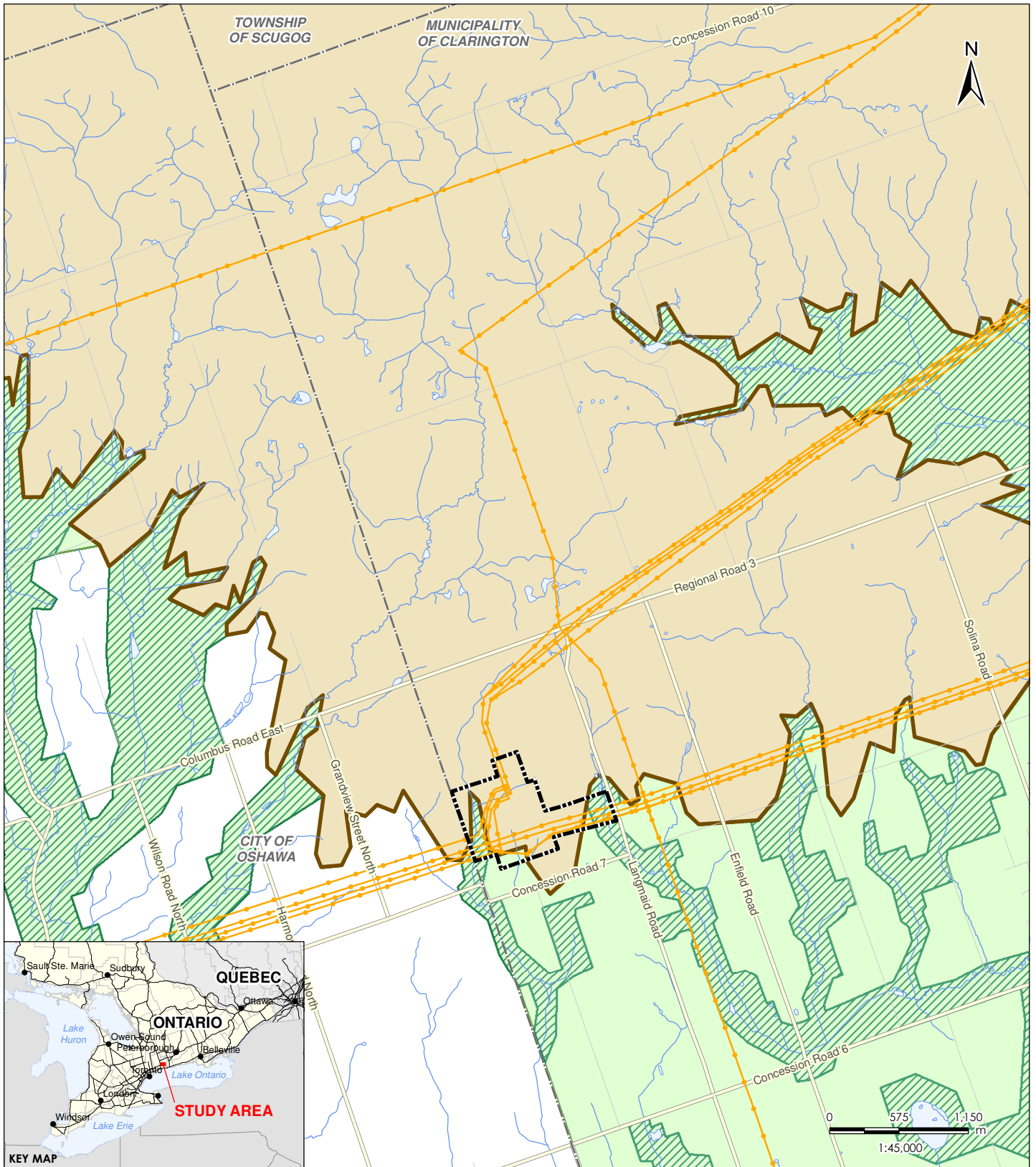


APPENDIX A

Figures

\\cd\1220-102\Work_Group\01609\active\60960745\drawing\MXD\Hydrogeology\2016_MonitoringReport\160900764_2016MonRepl_Fig01_ProjectLocation.mxd
 Revised: 2016-12-14 By: pmoser



February 2017
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- Legend**
- Project Area
 - Municipal Boundary
 - Utility Line
 - Major Road
 - Local Road
 - Waterbody
 - Watercourse
 - Oak Ridges Moraine
 - Greenbelt - Natural Heritage System
 - Greenbelt - Protected Countryside

- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

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 Hydro One - Clarington
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Figure No.
1

Title
Project Location



Legend

- Project Area
- Station Site
- Borehole (Stantec, 2015)
- Monitoring Well (Stantec, 2013, 2015)
- Piezometer (Stantec, 2013)
- Test Pit (Stantec, 2013)
- Surface Water Monitoring (Stantec, 2013)
- Monitoring Well (EXP, 2012)
- Monitoring Well (Inspec-Sol, 2012) - Abandoned
- Borehole (Inspec-Sol, 2012)
- Borehole (EXP, 2012)
- Topographic Contour (mAMSL)
- New/Planned Infrastructure
- Previously Existing Infrastructure
- Watercourse
- Wetland

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. Orthoimagery © First Base Solutions, 2012.
4. Topography derived from the MNR Digital Elevation Model - Version 2.0.0 - Provincial Tiled Dataset (DEM) © Queen's Printer for Ontario, 2006.
5. Wetland boundary as delineated by Stantec (Natural Heritage Existing Conditions Report, 2012). February 2017
160900764

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Figure No.

2

Title

Project Site Plan

\\cd\1220-02\Work_group\01609\active\60960745\drawing\WXD\Hydrology\2016_MonitoringReport\160900764_2016MonRepl_Fig02_ProjectSitePlan.mxd
 Revised: 2016-12-14 By: pmoser



- Legend**
- Project Area
 - Station Site
 - Private Well Monitoring Area
 - Drainage Catchment
 - Borehole (Stantec, 2015)
 - Monitoring Well (Stantec, 2013, 2015)
 - Piezometer (Stantec, 2013)
 - Test Pit (Stantec, 2013)
 - Surface Water Monitoring (Stantec, 2013)
 - Monitoring Well (EXP, 2012)
 - Monitoring Well (Inspec-Sol, 2012) - Abandoned
 - Monitoring Well (MTO, 2009)
 - Private Well
 - Topographic Contour (mAMSL)
 - Watercourse
 - Waterbody
 - Wetland

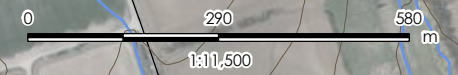
- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
 3. Orthoimagery © First Base Solutions, 2012.
 4. MOECC Water well locations are approximate and have been positioned based on published UTM coordinates © Queen's Printer for Ontario, 2012.

