CKSO Road Development

Hydrogeological Assessment
Proposed Lot Development
City of Greater Sudbury, ON

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1 Executive Summary

EXP Services Inc. (EXP) was retained by Wicker Image Inc. ("the Client") to complete a hydrogeological assessment for a proposed subdivision development at the property located immediately east adjacent to CKSO Road, in the City of Greater Sudbury, Ontario; hereinafter referred to as the 'Site.' The development is to consist of seven (7) lots and, as such, a hydrogeological assessment for individual septic system loading was required. The Site extends south from the intersection between CKSO Road and Goodview Road and is west adjacent to a driving range area (**Drawing A-1**). In general, areas to the north and west are residential, while areas to the south and east are commercial. Based on site plans provide by the client, the property is approximately 1.722 ha (4.26 acres) in area and is undeveloped. Adjacent residences are serviced with municipal water; however, residences are serviced by individual septic systems.

As observed during the drilling program, hydrogeological conditions were fairly consistent across the Site, with silty overburden noted within drilling depths. In addition, a review of available well records suggest a thick clay/silt overburden in areas to the west and south of the Site, while areas to the north are characterized by thin overburden and bedrock at or near the surface. In addition, based on a review of available topographic and waterbody information, groundwater flow across the Site is assumed to be in the (generally) south direction, from areas of high elevation and bedrock elevation to areas of low elevation. Water level data from monitoring wells showed on-Site suggest groundwater flow exhibits a shallow gradient to the south.

Two (2) groundwater samples were collected from on-Site monitoring wells and submitted for nitrate/nitrite analysis. Results showed nitrate and nitrite concentrations were below detectable limits for both parameters. As such, septic systems can be utilized on the Site.

Nitrate loading predictions, as calculated based on methods outlined in Ontario D-5-4 recommendations, were performed for multiple scenarios (**Table 6.1**). **Scenario 1** predicted nitrate loading and resultant groundwater concentrations at the property boundary with the proposed 7-lot development. In addition, **Scenario 2** predicted nitrate loading in response to a 7-lot development and tertiary treatment applications, while **Scenario 3** assessed nitrate loading with a 3-lot development and no tertiary treatment applications. Results were as follows:

Scenario 1 – 7-lots with no tertiary treatment resulted in predicted nitrate levels exceeding D-5-4 criteria (10 mg/L) criteria.

Scenario 2 – 7-lots with tertiary treatment (minimum 43% nitrate load removal) resulted in predicted nitrate levels being below the 10 mg/L criteria.

Scenario 3 – 3-lots (the maximum number of lots that can be developed, while satisfying ODWS using D-5-4 calculations) with no tertiary treatment resulted in predicted nitrate levels being below 10 mg/L criteria.

Based on the above observations, development **Scenarios 2 and 3** *specifically* satisfy D-5-4 criteria; however, it should be noted that D-5-4 mass loading calculations assume absolute conservation of mass – that is, it does not consider natural attenuation from aquifer crossflow, biodegradation or other processes.

Environmental, hydrogeological and other observations suggest considerable natural attenuation and denitrification processes on and near the Site. This conclusion is based on the following:

a. The presence of a shallow water table, which contributes to an oxygen poor (or anoxic) environment.
b. The presence of a shallow hydraulic gradient, which increases contaminant residence times.
c. A low conductivity silt/clay overburden layer, whereby a majority of the nitrate loading will likely occur.
d. Background water quality with nitrate and nitrite concentrations below the detectable limit, suggesting minimal impacts from active septic systems on upgradient or cross-gradient lots.

As noted in points a to d, the combination of a shallow water table, shallow hydraulic gradients and relatively low conductivity within the overburden creates a relatively anoxic environment and retards contaminant movement. In both cases, this would

enhance denitrification processes. In addition, due to the thickness of overburden noted at the Site and in adjacent areas to the west and south, it can be assumed that nitrate loading would be confined to relatively higher conductivity zones in the confined aquifer (coarser silt or sand seams), rather than migrating to the deep aquifer. Reported background water quality in the shallow aquifer also suggests limited nitrate/nitrite impacts, which further suggests limited impacts from up- or cross-gradient septic systems.

As it relates to human health, because the Site and adjacent areas are serviced by municipal water supplies, any nitrate loading is considered to have minimal risk.

Based on the above observations, it is assumed that nitrate loading (as described in D-5-4) is naturally reduced through attenuation and denitrification processes and, as such, tertiary treatment systems are not recommended. In addition, because municipal water supplies are present at the Site and adjacent areas, significant health impacts from elevated nitrate concentrations in potable groundwater supplies (if any) is not anticipated. Thus, a seven (7) lot development is not anticipated to have any significant impact on groundwater water quality or human health at or downstream from the Site.

2 Introduction

EXP Services Inc. (EXP) was retained by Wicker Image Inc. ("the Client") to complete a hydrogeological assessment for a proposed subdivision development at the property located immediately east adjacent to CKSO Road, in the City of Greater Sudbury, Ontario; hereinafter referred to as the 'Site.' The development is to consist of seven (7) lots and, as such, a hydrogeological assessment for individual septic system loading was required. The Site extends south from the intersection between CKSO Road and Goodview Road and is west adjacent to a driving range area (**Drawing A-1**). In general, areas to the north and west are residential, while areas to the south and east are commercial. Based on site plans provide by the client, the property is approximately 1.722 ha (4.26 acres) in area and is undeveloped. Adjacent residences are serviced with municipal water; however, residences are serviced by individual septic systems.

It is understood that groundwater wells are not to be used on the Site, as residences are serviced by the municipal water supply. Thus, a water quality, as it relates to Ontario Drinking Water Standards/Objectives, and water quantity assessment were not part of the scope of this report. However, residences are serviced by individual septic systems and, as such, an assessment of contaminant loading in response to septic systems is required for the property. As part of the contaminant loading investigation, borehole data from a geotechnical investigation was utilized. **Drawing A-2** shows the locations of boreholes, while **Drawing A-3** shows approximate proposed lot dimensions at the Site.

3 Scope of Work

EXP completed the following scope of work:

- Review existing information to characterize Site hydrogeological/geological conditions;
- Complete an on-Site septic system impact assessment, with consideration to the requirements of Ministry of Environment, Conservation and Parks (MECP) Procedures D-5-4;
- Complete a summary report that provides the findings, conclusions and recommendations.

4 Site Description

The Site is located immediately east adjacent to CKSO Road in the City of Greater Sudbury, ON (see **Drawing A-1**). The Site is largely undeveloped, while residential areas are noted to the north and west. Apparent institutional developments are noted to the south, while commercial developments (driving range) are noted to the east. Beyond noted developments to the west and south are vacant lands with minimal developments. Areas beyond the driving range to the east consist of institutional developments, while the Trans-Canada Highway is noted to the north.

Based on a review of available topographic maps, the Site is in an area of relatively low local relief, ranging from approximately 234 masl in north areas of the Site and 233 masl in south areas. As such, the property has a shallow gradient dipping to the

south. Topography in areas adjacent to the Site show similar topographic variations, whereby minimal local relief is observed. Topographic highs are noted in areas west and north of the Site, suggesting the Site exists within a low-lying "basin" area between elevated bedrock outcrops.

During the drilling program, boreholes noted relatively coarser silt materials near the surface, with progressively finer silt materials at depth. In addition, groundwater levels collected in March 2024 showed groundwater levels were between 0 to 0.2 m below ground surface, suggesting a very shallow groundwater table. The shallow groundwater may be due, in part, to melting snowfall during warm weather. Groundwater elevation data from March 2024 is provided in **Table 4.1**.

Table 4.1 Groundwater Elevation Data

Well ID	Geodetic Elevation (masl)	WL (mbg)	Water Elevation (masl)
MW7	234.04	0.355	233.69
MW1	233.03	0.21	232.82

A review of Ontario Geological Survey Quaternary Maps (Google Earth) suggest the Site is underlain by undifferentiated igneous and metamorphic rock, exposed at the surface or covered by a discontinuous, thin layer of drift. Similarly, a review of Ontario Geological Survey Bedrock Maps (Google Earth) suggest the Site is underlain by quartz-feldspar sandstone, argillite and conglomerates from the Huronian Supergroup, Hough Lake Group and Mississage Formation. In addition, a fault was noted spanning approximately east to west through south areas of the Site.

The proposed subdivision is to include seven (7) lots, as shown in **Drawing A-3**, with a total area of 1.722 ha. Proposed lots are arranged along CKSO Road, with individual lots ranging between 0.216 to 0.270 ha. Based on the observed topography, groundwater flow is assumed to be generally south towards low-lying topographic areas.

5 Well Records

To better characterize the Site, a review of nearby well records was completed. A total of eleven (11) well records were reviewed. Characteristics of the well records are summarized in **Table 5.1**

Table 5.1 Well record summary

Well ID	Location (approximate)	Date Drilled	Well Type	Total Depth	Lithology
On-Site					
5902468	On-Site	1970	Overburden	145'	0 to 120' – sand and clay 120 to 135' – clay 135 to 145' – boulders and gravel
West of Site					
5902354	200 m, W	1970	Overburden	143'	0 to 20' – clay 20 to 138' – (fine) sand 138 to 143' – hardpan
5901995	200 m, WSW	1968	Overb590urden	58'	0 to 53' – clay and sand 53 to 58' – gravel
5905537	250 m, W	1987	Bedrock	310'	0 to 80' – sand and clay 80 to 85' – stone and silt 85 to 310' – grey granite
South of Site					
5904686	10 m, S	1982	Overburden	142'	0 to 138' – clay 138 to 142' - gravel
5904963	50 m, SW	1984	Overburden	167'	0 to 150' – clay 150 to 167' – sand (and gravel)
5904339	250 m, SW	1980	Overburden	146'	0 to 135' – clay 135 to 145' – sand

					145 to 146’ – gravel
5904018	350 m, SW	1978	Bedrock	400’	0 to 15’ – sand 15 to 150’ – clay 150 to 189’ – sand 189 to 400’ – grey granite
North of Site					
5904124	50 m, N	1979	Bedrock	75’	0 to 75’ – white granite
5900465	70 m, NW	1965	Bedrock	50’	0 to 20’ – boulders and clay 20 to 56’ – red granite
5905533	100 m, NW	1987	Bedrock	370’	0 to 35’ – clay 35 to 40’ – sand and gravel 40 to 370’ – grey granite

Based on observations in **Table 5.1**, areas north of the Site generally show thin to nil overburden at the reviewed well record locations. In north areas, overburden was noted to consist of both sand or clay. Oppositely, overburden was considerably thicker in areas south and west of the Site and generally consisted of thick clay units. As such, south and west areas of the Site likely exhibit hydraulic isolation between the deeper and shallower aquifer units, while north areas of the Site likely exhibit hydraulic connection between the surface and deep aquifer systems. Overall, overburden beneath the Site likely increases in thickness to the south and west, with a significant confining clay/silt unit atop a bedrock or sand/gravel water producing zone. Oppositely, a relatively thinner clay/silt layer likely characterizes areas north of the Site, which is atop the higher conductive sand/gravel or bedrock unit.

6 Contaminant Loading Assessment

6.1 Background Water Quality

Two (2) samples were obtained from on-Site monitoring wells to assess background nitrate/nitrite in local groundwater, whereby results from both monitoring locations showed nitrite and nitrate concentrations were below detectable limits.

6.2 Predictive Assessment

MECP Procedures D-5-4 describes a three-step procedure to assess the impacts of individual on-site sewage systems to groundwater:

- Step 1: Assess whether the average lot size is greater than 1 hectare (ha).
- Step 2: Demonstrate whether on-site individual sewage systems are hydraulically isolated from existing or potential water supply aquifers.
- Step 3: Examine potential contaminant loadings to groundwater from the proposed on-site sewage systems.

MECP Procedure D-5-4 stipulates that if lot sizes are greater than 1 ha, or if the average lot size is 1 ha with no lot less than 0.8 ha, a hydrogeological assessment may not be required. The Site is proposed to be developed into seven (7) lots, with lots ranging between 0.21 and 0.27 ha. Based on the proposed Site Plan (**Drawing A-3**) and property size, it is assumed lot sizes will be consistently less than 0.8 ha. In addition, based on the total property area of 1.722 ha, it is assumed the average lot size will be less than 1 ha (1.722 ha / 7 lots = 0.246 ha/lot). As such, an on-Site sewage system impact assessment was completed.

