

**FOURTH LINE WELL FIELD EXPANSION, ACTON, MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT  
STUDY – PROJECT FILE**

Appendix C External Agency Comments  
January 21, 2015

## Appendix C External Agency Comments

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**From:** Freymond, Roger  
**Sent:** Monday, December 01, 2014 10:38 AM  
**To:** Wiersma, Robert  
**Subject:** FW: 4th Line Spawning Surveys

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**From:** Marray, Liam [<mailto:LMarray@creditvalleyca.ca>]  
**Sent:** Friday, October 31, 2014 10:38 AM  
**To:** Renic, Tom; [jon.clark@halton.ca](mailto:jon.clark@halton.ca); Freymond, Roger  
**Cc:** Clayton, Jon  
**Subject:** FW: 4th Line Spawning Surveys

Tom/Roger

CVC staff have undertaken a spawning survey in the area of the 4th Line Well. See Jon's comments below.

Could you overlay the surficial geology mapping onto the spawning information. I also think this would be beneficial information to include in your report.

thanks

Liam

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**From:** Clayton, Jon  
**Sent:** October 31, 2014 10:04 AM  
**To:** Marray, Liam; Mulchansingh, Kerry; Liu, Frank  
**Cc:** Morris, Bob; Sampson, Scott  
**Subject:** 4th Line Spawning Surveys

On Wednesday I walked a few reaches of the Beeney Creek at 4<sup>th</sup> Line and 32<sup>nd</sup> Sideroad. We were able to get onto the property upstream of the pumping station and saw some possible redds/spawning activity but nothing I would consider to be confirmed. There was also one Brook Trout in the pond. We did see a lot of definite spawning in the stream on the east side of 4<sup>th</sup> Line where it runs parallel to 4<sup>th</sup> Line and some possible spawning in a couple of spots where it runs beside the west side of 4<sup>th</sup> Line. It is interesting that the area where we saw the spawning is the lense of different surficial material. I would be interested in overlaying the two pieces of information to see how well they match up.

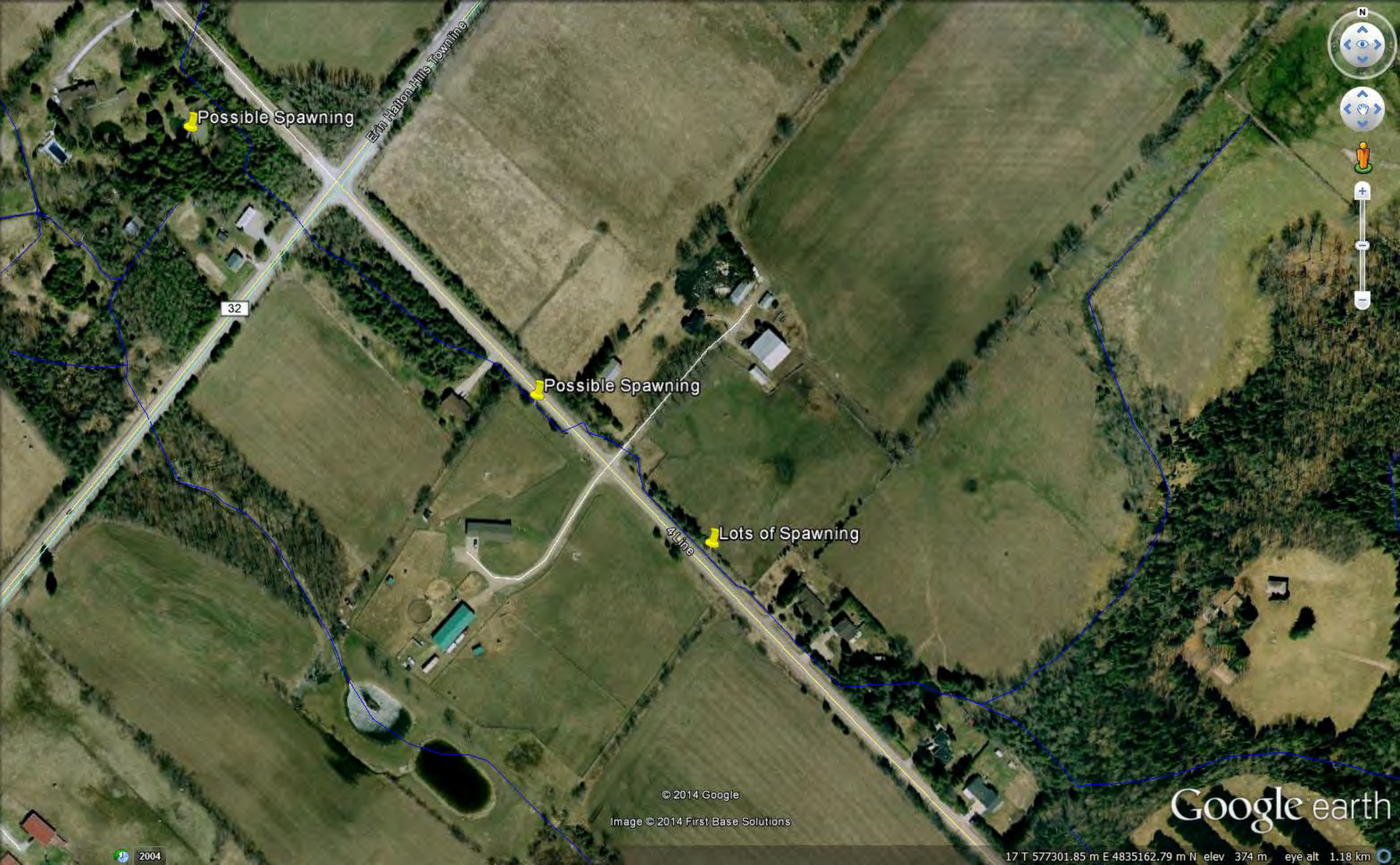
Jon

Jon Clayton



Aquatic Biologist  
Credit Valley Conservation  
[jclayton@creditvalleyca.ca](mailto:jclayton@creditvalleyca.ca) | 905.670.1615 ext 502





Possible Spawning

Erin Halton Hills Townline

32

Possible Spawning

4 Line

Lots of Spawning

© 2014 Google

Image © 2014 First Base Solutions

Google earth

2004

17 T 577301.85 m E 4835162.79 m N elev 374 m eye alt 1.18 km



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**From:** Freymond, Roger  
**Sent:** Monday, December 01, 2014 10:38 AM  
**To:** Wiersma, Robert  
**Subject:** FW: 4th Line Wells Supplemental Information

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**From:** Marray, Liam [<mailto:LMarray@creditvalleyca.ca>]  
**Sent:** Tuesday, October 14, 2014 7:36 AM  
**To:** Freymond, Roger; Renic, Tom  
**Subject:** 4th Line Wells Supplemental Information

Roger/Tom

CVC staff have reviewed the additional information and analysis provided in support of additional pumping at the 4<sup>th</sup> line Well. The larger scale plots and data provided for wells MP2-13 and 7-13 appear to confirm that surface water features are not affected by the additional pumping.