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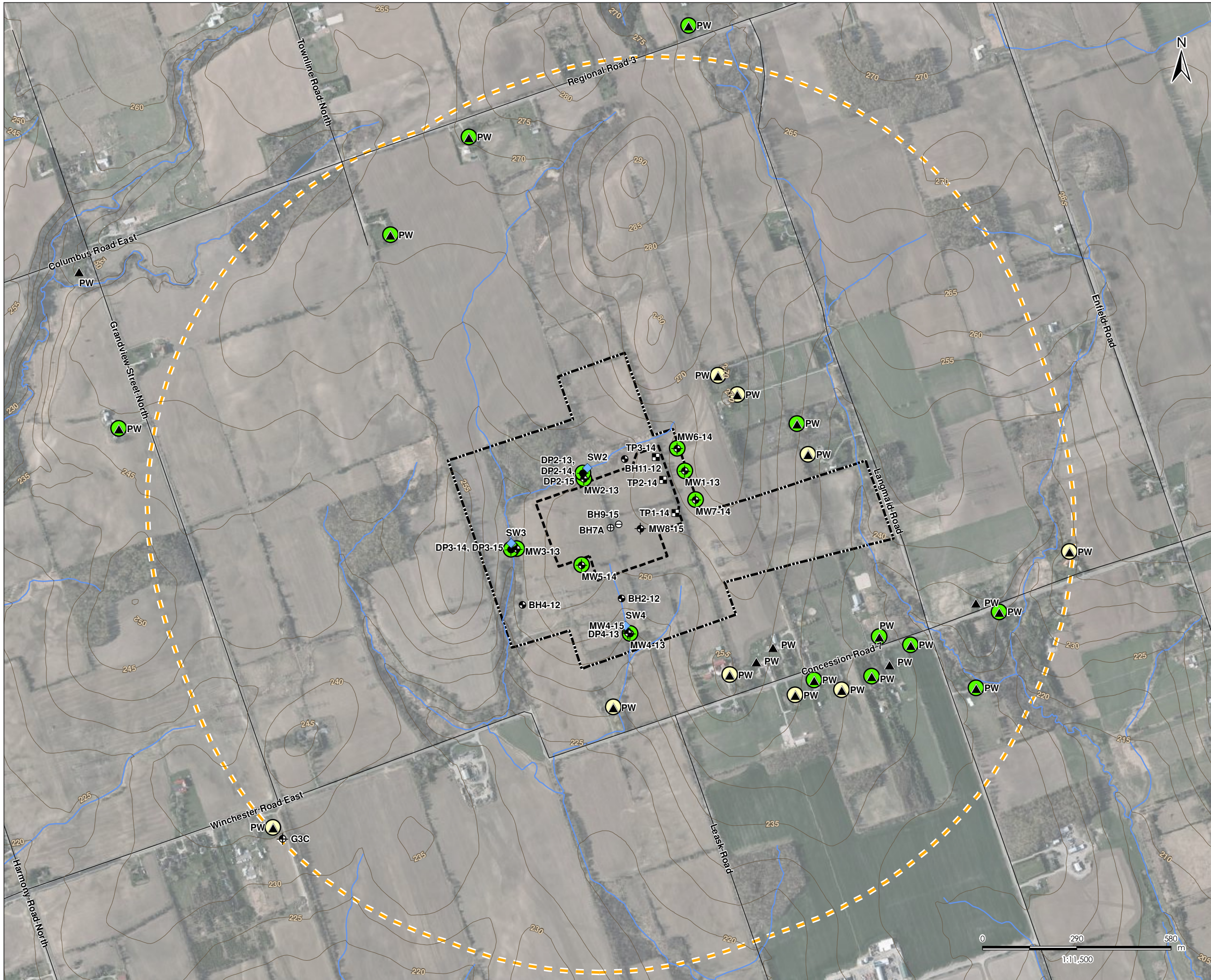
Client/Project
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Figure No.
3

Title
Site Setting



\\cd\1220-102\Work_group\01609\active\60960745\drawing\MXD\Hydrogeology\2016_MonitoringReport\160900764_2016MonRept_Fig03_SiteSetting.mxd
 Revised: 2017-01-23 By: pmoser



- Legend**
- Project Area
 - Station Site
 - Private Well Monitoring Area
 - Borehole (Stantec, 2015)
 - Monitoring Well (Stantec, 2013, 2015)
 - Piezometer (Stantec, 2013)
 - Test Pit (Stantec, 2013)
 - Surface Water Monitoring (Stantec, 2013)
 - Monitoring Well (EXP, 2012)
 - Monitoring Well (Inspec-Sol, 2012)
 - Monitoring Well (MTO, 2009)
 - Private Well
 - Topographic Contour (mAMSL)
 - Watercourse
 - Well Screened within Thorncliffe Formation
 - Well Screened up to 16 mBGS

- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
 3. Orthoimagery © First Base Solutions, 2012.
 4. MOECC Water well locations are approximate and have been positioned based on published UTM coordinates © Queen's Printer for Ontario, 2012.

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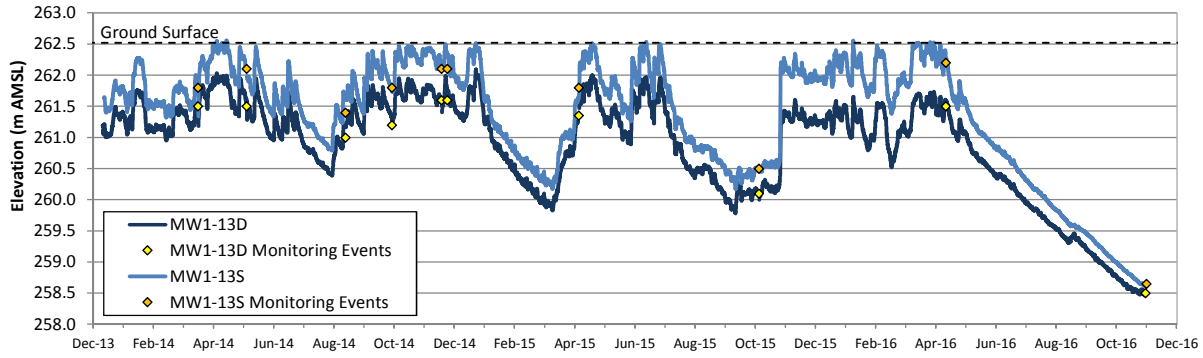
Client/Project
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Figure No.
4