Although potable water is provided by the municipal water supply in adjacent areas, an assessment was completed to ensure subsurface aquifers would not be significantly impacted. MECP Procedures D-5-4 stipulates that individual on-site sewage systems may be deemed acceptable if it can be demonstrated that effluent from on-site sewage systems are hydraulically isolated from existing or potential supply aquifers in the vicinity. Based on a review of borehole data and grain size analyses, overburden largely consisted of silt, becoming finer with depth. In addition, trace to some clay was noted in all samples, with trace sand noted at shallower depths. During drilling, all seven (7) boreholes were extended to 17’ and bedrock was not encountered at any borehole location. Due to the composition and thickness of overburden noted during drilling, it is assumed

the overburden aquifer system across the Site is *not* hydraulically isolated. In general, the Site is characterized by silt materials with varying amounts of sand and clay. Due to the potentially conductive properties of coarser silts and the unknown overburden depth, it is concluded that hydraulic isolation does not exist between potential on-site sewage systems and the overburden/shallow aquifer. Therefore, it is necessary to proceed to Step 3 of the procedure to assess the potential impacts of contaminant loadings of the on-site sewage systems on existing or potential supply aquifers. **However, it should be noted that hydraulic isolation, as outlined by the MOE Design Guidelines for Sewage Works (2008), likely exists for the bedrock/deep aquifer system, which is consistently used for water supplies in historical well records.**

EXP completed a predictive assessment of potential combined impacts from the on-site sewage systems to water supply sources at the Site boundaries, based on MECP Procedures D-5-4. The location of the proposed development in areas away from major waterbodies/receptors was also taken into consideration in the predictive assessment.

The contaminant attenuation model for the Site was based on the following assumptions:

- Dilution from infiltrating precipitation as the only mechanism for attenuation of contaminants;
- The approximate total size of the proposed lots is 1.722 ha so, collectively, an area of 17,220 m^2 is available for infiltrating precipitation;
- Utilization of precipitation data between 1971 and 2010 from Environment Canada for the Sudbury Station, which had an average annual precipitation of 903.3. Thus, the average annual precipitation at the Site was assumed to be 900 mm;
- Utilization of evapotranspiration data from Environment Canada and Statistics Canada (1981 to 2010) for the Great Lakes Area, which indicates an average annual evapotranspiration in the range of 500 mm to 600 mm;
- Estimation of infiltration based on site-specific conditions, including soils, topography, geology and impermeable surfaces (such as paved areas and bedrock – if any): The entire moisture surplus is assumed available for infiltration within the infiltration areas. While some of the moisture surplus may become runoff, this is assumed to be a minimal amount;
- Based on these data, a conservative average annual moisture surplus of 200 mm is designated for the Site;
- Nitrate-nitrogen is the critical contaminant;
- A nitrate-nitrogen concentration of 0.5 mg/L has been designated for the infiltrating precipitation. This is considered conservative for precipitation in northern Ontario;
- A nitrate-nitrogen concentration of 40 mg/L was assumed in the effluent;
- The estimated daily effluent flow rate for the Site is 1000 L/lot/day. Assuming individual sewage systems for the seven (7) proposed lots, the combined effluent flow rate for the Site is estimated at 7,000 L/day.

The contaminant concentrations at the Site boundaries (C_T) were derived from the total mass loading of nitrate-nitrogen in input waters (M_T) divided by the total volume of the input waters (V_T):

$$C_T = M_T / V_T$$

V_T is equal to the total volume of infiltrating precipitation (V_i) and the total volume of discharge from all on-site sewage systems (V_e). M_T is equal to the total mass of contaminant contained in both the infiltration precipitation (M_i) and the sewage effluent (M_e):

$$M_i = C_i \times V_i$$
$$M_e = C_e \times V_e,$$

Where C_i and C_e are the nitrate-nitrogen concentrations in infiltrating precipitation and sewage effluent, respectively.

The total predicted nitrate-nitrogen loadings to groundwater from the effluent sources at the Site are based on projected loadings from infiltrating precipitation and from sewage effluent discharges per the formulae defined above and as shown in

Table 6.1. The predicted nitrogen-nitrate loadings to groundwater across the entire Site (~1.722 ha) with no treatment (**Table 6.1, Scenario 1**) indicate a concentration of approximately 17.0 mg/L at the Site boundary, which is above the D-5-4 10 mg/L criteria.

In addition, the predicted nitrogen-nitrate loadings to groundwater across the entire Site (~1.722 ha) with 43% nitrate-nitrogen removal (**Table 6.1, Scenario 2**) indicate a concentration of approximately 9.8 mg/L at the Site boundary, which is below the 10 mg/L D-5-4 criteria. Similarly, D-5-4 criteria are met if the lot number is reduced to three (3), whereby the predicted nitrate loading showed a boundary concentration of 9.6 mg/L (**Table 6.1, Scenario 3**).

Note, additional consideration can be given to natural processes that can lead to attenuation and denitrification, which would further decrease contaminant concentrations at the property boundary.

Table 6.1 Generic Nitrate Loading Predictions

Basic Assumptions
1000 L/day effluent flow per household
Recharge = 0.20 m/yr (for silt, vegetation cover, flat topography)
No groundwater crossflow, no enhanced recharge, no in-situ denitrification

Calculation Scenario:	**1** **7 lots no treatment**	**2** **43% removal treatment**	**3** **3 lots no treatment**
Number Houses	7	7	3
Effluent Volume per House (L/day)	1,000	1,000	1,000
Nitrate Mass in Effluent per House (g/day)	40	23	40
Recharge Area (m^2)	17,220	17,220	17,220
Recharge Rate (m/yr)	0.2	0.2	0.2
Total Mass Nitrate (g/yr)	102,200	58,765	43,800
Volume Effluent (m^3/yr)	2,555	2,555	1,095
Volume Recharge (m^3/yr)	3,444	3,444	3,444
Total Volume Water (m^3/yr)	5,999	5,999	4,539
Resultant Nitrate Loading (g/m^3 or mg/L)	17.0	9.8	9.6

7 Data Assessment and Discussion

7.1 Background Water Quality

Two (2) samples were obtained from on-Site monitoring wells to assess background groundwater quality, as it relates to nitrate/nitrogen. Overall, results from both monitoring locations showed nitrite and nitrate concentrations were below the detectable limit. As such, this suggests minimal background nitrate/nitrite concentrations. Because the Site is in an area commonly serviced with septic systems, this suggests considerable natural attenuation and, possible, denitrification within areas adjacent to the Site.

7.2 Contaminant Loading

A review of contaminant loading suggests mass loading will exceed 10 mg/L at the property boundary. As shown in **Table 6.1, Scenario 1**, predictive assessments show a contaminant loading concentration of 17 mg/L, which is higher than the criteria of 10 mg/L. In **Scenario 2**, whereby 50% nitrate removal systems are applied, concentrations at the property boundary are reduced to levels less than 10 mg/L (8.5 mg/L). Similarly, if the lot number is reduced to three (3), this suggests mass loading would be 9.6 mg/L, which is less than the maximum 10 mg/L (**Scenario 3**).

7.3 Hydrogeological Conditions

A review of borehole logs on the Site suggest overburden largely consists of silt with varying minor amounts of clay and sand. As such, relatively higher conductivity layers may constitute an overburden aquifer system, while lower conductivity units (possibly at deeper depths) may act as a confining layer for a deeper sand or bedrock aquifer system. However, due to limited drilling depths completed during the geotechnical drilling program, definitive aquifer-aquitard depths could not be determined.

A review of nearby well records was completed to better assess hydrogeological conditions on and near the Site. In general, shallow overburden was noted in areas north of the Site, while thicker overburden was noted in areas to the west and south. In general, overburden largely consisted of clay or sandy clay, suggesting a significant aquitard layer in areas south and west of the Site. As observed during drilling, this aquitard layer likely extends beneath the Site, which consists of lower conductivity silt and/or clay layers. A review of well records also suggests water was found at considerable depths within deep aquifer systems – that is, significant water supplies were found within deep sand and gravel or bedrock aquifers. These observations suggest a confining aquifer system throughout the area of the Site which, historically, has been utilized for water supply.

A review of groundwater elevations across the Site also suggests a shallow gradient towards the south, which is consistent with both topographic variations and the presence of waterbodies. As mentioned previously, the Site appears to exist in a low-lying topographic area, as indicated by significant topographic highs to the north and west. In addition, shallow groundwater elevations and gradients suggest the Site is not in an area with significant groundwater movement, but may be better characterized as an area with minimal flow rates.

As it relates to nitrate loading into the subsurface across the Site, shallow groundwater tables and silty materials provide ideal conditions for denitrification. This is due to the adsorption capabilities of silt particles, which increases the amount of time available for chemical denitrification by microbes. In addition, a high water table corresponds to a larger percentage of pore space being filled with water, rather than oxygen. In these anoxic (or oxygen poor) conditions, where dissolved oxygen is depleted, this favors the use of nitrate and nitrite as terminal electron acceptors, thereby leading to denitrification in the groundwater.

Overall, the shallow groundwater flow system is hindered by both a shallow gradient and a low conductivity within the silt. However, other factors, such as the presence of natural microbes, anoxic conditions and low flux rates can support the denitrification of nitrates and nitrites across the Site. The absence of nitrates and nitrites in background water quality, despite the presence of septic systems in adjacent areas, suggests natural attenuation and biodegradation is efficient at reducing nitrate and nitrite concentrations in the shallow groundwater system.

8 Conclusions and Recommendations

Based on observations in the hydrogeological assessment and in consideration to D-5-4 procedures, the following conclusions were made:

1. Based on nitrate/nitrogen loading prediction calculations **with no treatment,** predicted nitrate concentrations at the property boundary were 17.0 mg/L, which is above D-5-4 criteria (10 mg/L);

2. Based on nitrate/nitrogen loading prediction calculations **with treatment** (43% nitrate removal), predicted nitrate concentrations at the property boundary were 9.8 mg/L, which is below D-5-4 criteria (10 mg/L);

3. Based on nitrate/nitrogen loading prediction calculations **with a maximum three (3) lots**, predicted nitrate concentrations at the property boundary were 9.6 mg/L, which is below D-5-4 criteria (10 mg/L);

4. Based on observations noted during drilling, this suggests nitrate loading would likely be confined to higher conductivity layers within the thick overburden;

5. Historically, groundwater supplies have been obtained from deep bedrock or sand and gravel aquifer systems. In upgradient areas to the north, bedrock is close to surface with minimal overburden cover. In south and west areas of the Site, bedrock is at deeper depths with considerable clay/silt overburden cover;

6. Despite septic systems being present in upgradient directions from the Site, noted background nitrate and nitrite concentrations in shallow groundwater on Site suggest considerable natural attenuation and denitrification, resulting in nitrate and nitrite in groundwater falling below the 10 mg/L limit; and

7. The Site and adjacent properties are serviced by municipal water supplies and, as such, it is unlikely that groundwater would be used on or near the Site as a potable water source. In addition, based on a review of well records, if wells were to be used it is very unlikely that wells will be installed in the shallow, unconfined aquifer system. Due to the presence of a relatively thick confining layer in downgradient areas to the south and west, this suggests water supply wells (if any) within the deep aquifer system would have nil to minimal impacts on the water supply due to septic systems at the Site.

Based on the above conclusions, the following recommendations are provided:

1. Septic beds should be placed as far from adjacent property boundaries as planning will allow (minimum 3 m from property lines and 15 m from residential wells, if present);
2. Based on a preliminary nitrate loading calculation for the proposed 7-lots, as outlined in **Table 6.1, Scenario 1**, nitrate loading would lead to exceedances at the property boundary, as it relates to the D-5-4 criteria of 10 mg/L for nitrate loading. To *specifically* satisfy a maximum of 10 mg/L nitrate concentration at the property boundary), the following recommendations can be implemented:
    a. If seven (7) lots are to be developed, tertiary treatment would have to be utilized, such that effluent concentrations can be reduced to levels below 10 mg/L. As outlined in **Table 6.1, Scenario 2**, this can be achieved through removal of (at minimum) 43% of nitrate mass from effluent.
    b. If tertiary treatment is not desired, reducing the number of lots to three (3) can also be proposed, as predicted nitrate loading would lead to boundary concentrations less than 10 mg/L (**Table 6.1, Scenario 3**)
3. However, counter to **recommendations 1 and 2**, environmental and hydrogeological conditions suggest considerable natural attenuation and denitrification processes occur on and near the Site. This conclusion is based on the following:
    a. The presence of a shallow water table, which contributes to an oxygen poor (or anoxic) environment.
    b. The presence of a shallow hydraulic gradient, which increases contaminant residence times.
    c. A low conductivity silt/clay overburden layer, whereby a majority of the nitrate loading will likely occur.

d. Background water quality with nitrate and nitrite concentrations below the detectable limit, suggesting minimal impacts from active septic systems on upgradient or cross-gradient lots.

