Strathroy Turf Farm Ltd.

Slope Assessment

FINAL

Project Name
Proposed Kettle Creek Residential Development

Project Location
37719 Lake Line, Port Stanley, Ontario

Project Number
LON-22006266-A0

Prepared By:
exp Services Inc.
15701 Robin's Hill Road
London, ON N5V 0A5
Canada

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exp
15701 Robin's Hill Road
London, ON N5V 0A5
Canada
T: 519-963-3000
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www.exp.com

_____
Philips Aby, M.Eng., E.I.T.
Project Engineer in Training, Geotechnical Services

_____
Idib Sadoun, M.Sc., P. Eng.
Senior Engineer, Geotechnical Services

Date Submitted:
April 7, 2022

Legal Notification

This report was prepared by **EXP** Services Inc. for the account of **Strathroy Turf Farm Ltd.**

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

Table of Contents

1. Introduction

EXP Services Inc. (EXP) was retained by **Strathroy Turf Farm Ltd.** to conduct a slope assessment and prepare a geotechnical report relating to the proposed development at 37719 Lake Line, Port Stanley, Ontario, hereinafter referred to as the 'Site'. It is understood that a new residential development will consist of dwelling units. The units will run along toe of slope from west, east and north sides and cover the entire Site.

The Site encroaches on regulated Lands of Kettle Creek Conservation Authority (KCCA) and will require approval from the conservation authority.

Based on an interpretation of soil and groundwater information from MOECC well records, EXP has provided geotechnical engineering guidelines to support the proposed Site development. Slope assessments for the north and west sides of the Site were conducted on April 2017 and March 2022 to determine the erosion hazard limits (development setback).

1.2 Terms of Reference

Authorization to proceed with this investigation was received from the Client through email communications.

The purpose of the assessment was to determine the recommended Development Setback Limit for the Site.

Based on MOECC well records and additional reconnaissance site visits, this report provides geotechnical comments and recommendations on slope stability and recommended Development Setback Limit.

This report is provided on the basis of the terms of reference presented above, and on the assumption that the design will be in accordance with applicable codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, or if any questions arise concerning geotechnical aspects of the codes and standards, this office should be contacted to review the design.

The information in this report in no way reflects on the environmental aspects of the soil. Should specific information in this regard be needed, additional testing may be required.

2.0 Site and Subsurface Conditions

3.1 Site Description

The Proposed Kettle Creek Residential Development is located on the west side of Carlow Road between George Street and Lake Line in Port Stanley, Ontario. The Site is bounded by vegetated slope to the north, west and east and Port Stanley Arena and Communications and Golf Course to the south. The site is relatively flat, and the majority of the site is used as agricultural land.

3.2 Soil Stratigraphy

The detailed stratigraphy encountered in the MOECC well records is detailed in the well logs found in **Appendix A** and summarized in the following paragraphs.

Based on the well records, the soils within the height of the slope and below the toe are consisted mainly from clayey and sandy soils. These soils were alternately deposited with thicker layers of clay compared to the sandy layers. Seepage groundwater were recorded within the sandy soils at various depths.

3.3 Site Reconnaissance

On reconnaissance site visits, a slope review survey was carried out. The survey included detailed observations such as slope height and inclination, soil type, the presence and location of seepage zones, vegetative cover, overland drainage, and evidence of previous instability or landslide activity.

At the time of the investigation, the following observations were made.

The slope surface along the north, west and east borders of the site was well vegetated with heavy shrubs and trees. No drainage was observed over slope except few seepage zones at lower portion of the slope, landslide or erosion activities were observed. Bare or exposed areas were not observed to indicate areas of slumping or slippage in the face of the slope. Few tilted trees were observed.

Selected photos for the slopes along the north, west and east borders of the site are presented below.

Photograph 1:

Looking to the east and northeast of the property from toe of slope.

Photograph 2:

Looking north to top of slope located along the north property line.

Photograph 3:

Looking to slope face along the north property line.

Photograph 4:

Looking down along the slope face at the east property line.

Photograph 5:

Water standing at toe of the north slope due to seepage from the face of the slope.

Photograph 6:

Looking down along the slope face at the west property line.

4.0 Slope Stability

Four (4) profiles, designated as Sections A-A', B-B', C-C' and D-D' were drawn for the slopes that are located along the north, east and west property lines. The cross-section locations are shown on **Drawing No. 1** and the profiles provided on Drawing Nos. 2,3,4 and 5. Slope at section C -C' has approximate overall gradient of 2.7H: 1V while sections A-A', B-B' and D-D' have overall gradients ranged between 3.2:1V and 5.7H:1V.

Worst slope gradient was found at Section C-C'; therefore, slope analysis was only undertaken at section C-C' by computer methods utilizing the Slope/W computer program.

The stability of the existing slope at cross section C-C' investigated for a number of different Factors of Safety (FOS). The various types of failures resulting include medium depth rotational failures near the crest of the slope, and deep rotational failures through the entire height of the slope.

The soil parameters found in the MOECC well records were used to build in an added safety factor for the analyses. The following table summarizes the parameters for the predominant soils which were used in **EXP**'s evaluation of the stable slope configuration:

Soil Type	Density	Cohesion	Angle of Internal Friction
Clayey Soils	18 kN/m^3	5 kPa	27 ^{o}
Sandy Soils	19 kN/m^3	0 kPa	30^o

Based on the analysis, the slope at the cross-section C-C' was found to be stable with factor of safety ranged from 1.8 to 2.4. To this end, as conclusion the entire slopes located along the north and west sides is considered to be stable and no further slope stability assessment is required.

The slope analysis for cross-section C-C' was undertaken considering bare slope surface and Factors of Safety (FOS) would be greater when it is covered with vegetation. The vegetation will reinforce soils and increase its shear strength. Furthermore, based on the slope reconnaissance there is no any evidence of land sliding observed which support our belief.