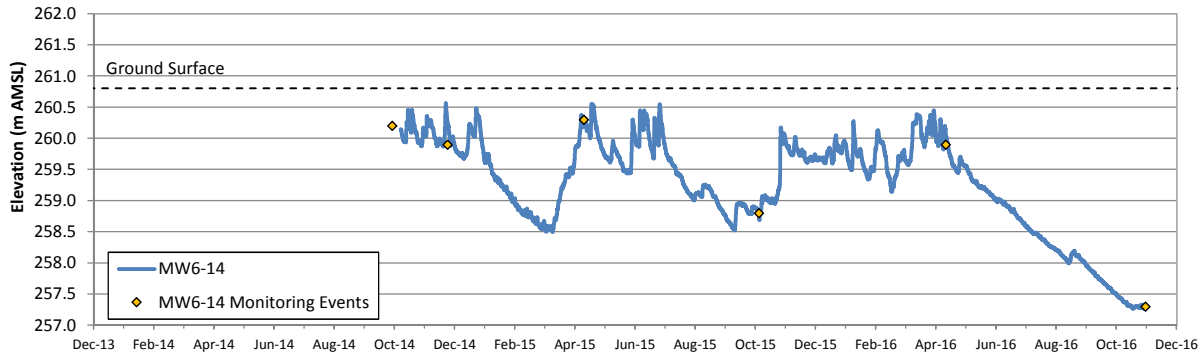
Title
Groundwater Monitoring Locations

\\cd\220-102\Work_group\01609\active\60960745\drawing\MXD\Hydrogeology\2016_MonitoringReport\160900764_2016MonRep1_Fig04_GWMonitoringLocs.mxd
 Revised: 2016-12-14 By: pmoser

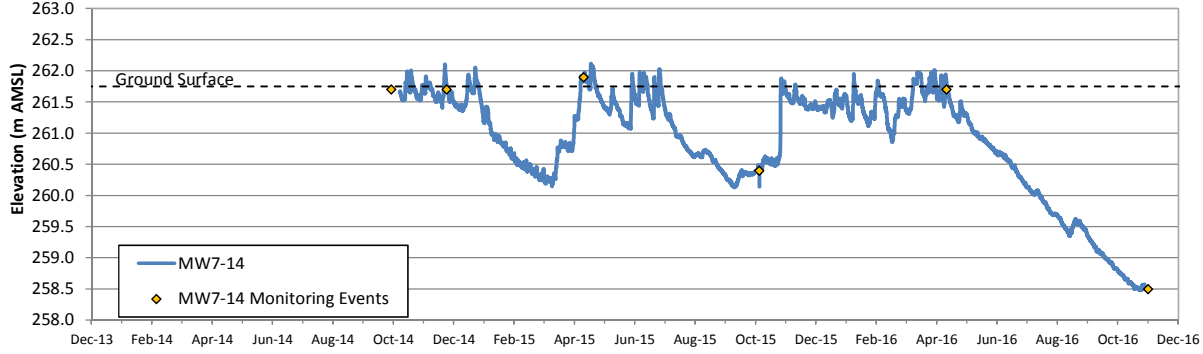
Monitoring Well MW1-13



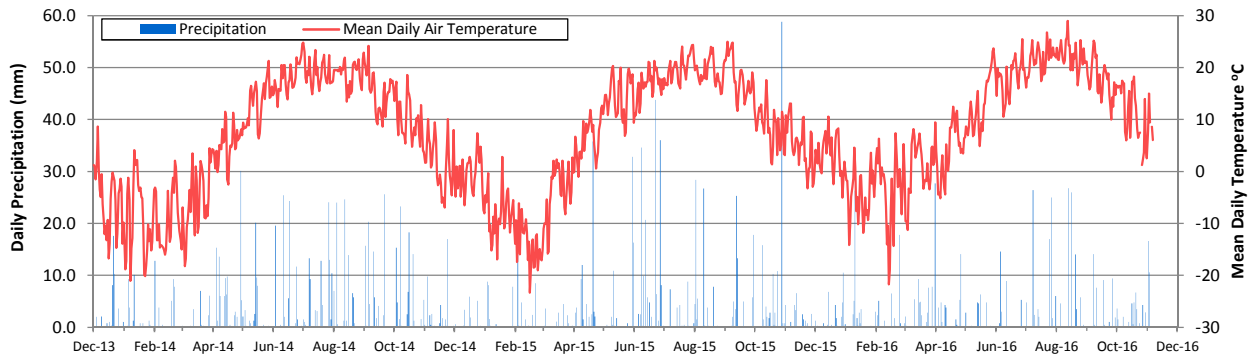
Monitoring Well MW6-14



Monitoring Well MW7-14



Climate Data (Oshawa Climate Station)



Notes:

Precipitation and temperature data were obtained from Environment Canada for the Oshawa Climate Station. Climate data gaps were filled using data from the Blackstock and Oshawa WPCP Climate Stations.