As noted in points a to d, the combination of a shallow water table, shallow hydraulic gradient and low conductivity within the overburden suggests a relatively anoxic environment and retarded contaminant movement. In both cases, this would enhance denitrification processes. In addition, due to the thickness of overburden noted at the Site and in adjacent areas to the west and south, it can be assumed that nitrate loading would be confined to relatively higher conductivity zones in the confined aquifer (sand seams), rather than migrating to the deep aquifer. Reported background water quality in the shallow aquifer suggest limited nitrate/nitrite impacts, which further suggests limited impacts from up- or cross-gradient septic systems. Based on the noted observations, it is assumed that nitrate loading (as described in D-5-4) is naturally reduced through attenuation and denitrification processes and, as such, treatment systems are not recommended for septic systems.

4. To further support **recommendation 3**, the use of municipal water supplies on Site and in adjacent areas suggests minimal risk to human health, as it relates to nitrate loading into groundwater. In addition, the depth of historic water supply wells also suggests minimal potential impacts from nitrate loading at the surface. As such, nitrate treatment systems are not recommended for septic systems.

5. If groundwater wells are to be installed at the Site, rather than connecting to the municipal water supply, all new water supplies should be tested for water quality to determine required treatment systems (in general, this should include particle filters for turbidity, softeners and microbial treatment); and

6. Prior to use as a residential water supply, all groundwater water supplies should be tested to ensure treated water does not exceed Ontario Drinking Water Standards and Objectives.

As noted in **recommendations 3** and **4**, the use for septic treatment systems at the Site is not anticipated, but they can provide added protection to reduce the risk of groundwater contamination. There are a number of available nitrate treatment systems, including the POINTTM system, the Waterloo Biofilter and the Premier Tech Environment Ecoflow Biofilter. Many of the readily available nitrate treatment systems are capable of consistently removing 40% of nitrogen compounds from the effluent. Typically, these systems require smaller field bed areas compared to conventional systems.

Available information, including case studies, suggests Waterloo Biofilter systems can consistently remove the following total nitrogen compounds:

- Single-Pass Waterloo System – 25 to 35% total nitrogen removal.
- Double-Pass Waterloo System – 50 to 65% total nitrogen removal.

9 General Limitations

The information presented in this report is based on a limited investigation designed to provide information to support an assessment of the current hydrogeological conditions within the subject property. The conclusions and recommendations presented in this report reflect Site conditions existing at the time of the investigation.

More specific information with respect to the conditions at individual lots, including the groundwater quality and well yields (if used), may become apparent during site development operations.

The environmental investigation was carried out to address the intent of applicable provincial and municipal Regulations, Guidelines, Policies, Standards, Protocols and Objectives administered by the Ministry of Environment.

It should also be noted that current Regulations, Guidelines, Policies, Standards, Protocols and Objectives are subject to change, and such changes, when put into effect, could alter the conclusions and recommendations noted throughout this report. Achieving the study objectives stated in this report has required us to arrive at conclusions based upon the best information presently known to us. No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information; it can only reduce the possibility to an acceptable level. Professional judgment

was exercised in gathering and analyzing the information obtained and in the formulation of the conclusions. Like all professional persons rendering advice we do not act as absolute insurers of the conclusions we reach, but we commit ourselves to care and competence in reaching those conclusions.

Our undertaking at **EXP**, therefore, is to perform our work within limits prescribed by our clients, with the usual thoroughness and competence of the engineering profession. It is intended that the outcome of this investigation assist in reducing the client's risk associated with environmental impairment. Our work should not be considered 'risk mitigation'. No other warranty or representation, either expressed or implied, is included or intended in this report.

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10 Closure

We trust this summary report is satisfactory for your purposes. If you have any questions regarding our submission, please do not hesitate to contact this office.

Yours truly,

EXP Services Inc.

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Hydrogeologist, Earth & Environmental
Northeastern Ontario

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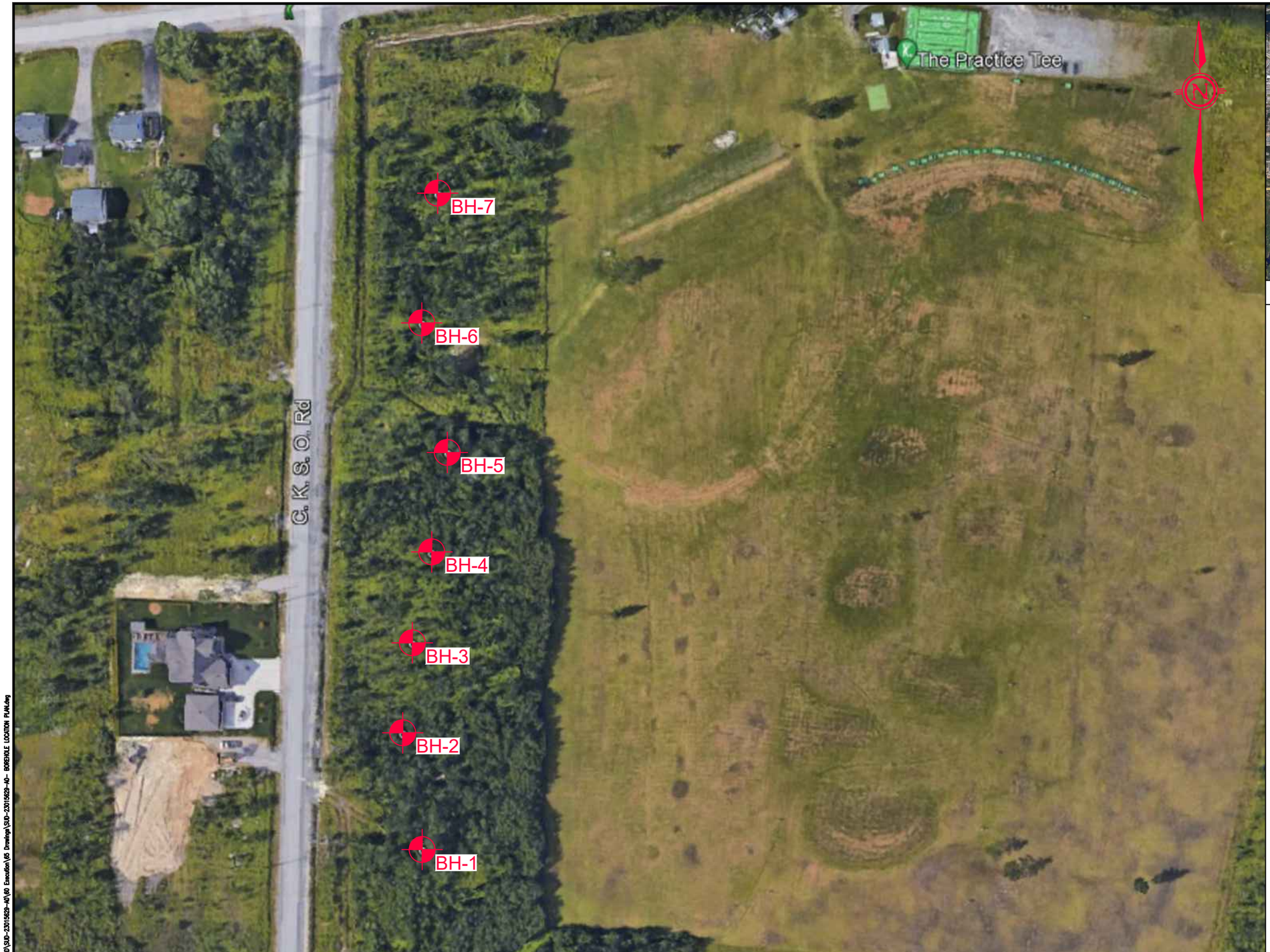
Appendix A – Drawings



KEYPLAN - N.T.S.

LEGEND

EXP BOREHOLE

— NOTES —

1) The boundaries and soil types have been established only at Test Hole locations. Between Test Holes, they are assumed and may be subject to considerable error.
2) Do not use Test Hole elevations for design purposes.
3) Soil samples will be retained in storage for 3 month and then destroyed unless client advises that an extended time period is required.
4) Quantities should not be established from the information provided at the Test Hole locations.
5) This drawing forms part of the report, project number as referenced, and should be used only in conjunction with this report.

EXP Services Inc.
Sudbury Branch
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Canada
www.exp.com

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REVISIONS

No.	DESCRIPTION	DATE

CLIENT: THE WICKER IMAGE INC.

PROJECT: PROPOSED RESIDENTIAL DEVELOPMENT CKSO ROAD, SUDBURY, ONTARIO

PROJECT NO.: SUD-23015629-A0

TITLE: BOREHOLE LOCATION PLAN

DATE	SCALE:	DWG NO.
MARCH 2024	NTS	A-1

Mar 06, 2024 - 10:18am E:\SUD\SUD-23015629-A0\00 Execution\05 Drawings\SUD-23015629-A0- BOREHOLE LOCATION PLAN.dwg

Appendix B – Well Logs

Log of Borehole BH-1

Project No. SUD-23015629-A0 | Figure No. B-2

Project: CKSO Road Residential Development | Sheet No. 1 of 1

Location: Sudbury, Ontario

503323E; 5141981N

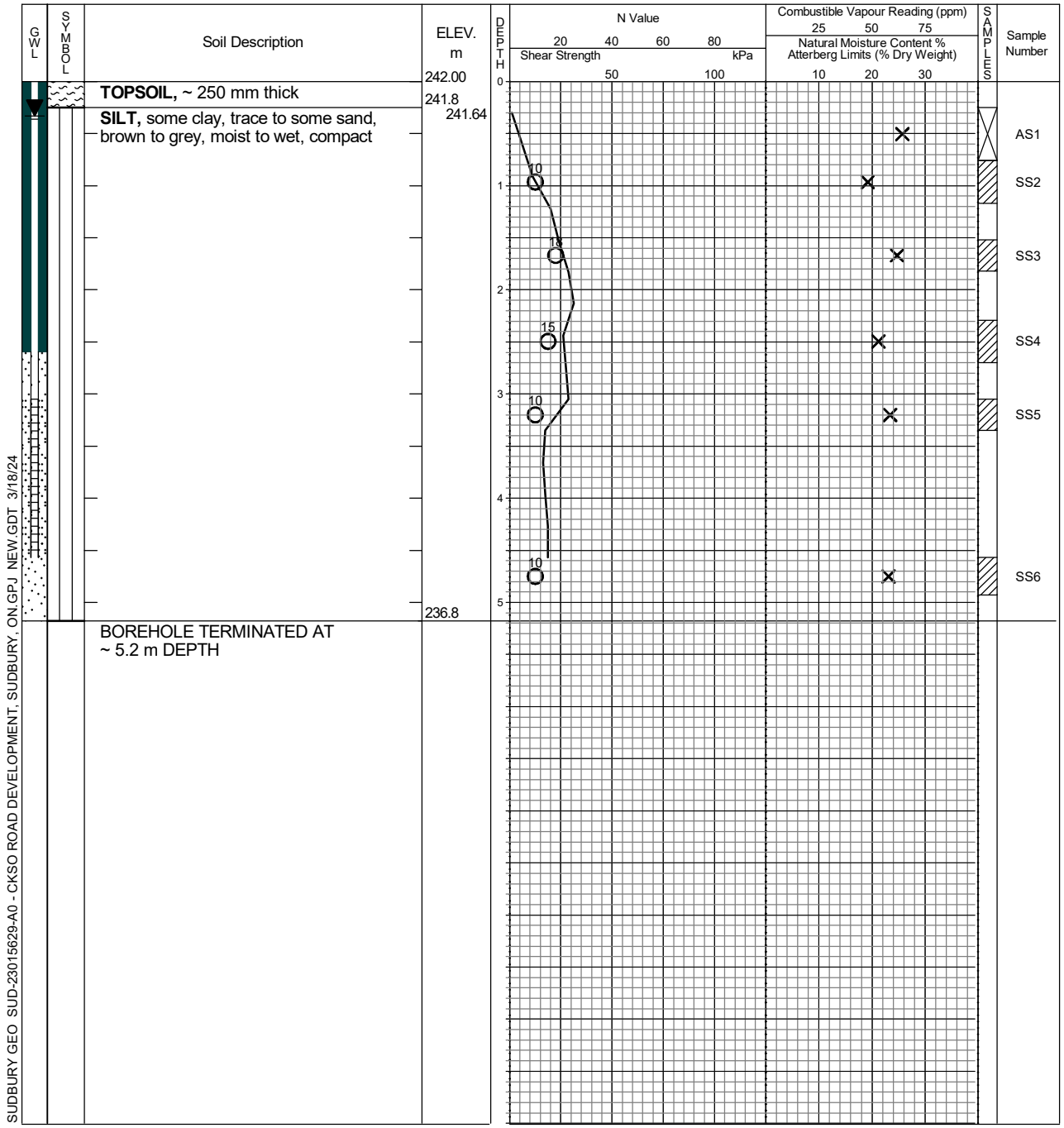
Date Drilled: January 22, 2024

Drill Type: CME 55 Track Mount

Datum: Geodetic (Hand Held GPS)