CVC is considering doing additional spawning surveys for the property upstream of the well site and along 4<sup>th</sup> line. We will provide the additional survey information to you when it is available.

If you have any additional questions do not hesitate to contact me.

Yours truly,

Liam



Liam Marray  
Manager Planning Ecology  
Credit Valley Conservation  
[lmarray@creditvalleyca.ca](mailto:lmarray@creditvalleyca.ca) | 905.670.1615 ext 239

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## **MEMO**

**To: Roger Freymond**  
**Stantec**  
**CC: Tom Renic**  
**Region of Halton**  
**From: Liam Marray**  
**Manager Planning Ecology**  
**Date: July 23, 2014**  
**Re: 4<sup>th</sup> Line Wells**  
**Region of Halton**

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Roger/Tom

Thank you for the meeting on June 27, 2014. CVC staff has reviewed the information provided and would like to request some additional information.

- a) Zoomed in/blown up graphs and Tables showing groundwater levels from May – Oct for MP7 and MP2
- b) Drawdown cone showing the 0.1 m line
- c) The impact on the aquifer if the pumping was carried out for 20 years
- d) Discussion/analysis of the ecological impacts resulting from the drawdown in the area surrounding MP5-13. It appears that the Dillon spawning survey did not include the area around MP5-13, did Stantec's surveys include this area?

If you have any additional questions or comments do not hesitate to contact me.



Liam Marray  
Manager Planning Ecology  
Credit Valley Conservation  
[lmarray@creditvalleyca.ca](mailto:lmarray@creditvalleyca.ca) | 905.670.1615 ext 239



## CVCA Comments Review Presentation and Discussion

Fourth Line Class EA  
1611-11105/45

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Date/Time: June 27, 2014 / 10:00 AM  
Place: CVCA Office, 1255 Old Derry Road, Mississauga, ON, Room A1  
Next Meeting: TBD  
Attendees: Roger Freymond; Tom Renic; Robert Wiersma; Sean Spisani; Nancy Harttrup;  
Ryan Park; Liam Marray; Kelly Mulchansingh; John Clayton; Frank Liu;  
Absentees: Norman Cato  
Distribution: All

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**Item:**

**Action:**

### Introductions

All parties introduced themselves and their project role.

### Safety Moment

As per Stantec protocol, Sean Spisani conducted a safety moment about Giant Hogweed and its H&S risks.

### Presentation

Stantec presented a brief overview of the project scope, objective and results thus far.

The second part of the presentation was dedicated to addressing the specific CVCA comments received by email prior to the meeting.

Notes and actions arising during Presentation:

- Liam Marray asked about the data from the October 2012 Dillon study. Nancy Harttrup provided a hardcopy to Liam at the meeting.
- John Clayton re-iterated that some of the wetland/tributary mapping in our report is not accurate. Stantec staff concurred. Stantec confirmed that any corrections to the mapping would only affect the boundary conditions, not the results.
- Liam Marray asked about the classification of the wooded area on 32<sup>nd</sup> Sideroad. Sean Spisani confirmed that it was classified as woodland, not wetland.
- CVC staff also asked questions about classification of organic wetlands vs. treed wetlands in the study area.

- Liam Marray noted to other CVCA staff that the “triggers” summarized in our presentation were developed for the hydrogeological test program and not for the future operation of the wells.
- Groundwater elevations & drawdown during the tests. There was some commentary on our drawdown contours. Roger Freymond noted the difference between the behaviors of bedrock fracture wells vs. overburden wells in terms of drawdown. Stantec’s choice of a 0.5 m interval for the contour was questioned. Roger indicated that a smaller interval could be chosen as well. CVCA noted that it was interested in the response of the overburden water table to the pumping. Roger noted that if the bedrock aquifer drawdown was a maximum of 1.3 m in close proximity to the well, no overburden drawdown could exceed 1.3 m anywhere else in the study area. If it did so, then other causes besides well drawdown were likely at play.

### **Response to CVCA Comment 1 - About Station M23**

Stantec reviewed the report figure and provided its explanation of what is happening at this overburden location. Essentially, the overburden response runs counter to the deep bedrock aquifer response and cannot reasonably be attributed to pumping effects. The data more reasonably supports an environmental effect. Roger used the data for Response 4 (see below) to illustrate a good MW response to pumping effects.

Roger pointed out that the longer test that was conducted for this assignment was not needed to understand the aquifer effects, since this could be done with a much shorter test, but rather to understand ecological effects.

Tom Renic did indicate that the Region does have continuous data for this station in its data archives if we wanted to analyze the longer term response at this location.

Halton/  
Stantec

Frank Liu asked about how the drawdown curves were created. Roger indicated that they were created by subtracting the water surface plot of the 19.8 L/s flow test elevations from the 15.2 L/s elevations.

Stantec concluded that the Wentworth Till provides hydraulic separation between the bedrock aquifer system and the wetlands/watercourses.

### **Response to CVCA Comment 2 – About Station MP7**

Stantec showed the data plots for this station, where surface water dries and then the lower aquifer level begins to change. The effect is reversed when surface water returns.

CVCA staff noted that the lowest response does appear to coincide with the time of highest pumping. Stantec noted that on the scale of these plots, it does appear so, but if we lowered the scale to the 15 minute data intervals, the response does not show it being tied to pump rate changes. Again, Stantec cited the effect of the Wentworth Till, which is present in this location.

Stantec to provide expanded data scale to show 15 minute intervals for the end of pump testing in October and the subsequent major rain event.

Stantec



Liam Marray noted that all of us agree that the climate does have an impact, but the central question is whether the pumping is having an ADDITIONAL impact.

### **Response to CVCA Comment 3 – About Station MW2A**

Stantec presented its data on this station and noted that the vertical hydraulic gradient is opposite to what one would expect from a pumping response. This strongly suggested that that response was created from a stress from above rather than below the feature (i.e., weather related not pumping related).

### **Response to CVCA Comment 4 – About Station (MP5)**

Stantec discussed the data for this station and how the aquifer showed ideal response to the pumping.

Stantec interprets the overburden response as being unrelated to pumping response.

### **Response to CVCA Comment 5 – About Stations MW2B & 3B**

Station 3B shows a characteristic response versus Station 2B not showing a response.

### **Aquatic Environment Related Responses – About Station MP5 – 13**

Stantec noted that the data shows that at a 15.2 L/s pumping level (current maximum permitted rate), vertical hydraulic gradient is reversed. But it was noted that this was now the normal course of things. At 19.8 L/s the downward vertical hydraulic gradient increases. This reversal corresponds to an area along 4<sup>th</sup> Line, where there is a “window” in the Wentworth Till. Stantec estimates the window at approximately 250m long, south of 32 Sideroad. The Wentworth Till is an effective barrier because the monitoring station immediately adjacent to the new well showed no surface response when pumping at 19.8 L/s.

The central question is whether the impact of the INCREASED downward vertical hydraulic gradient is significant.

In response to a CVC staff question, Ryan Park noted that the monitoring stations collected temperature data as well as level and flow. The temperature data was not provided in the report that CVC had reviewed. It can be added to the final report.