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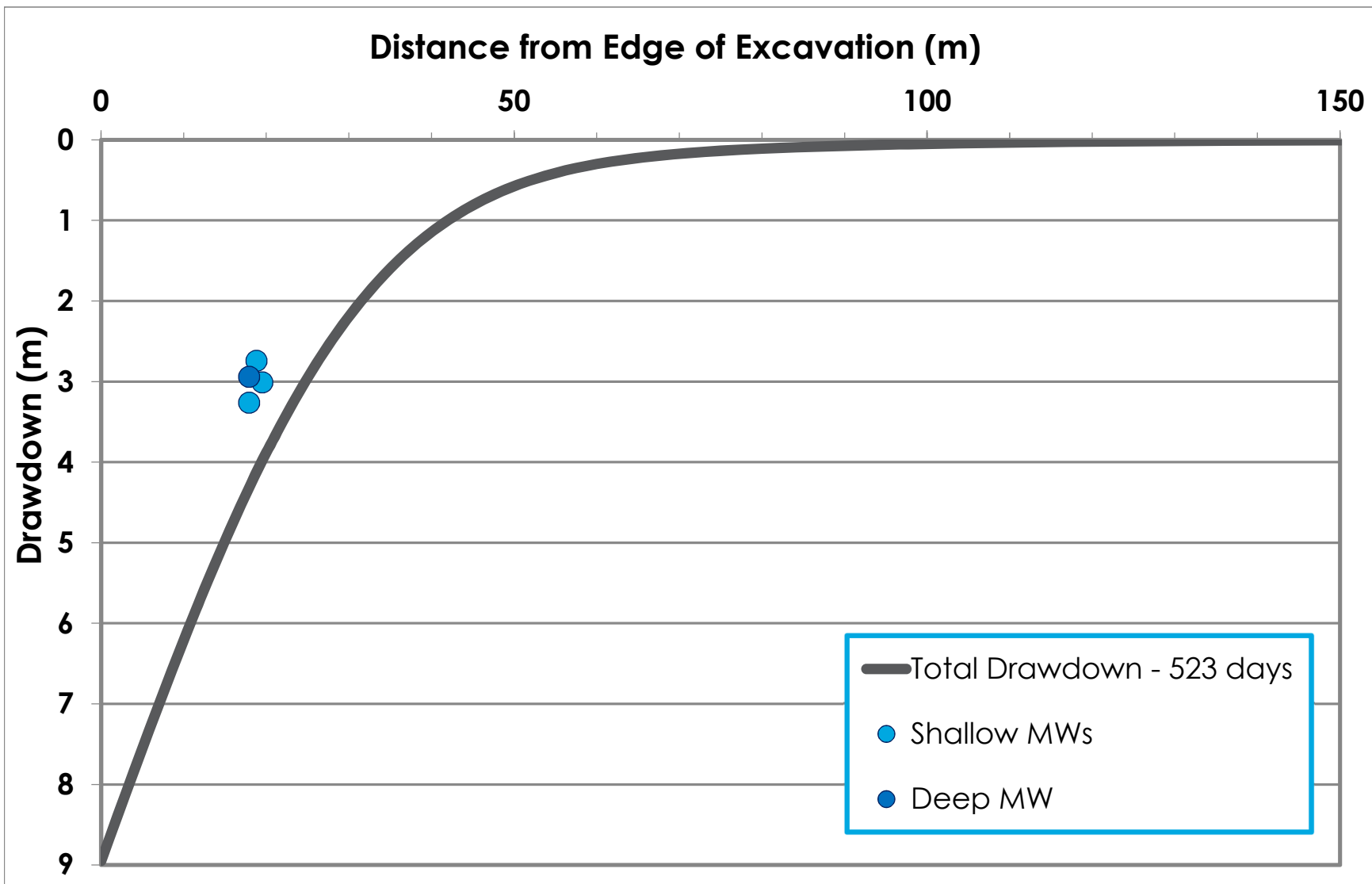
Figure No.