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test — | Shelby Tube ■ | Field Vane Test S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit |—○| | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲



SUDBURY GEO SUD-23015629-A0 - CKSO ROAD DEVELOPMENT, SUDBURY, ON.GPJ NEW.GDT 3/18/24

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f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
Upon Completion Mar. 6, 2024	Dry 0.36	Open

Log of Borehole BH-2

Project No. SUD-23015629-A0 | Figure No. B-3

Project: CKSO Road Residential Development | Sheet No. 1 of 1

Location: Sudbury, Ontario

503317E; 5142017N

Date Drilled: January 22, 2024

Drill Type: CME 55 Track Mount

Datum: Geodetic (Hand Held GPS)

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test — | Shelby Tube ■ | Field Vane Test S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample Number
		TOPSOIL, ~ 150 mm thick	236.00	0				
			235.9					
		SILT, some clay, trace to some sand, brown to grey, moist to wet, compact to loose		1	13			AS1
								SS2
				2	15			SS3
					15			SS4
				3	8			SS5
				4				
				5	9			SS6
			230.8					
		BOREHOLE TERMINATED AT ~ 5.2 m DEPTH						

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Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	Dry	3.9

Log of Borehole BH-3

Project No. SUD-23015629-A0 | Figure No. B-4

Project: CKSO Road Residential Development | Sheet No. 1 of 1

Location: Sudbury, Ontario

503320E; 5142045N

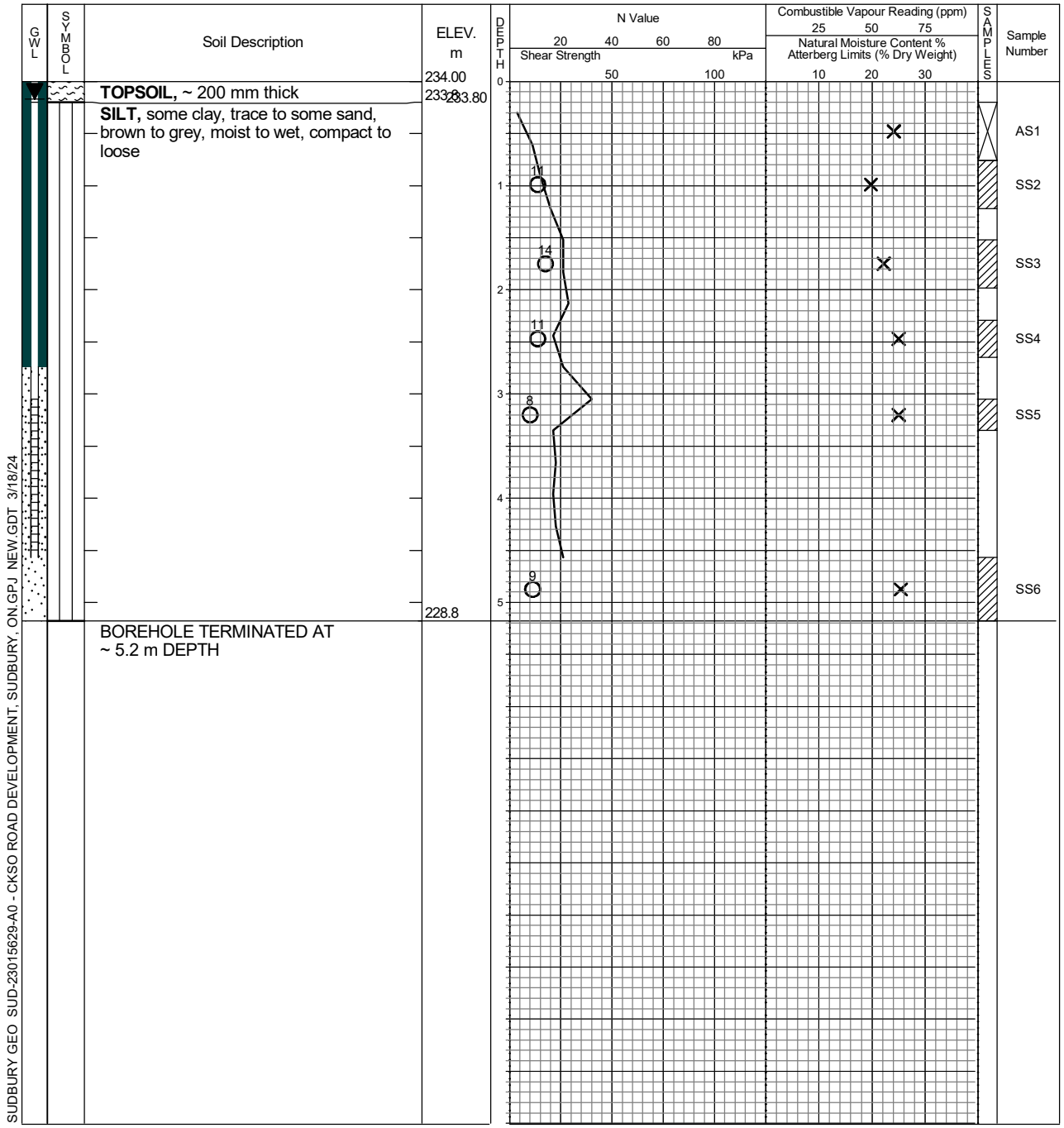
Date Drilled: January 22, 2024

Drill Type: CME 55 Track Mount

Datum: Geodetic (Hand Held GPS)

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test — | Shelby Tube ■ | Field Vane Test S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit —○— | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲



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f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
Upon Completion Mar. 6, 2024	Dry 0.20	Open

Log of Borehole BH-4

Project No. SUD-23015629-A0 | Figure No. B-5

Project: CKSO Road Residential Development | Sheet No. 1 of 1

Location: Sudbury, Ontario

503326E; 5142073N

Date Drilled: January 22, 2024

Drill Type: CME 55 Track Mount

Datum: Geodetic (Hand Held GPS)

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test — | Shelby Tube ■ | Field Vane Test + S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit —○— | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample Number
		TOPSOIL, ~ 200 mm thick	234.00 233.8	0				
		SILT, some clay, trace to some sand, brown to grey, moist to wet, compact to loose		1	11			AS1 SS2
				2	12 9			SS3 SS4
			231.0	3	9			SS5
		CLAYEY SILT, trace sand, brown to grey, wet, loose		4				
			228.8	5	8			SS6
		BOREHOLE TERMINATED AT ~ 5.2 m DEPTH						

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f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	Dry	3.7

Log of Borehole BH-5

Project No. SUD-23015629-A0 | Figure No. B-6

Project: CKSO Road Residential Development | Sheet No. 1 of 1

Location: Sudbury, Ontario

503331E; 5142104N

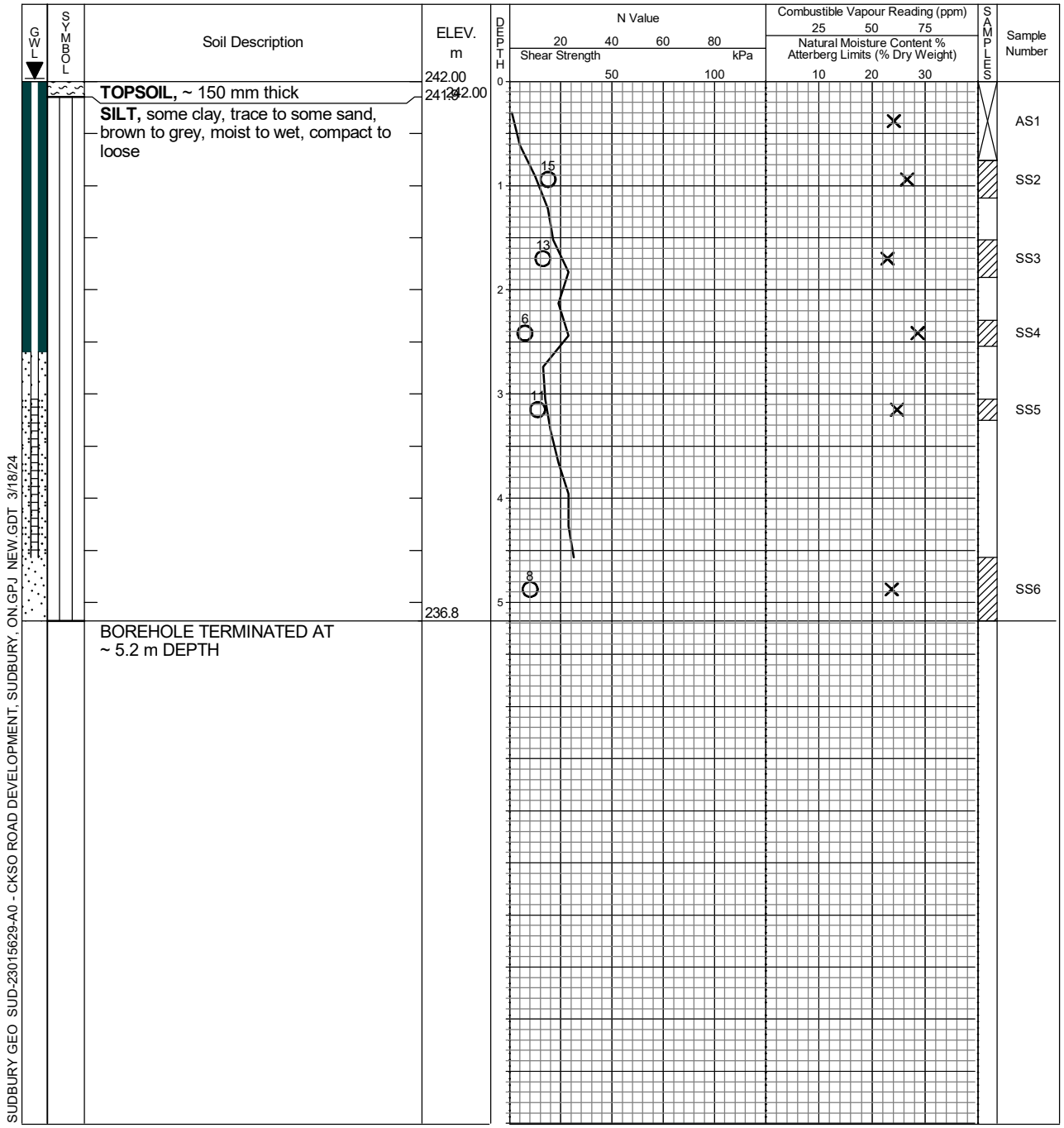
Date Drilled: January 22, 2024

Drill Type: CME 55 Track Mount

Datum: Geodetic (Hand Held GPS)

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test — | Shelby Tube ■ | Field Vane Test S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit —○— | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲



SUDBURY GEO SUD-23015629-A0 - CKSO ROAD DEVELOPMENT, SUDBURY, ON.GPJ NEW.GDT 3/18/24

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Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
Upon Completion Mar. 6, 2024	Dry 0.0	Open