Stantec

John Clayton noted that the mapping was inaccurate. He provided images and a sketch of the correct tributary pathways. Nancy Harttrup and Ryan Park discussed this with John and received the information.

Liam Marray requested that the mapping be updated to show correct classifications and correct flow paths for the tributaries.

Stantec

John Clayton also noted that the resident just to the north of the well site has claimed the presence of Brook Trout in the waterway.

## Other Items

The attendees reviewed the upwelling site at MP4. It was noted that there is an error in the data table title on Figure 2a.

Stantec

## Summary of Conclusions and Actions

The summary conclusion is that in Stantec's analysis, the presence of the Wentworth Till provides the wetlands and watercourses in the area good hydraulic protection from pumping. We have identified one window in the Wentworth Till beneath Beeney Creek and this is an area of concern. ***The significant question is does an increase in the downward vertical hydraulic gradient in this area affect natural features such as wetlands and Brook Trout habitat in Beeney Creek and, if so, how can effects be mitigated?***

CVC

CVCA will hold internal discussions whether there are other areas of concern besides the identified area on 4<sup>th</sup> Line. CVCA will provide formal comments to Halton/Stantec following these internal discussions

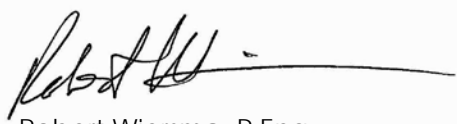
Liam Marray acknowledged that this meeting and presentation have addressed the questions posed in the email of initial comments. No further formal response is required.

CVC

The meeting adjourned at 12:30 PM.

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

**Stantec Consulting Ltd.**



Robert Wiersma, P.Eng.  
Senior Project Manager, Water  
Phone: (519) 585-7409  
Fax: (519) 579-8806  
robert.wiersma@stantec.com



# Environmental Impact Assessment Fourth Line Well Field

Regional Municipality of Halton  
Fourth Line Environmental Impact Assessment



June 27, 2014

# Agenda

1 Introduction

2 Health and Safety

3 Study Overview

4 Site Setting

5 Response to Comments

6 Questions



# Giant Hogweed (*Heracleum mantegassianum*)



## *Characteristic Appearance*

- Looks somewhat like Wild Parsnip and Cow Parsnip, but larger and with whitish flowers.
- An extremely tall flowering plant, typically growing between 2 and 5 meters in height.
- Thick, hollow reddish-purple stalk, up to 10 centimeters in diameter, with stiff bristle-like hairs growing from bumps on the stalk.
- Blooms from June to September, producing numerous thick stems that contain hundreds of white flowers.

## *Where Giant Hogweed is Likely to be Found*

- Typically found in disturbed areas, such as around field edges, meadows, floodplains, along railroad tracks, roadsides, and walking trails, or in clearings within the woods, etc.
- Prefers dry to fresh soils and thrives in areas that receive plenty of sunlight.

## *Contact with the Body*

- The juice within the plant contains toxic chemicals. Absorbed by the skin and exposed to the sun's UV rays, it will cause photo-sensitivity-related dermatitis and can lead to severe sunburn and blistering.
- Contact with the eyes followed by exposure to UV rays can lead to temporary and in severe cases, permanent blindness.
- If you suspect that you have been exposed to the juice of the Giant Hogweed get out of the sun and wash the exposed area well with soap and water, and seek medical attention.

# Study Overview

## Study Purpose

- Assess the impact of increasing the daily taking from the well field by about 400 m<sup>3</sup>/day, from the existing permitted rate of 1,309 m<sup>3</sup>/day (15.2 L/s) to 1,709 m<sup>3</sup>/day (19.8 L/s)



# Study Overview

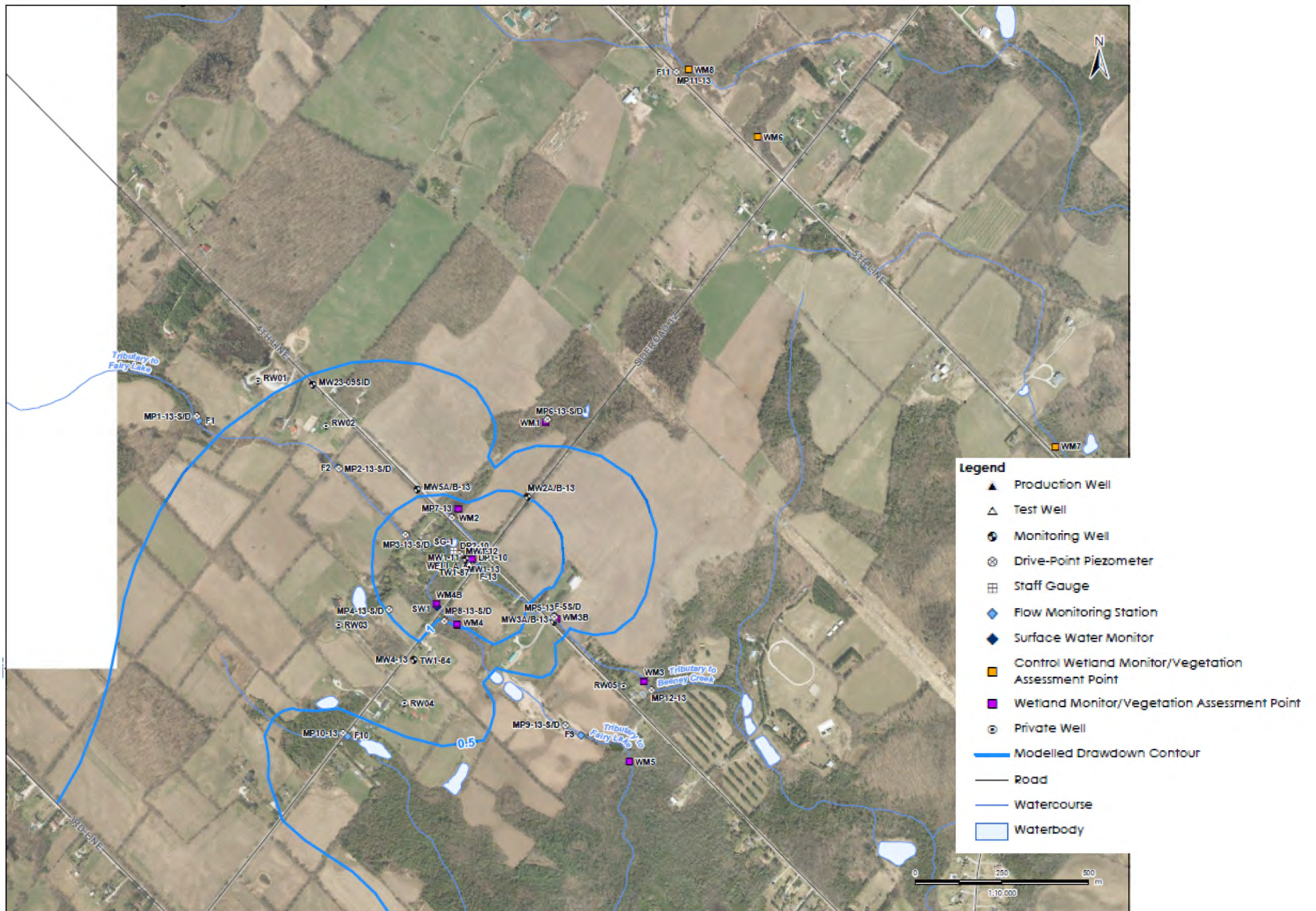
## Study Objectives

- To confirm aquifer sustainability at the higher pumping rate;
- Assess the impact of the increased water taking on the natural environment and existing water users in the area; and
- Satisfy all the requirements for the submission of an application for a Permit To Take Water, should the assessment support such an application.