5

Title

**Hydrographs
Monitoring Wells MW1, MW6, and MW7**





Client/Project

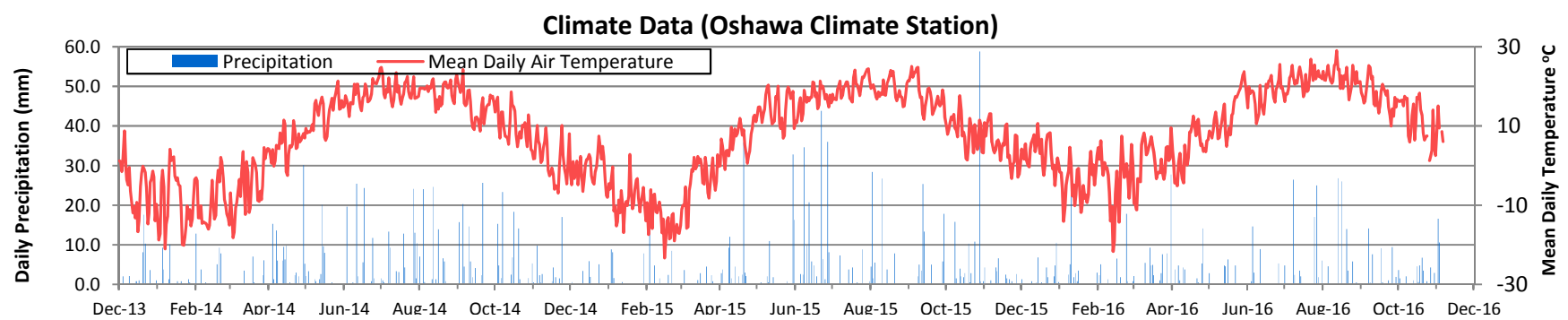
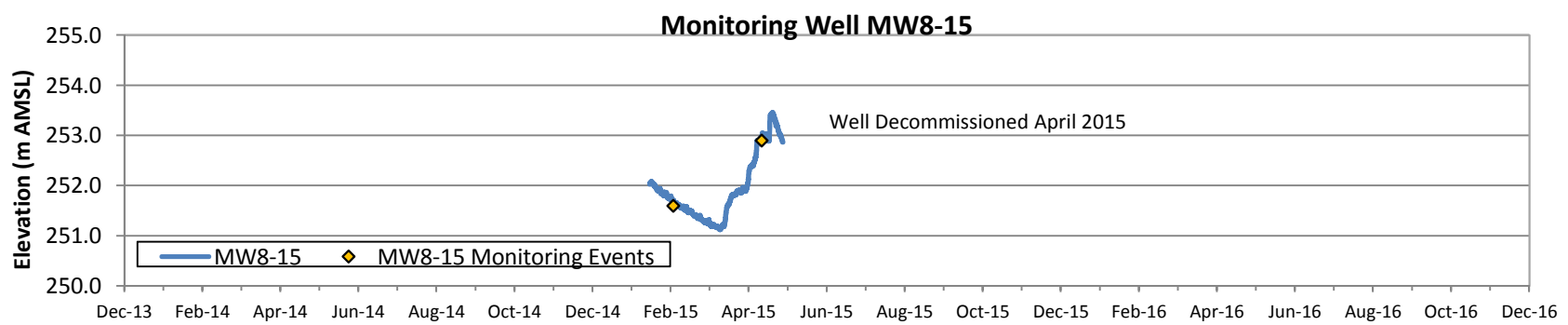
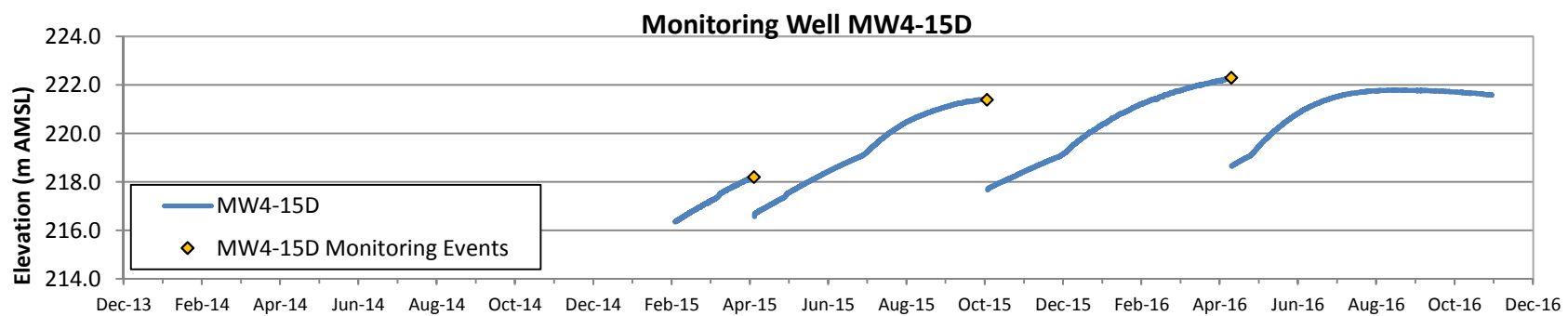
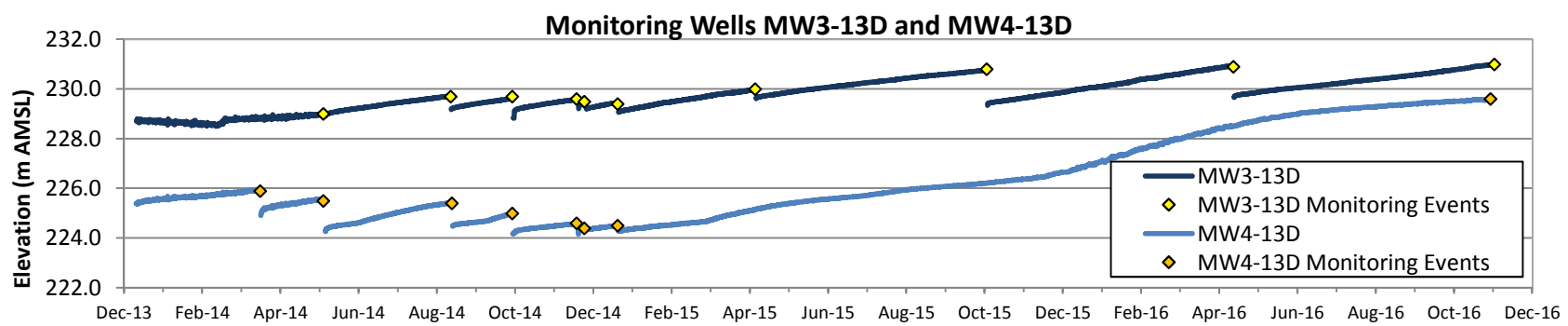
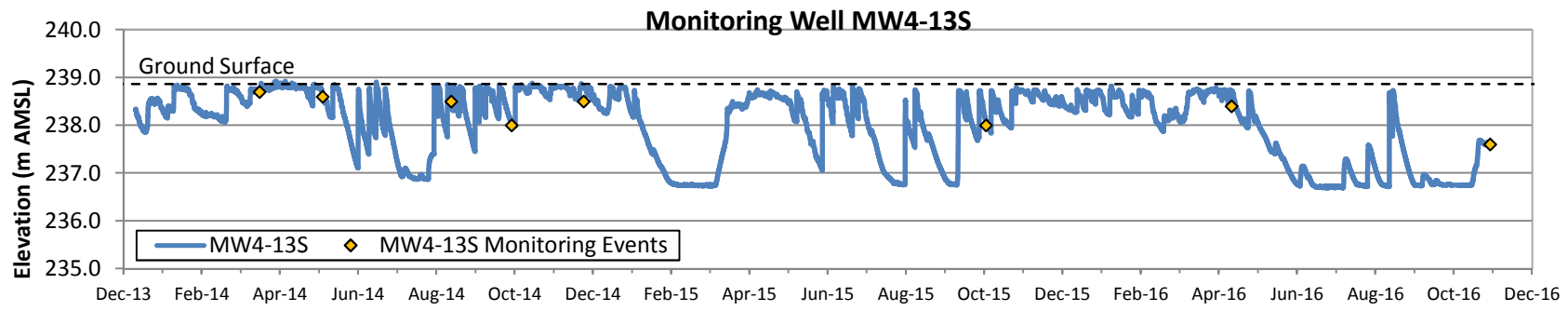
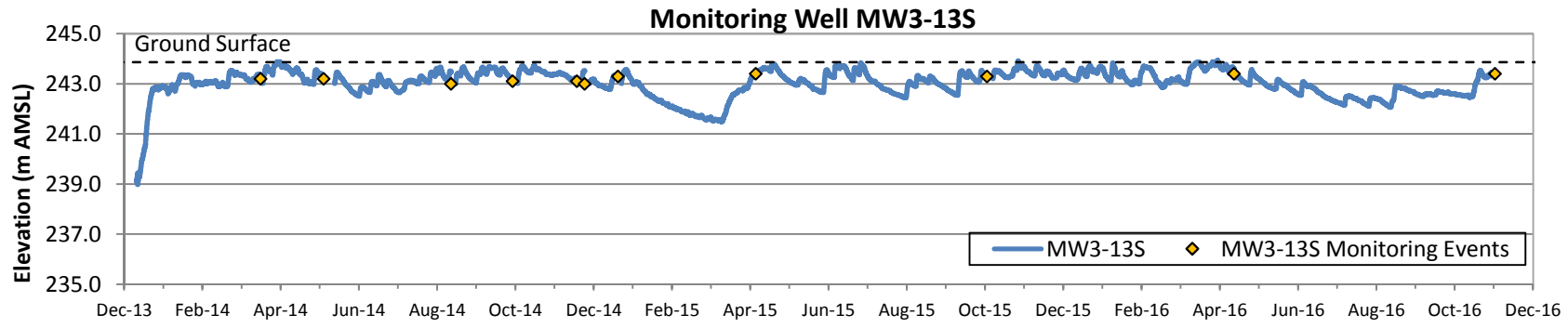
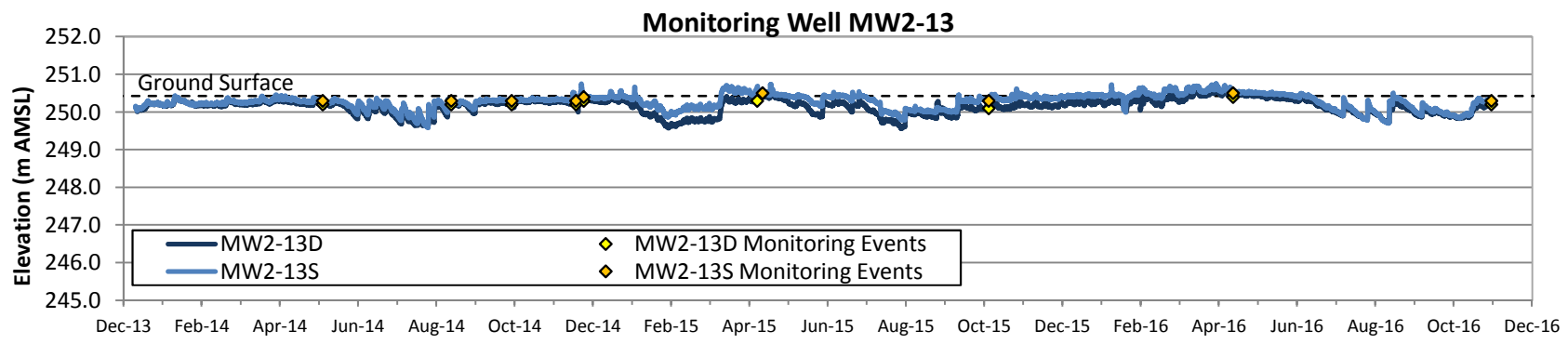
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2016 Annual Groundwater and
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Figure No.

