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**PROPOSED GROUNDWATER MONITORING  
FOR A PROPOSED SOLAR FARM  
William Rutley Solar Park  
Township of South Stormont; United Counties of Stormont,  
Dundas and Glengarry  
15041 Colonial Drive, Ingleside, Ontario**

***Draft*  
SCOPING REPORT**

**Prepared for:**

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and  
Saturn Power Inc.

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Project No. OCP-11-254  
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## 1.0 INTRODUCTION

McIntosh Perry Consulting Engineers Ltd. (McIntosh Perry) was retained by Canadian Solar Solutions Inc. and Saturn Power Inc. (Canadian Solar) to prepare a groundwater monitoring plan related to a proposed solar farm project (William Rutley Solar Park) located in the Township of South Stormont; United Counties of Stormont, Dundas and Glengarry near the community of Ingleside (Figure 1, from Hatch™). The legal description of the property is Part of Lots 16, 17 and 18, Concession 2; Township of South Stormont; United Counties of Stormont, Dundas and Glengarry. The civic address for the site is 115041 Colonial Drive, Ingleside, Ontario.

For the purposes of this report it is assumed that Colonial Drive runs east-west along the south boundary of the site (Figure 1). The site is bounded as follows:

- To the west by farm fields and unused forested land
- To the north by a railway line and Hopple Creek
- To the east by farm fields, unused agricultural land and a non-provincially significant wetland
- To the south by Colonial Drive and residential properties.

This scoping report provides background information and a plan for monitoring groundwater around the proposed solar farm. The report forms part of the Renewable Energy Approval (REA) submission for this project.

### 1.1 Rationale

As part of the REA application process, it is understood that applicants should consider the potential impact of the development on groundwater, in particular drinking water. In order to be pro-active, Canadian Solar retained McIntosh Perry to prepare this document to assess and mitigate any *potential* groundwater impacts from the proposed solar farm development.

### 1.2 MOE Consultation

The Ontario Ministry of the Environment (MOE) has been consulted concerning groundwater monitoring and proposed solar farms in Eastern Ontario (June 2011). The MOE Regional Hydrogeologist (Frank Crossley) was consulted. Mr. Crossley provided some general guidance on groundwater monitoring requirements for solar farms in eastern Ontario (Appendix A). Mark Priddle, P.Geo. of McIntosh Perry verbally consulted with Mr. Crossley (July 2011) concerning groundwater monitoring at proposed solar farms in eastern Ontario.

## **2.0 BACKGROUND INFORMATION**

### **2.1 Site Setting**

The subject property (site) is located at 115041 Colonial Drive, Ingleside, Ontario. For the purpose of discussions in this report, it is considered that Colonial Drive Road is oriented east-west and represents the southern boundary of the subject property.

### **2.2 Site Water Services**

There are no municipal potable water services or sewer services supplying the subject property or neighbouring properties. There are several residential properties with private wells to the south of the subject property. There is a commercial well located to the south west of the property. All neighbouring properties probably have drilled bedrock wells and individual septic systems.

### **2.3 Topography and Drainage**

The highest elevation on site ranges between 75 and 85 m asl. The site is relatively flat. The central portion of the site is slightly higher. The northern portion of the site drains overland to the north and northeast toward two small water courses that run into Hoople Creek. The eastern portion of the site drains overland eastwards toward the Hopple Creek wetland. The southern portion of the site slopes southward and flow is overland towards a small unnamed water course that crosses the site (see Figure 1). Drainage features on and around the site include:

- Hoople Creek,
- Two small tributaries
- A small pond that is located along the northern boundary of the site
- Hoople Creek Wetland to the east of the site
- A watercourse to the south of the site. (Dillon, July 13, 2011)

Locally, the shallow groundwater flow direction is expected to be to the northeast. The regional bedrock groundwater flow direction is likely to be to the southeast towards the St. Lawrence River.

### **2.4 Surficial and Bedrock Geology**

General geological maps of the area indicate that overburden consists of glaciomarine and marine deposits consisting of silt and clay. Overburden in the area also includes till, described as undifferentiated, predominantly sandy silt. The bedrock in the area is of the Ottawa formation, described as limestone, dolostone, shale, arkose and sandstone (OGS, 2011).