Log of Borehole BH-6

Project No. SUD-23015629-A0 | Figure No. B-7

Project: CKSO Road Residential Development | Sheet No. 1 of 1

Location: Sudbury, Ontario

503323E; 5142144N

Date Drilled: January 22, 2024

Drill Type: CME 55 Track Mount

Datum: Geodetic (Hand Held GPS)

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test — | Shelby Tube ■ | Field Vane Test S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample Number
		TOPSOIL, ~ 150 mm thick	235.00 234.9	0				
		SILT, some clay, trace to some sand, brown to grey, moist to wet, compact to loose		1	15			AS1 SS2
				2	11 11			SS3 SS4
				3	10			SS5
				4				
				5	7			SS6
		BOREHOLE TERMINATED AT ~ 5.2 m DEPTH	229.8					

N Value: 20 40 60 80 | Shear Strength: 50 100 kPa

Combustible Vapour Reading (ppm): 25 50 75 | Natural Moisture Content % Atterberg Limits (% Dry Weight): 10 20 30

SUDBURY GEO SUD-23015629-A0 - CKSO ROAD DEVELOPMENT, SUDBURY, ON.GPJ NEW.GDT 3/18/24

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Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	Dry	4.6

Log of Borehole BH-7

Project No. SUD-23015629-A0 | Figure No. B-8

Project: CKSO Road Residential Development | Sheet No. 1 of 1

Location: Sudbury, Ontario

503328E; 5142184N

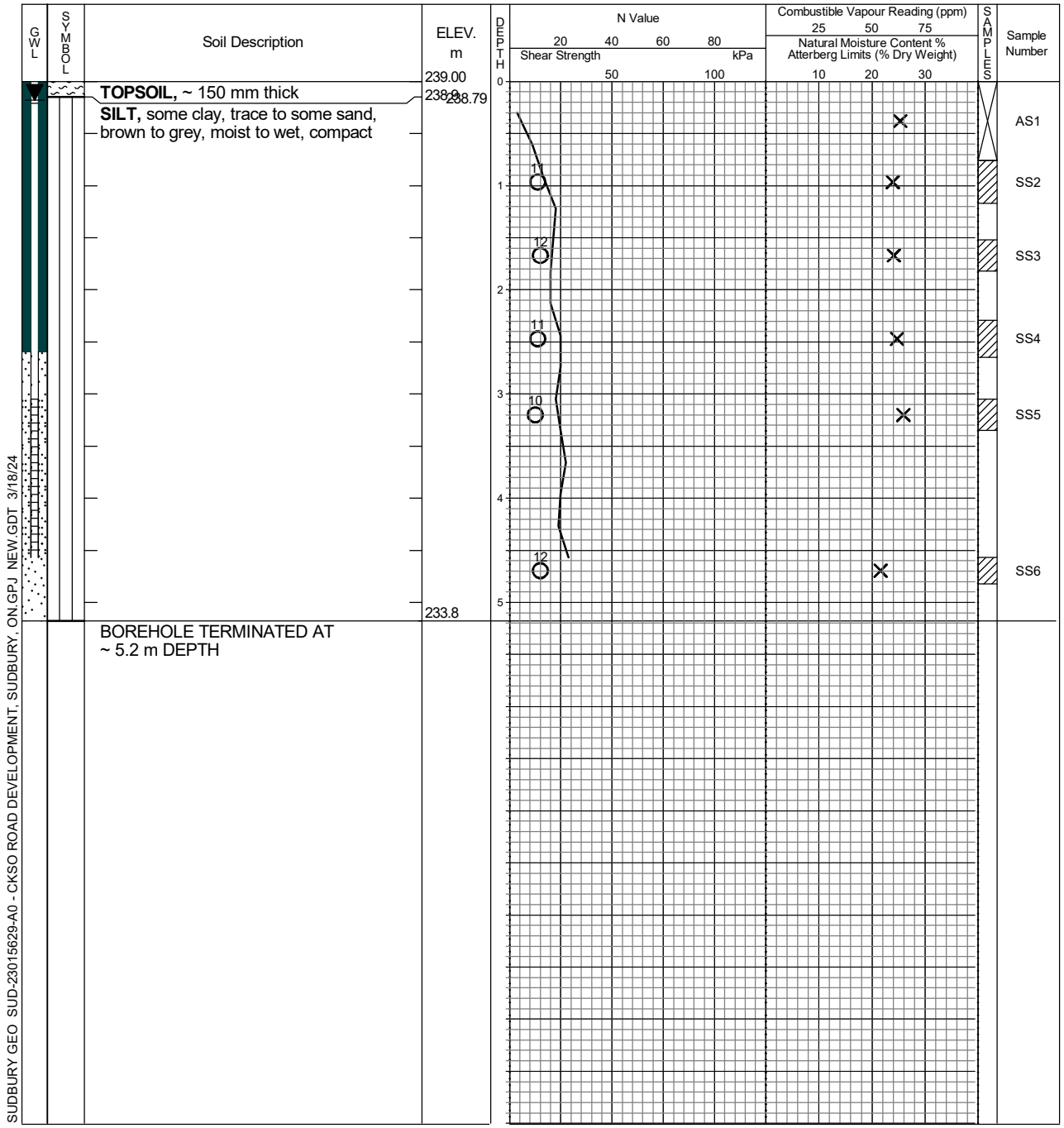
Date Drilled: January 22, 2024

Drill Type: CME 55 Track Mount

Datum: Geodetic (Hand Held GPS)

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Undrained Triaxial at % Strain at Failure
Penetrometer



SUDBURY GEO SUD-23015629-A0 - CKSO ROAD DEVELOPMENT, SUDBURY, ON.GPJ NEW.GDT 3/18/24

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f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
Upon Completion Mar. 6, 2024	Dry 0.21	Open

1·0 180

UTM 17 Z 503 540 E

Con 5 R 5140040 N

Elev Con 4 R 780

Basin 2 2 1

41 I 7 e

59 № 465 B

7

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District SUDBURY — Township, Village, Town or City BRODER

Con. V — Lot 2 — Date completed 6 (day) OCT. (month) 1965 (year)

Owner CENTRAL MORTGAGE (print in block letters) — Address R.R.3 SUDBURY

Casing and Screen Record

Inside diameter of casing	2"
Total length of casing	20'
Type of screen	—
Length of screen	—
Depth to top of screen	—
Diameter of finished hole	2"

Pumping Test

Static level	5'
Test-pumping rate	1½ G.P.M.
Pumping level	
Duration of test pumping	2 HRS.
Water clear or cloudy at end of test	CLEAR
Recommended pumping rate	1½ G.P.M.
with pump setting of	30' feet below ground surface

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
BOULDERS & YELLOW CLAY	0	20		
RED GRANITE	20	56	50	FRESH

For what purpose(s) is the water to be used? HOUSE

Is well on upland, in valley, or on hillside? ✓ upland

Drilling or Boring Firm SUDBURY DIAMOND DRILLING

Address 177 BROOKSIDE ST. CHELMSFORD

Licence Number 1717

Name of Driller or Borer G. BENOIT

Address 177 BROOKSIDE ST CHELMSFORD.

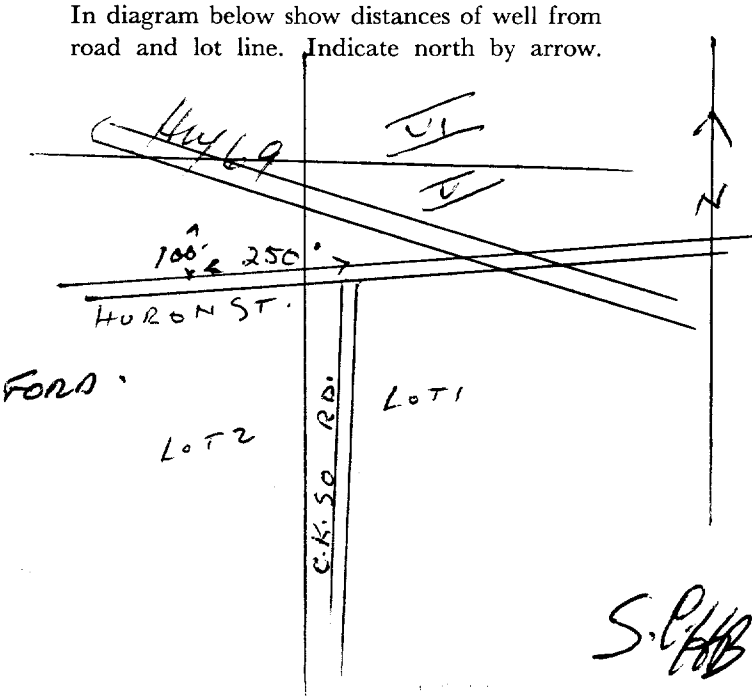
Date JUNE 21/66

G. Benoit

(Signature of Licensed Drilling or Boring Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



S.C.

Form 7 15M-60-4138

OWRC COPY

TM 1|7 Z 5|0|3|0|6|1|0 Con V Lot 02 CODED 5901995 - 3 9 J.B.

5 R 5|1|1|4|1|1|7|6|1|0

ev. 6 R 0|7|8|0

in 2|2

41 I/7W

The Ontario Water Resources Commission Act

WATER WELL RECORD

~~County or~~ District SUDBURY Township, ~~Village, Town or City~~ BRODER

Con. V Lot 2 Date completed 14 (day) OCT. (month) 1968 (year)

[redacted]dress SITE 5 RR#3 SUDBURY

Casing and Screen Record		Pumping Test	
Inside diameter of casing	11/2 IN	Static level	8 FT.
Total length of casing	58 FT.	Test-pumping rate	80 gals per hr. G.P.M.
Type of screen	—	Pumping level	13 FT
Length of screen	—	Duration of test pumping	8 hrs.
Depth to top of screen		Water clear or cloudy at end of test	CLEAR.
Diameter of finished hole	11/2 IN	Recommended pumping rate	80 gals per hr. G.P.M.
		with pump setting of	56 feet below ground surface

Well Log			Water Record	
Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
CLAY & QUICK SAND.	0	53		
FINE GRAVEL.	53	58.	54	FRESH.

For what purpose(s) is the water to be used? HOME

Is well on upland, in valley, or on hillside? VALLEY

Drilling or Boring Firm A. Quenville Site #2 R.R. 3.

Address Sudbury, Ont.

Licence Number 3091

Name of Driller or Borer Aurel Quenville

Address Site 2 RR#3.

Date Oct 24th 1968

Aurel Quenville

(Signature of Licensed Drilling or Boring Contractor)

Form 7 5M 60-20912

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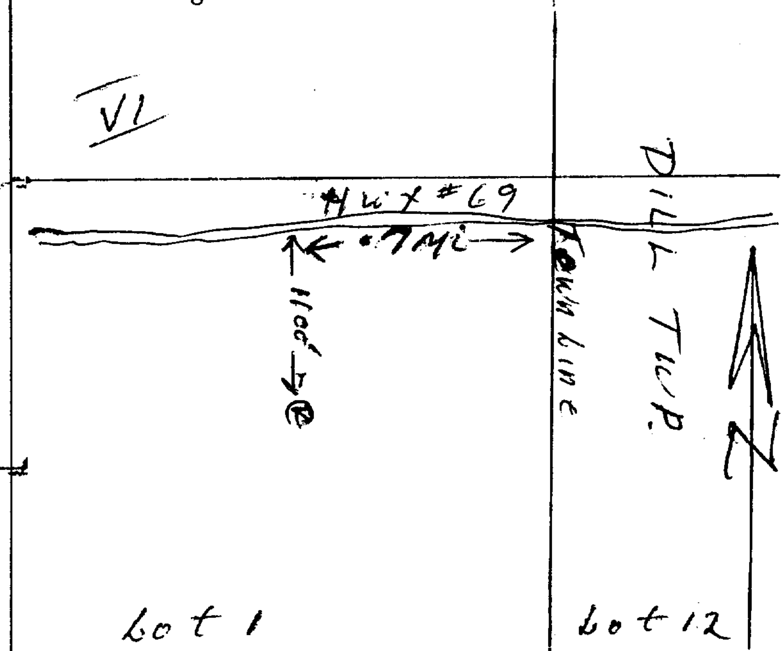
Location of Well

In diagram below show distances of well from



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WATER WELL RECORD

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SUDBURY	BRODER	✓	002 ~~262~~

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED 48-53
[redacted]	#3 Site 4 Box 28	DAY 02 MO 08 YR. 70

...ING	RC.	ELEVATION	RC.	BASIN CODE
141770	4	0770	5	22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
GREY	CLAY			0	20
GREY	FINE SAND			20	138
	HARD PAN			138	143

31 | 0020205 | 0138208 | 0143 14

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0143	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
02 ~~2¼~~	1 ☐ STEEL 2 ☒ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	STD.	0	0143 ~~143~~
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER	PUMPING RATE: 0002 ~~1½~~ GPM.	DURATION OF PUMPING: 12 HOURS 00 MINS.		
STATIC LEVEL: 000 FEET	WATER LEVEL END OF PUMPING: 010 FEET	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY — 15 MINUTES / 30 MINUTES / 45 MINUTES / 60 MINUTES: ~~unable to take levels~~		
IF FLOWING, GIVE RATE: GPM.	PUMP INTAKE SET AT: 25 FEET	WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY		
RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP	RECOMMENDED PUMP SETTING: 025 FEET	RECOMMENDED PUMPING RATE: 0002 ~~1½~~ GPM.		