6

Title

Shallow / Deep Well Drawdown
at 523 Days



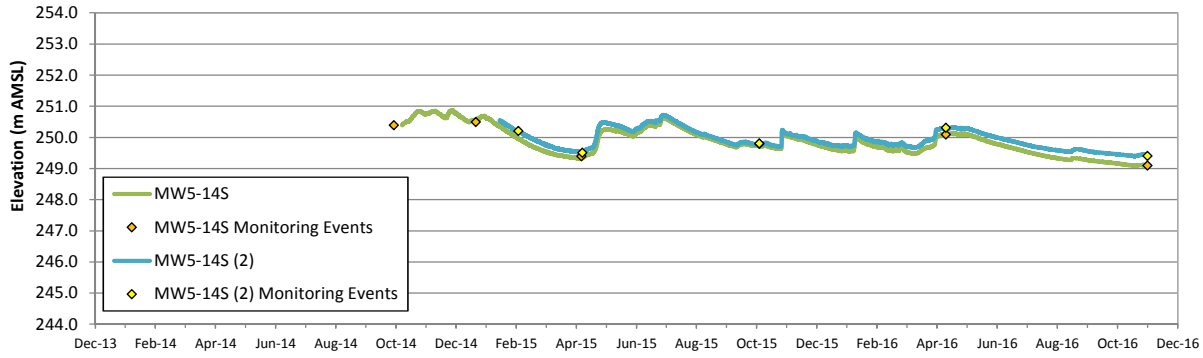
Notes:
Precipitation and temperature data were obtained from Environment Canada for the Oshawa Climate Station. Climate data gaps were filled using data from the Blackstock and Oshawa WPCP Climate Stations.

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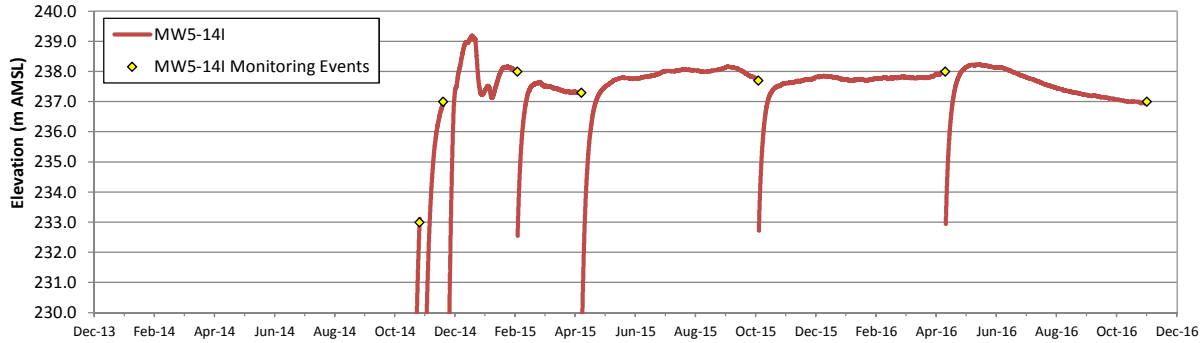
Figure No.
7

Title
**Hydrographs
Monitoring Wells MW2, MW3, MW4 and MW8**

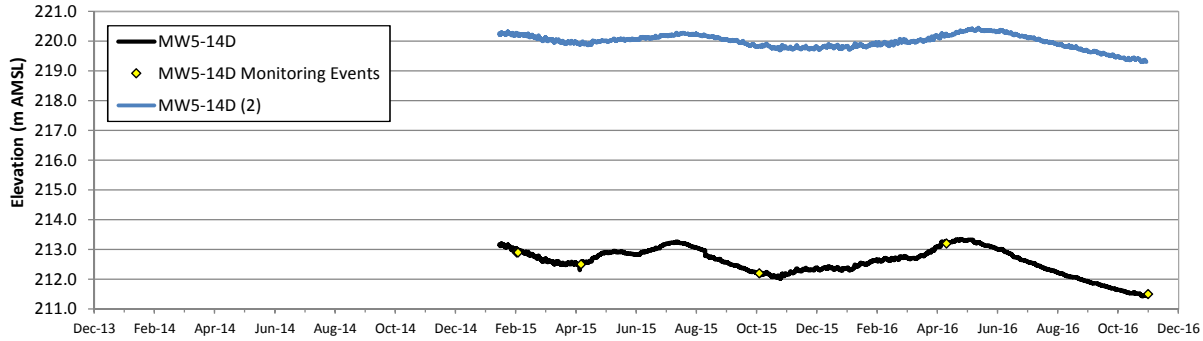
Monitoring Well MW5-14S and MW5-14S (2)



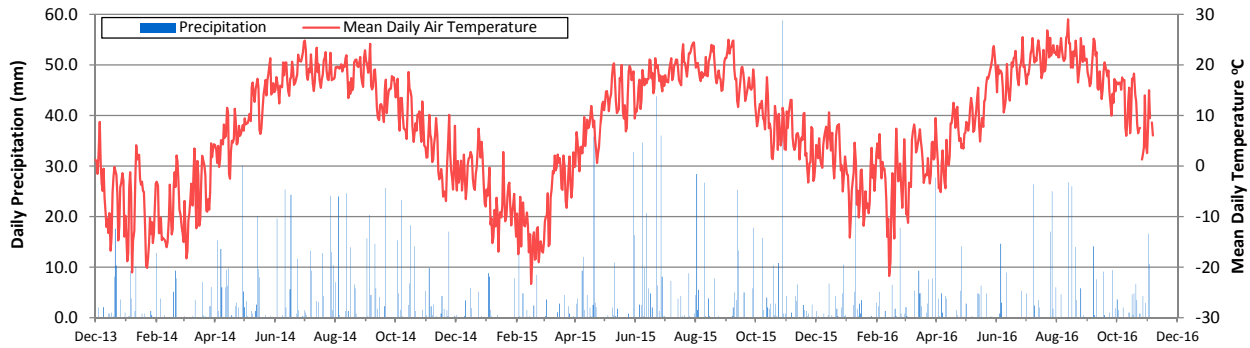
Monitoring Well MW5-14I



Monitoring Well MW5-14D and MW5-14D (2)



Climate Data (Oshawa Climate Station)



Notes:

Precipitation and temperature data were obtained from Environment Canada for the Oshawa Climate Station. Climate data gaps were filled using data from the Blackstock and Oshawa WPCP Climate Stations.