Whatever the slope/W results yield, it is recommended, based on the engineering judgment, that a development setback should be considered. The development setback should be measured from existing or determined toe of slope and should be equal half of slope height but need not exceed 4.5 m. However, conservatively a 6 m setback is recommended for north and west sides.

The Recommended Development Setback Limit is shown on Drawing No.'s 1, 2, 3, ,4 and 5.

5.0 Additional Comments

The vegetation on the slope should be maintained and no tree removal is allowed.

The site should be graded such that surface water is directed away from the slope.

Groundwater seepage from the slope surface should be collected at the toe and directed to daylight.

Water from downspouts and perimeter weeping tile etc. should be collected in a controlled manner and directed away from the slope.

Additional loading should be avoided in proximity to the slope crest.

6.0 General Comments

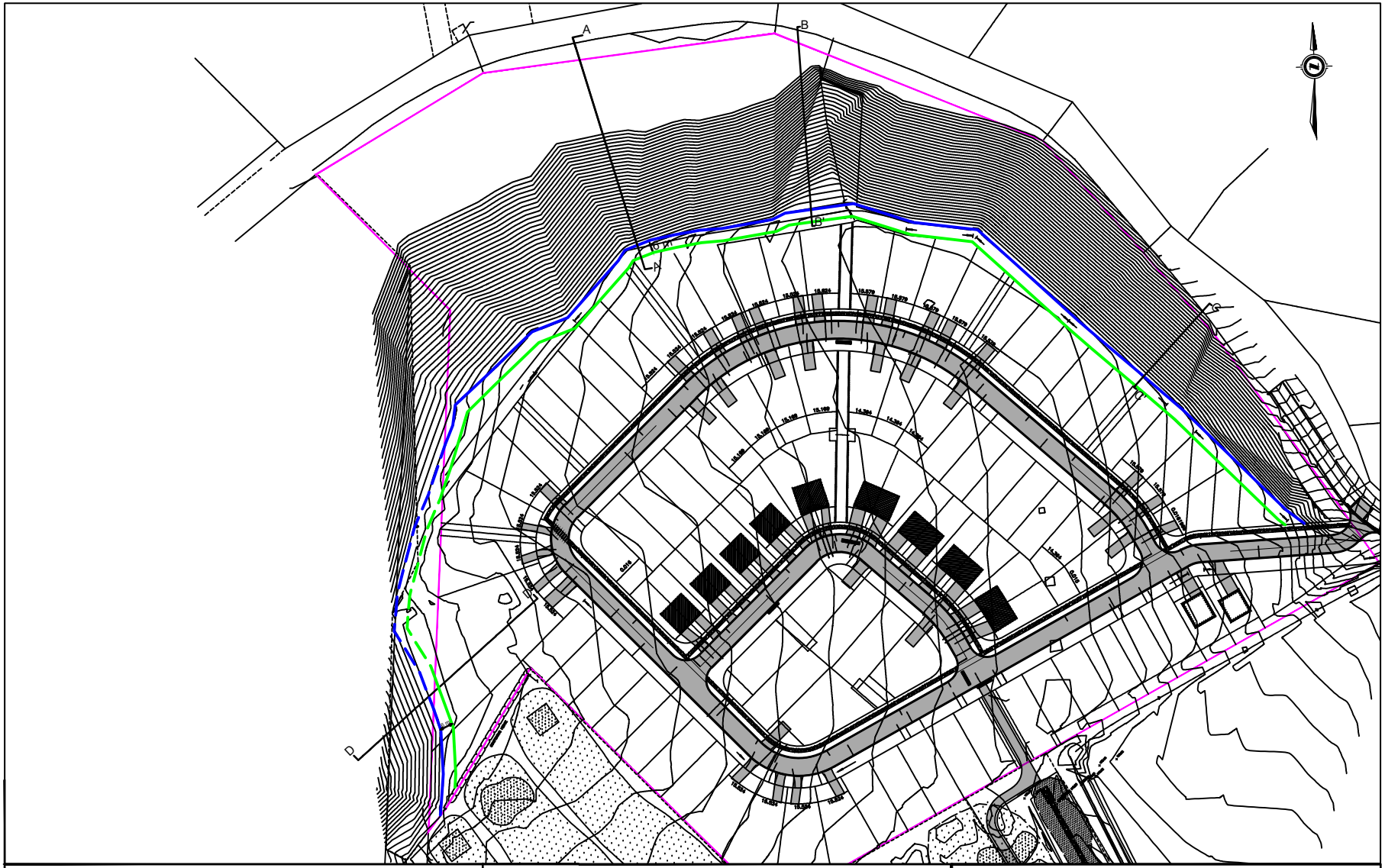
The comments given in this report are intended only for the guidance of design engineers; and should be read in conjunction with the complete package of design documents, when used during construction.

The number of test holes required to determine the localized underground conditions between test holes affecting construction costs, techniques, sequencing, equipment, scheduling, etc. would be much greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

EXP Services Inc. should be retained for a general review of the final design and specifications to verify that this report has been properly interpreted and implemented. If not afforded the privilege of making this review, **EXP** Services Inc. will assume no responsibility for interpretation of the recommendations in this report. In the event that variations in soil or groundwater conditions are encountered onsite, it is recommended that **EXP** be contacted to review the findings and confirm the suitability of recommendations provided in this report.

We trust that this report is satisfactory to your present requirements and we look forward to assisting you in the completion of this project. Should you have any questions, please contact the office at your convenience.

Drawings



Legend :

- Site Boundary
- Toe of Slope
- Development Setback

-NOTES-

1. The site plan was reproduced from the drawing provided by SBM and should be read in conjunction with EXP Slope Assessment Report LON-22006266-A0.