A test pit investigation was completed at the site on November 4<sup>th</sup>, 2010 by Inspec-Sol Inc. A total of 12 test pits were excavated. The observed stratigraphy in the test pits included

organic topsoil over native glacial till. A layer of native sandy silt with some clay and trace amounts of cobbles and boulders was identified beneath the topsoil in all of the test pits. Three test pits revealed clayey silt till under the primary layer of sandy silt. Bedrock was not encountered in any of the test pits at any of the locations on the site (Dillon, July 13, 2011).

## **2.5 Water Wells**

An MOE Well Records search was requested by McIntosh Perry. The well records that were obtained indicated that there are 22 wells located within 500 m of the subject property. The average depth to bedrock is 20.7 m. The primary use of the wells is domestic, but some of the wells are for commercial and livestock uses. According to the well records the average static groundwater level is 5.5m. The well records are included as Appendix B.

### 3.0 PROPOSED MONITORING AND CONTINGENCY PLANS

While no negative effects on surrounding well water are expected from this project, Canadian Solar is pro-actively proposing a monitoring plan to ensure that the construction of the solar farm will not affect local wells. This plan is to address potential issues related to construction and/or public concern which have been raised. A proposed work plan was developed after the following tasks were completed:

- A site visit
- A review of the available water well records information for neighbouring wells
- Pre-consultation with the MOE

All of this information was compiled to help address potential issues related to construction and/or public concern that may be raised. An initial response from Frank Crossley, P.Geo., (Hydrogeologist with the Technical Support Section of the MOE Eastern Region) was received as part of the MOE pre-consultation and is included as Appendix B. Frank Crossley of the MOE Eastern Region Groundwater Unit recommended that the following groundwater monitoring program be followed:

- Interview selected residents regarding well construction, groundwater quality, groundwater quantity, and well locations to establish a history of the water well.
- Collect a water well sample after allowing the distribution system to flow for approximately five minutes. The sample should be collected prior to any treatment systems (i.e. it should be a 'raw' water sample).
- Submit the water sample for analysis to a suitably qualified laboratory. The analysis should be the 'subdivision suite' (alkalinity, ammonia, bacteria, calcium, chloride, colour, conductivity, DOC, hardness, iron, magnesium, manganese, nitrite, nitrate, pH, potassium, sodium, sulphate, TDS and turbidity).
- Establish a contingency plan prepared by a Qualified Person.

Subsequent discussion with Mr. Crossley indicated that only vulnerable wells need to be addressed and only a sub-sample of representative wells need to be sampled. It was also noted that on-site monitoring wells are not required.

Vulnerable wells are those that are in close proximity to the solar project and which are drilled bedrock wells near on-site locations where bedrock drilling will be required as part of the project construction (i.e. typically for the foundations of proposed solar panel arrays). Other factors that will be considered in the selection of potentially vulnerable wells include: groundwater flow directions; well construction and subsurface conditions.

The identification of potentially vulnerable wells will determine the extents of the 'assessment area'. MOE has recommended that Canadian Solar seek permission from selected well owners within the assessment area to undertake a groundwater survey. If permission is granted the vulnerable wells will be monitored and sampled prior to the commencement of construction activities.

### 3.1 Groundwater Monitoring Plan

Well water monitoring will be performed to establish baseline conditions and ensure that any potential impacts to the wells associated with construction can be identified. The neighbouring properties are all serviced by private wells for potable water supply. Most of these wells are drilled into bedrock but there may also be some dug wells..

Based on our review of the project location and surrounding area, we have prepared a plan for groundwater monitoring that will effectively assess potential groundwater impacts to neighbouring properties. This Plan has been prepared by an Ontario-registered Professional Geoscientist and Qualified Person (P.Geo., QP).

Prior to any actual monitoring of residential wells, selected well owners with properties abutting the subject site boundaries will be contacted by McIntosh Perry to seek permission to undertake a groundwater survey. Where permission is granted, residents will be interviewed regarding well construction, groundwater quality, groundwater quantity and well locations. Any information about the known history of the water well will also be discussed. At this stage these closest wells will be selected for monitoring and sampling, subject to the well owner granting permission.