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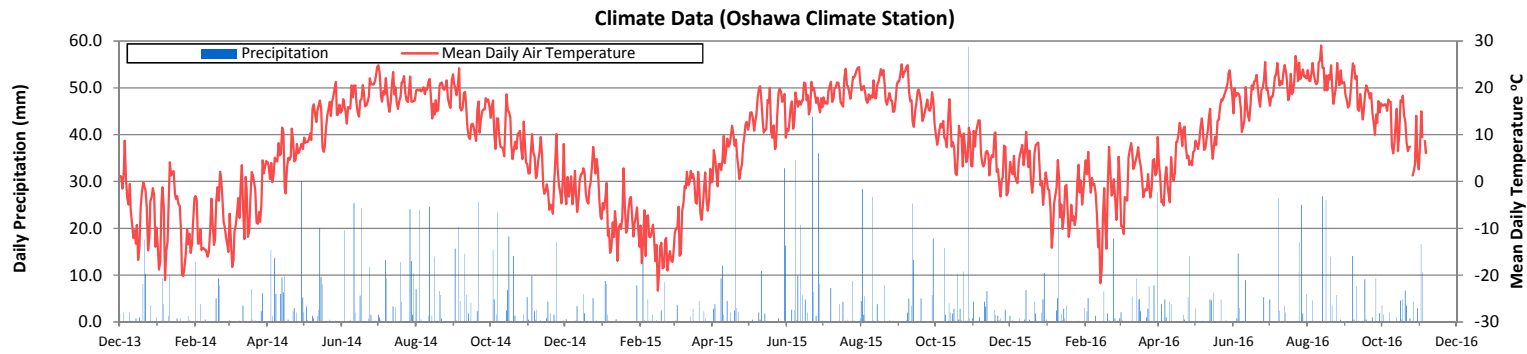
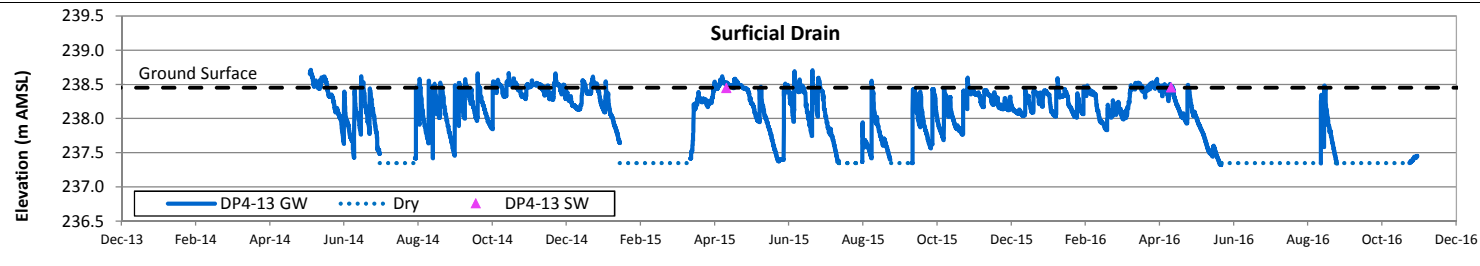
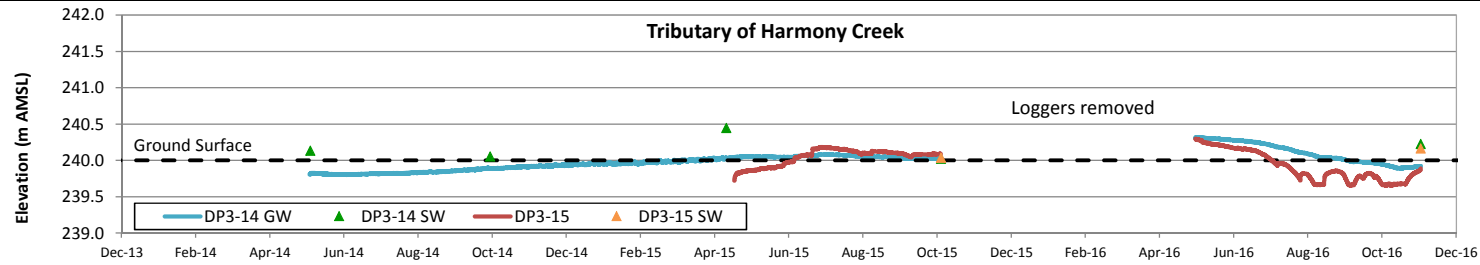
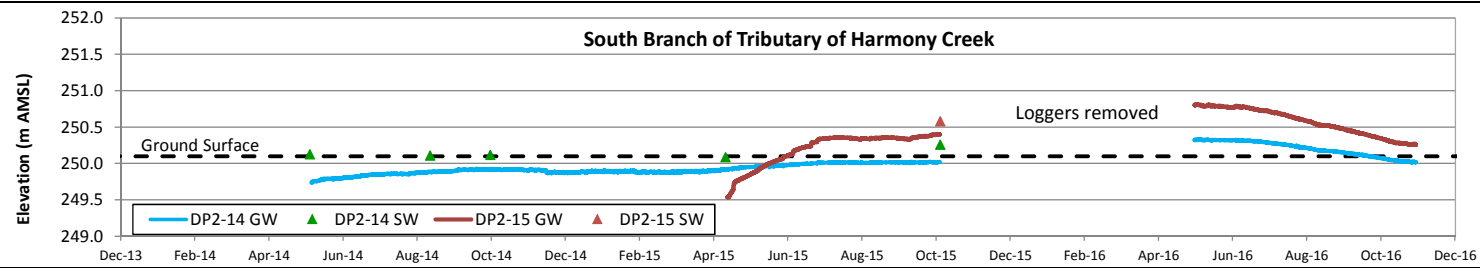
Figure No.

8

Title

Hydrographs
Monitoring Well MW5





Notes:

Precipitation and temperature data were obtained from Environment Canada for the Oshawa Climate Station. Climate data gaps were filled using data from the Blackstock and Oshawa WPCP Climate Stations.

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Figure No.