Slope Assessment

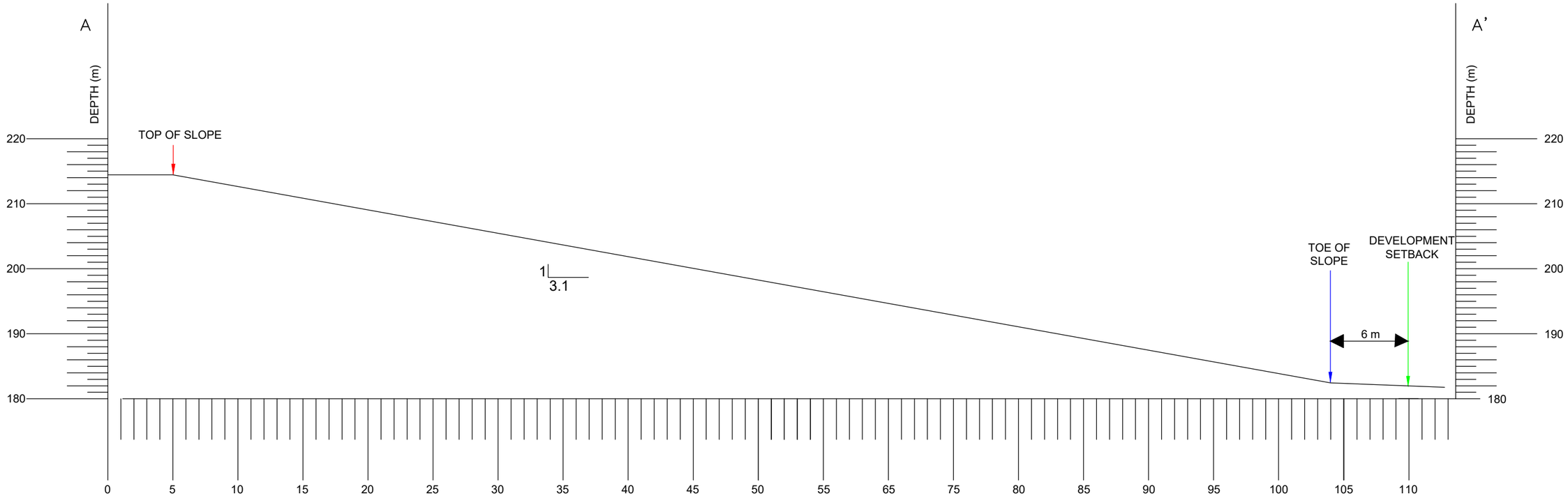
Proposed Kettle Creek Residential Development

Port Stanley, Ontario

CLIENT	Strathroy Turf Farm Ltd.
TITLE	Site Plan
Prepared By: P.A.	Reviewed By: A.S.

EXP Services Inc.
15701 Robin's Hill Road, London, ON, N5V 0A5

DATE	APPROXIMATE SCALE	PROJECT NO.	DWG.
MARCH 2022	NTS	LON-22006266-A0	1



SECTION A-A'

NOTES:

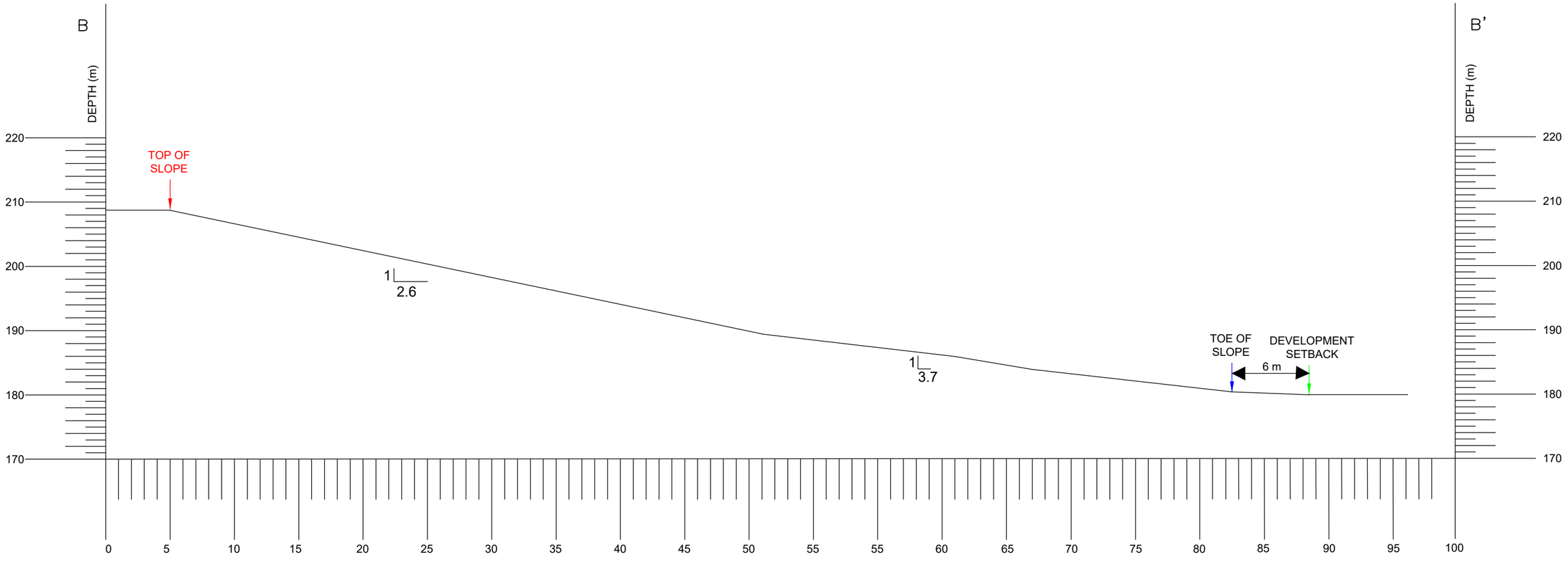
1. The elevations are reproduced from drawing provided by client and should be read in conjunction with EXP Slope Assessment Report LON-22006266-A0 .