Based on the available information, McIntosh Perry and Canadian Solar have determined that 11 wells to the south and southwest of the site are potentially vulnerable. The final number of wells that are sampled depends on whether or not permission is granted by well owners. The following is a proposed plan for groundwater monitoring at this site:

Site	Private Wells	Monitoring Wells (proposed)
William Rutley Solar Park 115041 Colonial Drive; Ingleside, Ontario	10 domestic wells on Colonial Drive 1 commercial well for a trailer park on Colonial Drive	none

Laboratory analytical testing parameters for groundwater samples will include alkalinity, ammonia, bacteria (TC, EC), calcium, chloride, colour, conductivity, DOC, hardness, iron, magnesium, manganese, nitrite, nitrate, pH, potassium, sodium, sulphate, TDS and turbidity.

Samples from the selected domestic wells will be collected from appropriately flushed, untreated (raw water) taps in residences by trained McIntosh Perry personnel. Strict QA/QC procedures will be followed, including the collection of blind duplicate samples.

If a complaint arises during construction, the subject well will be re-sampled and the results will be compared to the pre-construction results to determine if the well may have been impacted by construction activities. If evidence suggests that the well has been impacted by project construction a contingency plan will be implemented (details provided below).

Post-construction groundwater samples will be collected following substantial completion of the solar farm project. No further sampling or chemical analysis of samples will be undertaken unless agreed upon with Canadian Solar or required during the REA process. All work to be undertaken as part of this Plan will be overseen by a Professional Geoscientist.

### **3.2 Contingency Plan**

In the event that a groundwater complaint arises during the construction activities, Canadian Solar will repeat the sampling at the complainant's residence. The water sample(s) will be submitted as "high priority" (rush analysis) to a qualified laboratory. If a problem appears to be related to the construction activities at the subject site (Canadian Solar's Rutley Site), then Canadian Solar will immediately provide bottled water to the owner of the impacted well.

Contingency plan:

1. Supply bottled water or water cooler for drinking (potable uses)
2. Supply portable water supply for household use (non-potable) – storage tank
3. Fill dug well (if present) with trucked potable water
4. Retain licensed driller to assess the well and determine if deepening or other options are available
5. Evaluate modifications to the solar farm construction process which potentially caused groundwater issues

The MOE will be notified of any complaints and Canadian Solar's actions to address the complaints.

### **3.3 Reporting**

Following each sampling event, a short letter report will be prepared. It is recommended that the results of the private well sampling be provided to the well owners. The data will be compiled in spreadsheets in order to assist in the evaluation of potential groundwater impacts.

#### **4.0 REFERENCES**

OGS (Ontario Geological Survey), 2011 – Google Earth™ (website:  
[http://www.mndmf.gov.on.ca/mines/ogs\\_earth\\_e.asp](http://www.mndmf.gov.on.ca/mines/ogs_earth_e.asp)).

Dillon Consulting Limited (Dillon), July 13, 2011 – “*William Rutley Solar Park, Stormwater Management Project (Draft)*”, prepared for Canadian Solar

## 5.0 LIMITATIONS

This report has been prepared and the work referred to in this report has been undertaken by McIntosh Perry Consulting Engineers Ltd. for “Canadian Solar Solutions Inc. and Saturn Power Inc.”. It is intended for the sole and exclusive use of Canadian Solar Solutions Inc. and Saturn Power Inc., any affiliated companies and partners and their respective financial institutions, insurers, agents, employees and advisors (collectively, “the proponent”). The report may not be relied upon by any other person or entity without the express written consent (*Reliance Letter*) of McIntosh Perry Consulting Engineers Ltd.

Any use which a third party makes of this report, or any reliance on decisions made based on it, without a *reliance letter* are the responsibility of such third parties. McIntosh Perry Consulting Engineers Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The conclusions presented represent the best professional judgment of the professional geoscientist based on current environmental standards and site conditions. Should additional information become available, McIntosh Perry Consulting Engineers Ltd. requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

We trust that this information is satisfactory for your present requirements. Should you have any questions or require additional information, please do not hesitate to contact the undersigned.