9

Title

Hydrographs
Drivepoints



Legend

- Project Area
- Station Site
- Private Well Monitoring Area
- 250.2 Groundwater Elevation (mAMSL)
- PW Private Well
- Borehole (Stantec, 2015)
- Monitoring Well (Stantec, 2013, 2015)
- Piezometer (Stantec, 2013)
- Test Pit (Stantec, 2013)
- Surface Water Monitoring (Stantec, 2013)
- Monitoring Well (EXP, 2012)
- Monitoring Well (Inspec-Sol, 2012) - Abandoned
- Borehole (Inspec-Sol, 2012)
- Monitoring Well (MTO, 2009)
- Private Well
- Topographic Contour (mAMSL)
- Watercourse
- Groundwater Flow Direction
- Interpreted Shallow Groundwater Contour (mASL)
- Watershed Divide
- Wetland
- Area Downgradient from Clarington TS Station Site



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
 3. Orthoimagery © First Base Solutions, 2012.
 4. Water levels for private wells are representative of levels between October 1 and October 14, 2016.
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Figure No.
10

Title
**Groundwater Levels
Shallow Overburden - October 2016**

\\C:\220-102\01_609\active\60960745\drawing\MXD\Hydrogeology\2016_MonitoringReport\160900764_2016MonRep1_Fig09_GW_ShallowOverburden_Oct2016.mxd
 Revised: 2017-01-23 By: pmoser



- Legend**
- Project Area
 - Station Site
 - Private Well Monitoring Area
 - 250.1 Groundwater Elevation (mAMSL)
 - PW Private Well
 - Borehole (Stantec, 2015)
 - Monitoring Well (Stantec, 2013, 2015)
 - Piezometer (Stantec, 2013)
 - Test Pit (Stantec, 2013)
 - Surface Water Monitoring (Stantec, 2013)
 - Monitoring Well (EXP, 2012)
 - Monitoring Well (Inspec-Sol, 2012)
 - Borehole (Inspec-Sol, 2012)
 - Monitoring Well (MTO, 2009)
 - Private Well
 - Well Screened Within Thorncliffe Formation
 - Topographic Contour (mAMSL)
 - Watercourse
 - Waterbody

- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
 3. Orthoimagery © First Base Solutions, 2012.
 4. Water levels for private wells are representative of levels between October 1 and October 14, 2016.

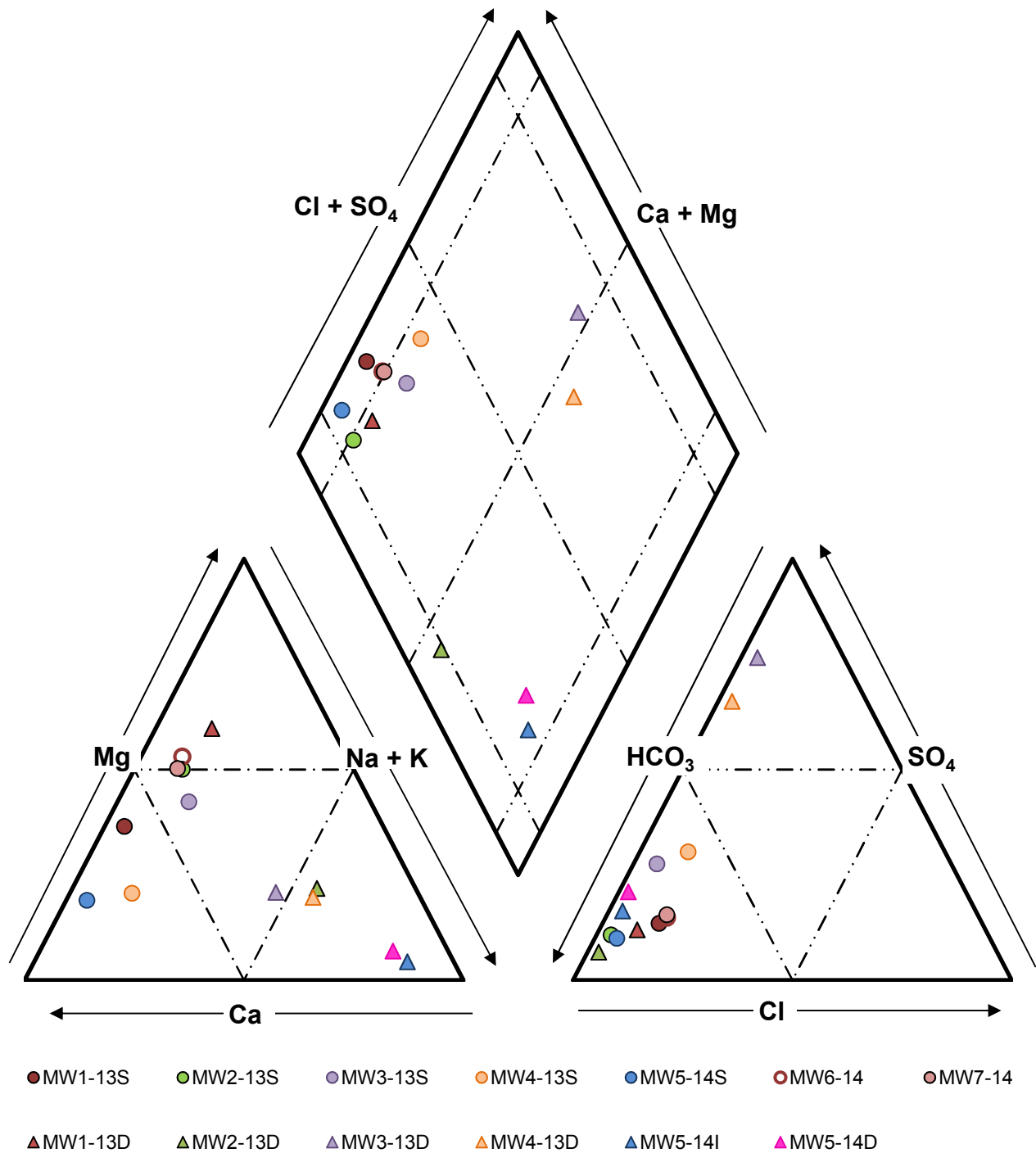
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Figure No.
11

Title
**Groundwater Elevations
Thorncliffe Formation - October 2016**

\\C:\1220-102\01_609\active\60960745\drawing\MXD\Hydrogeology\2016_MonitoringReport\160900764_2016MonRep1_Fig10_GW_Thorncliffe_Oct2016.mxd
 Revised: 2017-01-23 By: pmoser



Water quality data from groundwater samples were collected on October 31, 2016 at MW4-13S/D, November 1, 2016 at MW1-13D, MW2-13S/D, MW6-14 and PW21, November 2, 2016 at MW1-13S, MW5-14S/I/D, MW7-14 and PW10 and November 3, 2016 at MW3-13S/D.

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Figure No.

12

Title

Water Chemistry - Piper Plot