Slope Assessment

Proposed Kettle Creek Residential Development

Port Stanley, Ontario

CLIENT: Strathroy Turf Farm Ltd.			
TITLE: SECTION A-A'			
DRAWN BY: J.T./P.A.	REVIEWED BY: A.S.		
exp Services Inc. 15701 Robin's Hill Road, London, ON, N5V 0A5			
DATE: MARCH 2022	SCALE: NTS	PROJECT NO.: LON-22006266-A0	DWG.: 2



SECTION B-B'

NOTES:

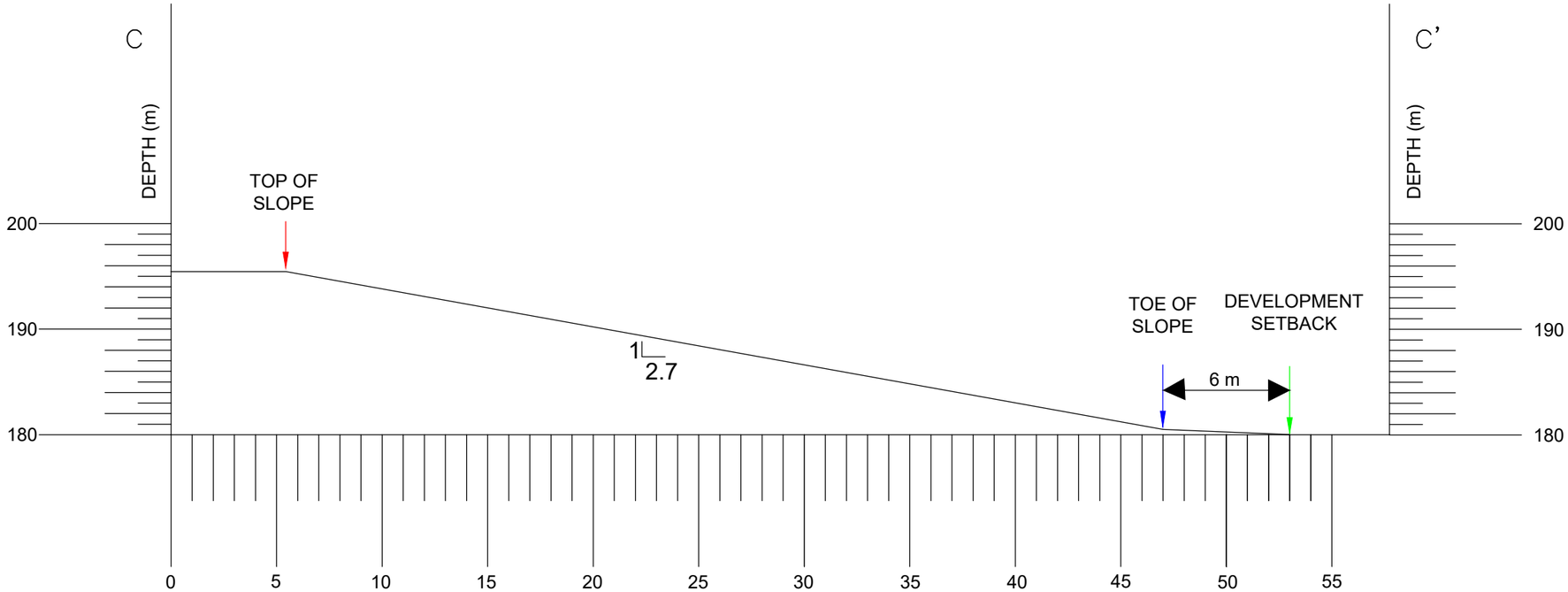
1. The elevations are reproduced from drawing provided by client and should be read in conjunction with EXP Slope Assessment Report LON-22006266-A0 .

Slope Assessment

Proposed Kettle Creek Residential Development

Port Stanley, Ontario

CLIENT: Strathroy Turf Farm Ltd.			
TITLE: SECTION B-B'			
DRAWN BY: J.T./P.A.	REVIEWED BY: A.S.		
exp Services Inc. 15701 Robin's Hill Road, London, ON, N5V 0A5			
DATE: APRIL 2022	SCALE: NTS	PROJECT NO.: LON-22006266-A0	DWG.: 3



SECTION C-C'

NOTES:

1. The elevations are reproduced from drawing provided by client and should be read in conjunction with EXP Slope Assessment Report LON-22006266-A0 .