# Study Overview

## Scope of Work

- Establish and instrument monitoring network between April and June 2013;
- Multi-stage pumping test involving both Well A and TW1-87:
  - Stage 1: Shutdown (June 27-July 18);
  - Stage 2: Well A at 15.2 L/s (July 18-Aug. 19);
  - Stage 3: Well A and TW1-87 each at 9.9 L/s (Aug. 19-Sept. 16)
  - Stage 4: Well A at 15.2 L/s (Sept. 16–Sept. 24)



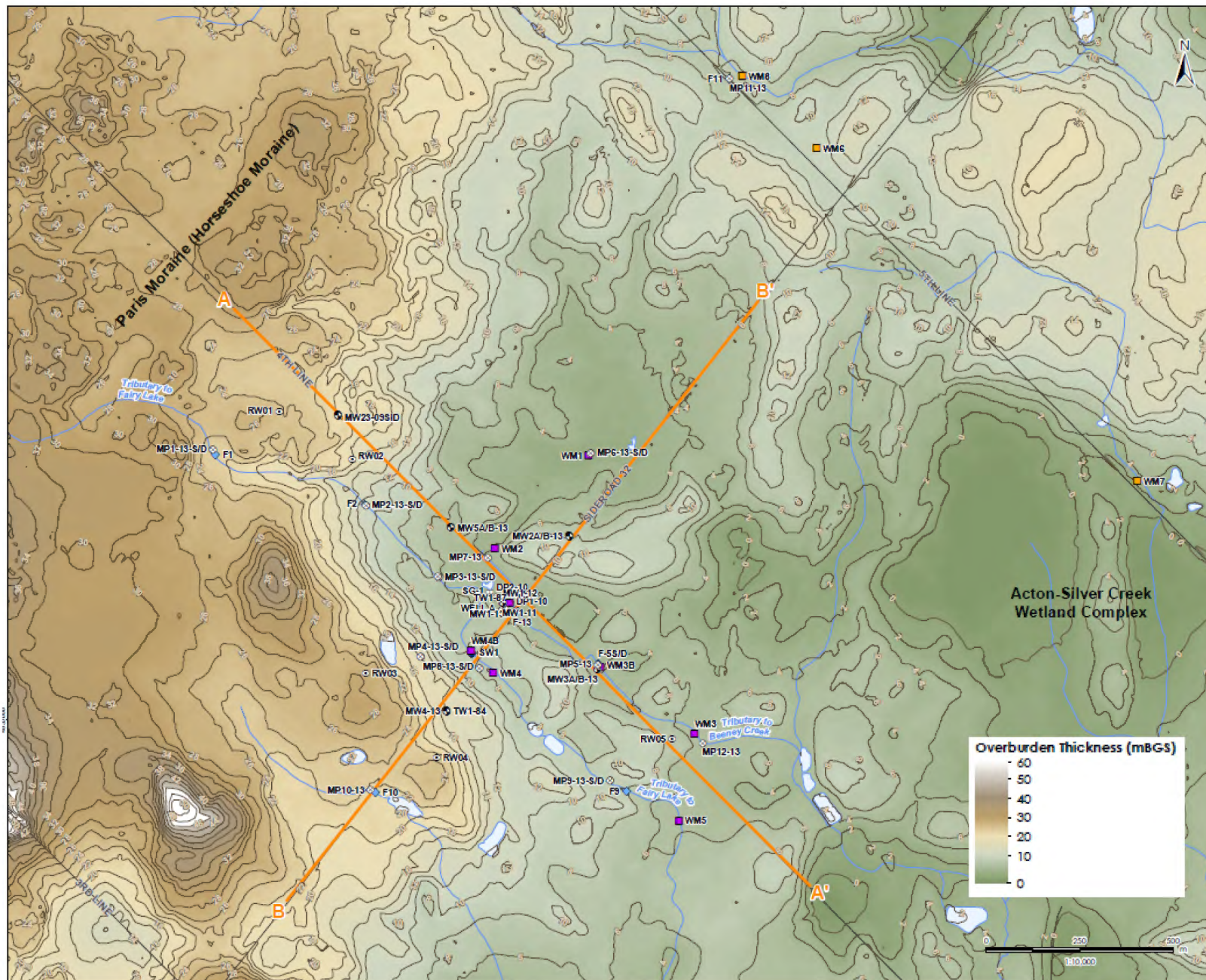


Monitoring Activity	Locations	Date(s) Manual Data Recorded	Frequency of Continuous Measurements
Groundwater Level Monitoring	Well A, TW1-87, MW1-11, MW1-12, MW2A-13, MW2B-13, MW3A-13, MW3B-13, MW4-13, MW5A-13, MW5B-13, OW3-85, OW4-85, MW23/09-S, MW23/09-L, MW23/09-D, TW1-84, DP1-10, MP1-13 S/D, MP2-13 S/D, MP3-13 S/D, MP4-13 S/D, MP5-13 S/D, MP6-13 S/D, MP7-13, MP8-13 S/D, MP9-13 S/D, MP10-13, MP11-13, MP12-13, plus 5 private wells (RW01 through RW05)	Full round monitoring June 28, August 22, and October 10, 2013; Trigger locations only July 23, and weekly from August 1 through to October 4, 2013	15 minute frequency (downloaded during each manual monitoring event)
Surface Water Level Monitoring	DP1-10SW, MP1-13SW, MP2-13SW, MP3-13SW, MP4-13SW, MP5-13SW, MP6-13SW, MP7-13SW, MP9-13SW, MP10-13SW, MP11-13SW, MP12-13SW	Full round monitoring June 28, August 22, and October 10, 2013; Trigger locations only July 23, and weekly from August 1 through to October 4, 2013	15 minute frequency (downloaded during each manual monitoring event)
Streamflow Measurements	F1, F2, F5, F9, F10, F11, F13, F14, F15	June 28; July 23; weekly from August 1 through to October 10, 2013	N/A
Redd Survey	Tributary to Beeney Creek (well field property and parallel to Fourth Line), MP8, and MP10	November 8, 2012	N/A
Fish Habitat Survey	F10, MP10, MP8, MP7, MP5	September 21, 2012	N/A
Groundwater Sampling	Well 1, TW1-87	August 29, and September 13, 2013 at TW1-87, August 29, 2013 at Well A	N/A
Fall Flora Inventory/Ecological Land Classification	Study Area	August 21, 2012	N/A
Amphibian #1 - Early Breeders	Study Area	April 17, 2013	N/A
Spring Flora Inventory/Ecological Land Classification/Amphibian Egg Mass	Study Area	April 25, 2013	N/A
Amphibian #2 - Mid-season Breeders	Study Area	May 30, 2013	N/A
Summer Flora Inventory/Ecological Land Classification/Vernal Pool Assessment/Amphibian Egg Mass	Study Area	July 17, 2013	N/A