Yours truly,

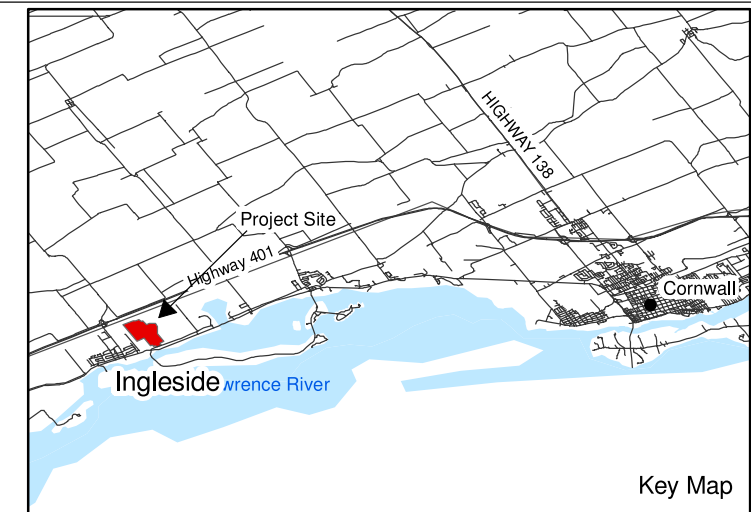
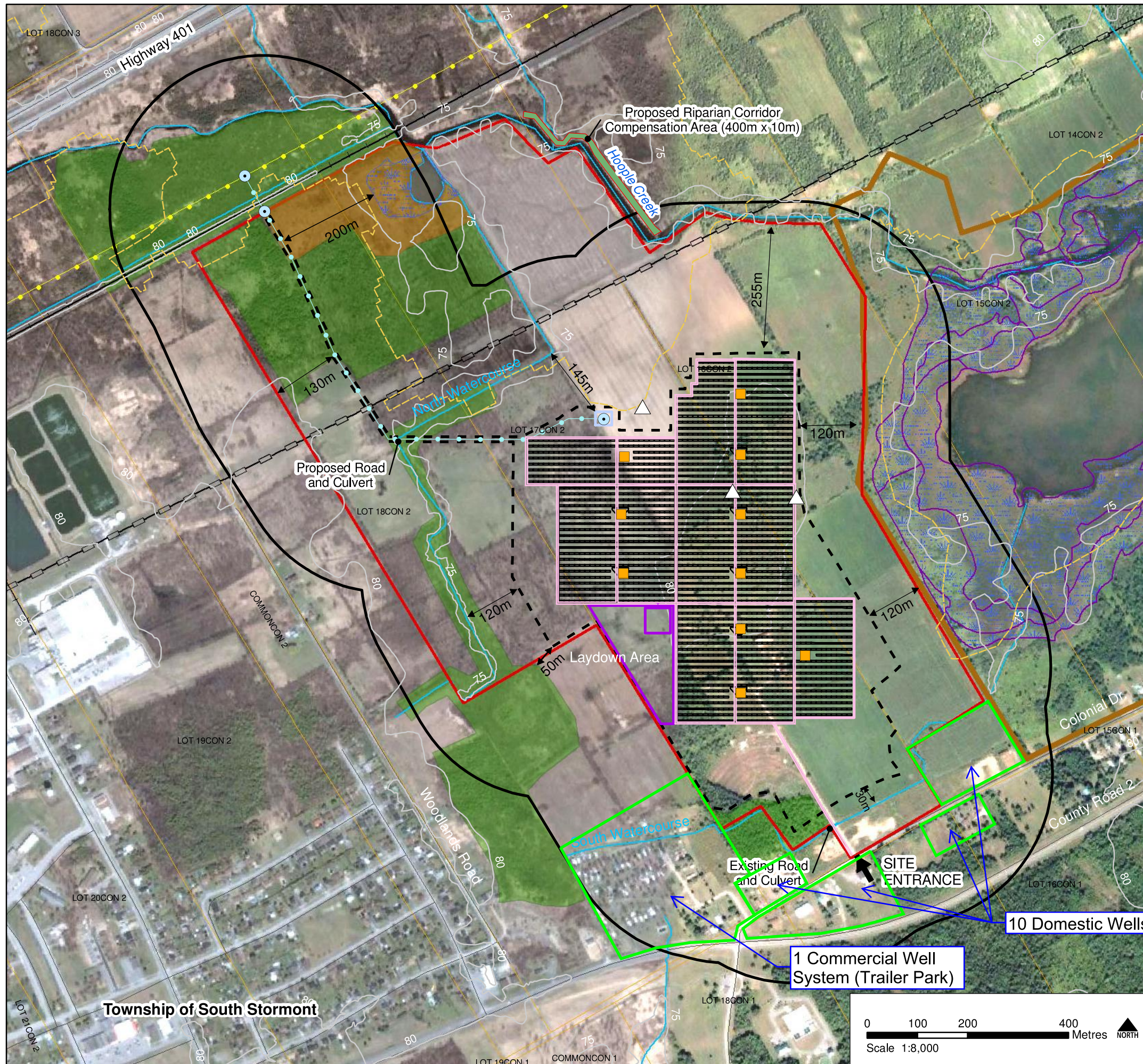
**McIntosh Perry Consulting Engineers Ltd**