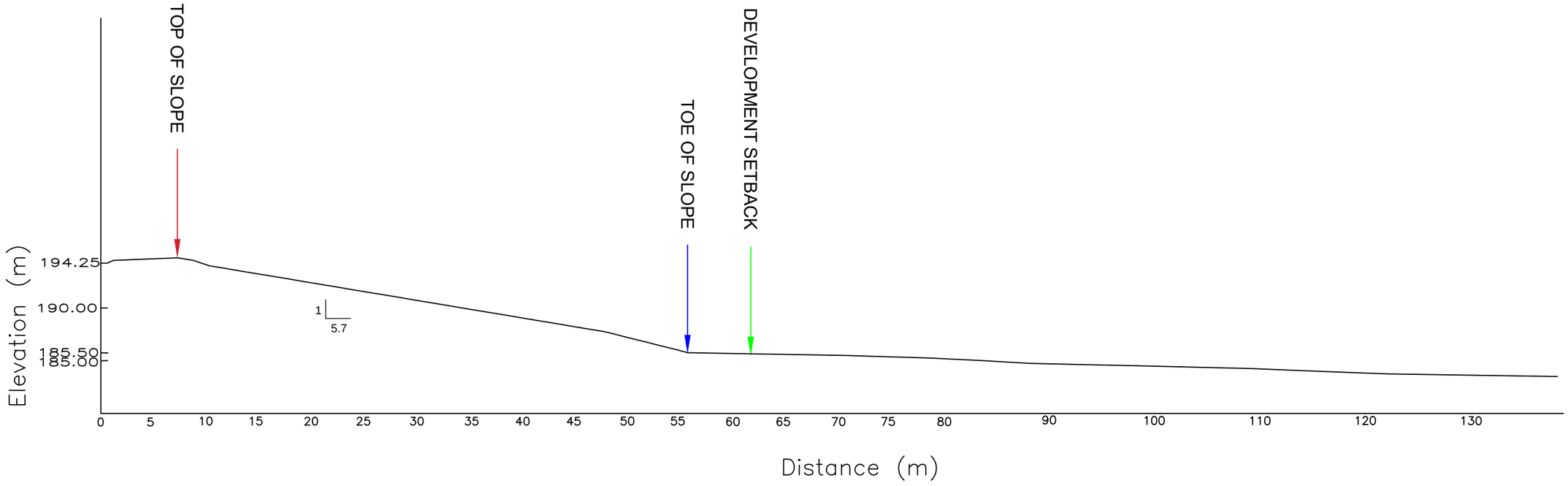
Slope Assessment

Proposed Kettle Creek Residential Development

Port Stanley, Ontario

CLIENT	Strathroy Turf Farm Ltd.
TITLE	SECTION C-C'
DRAWN BY	E.B./P.A.
REVIEWED BY	A.S.
	exp Services Inc. 15701 Robin's Hill Road, London, ON, N5V 0A5
DATE	MARCH 2022
SCALE	NTS
PROJECT NO.	LON-22006266-A0
DWG.	4

CROSS SECTION D-D'



-NOTES-

1. The cross section diagram should be read in conjunction with EXP Slope Assessment Report LON-22006266-A0.

2. Refer to Drawing 1 for cross section location.

Slope Assessment

Proposed Kettle Creek Residential Development

Port Stanley, Ontario

CLIENT	Strathroy Turf Farm Ltd.
TITLE	Cross Section D-D'
Prepared By: P.A.	Reviewed By: A.S.

EXP Services Inc.
15701 Robin's Hill Road, London, ON, N5V 0A5

DATE	SCALE	PROJECT NO.	DWG.
MARCH 2022	1:645	LON-22006266-A0	5

Appendix A - MOECC Well Records

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 (1 2)

2005459

Municipality (10–14): 20006 Con. (15–22 23 24): CON 01

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot (25 27)
ELGIN	SOUTHWOLD	1	14

First name	Address	Date completed (day / month / year)
[redacted]	PT. STANLEY	25 / 07 / 97

21 (1 2)

UTM: Zone (10) Easting (12–17) Northing (18–24) RC (25) Elevation (26–30) RC (30) Basin Code (31–47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
BLACK	TOPSOIL		LOAMY	0	1
BROWN	CLAY	SAND	SOFT	1	12
BROWN	CLAY		SOFT	12	16.
BROWN	SAND	GRAVEL MIX	CLEAN	16	18
GREY	CLAY		PACKED.	18	30

31
32
(10 14 15 21 32 43 54 65 75 80)

41 WATER RECORD

Water found at – feet	Kind of water	
16 (10–13)	1 ☑ Fresh, 2 ☐ Salty	3 ☐ Sulphur, 4 ☐ Minerals, 6 ☐ Gas (14)
(15–18)	1 ☐ Fresh, 2 ☐ Salty	3 ☐ Sulphur, 4 ☐ Minerals, 6 ☐ Gas (19)
(20–23)	1 ☐ Fresh, 2 ☐ Salty	3 ☐ Sulphur, 4 ☐ Minerals, 6 ☐ Gas (24)
(25–28)	1 ☐ Fresh, 2 ☐ Salty	3 ☐ Sulphur, 4 ☐ Minerals, 6 ☐ Gas (29)
(30–33)	1 ☐ Fresh, 2 ☐ Salty	3 ☐ Sulphur, 4 ☐ Minerals, 6 ☐ Gas (34)

(60)

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
36 (10 11)	1 ☐ Steel (12), 2 ☐ Galvanized, 3 ☑ Concrete, 4 ☐ Open hole, 5 ☐ Plastic	3"	0	30 (13 16)
(17–18)	1 ☐ Steel (19), 2 ☐ Galvanized, 3 ☐ Concrete, 4 ☐ Open hole, 5 ☐ Plastic			(20–23)
(24–25)	1 ☐ Steel (26), 2 ☐ Galvanized, 3 ☐ Concrete, 4 ☐ Open hole, 5 ☐ Plastic			(27–30)

SCREEN

Sizes of opening (Slot No.) (31–33)	Diameter (34–38) inches	Length (39–40) feet

Material and type	Depth at top of screen (41–44) feet	(30)
FILTERSAND		

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0 (10–13)	10 (14–17)	HOLE PLUG AND CLAY FILL.
(18–21)	(22–25)	
(26–29)	(30–33)	(80)

71 PUMPING TEST

Pumping test method (10)	Pumping rate (11–14)	Duration of pumping (15–16 Hours / 17–18 Mins)
1 ☐ Pump 2 ☑ Bailer	12 GPM	1 Hours 0 Mins

Static level	Water level end of pumping	Water levels during (25) 1 ☐ Pumping 2 ☐ Recovery			
10 (19–21) feet	25 (22–24) feet	15 minutes (26–28) feet	30 minutes feet	45 minutes feet	60 minutes (35–37) feet