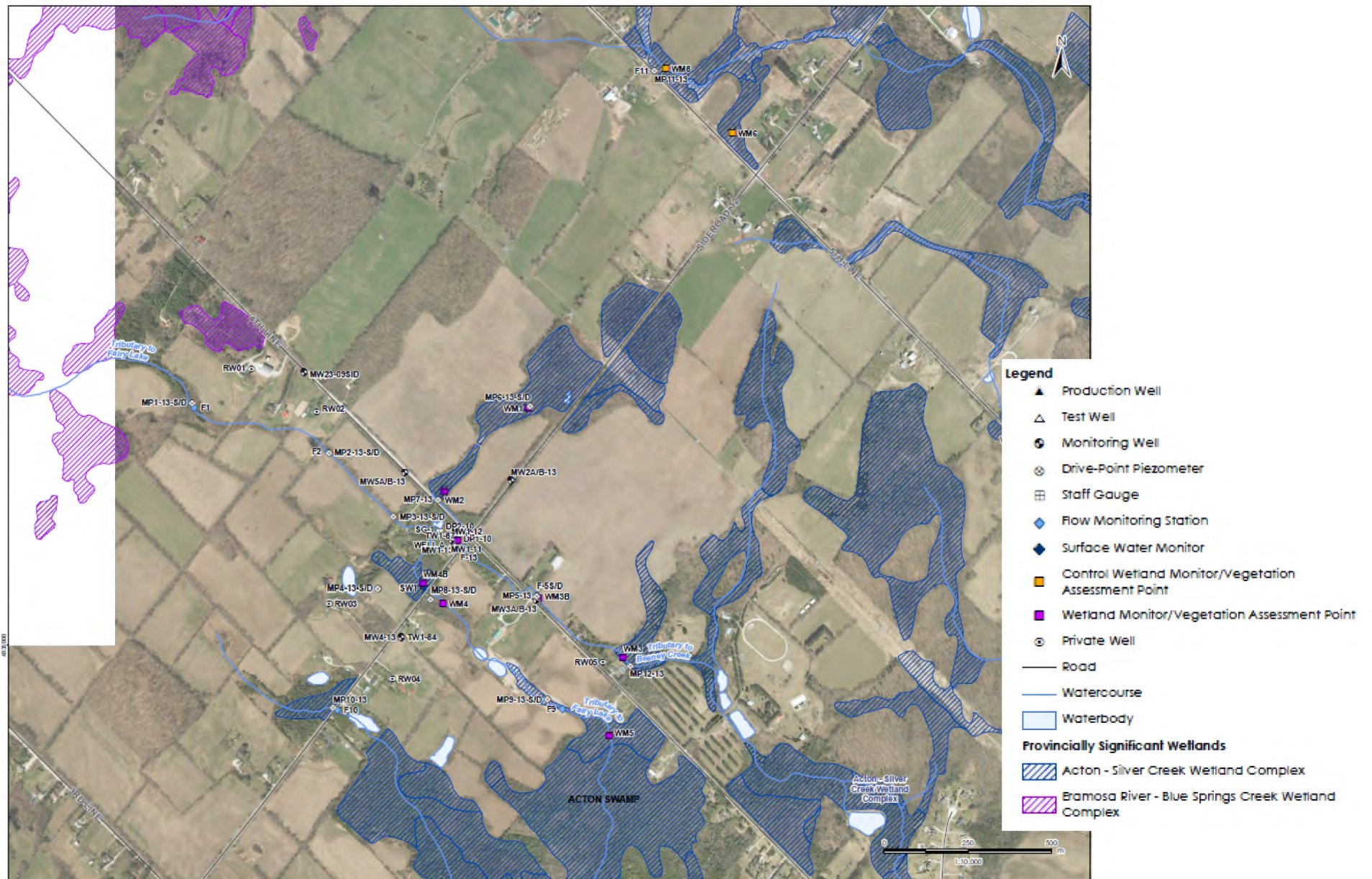










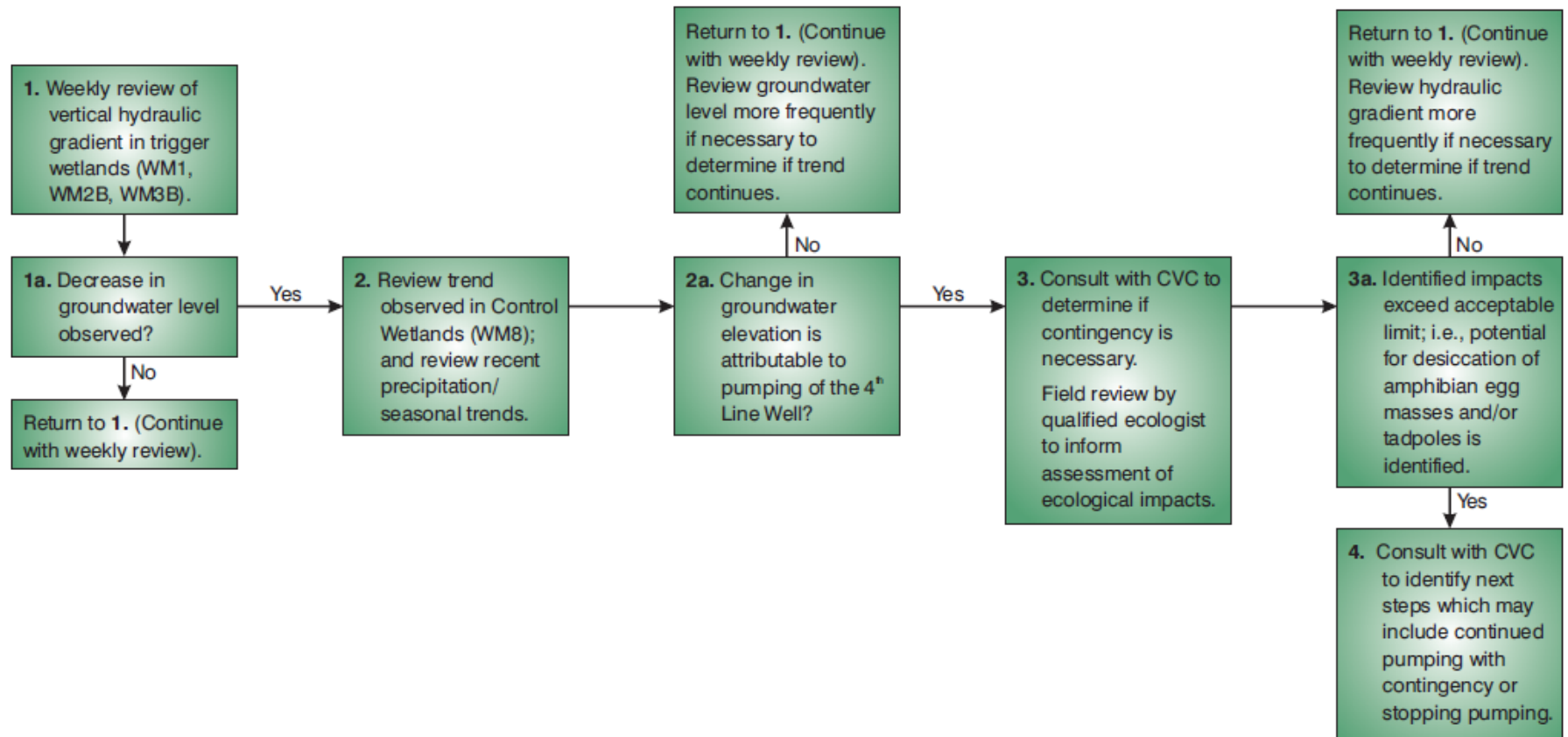






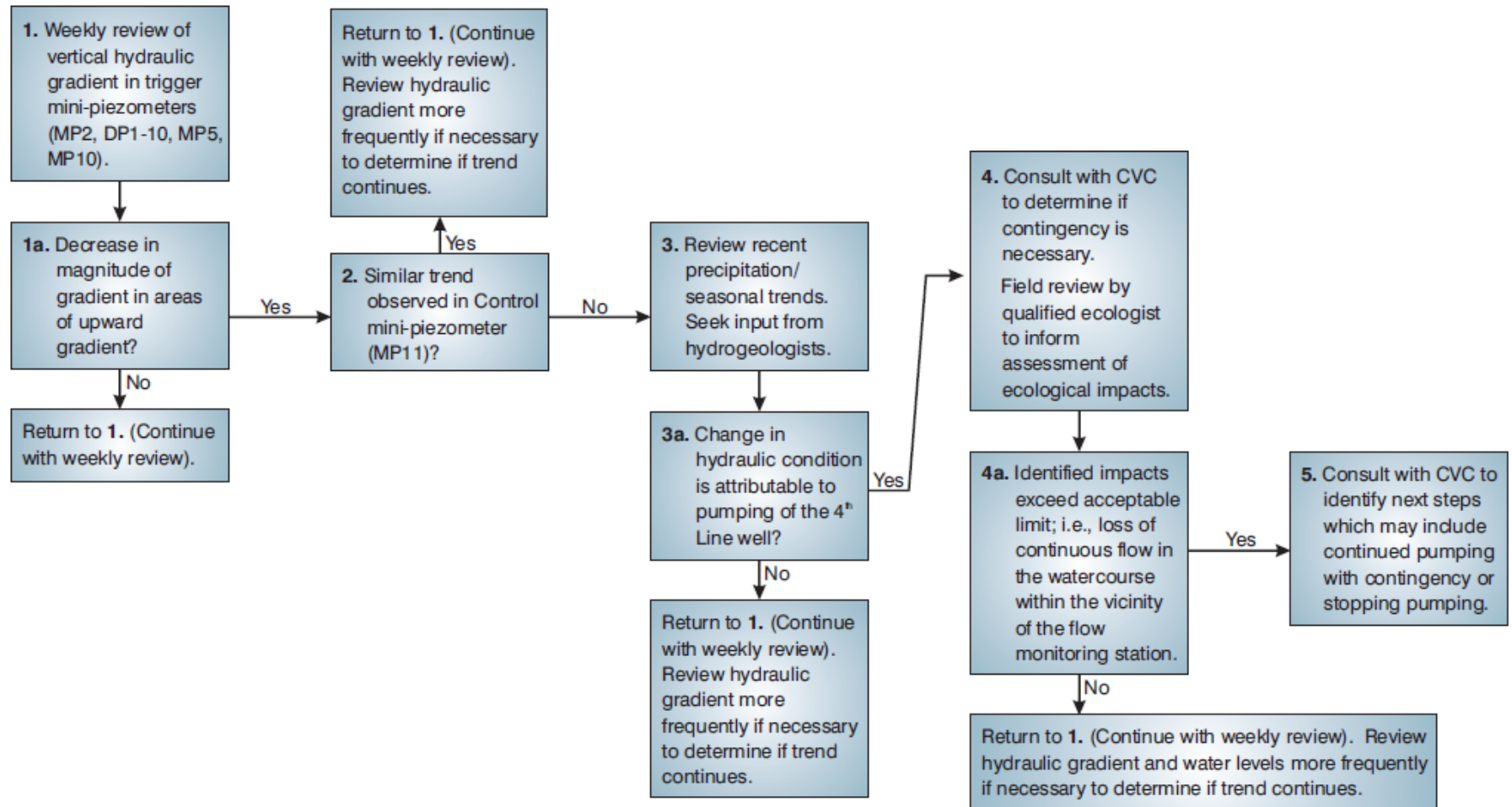


