the results of a numerical model should be adjusted to match observed drawdowns in a pumping well, for the case of the Kandieng Reay pumping test.

For this example, we consider a MODFLOW model that consists of one layer, 51 rows and 51 columns with a uniform grid spacing of 1000 m. Although this is a relatively course discretization for the simulation of a pumping test, it is typical for a simulation of regional groundwater flow.

The "raw" results from the numerical simulation are plotted in Figure 14. As shown in the figure, the drawdowns calculated with the numerical model are significantly less than those observed during the Kandieng Reay pumping test. We must supplement the drawdowns calculated with the numerical model with the following additional components of the total drawdown:

$$\Delta h_1 = \frac{Q}{2\pi T}\ln\left\{\frac{r_e}{r_w}\right\}$$
$$= \frac{\left(25.2\ \mathrm{m^3/hr}\left|\frac{24\ \mathrm{hr}}{\mathrm{d}}\right|\right)}{2\pi\left(773\ \mathrm{m^2/d}\right)}\ln\left\{\frac{\left(0.208\times 1000\ \mathrm{m}\right)}{\left(0.15\ \mathrm{m}\right)}\right\} = 0.901\ \mathrm{m}$$

$$\Delta h_2 = \frac{Q}{4\pi T}2S_w$$
$$= \frac{\left(25.2\ \mathrm{m^3/hr}\left|\frac{24\ \mathrm{hr}}{\mathrm{d}}\right|\right)}{4\pi\left(773\ \mathrm{m^2/d}\right)}2\left(7.4\right) = 0.921\ \mathrm{m}$$

$$\Delta h_3 = CQ^2 = \left(7.286\times 10^{-4}\ \mathrm{m/(m^3/hr)^2}\right)\times\left(25.2\ \mathrm{m^3/hr}\right)^2 = 0.463\ \mathrm{m}$$

The resulting corrected drawdowns are plotted in Figure 15. As shown in the figure, the match to the observed drawdowns is improved significantly.