If flowing give rate (38–41) GPM	Pump intake set at	Water at end of test (42)
	25 feet	☑ Clear ☐ Cloudy

Recommended pump type	Recommended pump setting (43–45)	Recommended pump rate (46–49)
☑ Shallow ☐ Deep	25 feet	8 GPM

(50–53)

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 ☐ Abandoned (Other)
8 ☐ Dewatering
9 ☐ Unfinished
10 ☐ Replacement well

WATER USE (55–56)

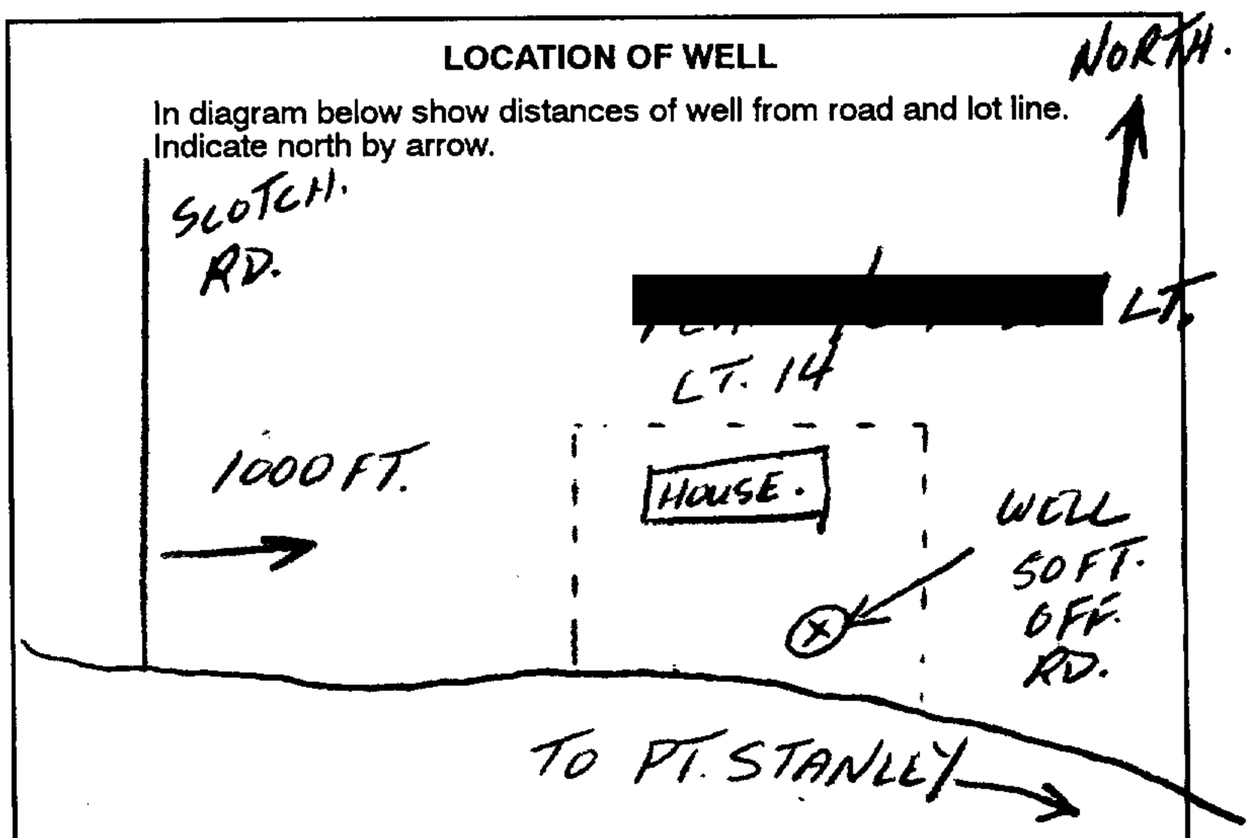
1 ☑ Domestic
2 ☐ Stock
3 ☐ Irrigation
4 ☐ Industrial
5 ☐ Commercial
6 ☐ Municipal
7 ☐ Public supply
8 ☐ Cooling & air conditioning
9 ☐ Not used
10 ☐ Other .....

METHOD OF CONSTRUCTION (57)

1 ☐ Cable tool
2 ☐ Rotary (conventional)
3 ☐ Rotary (reverse)
4 ☐ Rotary (air)
5 ☑ Air percussion
6 ☑ Boring
7 ☐ Diamond
8 ☐ Jetting
9 ☐ Driving
10 ☐ Digging
11 ☐ Other .....

LOCATION OF WELL

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



177785

Name of Well Contractor	Well Contractor's Licence No.
HAYDEN WATER WELLS	2552
Address: R.R.#1 LUCAN ONT.	
Name of Well Technician: J. HAYDEN.	Well Technician's Licence No.
Signature of Technician/Contractor	Submission date: day mo yr

MINISTRY USE ONLY

Data source (58)	Contractor (59–62)	Date received (63 68)	(80)
	2552	JUL 16 1998	

Date of inspection	Inspector

Remarks: CSS.