Mark Priddle, P.Geo.  
Project Manager

Meghan Cameron, B.Sc.  
Project Coordinator

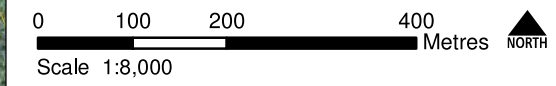
H:\01 Project - Proposals\2011 Jobs\0CP-11-254 Canadian Solar\_Groundwater monitoring\_Rutley site\Report\0CP-11-254 Cdn solar\_Water\_Monitoring\_Rutley \_Final\_REPORT Oct.5.2011.doc

## FIGURE



- LEGEND**
- Existing Features**
- Pipeline
  - Railway
  - Road
  - Topographic Contour (5 m Interval)
  - Transmission Line
  - Watercourse
  - Parcel
  - Project Location
  - 300 m from Project Location
  - Project Site
- Natural Features and Hazards**
- Significant Woodland
  - Non-Provincially Significant Wetland
  - Hoople Creek Wetland Non-Provincially Significant ANSI (Life Science)
  - Cultural Meadow (Breeding Bird Habitat)
  - 100 Year Floodplain (as per RRCA)
- Proposed Project Components**
- Panel Layout
  - Inverter
  - Access Roads
  - Laydown Area
  - Transmission Line Corridor (10 m wide)
  - Fence (No Fence along Transmission line)
  - Substation
  - Connection Point
  - Proposed Riparian Corridor Compensation Area (400m x 10m)
- Heritage and Archaeological Resources**
- Historic Site (Stage1/2 Archaeology)

Notes:  
 1. OBM and NRVIS data downloaded from LIO, with permission.  
 2. Spatial Referencing UTM NAD 83, August 2010.  
 3. Satellite Imagery from Google Earth Pro July 2010.  
 4. 100-Yr Flood Plain Digitized from RRCA Drawing.



## **APPENDIX A**

# **MOE CONSULTATION RECORD**

*Edited E-mail response from MOE*

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**From:** Crossley, Frank (ENE) [mailto:Frank.Crossley@ontario.ca]

**Sent:** Wednesday, June 15, 2011 1:56 PM

**To:** Mark Priddle

**Cc:** Harrison, Courtney (ENE); Robert, Marc (ENE); Ryan, Jason (ENE); Taylor, Peter (ENE)

**Subject:**

Mark Priddle - McIntosh Perry Consulting Engineers

Hello Mark

Thank you for your e-mail dated June 09, 2011 requesting a groundwater monitoring program at upcoming solar farm construction sites by *PROPONENT*. You indicated that the proposed installations are in Eastern Ontario. As part of the Renewable Energy Approval (REA) process, a groundwater monitoring program is required.

To this end, the Eastern Region Groundwater Unit recommends the following groundwater monitoring program:

- Contact all well owners within 500 metres of the site boundaries prior to the commencement of construction activities and seek permission to undertake a groundwater survey. If permission is granted then:
  - interview the residents regarding well construction, groundwater quality, groundwater quantity and well locations to establish a history of the water well.
  - collect a water well sample from the well after allowing the distribution system to flow for approximately 5 minutes. The sample should be collected prior to any treatment systems ("raw").
  - submit the water sample for analysis to a qualified laboratory. The analysis should be the "subdivision suite" (alkalinity, ammonia, bacteria, calcium, chloride, colour, conductivity, DOC, hardness, iron, magnesium, manganese, nitrite, nitrate, pH, potassium, sodium, sulphate, TDS and turbidity).
  - establish a contingency plan by a qualified person.

The groundwater monitoring program should be conducted under the supervision of a qualified person (P.Eng. or P.Geo.). The survey information should be summarized in a report by a qualified person and a copy forwarded to this Ministry.

In the event that a complaint arises against the construction activities, *PROPONENT* should repeat the survey at the complainant's residence. The water samples should be submitted as "high priority" to a qualified laboratory. If a problem is confirmed related to the construction activities at *PROPONENT*, then *PROPONENT* should immediately provide bottled water to the impacted party and implement their contingency plan. This Ministry should be notified of any complaints and the company's actions to address the complaints.