50-53 000.2 GPM./FT. SPECIFIC CAPACITY

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED, POOR QUALITY
7 ☐ UNFINISHED

WATER USE 01

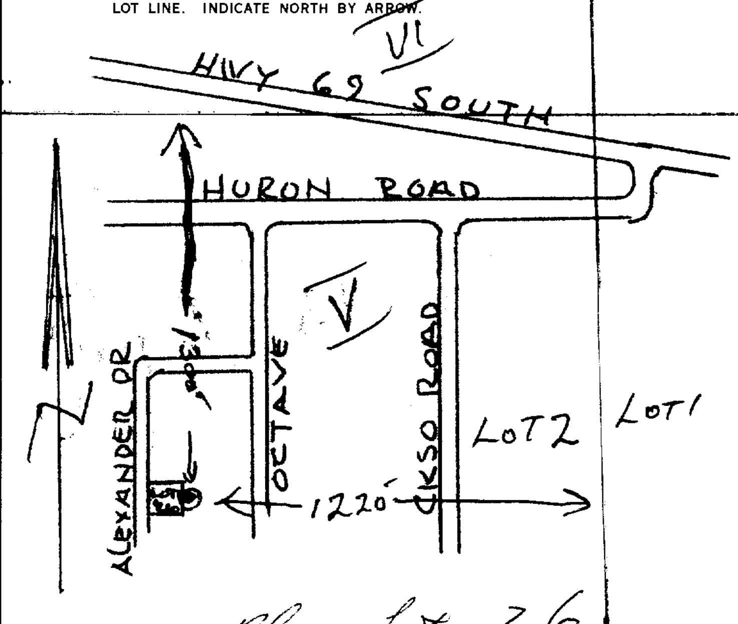
1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF DRILLING

1 ☐ CABLE TOOL
2 ☐ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☐ ROTARY (AIR)
5 ☐ AIR PERCUSSION
6 ☐ BORING
7 ☐ DIAMOND
8 ☒ JETTING
9 ☐ DRIVING

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS: Plan Lot 26

CONTRACTOR

NAME OF WELL CONTRACTOR: Leo Houle	LICENCE NUMBER: 2646
ADDRESS: RR 3 - Site 2. Sudbury Ont	
NAME OF DRILLER OR BORER: Leo Houle	LICENCE NUMBER: 2646
SIGNATURE OF CONTRACTOR: Leo Houle	SUBMISSION DATE: DAY 16 MO Aug YR 70

OFFICE USE ONLY

DATA SOURCE: 1	CONTRACTOR: 2646	DATE RECEIVED: 270870
DATE OF INSPECTION: Aug. 25/71	INSPECTOR: P/J.B.	
REMARKS:		

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WATER WELL RECORD

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SUDBURY	~~Sudbury~~ BRODER	✓	~~X~~ 002

[redacted] Ash Street, Sudbury, Ontario

DATE COMPLETED: DAY 01 MO. 12 YR. 70

41740 | RC. 4 | ELEVATION 0770 | 5 | BASIN CODE 22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
Brown	Top Soil			0	3
Blue	Quck Sand with layers of Blue Clay			3	120
Blue	Clay	Boulders		120	135
Blue	Boulders and	Coarse Gravel		135	145

31 | 0003602 | 01203 0705 | 01353 0513 | 01453 1311

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0143	☒ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
~~3 3/16~~ 03	☒ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE	3/16	0	0145
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE			
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

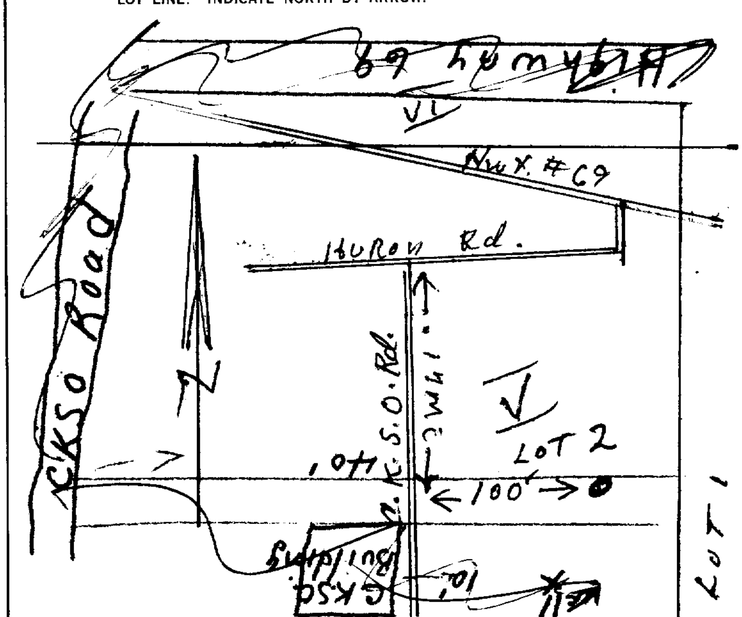
71 PUMPING TEST

PUMPING TEST METHOD	☒ PUMP ☐ BAILER
PUMPING RATE	0004 GPM.
DURATION OF PUMPING	07 HOURS 00 MINS.
STATIC LEVEL	~~145~~ 04 FEET
WATER LEVEL END OF PUMPING	06 FEET
WATER LEVELS DURING	☒ PUMPING ☐ RECOVERY
15 MINUTES	006 FEET
30 MINUTES	006 FEET
45 MINUTES	006 FEET
60 MINUTES	006 FEET
IF FLOWING, GIVE RATE	0004 GPM.
PUMP INTAKE SET AT	30 FEET
WATER AT END OF TEST	☒ CLEAR ☐ CLOUDY
RECOMMENDED PUMP TYPE	☒ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING	030 FEET
RECOMMENDED PUMPING RATE	0004 GPM.

000.4 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL

☒ WATER SUPPLY ☐ OBSERVATION WELL ☐ TEST HOLE ☐ RECHARGE WELL ☐ ABANDONED, INSUFFICIENT SUPPLY ☐ ABANDONED, POOR QUALITY ☐ UNFINISHED

WATER USE 05

☐ DOMESTIC ☐ STOCK ☐ IRRIGATION ☐ INDUSTRIAL ☐ OTHER ☒ COMMERCIAL ☐ MUNICIPAL ☐ PUBLIC SUPPLY ☐ COOLING OR AIR CONDITIONING ☐ NOT USED

METHOD OF DRILLING

☐ CABLE TOOL ☐ ROTARY (CONVENTIONAL) ☐ ROTARY (REVERSE) ☐ ROTARY (AIR) ☐ AIR PERCUSSION ☐ BORING ☒ DIAMOND ☐ JETTING ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR	THE MARKSTAY DIAMOND DRILLERS LTD
LICENCE NUMBER	3614
ADDRESS	Markstay, Ontario.
NAME OF DRILLER OR BORER	Robert Turcot
LICENCE NUMBER	
SIGNATURE OF CONTRACTOR	Robert Turcot
SUBMISSION DATE	DAY 09 MO. 12 YR. 70

OFFICE USE ONLY

DATA SOURCE	1
CONTRACTOR	3614
DATE RECEIVED	11-12-70
DATE OF INSPECTION	Aug. 25/71
INSPECTOR	P/JB.
REMARKS:	J.B.

OWRC COPY

Ministry of the Environment

Ontario

The Ontario Water Resources Act

WATER WELL RECORD

41/7 W

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

(11) 5904018 MUNICIP 59051 CON. CON 05

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Sudbury	Broder	Con. 5	001 1

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Separate Schøøl Bøard	201 Jogues St. Sudbury Ont	DAY 28 MO. ~~Aug~~ 08 YR. ~~78~~ 78

(21) UTM ZONE 17 EASTING 503250 NORTHING 5141500 RC 5 ELEVATION 0775 RC 6 BASIN CODE 22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	Sand			0	15
	Clay			15	150
	Sand			150	189
	Gray Granite			189	400

(31) 0015 28 | 0150 05 | 0189 28 | 0400 22

(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0290	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
~~6 1/4~~ 06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0189
06"	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		189	0400
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

(61) PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)

(71) PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP ~~Blow~~ 2 ☐ BAILER

PUMPING RATE: ~~1 1/2~~ 0002 GPM

DURATION OF PUMPING: 01 HOURS 00 MINS

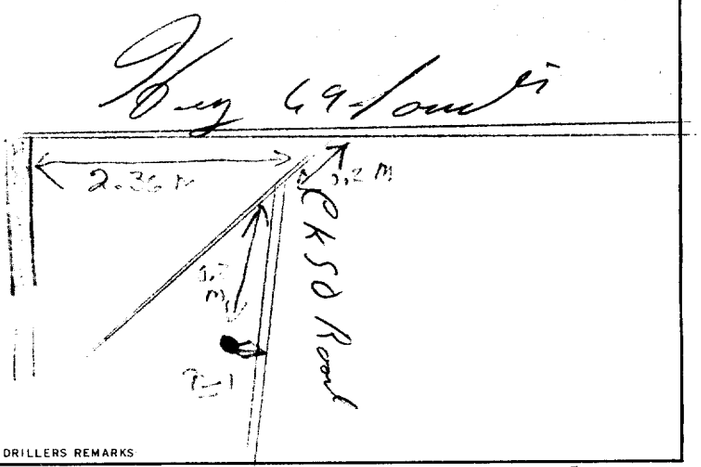
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
006 FEET	400 FEET	1 ☐ PUMPING 2 ☐ RECOVERY	[illegible] FEET	[illegible] FEET	[illegible] FEET	[illegible] FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	400 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	380 FEET	0002 ~~1 1/2~~ GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

FINAL STATUS OF WELL (54): 1 ☒ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED

WATER USE (55-56): 07 — 1 ☐ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☒ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; ☒ OTHER School; 9 ☐ NOT USED

METHOD OF DRILLING (57): 4 — 1 ☐ CABLE TOOL; 2 ☐ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☒ ROTARY (AIR); 5 ☐ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR	LICENCE NUMBER
R. Vaillancourt & Sons Ltd Well Drilling	5210

ADDRESS: Chelmsford

NAME OF DRILLER OR BORER	LICENCE NUMBER
R. Vaillancourt	5210

SIGNATURE OF CONTRACTOR: R. Vaillancourt

SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE (58)	CONTRACTOR (59-62)	DATE RECEIVED (63-68)
1	5210	221178

DATE OF INSPECTION: 16/5/79 INSPECTOR: D.M. P.M.