0506 (07/94) Front Form 9

2 MINISTRY OF ENVIRONMENT & ENERGY COPY

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 | 2004518 | MUNICIP 20006 | CON. U.R.S. R 101

COUNTY OR DISTRICT: [redacted]
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: [redacted]old Township
CON., BLOCK, TRACT, SURVEY, ETC: Pl 39 Pt K, Pt 3, Pl 11R-3244
LOT: C14
DATE COMPLETED: DAY 6 MO 6 YR 90
ADDRESS OF WELL: [redacted] Inverness Ave., London, Ontario
RC: 24710 | ELEVATION: 0690 | RC: | BASIN CODE:

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
Yellow	Sand			0	1
Brown	Clay			1	15
Grey	Sand	Clay		15	32
Yellow	Sand	Clay		32	43
Brown	Clay	Sand		43	75
Grey	Sand	Silt		75	88
Brown	Clay			88	101
Grey	Sand	Clay		101	118
Grey	Clay	Stones		118	179
Brown	Clay	Stones		179	234
Grey	Sand			234	238

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
234	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	TO
6¼	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	188	+2	235
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
12ths	5 INCHES	3 FEET

MATERIAL AND TYPE: S/S
DEPTH TO TOP OF SCREEN: 235 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

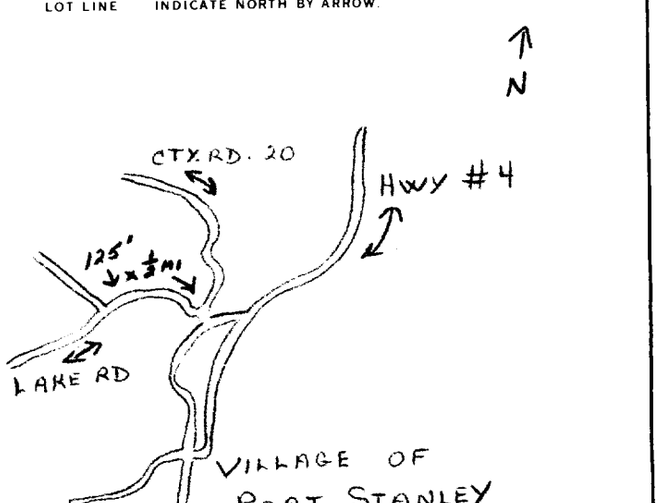
PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 5 GPM
DURATION OF PUMPING: 24 HOURS ____ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
85 FEET	95½ FEET		94 FEET	94½ FEET	95 FEET	95 FEET

IF FLOWING, GIVE RATE: ____ GPM
PUMP INTAKE SET AT: 150 FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 150 FEET
RECOMMENDED PUMPING RATE: 5 GPM

LOCATION OF WELL

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



75827

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 ☐ 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: Hopper Well Drilling Limited
WELL CONTRACTOR'S LICENCE NUMBER: 2658
ADDRESS: Box 203, Port Stanley, Ontario
NAME OF WELL TECHNICIAN: A. Roberts
WELL TECHNICIAN'S LICENCE NUMBER: T-0261
SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature]
SUBMISSION DATE: DAY 20 MO 6 YR 90

OFFICE USE ONLY

DATA SOURCE
CONTRACTOR: 2658
DATE RECEIVED: JUN 26 1990
DATE OF INSPECTION
INSPECTOR
REMARKS: CSS S8

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

40 I/11 G

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

11 — 2003464 — MUNICIP. — CON. 02

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY ETC.	LOT	DATE COMPLETED
[redacted]	Southwold	Plan 20 North Lake Road R. 1, Port Stanley, Ontario	D Pt. 015	DAY 31 MO 05 YR 80

RC — ELEVATION — RC — BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Yellow	sand			0	6
Grey	clay			6	45
Grey	clay	sand		45	50
Grey	clay	stones		50	192
	gravel			192	193
Grey	sand			193	196

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
192	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
5	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	193
	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	LENGTH
12ths.	5 INCHES	3 FEET

MATERIAL AND TYPE: stainless steel

DEPTH TO TOP OF SCREEN: 193 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
0	20	clay

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☐ PUMP 2 ☒ BAILER	6 GPM	2 HOURS 00 MINS

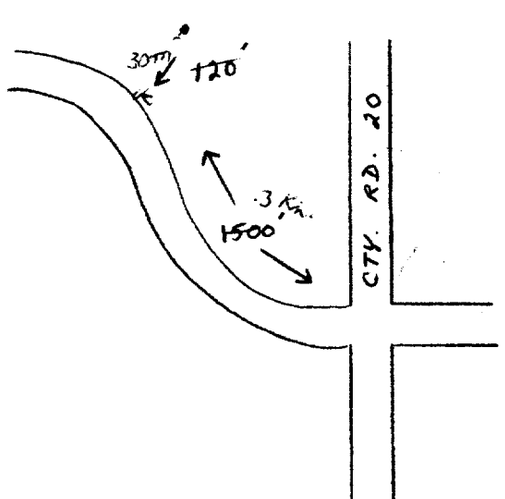
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
42 FEET	70 FEET	1 ☒ PUMPING 2 ☐ RECOVERY	52 FEET	62 FEET	67 FEET	70 FEET

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

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	125 FEET	6 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 ☒ 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: Gordon Hopper — LICENCE NUMBER: 2658

ADDRESS: Box 203, Port Stanley, Ontario

NAME OF DRILLER OR BORER: Gordon Hopper — LICENCE NUMBER: 2658

SIGNATURE OF CONTRACTOR: Gordon Hopper — SUBMISSION DATE: DAY 2 MO 6 YR 80

OFFICE USE ONLY

DATA SOURCE — CONTRACTOR — DATE RECEIVED — 090680

DATE OF INSPECTION: 20, 07 81 — INSPECTOR

REMARKS: CSS.88

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506-4-77

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

ONTARIO

40/11E

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

11 | 2002022 | MUNICIP. 20006 | CON. LR N R 10 2

COUNTY OR DISTRICT: ELGIN
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: SOUTHWOLD
CON., BLOCK, TRACT, SURVEY, ETC.: ~~2~~ ~~NORTH~~ LAKE RD. N.
LOT: [redacted]
[redacted] R#1 PORT STANLEY
DATE COMPLETED: DAY 03 MO. MAR. YR. 73
ING 7246440 | RC. 4 | ELEVATION 0675 | RC. 6 | BASIN CODE 23