# Wetland Assessment Chart



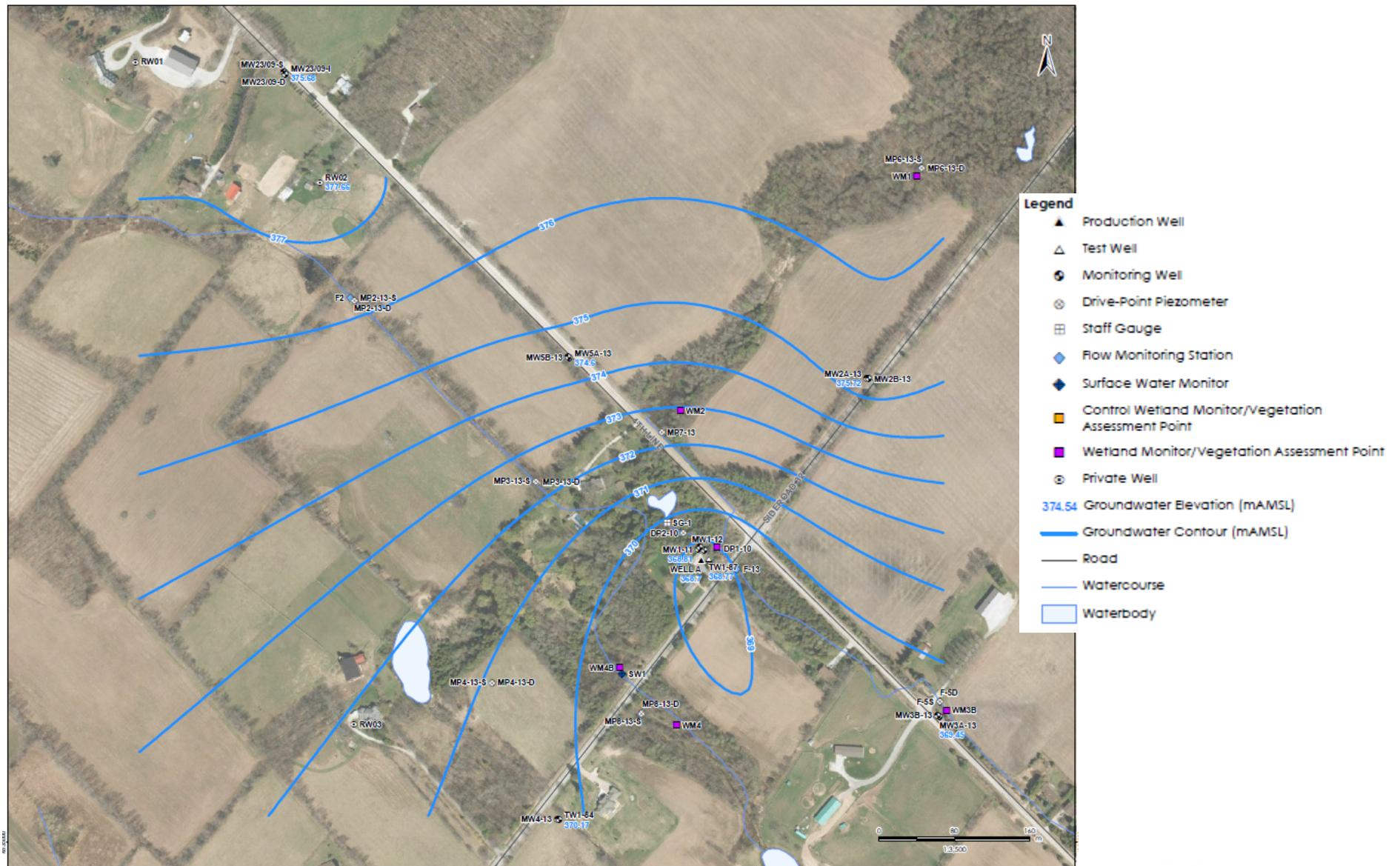
DRAFT

# Fisheries Assessment Chart