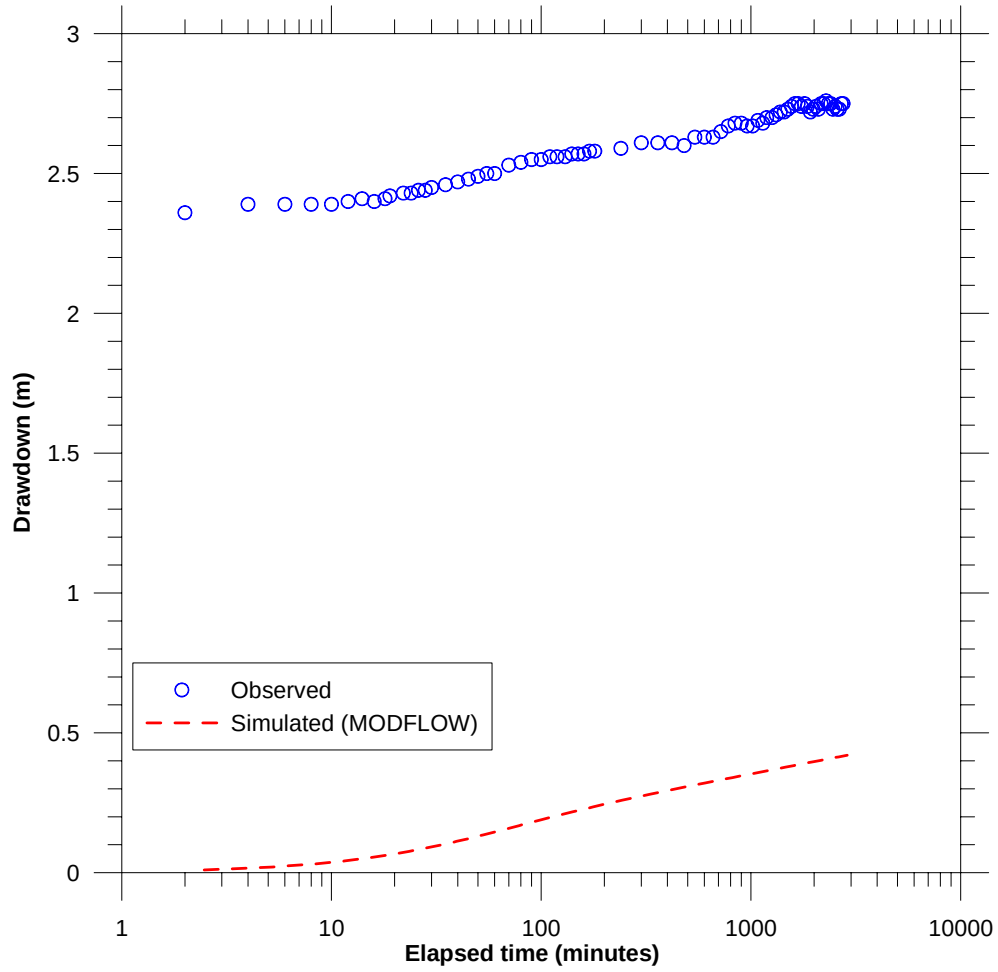

Figure 14. Comparison of observed drawdowns and "raw" simulation results

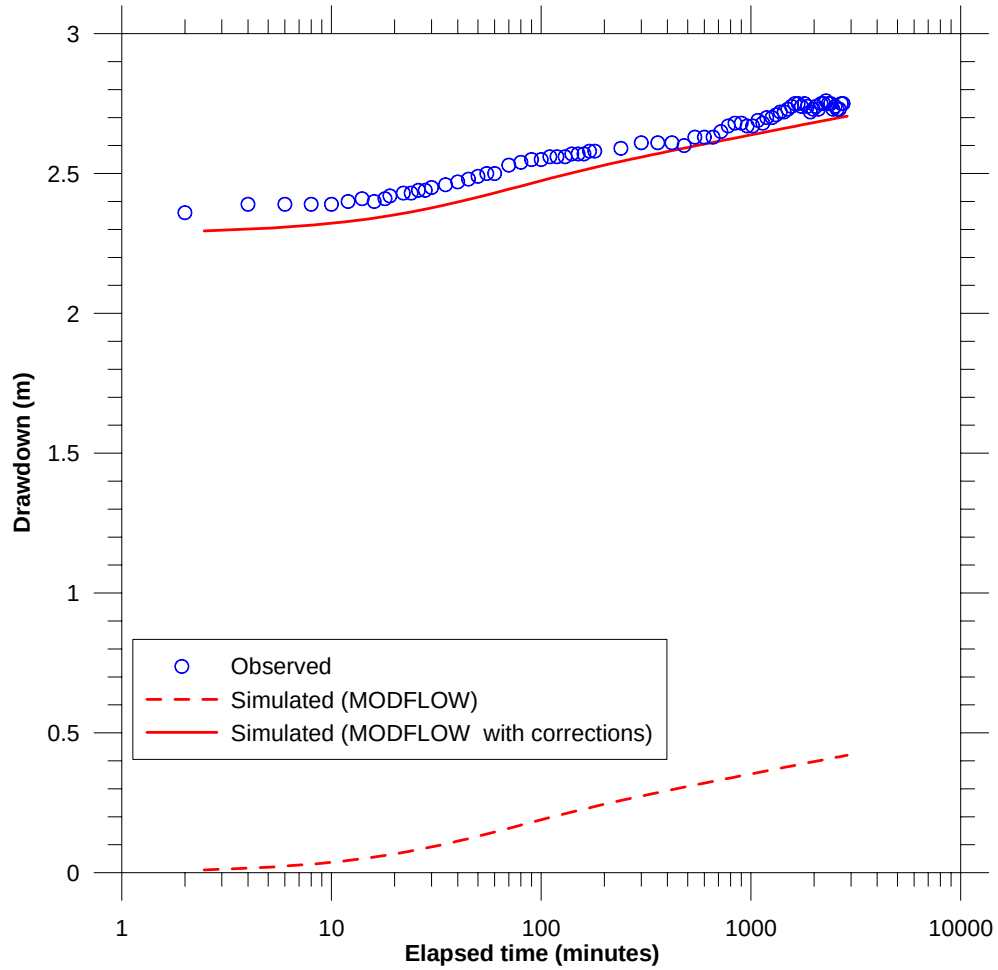

Figure 15. Comparison of observed drawdowns and corrected simulation results

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