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
BLUE	CLAY			15	21

31 | 0015 28 | 0021305

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0014	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
36	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☒ CONCRETE; 4 ☐ OPEN HOLE	3"	0'	16' 0016
27"	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☒ CONCRETE; 4 ☐ OPEN HOLE	16 GUAGE	15'	21' 0021
	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	

OWRC P.8

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER
PUMPING RATE: 0000 2 GPM
DURATION OF PUMPING: HOURS ____ MINS. ____

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
014 FEET	021 FEET	FEET	FEET	FEET	020 ~~191~~ FEET

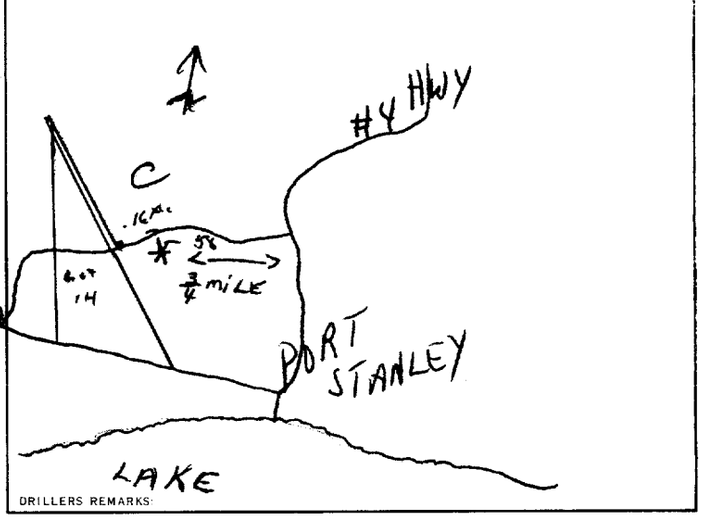
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	19 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☒ SHALLOW ☐ DEEP	019 FEET	0003 ~~INT~~ GPM

50-53 ——— 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

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 01

55-56: 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: 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: ROY HUDSON — LICENCE NUMBER: 2607
ADDRESS: R.R. #1 ARVA Nom 1C0
NAME OF DRILLER OR BORER: ROY HUDSON — LICENCE NUMBER: 2607
SIGNATURE OF CONTRACTOR: Roy Hudson per [illegible] — SUBMISSION DATE: DAY 15 MO. MARCH YR. 73

OFFICE USE ONLY

DATA SOURCE 58: 1 — CONTRACTOR 59-62: 2607 — DATE RECEIVED 63-68: 050473 — 80
DATE OF INSPECTION: 4, 9, 73 — INSPECTOR: 7
REMARKS:
P 3
WI

MINISTRY OF THE ENVIRONMENT COPY 3

FORM 7 07-091

UTM 17 Z 418115150 E
9 R 4712411215 N
Elev. 9 R 016010
Basin 213

Lake Rd. North
Range II
Lot 15

RECEIVED
OCT 11 19[illegible]
GEOLOGICAL BRANCH
DEPARTMENT OF MINES

20 No. X 769

ONTARIO

The Well Drillers Act
Department of Mines, Province of Ontario

55-1

Water Well Record

County or Territorial District. Elgin ..... Township, ~~Village, Town or City~~ Southwold .....
Con. ..... Lot. 15 ... Street and Number (if in Village, Town or City) .....
Owner. [redacted] ..... Address. R.R.2 ... Pt. Stanley .....
Date Completed ... 20 (day) ... May (month) ... 19/55 (year) Cost of Well (excluding pump) .....

Pipe and Casing Record

Casing diameter(s) ... 5 in. Dia. .....
Length(s) of casing(s) ... [illegible] .....
Type of screen ... [illegible] .....
Length of screen .....
Distance from top of screen to ground level .....
Is well a gravel-wall type? .....

Pumping Test

Date .....
Static level ... 320' .....
Pumping level ... ~~Artesian~~ .....
Pumping rate ... ~~Flowed~~ .....
Duration of test .....
Distance from cylinder or bowls to ground level .....

Water Record

Kind (fresh or mineral) ... Sulphur ... Black .....
Quality (hard, soft, contains iron, sulphur, etc.) .....
Appearance (clear, cloudy, coloured) ... Black .....
For what purpose(s) is the water to be used? .....
.....
How far is well from possible source of contamination? .....
What is the source of contamination? .....
Enclose a copy of any mineral analysis that has been made of water .....

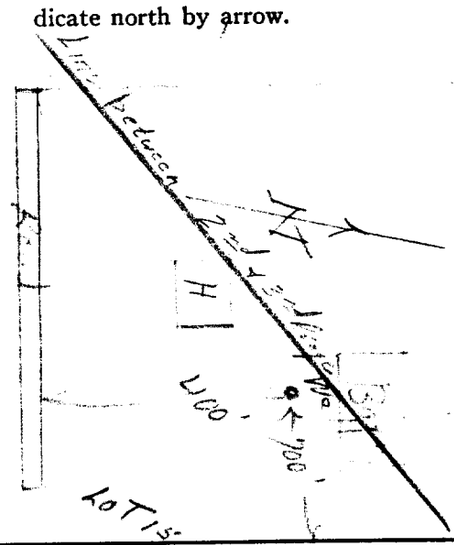
Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises

Well Log

Overburden and Bedrock Record	From 0 ft.	To ....ft.
Sand	0	70
Clay	70	150
Sand Gravel	150	200
Clay	200	250
Brown Lime	250	360
Pulled and Plugged Well		

Location of Well

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



Situation: Is well on upland, in valley, or on hillside? Uplands .....
Drilling Firm ... [illegible] .....
Address ... [illegible] St. East ... Aylmer .....
Name of Driller ... [illegible] ... Address ... [illegible] .....
Date ... [illegible] ... Licence Number ... 678 .....

Signature of Licensee

FORM 5

CSS.S8