F. Crossley, P.Geo.  
Hydrogeologist  
Technical Support  
Eastern Region  
1259 Gardiners Road, Unit 3  
Kingston, Ontario K7P 3J6  
(613)549-4000x2631

## **APPENDIX B**

### **WELL RECORD SEARCH**

TOWNSHIP CONCESSION (LOT)	UTM <sup>1</sup>	DATE <sup>2</sup> CNTR <sup>3</sup>	CASING DIA <sup>4</sup>	WATER <sup>5,6</sup> DETAIL	STAT LVL/PUMP LVL <sup>7</sup> RATE <sup>8</sup> /TIME HR:MIN	WATER USE <sup>9</sup>	SCREEN INFO <sup>10</sup>	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND <sup>5,11</sup>
CORNWALL TOWNSHIP ( )	18 502169 4982878 <sup>N</sup>	2010/03 1517	06	FR 0105	001 / 010 008 / 1:0			7145687 (Z101635) A088601 BRWN CLAY SAND 0004 BRWN CLAY SAND GRVL 0024 BRWN CLAY HPAN FSND 0057 GREY ROCK GRVL SAND 0059 GREY ROCK 0110
OSNABRUCK TOWNSHIP CON 01(016)	18 502581 4983022 <sup>N</sup>	1979/05 1505	06	FR 0093	015 / 050 006 / 1:0	CO		5802312 ( ) BRWN HPAN HARD PCKD 0062 GREY LMSN STNS HARD 0103
OSNABRUCK TOWNSHIP CON 01(016)	18 502730 4983121 <sup>N</sup>	1979/06 1505	06	FR 0085	015 / 060 010 / 1:0	CO		5802163 ( ) BRWN SAND LOOS PCKD 0010 BRWN HPAN BLDR HARD 0085 GREY LMSN STNS HARD 0094
OSNABRUCK TOWNSHIP CON 01(017)	18 502418 4982758 <sup>L</sup>	1992/03 4609	06 06	FR 0060 FR 0070	015 / 065 003 / 1:0	DO		5803562 (113225) BRWN HPAN STNS HARD 0015 GREY HPAN STNS HARD 0056 GREY LMSN LYRD 0075
OSNABRUCK TOWNSHIP CON 01(017)	18 502418 4982758 <sup>L</sup>	1989/08 1414	07 06	FR 0071	020 / 060 010 / 1:0	DO		5803136 (51367) BRWN TILL BLDR 0025 GREY TILL SAND 0050 GREY TILL BLDR 0061 GREY GRVL 0068 GREY LMSN 0075
OSNABRUCK TOWNSHIP CON 01(018)	18 501981 4982712 <sup>N</sup>	1961/02 1505	05 05	FR 0086	028 / 042 012 / 1:0	DO		5800751 ( ) LOAM 0002 BLDR HPAN 0025 HPAN 0059 GREY LMSN 0096
OSNABRUCK TOWNSHIP CON 02(014)	18 502779 4984463 <sup>L</sup>	1988/09 4609	06 06	FR 0095	020 / 075 010 / 1:0	DO		5803054 (40638) BRWN FILL PCKD 0003 GREY HPAN PCKD 0070 GREY GRVL PCKD 0078 GREY LMSN FCRD 0092 GREY LMSN LYRD 0100
OSNABRUCK TOWNSHIP CON 02(014)	18 502779 4984463 <sup>L</sup>	1988/09 4609	06 06	FR 0120 FR 0115	020 / 080 026 / 1:0	DO		5803055 (40637) BRWN FILL 0003 GREY HPAN PCKD 0070 GREY GRVL PCKD 0084 GREY LMSN LYRD 0140
OSNABRUCK TOWNSHIP CON 02(015)	18 502440 4984256 <sup>L</sup>	1997/08 4609	06 06	FR 0047	015 / 050 010 / 1:0	DO		5804157 (171697) BRWN HPAN PCKD 0015 GREY HPAN PCKD 0043 GREY GRVL PCKD 0050
OSNABRUCK TOWNSHIP CON 02(015)	18 502440 4984256 <sup>L</sup>	1992/07 4609	06 06	UK 0085	017 / 088 020 / 1:0	DO		5803606 (113280) BRWN HPAN STNS PCKD 0010 GREY HPAN GRVL PCKD 0021 GREY GRVL SAND PCKD 0057 GREY HPAN PCKD 0068 GREY LMSN LYRD 0088
OSNABRUCK TOWNSHIP CON 02(015)	18 502745 4983272 <sup>N</sup>	2001/08 4609	06 06	FR 0058	020 / 058 006 / 1:0	DO		5804532 (235959) BRWN TILL 0017 GREY TILL 0052 GREY GRVL 0055 GREY LMSN 0058
OSNABRUCK TOWNSHIP CON 02(015)	18 502441 4984257 <sup>L</sup>	1987/07 1414	06 06	FR 0085	020 / 080 007 / 1:0	DO		5802826 (11308) BRWN TILL BLDR 0018 GREY TILL 0055 GREY TILL GRVL SAND 0070 GREY GRVL 0072 GREY LMSN 0088
OSNABRUCK TOWNSHIP CON 02(015)	18 502440 4984256 <sup>L</sup>	1985/12 1414	06 06	FR 0067	010 / 062 004 / 1:0	DO		5802682 ( ) BRWN TILL BLDR HARD 0018 GREY TILL HARD 0052 GREY GRVL HARD 0054 GREY ROCK HARD 0069
OSNABRUCK TOWNSHIP CON 02(015)	18 502440 4984256 <sup>L</sup>	1994/09 4609	06 06	SU 0087	020 / 090 005 / 1:0	DO		5803963 (149792) PRDG 0018 GREY HPAN GRVL PCKD 0071 GREY LMSN LYRD 0090