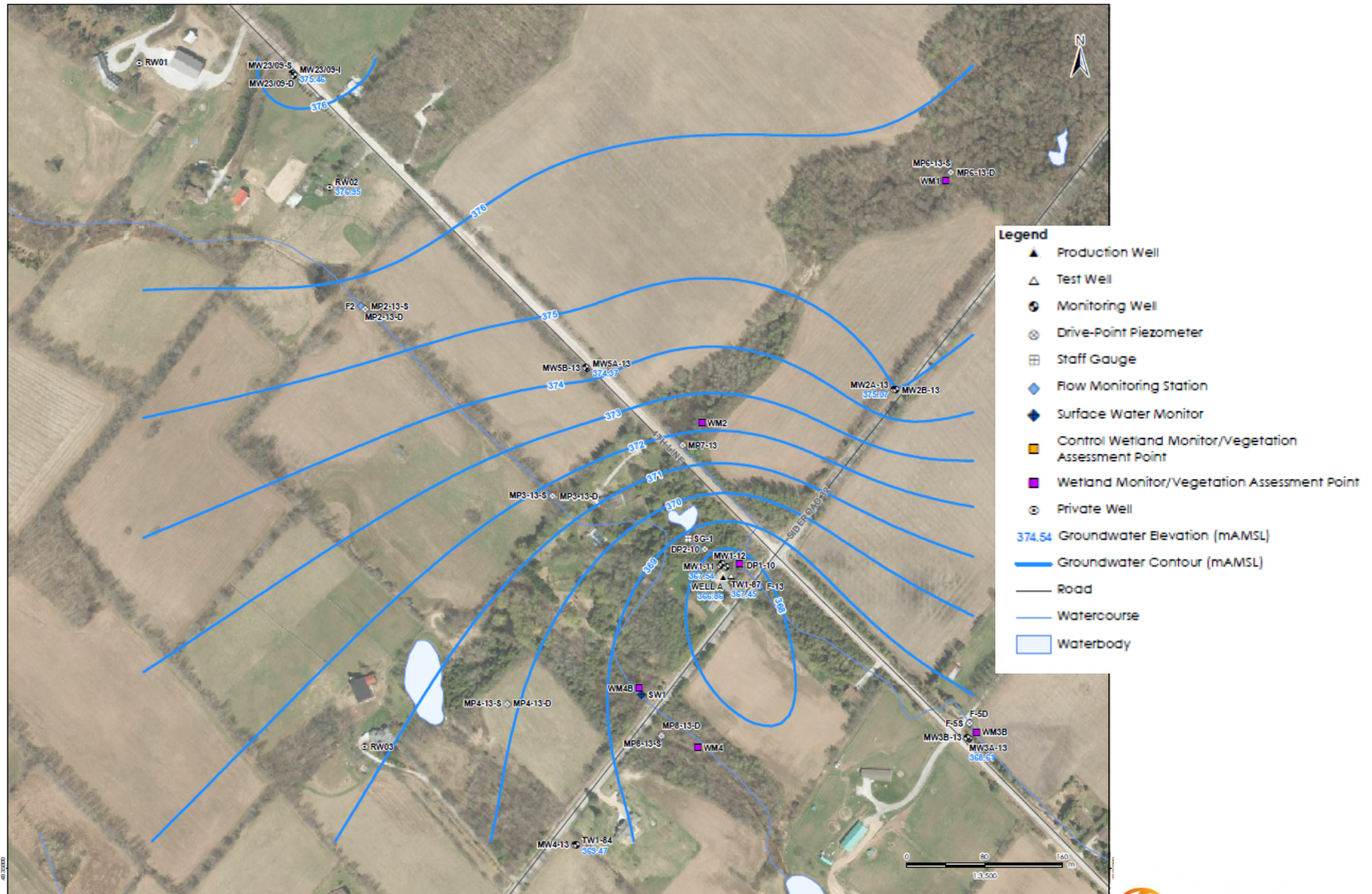
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# Bedrock Groundwater Flow – Baseline Pumping Conditions