REMARKS:

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506-4-77

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

Ontario

41-I/1

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 5904124 | MUNICIP. 59051 | CON. CON | 05

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Ontario	Broder	5	002

[redacted] 190 Good View Rd

DATE COMPLETED: DAY 01 MO. 8 YR. 79

[redacted] 42950 | RC 5 | ELEVATION 0890 | RC 6 | BASIN CODE 22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
White	Granite		2" flush joint	1	75

31 | 0075[illegible]
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
71	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
2	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	1/4	0	75
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

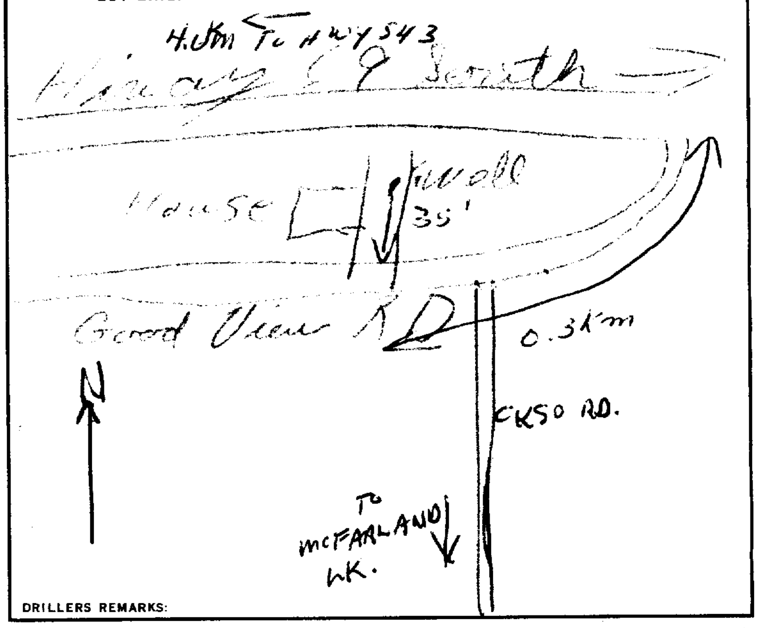
DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE	3 GPM
DURATION OF PUMPING	01 HOURS 00 MINS
STATIC LEVEL	08 FEET
WATER LEVEL END OF PUMPING	08 FEET
WATER LEVELS DURING	1 ☒ PUMPING 2 ☐ RECOVERY
15 MINUTES	08 FEET
30 MINUTES	08 FEET
45 MINUTES	08 FEET
60 MINUTES	08 FEET
IF FLOWING, GIVE RATE	GPM
PUMP INTAKE SET AT	FEET
WATER AT END OF TEST	1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE	☒ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING	3 FEET
RECOMMENDED PUMPING RATE	003 GPM
GPM./FT. SPECIFIC CAPACITY	

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL	1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED
WATER USE	1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED
METHOD OF DRILLING	1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR	S.S. Drilling
LICENCE NUMBER	4862
ADDRESS	RR*3 Site 4 Box 83 Sud Ont.
NAME OF DRILLER OR BORER	Leo Paul Seguin
LICENCE NUMBER	4862
SIGNATURE OF CONTRACTOR	[signature]
SUBMISSION DATE	DAY 9 MO. 8 YR. 79

OFFICE USE ONLY

DATA SOURCE	1
CONTRACTOR	4862
DATE RECEIVED	150879
DATE OF INSPECTION	16/10/79
INSPECTOR	D.M.
REMARKS:	

P

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FORM 7 MOE 07-091

41-I-7

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
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11 5904339 MUNICIP 59051 CON. CON 05

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC	LOT
	[redacted] Broder	Con 5	002 1x2

DATE COMPLETED: DAY 25 MO ~~Aug~~ YR 80

[redacted] 2 Whittaker Sudbury Ont

UTM 41600 RC 5 ELEVATION 0800 RC 6 BASIN CODE 22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	Clay			0	135
	Quicksand			135	145
	Gravel			145	146

31 0135 05 0145 07 0146 11

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0146	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☒ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06 ~~6~~	1 ☒ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE	188	0	0146
	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			
	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33	

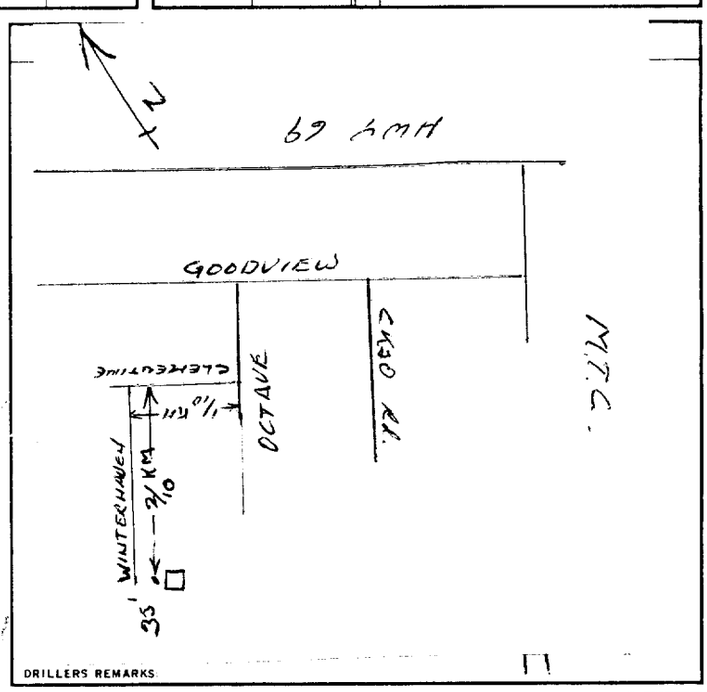
71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	005 GPM	05 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING (1 ☒ PUMPING 2 ☐ RECOVERY)	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
FEET	135 FEET		050 FEET	075 FEET	090 FEET	100 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
~~15 HP~~ GPM	135 FEET	1 ☐ CLEAR 2 ☒ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☐ DEEP	040 FEET	005 GPM



DRILLERS REMARKS

FINAL STATUS OF WELL 54: 1 ☐ WATER SUPPLY; 2 ☒ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED

WATER USE 55-56 01: 1 ☒ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; ☐ OTHER; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; 9 ☐ NOT USED

METHOD OF DRILLING 57 02: 1 ☐ CABLE TOOL; 2 ☐ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☒ ROTARY (AIR); 5 ☐ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: R Vaillancoyrt & Sons Ltd Well Drilling — LICENCE NUMBER: 5210

ADDRESS: Chelmsford Ont

NAME OF [illegible] — LICENCE NUMBER: 5210

SIGNATURE OF CONTRACTOR: R Vaillancourt

SUBMISSION DATE: DAY ____ MO ____ YR ____

OFFICE USE ONLY

DATA SOURCE 58: 1 — CONTRACTOR 59-62: 5210 — DATE RECEIVED 63-68: 021080

DATE OF INSPECTION: 20/5/81 — INSPECTOR

REMARKS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

4117

1. PRINT ONLY IN SPACES PROVIDED
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(11) 5904686 MUNICIP. 59051 CON. Con 05

COUNTY OR DISTRICT: Sudbury
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: [redacted]
CON, BLOCK, TRACT, SURVEY, ETC.: Con 5
LOT: 001 1
DATE COMPLETED: DAY 19 MO Aug YR 82

[redacted] Box 400 Sudbury Ont

ELEVATION: 41700 RC: 5 ELEVATION: 0850 RC: 6 BASIN CODE: 22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH FEET FROM	DEPTH FEET TO
	Brown Clay			0	15
	Grey Clay			15	138
	Gravel			138	142

(31) 0015 6 05 | 0138 2 05 | 0142 1 1
(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0142	[X] 1 FRESH [ ] 2 SALTY [ ] 3 SULPHUR [ ] 4 MINERAL
	[ ] 1 FRESH [ ] 2 SALTY [ ] 3 SULPHUR [ ] 4 MINERAL
	[ ] FRESH [ ] SALTY [ ] SULPHUR [ ] MINERAL
	[ ] 1 FRESH [ ] 2 SALTY [ ] 3 SULPHUR [ ] 4 MINERAL
	[ ] 1 FRESH [ ] 2 SALTY [ ] 3 SULPHUR [ ] 4 MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH FEET FROM	DEPTH FEET TO
6	[X] 1 STEEL [ ] 2 GALVANIZED [ ] 3 CONCRETE [ ] 4 OPEN HOLE	.188	0	0142
06	[ ] STEEL [ ] GALVANIZED [ ] CONCRETE [ ] OPEN HOLE			
	[ ] 1 STEEL [ ] 2 GALVANIZED [ ] 3 CONCRETE [ ] 4 OPEN HOLE			

SCREEN

SLOT NO.	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE: | DEPTH TO TOP OF SCREEN FEET:

(61) PLUGGING & SEALING RECORD

DEPTH SET AT FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)

PUMPING TEST

(71) PUMPING TEST METHOD: [X] 1 Flow [ ] BAILER
PUMPING RATE: 0075 GPM
DURATION OF PUMPING: 02 HOURS 00 MINS

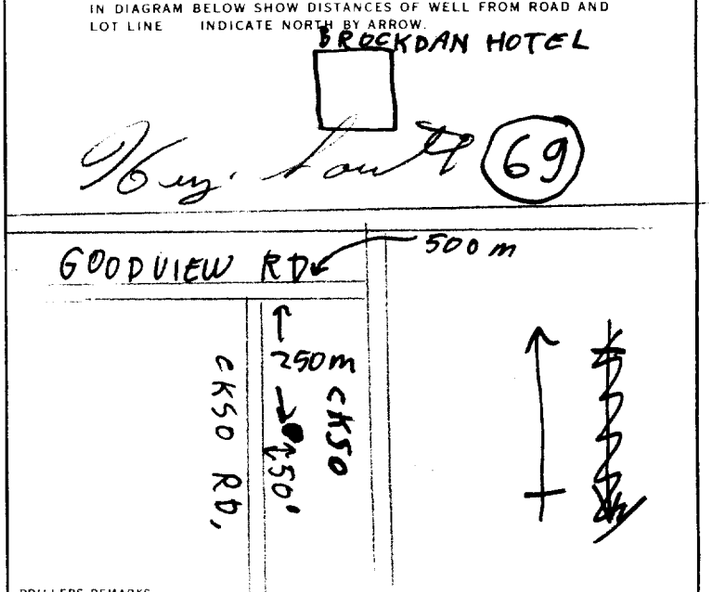
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: [X] 1 PUMPING [ ] 2 RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
001 FEET	135 FEET	135 FEET	135 FEET	135 FEET	135 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	135 FEET	[X] 1 CLEAR [ ] 2 CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
[ ] SHALLOW [X] DEEP	100 FEET	0010 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL: 1

[X] 1 WATER SUPPLY [ ] 2 OBSERVATION WELL [ ] 3 TEST HOLE [ ] 4 RECHARGE WELL [ ] 5 ABANDONED, INSUFFICIENT SUPPLY [ ] 6 ABANDONED, POOR QUALITY [ ] 7 UNFINISHED

WATER USE: 01

[X] 1 DOMESTIC [ ] 2 STOCK [ ] 3 IRRIGATION [ ] 4 INDUSTRIAL [ ] OTHER [ ] 5 COMMERCIAL [ ] 6 MUNIC PAL [ ] 7 PUBLIC SUPPLY [ ] 8 COOLING OR AIR CONDITIONING [ ] 9 NOT USED

METHOD OF DRILLING: 4

[ ] 1 CABLE TOOL [ ] 2 ROTARY (CONVENTIONAL) [ ] 3 ROTARY (REVERSE) [X] 4 ROTARY (AIR) [ ] 5 AIR PERCUSSION [ ] 6 BORING [ ] 7 DIAMOND [ ] 8 JETTING [ ] 9 DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: R. Vaillancourt & Sons LTD.
LICENCE NUMBER: 5210
ADDRESS: Chelmsford Ont.
NAME OF DRILLER OR BORER: A. Vaillancourt
LICENCE NUMBER: 5816
SIGNATURE OF CONTRACTOR: R Vaillancourt
SUBMISSION DATE: DAY ____ MO ____ YR ____

OFFICE USE ONLY

DATA SOURCE: 1
CONTRACTOR: 5210
DATE RECEIVED: 25 01 83
DATE OF INSPECTION: 830509
INSPECTOR: A. Morgan
REMARKS:

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506-4-77 FORM 7

41-I-7

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
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(11) 5904963 MUNICIP 59051 CON. CON 05

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	...ders	Con 5	007
	... Joques St Sudbury Ont	DATE COMPLETED	DAY 04 MO ~~Oct~~ 3 YR 84

...41700 | RC. 5 | ELEVATION 0800 | RC. 6 | BASIN CODE 22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	Brown clay			0	5
	grey clay			5	150
	sand			150	160
	sand & Gravel			160	167

31 | 0005605 | 0150205 | 0160 28 | 0167 2811

32

41 WATER RECORD	
WATER FOUND AT - FEET	KIND OF WATER
0167	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD				
INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
~~6¼~~ 06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0167
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN: SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET | MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD		
DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ ~~PUMP~~ blow 2 ☐ BAILER	0025 GPM	01 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
005 FEET	167 ~~167~~ FEET	167 FEET	167 FEET	167 FEET	167 FEET