TOWNSHIP CONCESSION (LOT)	UTM <sup>1</sup>	DATE <sup>2</sup> CNTR <sup>3</sup>	CASING DIA <sup>4</sup>	WATER <sup>5,6</sup> DETAIL	STAT LVL/PUMP LVL <sup>7</sup> RATE <sup>8</sup> /TIME HR:MIN	WATER USE <sup>9</sup>	SCREEN INFO <sup>10</sup>	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND <sup>5,11</sup>
OSNABRUCK TOWNSHIP CON 02(015)	18 502440 4984256 <sup>L</sup>	1988/08 4609	06 06	FR 0074	025 / 025 / 1:0	DO		5803001 (40607) BLCK LOAM LOOS 0003 BRWN HPAN PCKD 0009 GREY HPAN PCKD 0072 GREY LMSN LYRD 0075
OSNABRUCK TOWNSHIP CON 02(016)	18 502089 4984068 <sup>L</sup>	1987/09 4609	06 06	FR 0075	020 / 040 020 / 1:0	DO		5802878 (11358) BRWN HPAN STNS HARD 0013 GREY HPAN STNS HARD 0069 GREY LMSN LYRD 0080
OSNABRUCK TOWNSHIP CON 02(016)	18 502781 4983407 <sup>N</sup>	1964/09 1505	06 06	FR 0103	019 / 045 017 / 1:0	ST DO		5800784 () PRDG 0021 CLAY GRVL BLDR 0073 LMSN 0113
OSNABRUCK TOWNSHIP CON 02(017)	18 502081 4982922 <sup>N</sup>	1962/08 1539	05 05	FR 0050	035 / 090 004 / 1:0	DO		5800785 () HPAN 0025 QSND 0040 GRVL 0050 LMSN 0090
OSNABRUCK TOWNSHIP CON 02(017)	18 501745 4983869 <sup>L</sup>	2003/10 1414	06 08 06	FR 0095	020 / 100 009 / 1:0	DO		5804792 (257466) BRWN HPAN SAND STNS 0012 GREY HPAN SAND STNS 0065 GREY SAND GRVL 0073 BLCK ROCK SOFT 0080 GREY LMSN ROCK 0105
OSNABRUCK TOWNSHIP CON 02(018)	18 501374 4983640 <sup>L</sup>	1999/07 4609	06 06	FR 0085	015 / 090 010 / 1:0	DO		5804373 (196858) PRDG 0020 GREY HPAN GRVL PCKD 0073 GREY LMSN LYRD 0090
OSNABRUCK TOWNSHIP CON 02(019)	18 501181 4983547 <sup>N</sup>	1962/09 1505	05 05	FR 0095	017 / 100 008 / 1:0	DO ST		5800786 () PRDG 0018 HPAN BLDR 0062 HPAN GRVL 0084 LMSN 0103
OSNABRUCK TOWNSHIP 02(008)	18 501768 4982821 <sup>N</sup>	2005/11 1414	06	FR 0072	004 / 012 009 / 1:0	DO		5805001 (Z40067) A036251 BRWN TILL STNS HARD 0004 BRWN CLAY DNSE 0007 GREY TILL HARD 0020 GREY GRVL PCKD 0055 GREY LMSN LYRD 0078

- Notes:
1. UTM in Zone, Easting, Northing and Datum is NAD83; L: UTM estimated from Centroid of Lot; W: UTM not from Lot Centroid
  2. Date Work Completed
  3. Well Contractor Licence Number
  4. Casing diameter in inches
  5. Unit of Depth in Feet
  6. See Table 4 for Meaning of Code
  7. STAT LVL: Static Water Level in Feet ; PUMP LVL: Water Level After Pumping in Feet
  8. Pump Test Rate in GPM, Pump Test Duration in Hour : Minutes
  9. See Table 3 for Meaning of Code
  10. Screen Depth and Length in feet
  11. See Table 1 and 2 for Meaning of Code

1. Core Material and Descriptive terms													
Code	Description	...	Code	Description	...	Code	Description	...	Code	Description			
BLDR	BOULDERS		FCRD	FRACTURED		IRFM	IRON FORMATION		PORS	POROUS		SOFT	SOFT
BSLT	BASALT		FGRD	FINE-GRAINED		LIMY	LIMY		PRDG	PREVIOUSLY DUG		SPST	SOAPSTONE
CGRD	COARSE-GRAINED		FGVL	FINE GRAVEL		LMSN	LIMESTONE		PRDR	PREV. DRILLED		STKY	STICKY
CGVL	COARSE GRAVEL		FILL	FILL		LOAM	TOPSOIL		QRTZ	QUARTZITE		STNS	STONES
CHRT	CHERT		FLDS	FELDSPAR		LOOS	LOOSE		QSND	QUICKSAND		STNY	STONEY
CLAY	CLAY		FLNT	FLINT		LTCL	LIGHT-COLOURED		QTZ	QUARTZ		THIK	THICK
CLN	CLEAN		FOSS	FOSILIFEROUS		LYRD	LAYERED		ROCK	ROCK		THIN	THIN
CLYY	CLAYEY		FSND	FINE SAND		MARL	MARL		SAND	SAND		TILL	TILL
CMTD	CEMENTED		GNIS	GNEISS		MGRD	MEDIUM-GRAINED		SHLE	SHALE		UNKN	UNKNOWN TYPE
CONG	CONGLOMERATE		GRNT	GRANITE		MGVL	MEDIUM GRAVEL		SHLY	SHALY		VERY	VERY
CRYS	CRYSTALLINE		GRSN	GREENSTONE		MRBL	MARBLE		SHRP	SHARP		WBRG	WATER-BEARING
CSND	COARSE SAND		GRVL	GRAVEL		MSND	MEDIUM SAND		SHST	SCHIST		WDFR	WOOD FRAGMENTS
DKCL	DARK-COLOURED		GRWK	GREYWACKE		MUCK	MUCK		SILT	SILT		WTHD	WEATHERED
DLMT	DOLOMITE		GVLY	GRAVELLY		OBDN	OVERBURDEN		SLTE	SLATE			
DNSE	DENSE		GYPS	GYP SUM		PCKD	PACKED		SLTY	SILTY			
DRTY	DIRTY		HARD	HARD		PEAT	PEAT		SNDS	SANDSTONE			
DRY	DRY		HPAN	HARDPAN		PGVL	PEA GRAVEL		SNDY	SANDY			

2. Core Color	
Code	Description
WHIT	WHITE
GREY	GREY
BLUE	BLUE
GREN	GREEN
YLLW	YELLOW
BRWN	BROWN
RED	RED
BLCK	BLACK
BLGY	BLUE-GREY

3. Water Use			
Code	Description	Code	Description
DO	Domestic	OT	Other
ST	Livestock	TH	Test Hole
IR	Irrigation	DE	Dewatering
IN	Industrial	MO	Monitoring
CO	Commercial		
MN	Municipal		
PS	Public		
AC	Cooling And A/C		
NU	Not Used		

4. Water Detail			
Code	Description	Code	Description
FR	Fresh	GS	Gas
SA	Salty	IR	Iron
SU	Sulphur		
MN	Mineral		
UK	Unknown		