1 ☒ PUMPING 2 ☐ RECOVERY

IF FLOWING, GIVE RATE: GPM | PUMP INTAKE SET AT: 160 FEET | WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING: 100 FEET | RECOMMENDED PUMPING RATE: 0025 GPM

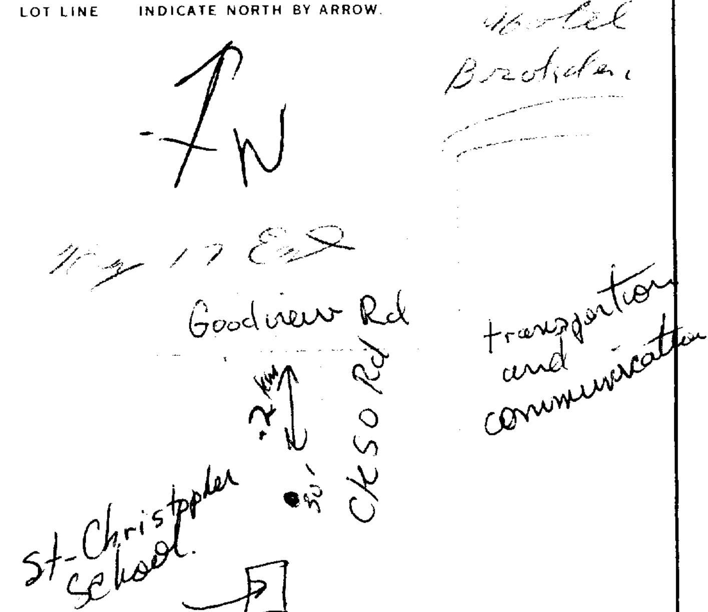
FINAL STATUS OF WELL 1
1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 07
1 ☐ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☒ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING 4
1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☒ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

CONTRACTOR	
NAME OF WELL CONTRACTOR: A. Vaillancourt & Sons LTD.	LICENCE NUMBER: 5210
ADDRESS: Chelmsford	
NAME OF DRILLER OR BORER: A. Vailancourt	LICENCE NUMBER: 5216
SIGNATURE OF CONTRACTOR: R Vaillancourt	SUBMISSION DATE: DAY ___ MO. ___ YR. ___

OFFICE USE ONLY		
DATA SOURCE: 1	CONTRACTOR: 5210	DATE RECEIVED: 030485
DATE OF INSPECTION: 29/05/85	INSPECTOR: [signature]	
REMARKS		

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 — 5905533 — MUNICIP 59051 — CON

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY, ETC	LOT
Sudbury	Broder	4	1

[redacted]6 Goodview Drive Sudbury

DATE COMPLETED: DAY 17 MO Nov YR 87

[redacted]nd Communications

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	Cley			0	35
	Sand And Gravel			35	40
	Grey Granite			40	370

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
250	1 ☐ FRESH 2 ☒ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
To	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
370	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6¼	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	188	0	85
6	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		85	370
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

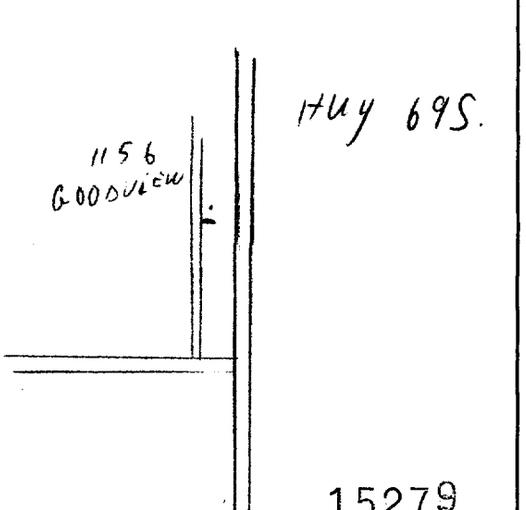
PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☐ PUMP 2 ☒ BAILER	6 GPM	48 HOURS ___ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
20 FEET	100 FEET	1 ☐ PUMPING 2 ☐ RECOVERY	100 FEET	100 FEET	100 FEET	100 FEET

IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST	RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
GPM	100 FEET	1 ☐ CLEAR 2 ☐ CLOUDY	☐ SHALLOW ☒ DEEP	300 FEET	15 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS: 15279

FINAL STATUS OF WELL

1 ☐ WATER SUPPLY 2 ☒ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED 9 ☐ DEWATERING

WATER USE

1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING ☐ OTHER 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: R Vaillancourt& Sons Ltd — WELL CONTRACTOR'S LICENCE NUMBER: 5210

ADDRESS: Well Drilling Chelmsford Ont

NAME OF WELL TECHNICIAN: A Vaillancourt — WELL TECHNICIAN'S LICENCE NUMBER: 5216

SIGNATURE OF TECHNICIAN OR CONTRACTOR: R Vaillancourt — SUBMISSION DATE: DAY ___ MO. ___ YR. ___

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR | DATE RECEIVED: DEC 08 1987

DATE OF INSPECTION: June 28/88 — INSPECTOR

REMARKS

WWIS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 5905537 MUNICIP 5905 1 CON.

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY, ETC	LOT
[redacted]	Broder	4	

[redacted] 65 Winterhaven Sudbury Ont

DATE COMPLETED DAY 18 MO Nov YR 87

[redacted] And Communications

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	Sand And Cley			0	80
	Stone And Silk			80	85
	Grey Granite			85	310

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
290	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	188	0	110
6	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		110	310
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)

71 PUMPING TEST

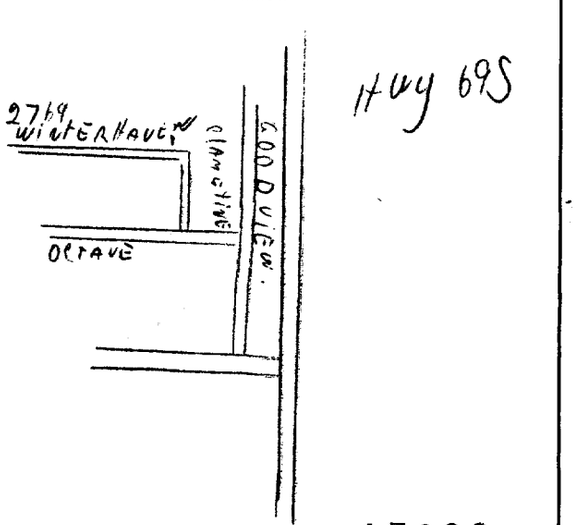
PUMPING TEST METHOD: 1 ☐ PUMP ☒ 2 ☐ BAILER
PUMPING RATE: 1 GPM
DURATION OF PUMPING: 48 HOURS ____ MINS
WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
10 FEET	100 FEET	45 FEET	75 FEET	100 FEET	100 FEET

IF FLOWING GIVE RATE: ____ GPM
PUMP INTAKE SET AT: 100 FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 250 FEET
RECOMMENDED PUMPING RATE: 1 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE INDICATE NORTH BY ARROW.



DRILLERS REMARKS: 15280

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED 9 ☐ DEWATERING

WATER USE

1 ☒ DOMESTIC 2 ☒ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: R. Vaillancourt & Sons Ltd Well Drilling
WELL CONTRACTOR'S LICENCE NUMBER: 5210
ADDRESS: Chelmsford Ont
NAME OF WELL TECHNICIAN: A Vaillancourt
WELL TECHNICIAN'S LICENCE NUMBER: 5216
SIGNATURE OF TECHNICIAN/CONTRACTOR: R Vaillancourt
SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE
CONTRACTOR
DATE RECEIVED: DEC 08 1987
DATE OF INSPECTION: June 28/88
INSPECTOR
REMARKS
WWIS

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FORM NO. 0506 (11/86) FORM 9

Appendix C – Raw Data and Certificates of Analysis

FINAL REPORT

CA40010-MAR24 R---

SUD-23015629-AO

Prepared for

EXP Services Inc.

FINAL REPORT

CA40010-MAR24 R---

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	EXP Services Inc.	Project Specialist	Brad Moore Hon. B.Sc
		Laboratory	SGS Canada Inc.
Address	885 Reagent Street Sudbury, Ontario P3E 5M4. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Jamie Batten	Telephone	705-652-2143
Telephone	705-674-9681	Facsimile	705-652-6365
Facsimile	705-674-5583	Email	brad.moore@sgs.com
Email	jamie.batten@exp.com; yves.beauparlant@exp.com	SGS Reference	CA40010-MAR24
Project	SUD-23015629-AO	Received	03/02/2024
Order Number		Approved	03/04/2024
Samples	Solution (2)	Report Number	CA40010-MAR24 R---
		Date Reported	03/04/2024

COMMENTS

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes
Chain of Custody Number: 035574

RL is raised due to sample matrix

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

FINAL REPORT

CA40010-MAR24 R---

Client: EXP Services Inc.
Project: SUD-23015629-AO
Project Manager: Jamie Batten
Samplers: Shianne Van Duzen

MATRIX: WATER

Sample Number	5	6
Sample Name	MW1	MW4
Sample Matrix	Solution	Solution
Sample Date	29/02/2024	29/02/2024

Parameter	Units	RL		Result	Result
Metals and Inorganics					
Nitrite (as N)	as N mg/L	0.03		< 0.03	< 0.3↑
Nitrate (as N)	as N mg/L	0.06		< 0.06	< 0.6↑
Nitrate + Nitrite (as N)	as N mg/L	0.06		< 0.06	< 0.6↑

QC SUMMARY

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate + Nitrite (as N)	DIO0046-MAR24	mg/L	0.06	<0.06	NA		NA			NA		
Nitrite (as N)	DIO0046-MAR24	mg/L	0.03	<0.03	4	20	97	90	110	102	75	125
Nitrate (as N)	DIO0046-MAR24	mg/L	0.06	<0.06	0	20	97	90	110	98	75	125

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS	Insufficient sample for analysis.
RL	Reporting Limit.
↑	Reporting limit raised.
↓	Reporting limit lowered.
NA	The sample was not analysed for this analyte
ND	Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

No: 035574

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

Page _____ of _____

Laboratory Information Section - Lab use only

Received By: Siri Romard.
Received Date: 03/02/24. (mm/dd/yy)
Received Time: _____ : _____ (hr : min)
Received By (signature): Siri Romard.
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ICE PACK.
Temperature Upon Receipt (°C) 9.9.
LAB LIMS #: CA-40010-MAR24 SR

REPORT INFORMATION	INVOICE INFORMATION
Company: EXP Services	☐ (same as Report Information)
Contact: Jamie Batten	Company:
Address: 885 Regent St. Sudbury.	Contact:
Phone:	Address:
Fax:	Phone:
Email:	Email:

Quotation #: _____ P.O. #: _____
Project #: SUD-23015629-A0. Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☐ Regular TAT (5-7days)

TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date: _____

*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture: ☐ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☐ Table _____ Appx. _____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations: ☐ Reg 347/558 (3 Day min TAT) ☐ PWQO ☐ MMER ☐ CCME ☐ Other: _____ ☐ MISA ☐ ODWS Not Reportable *See note

Sewer By-Law: ☐ Sanitary ☐ Storm Municipality: _____

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	MW1	2024-02-29	13:00	1	Water
2	MW4	2024-02-29	13:10	1	Water
3	Dup	~~2024-02-29~~	~~13:05~~	1	Water
4					
5					
6					
7					
8					
9					
10					
11					
12					

	M & I				SVOC		PCB	PHC		VOC		Pest	Other (please specify)						SPLP	TCLP	
	Field Filtered (Y/N)	Metals & Inorganics incl CrVI, CN,Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Ti,U,V,Zn	PAHs only	SVOCs all incl PAHs, ABNs, CPs	PCBs Total ☐ Aroclor ☐	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs all incl BTEX	BTEX only	Pesticides Organochlorine or specify other	Nitrate + Nitrite				Sewer Use: Specify pkg:	Water Characterization Pkg General ☐ Extended ☐	Specify tests ☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN	Specify tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
1													✓								
2													✓								
3													✓								
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Observations/Comments/Special Instructions

Sampled By (NAME): Shianne Van Duzen Signature: S. VanDuzen Date: 03/01/24 (mm/dd/yy)
Relinquished by (NAME): Shianne Van Duzen Signature: S. VanDuzen Date: 03/01/24 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.7
Date of Issue: 07 JUNE 2023