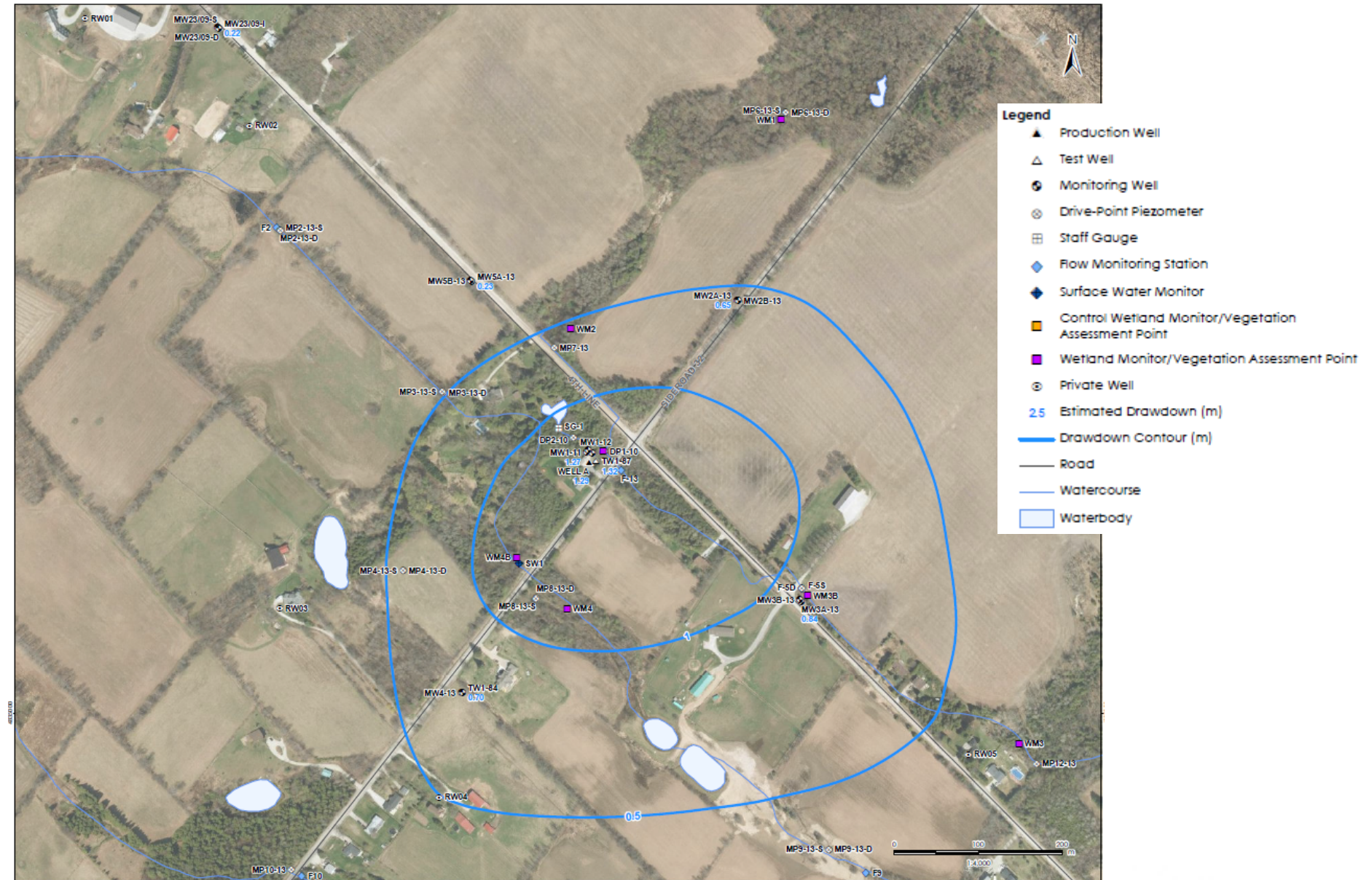


# Bedrock Groundwater Flow – Stage 3 Pumping Conditions





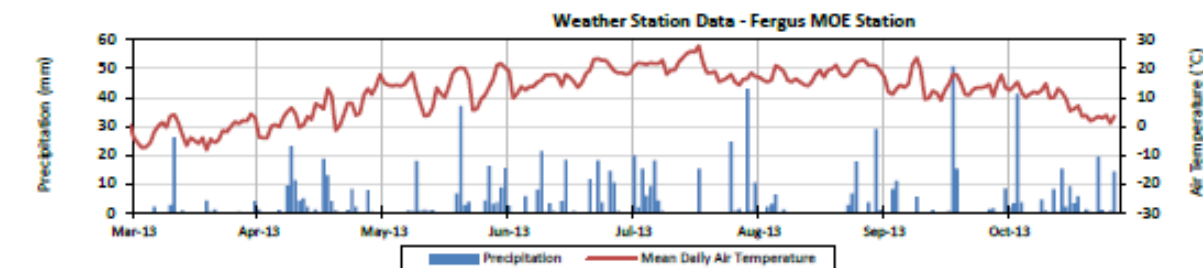
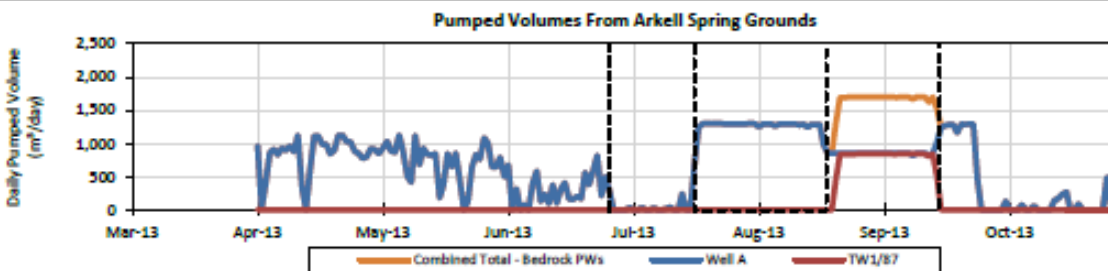
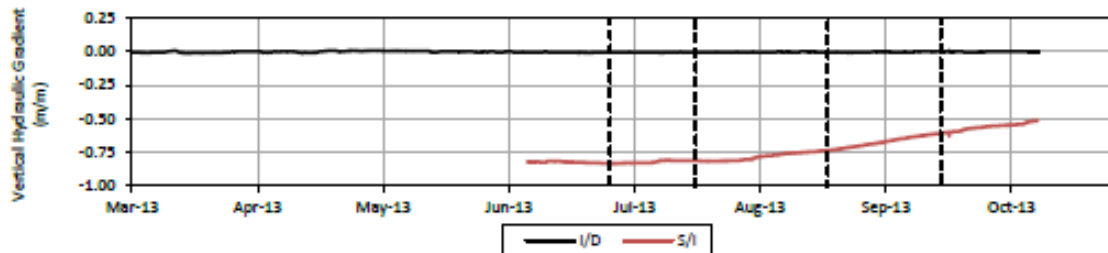
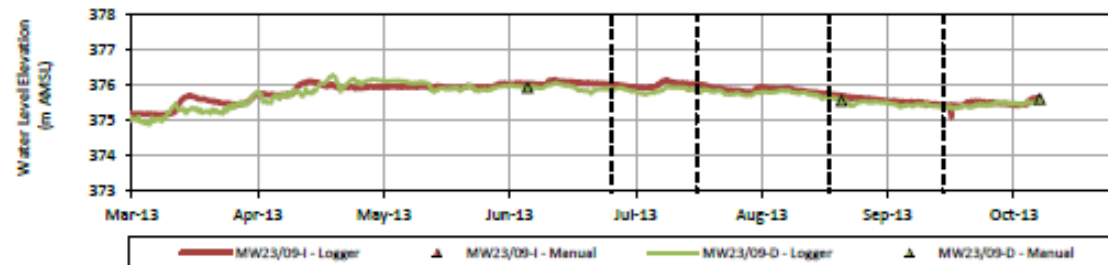
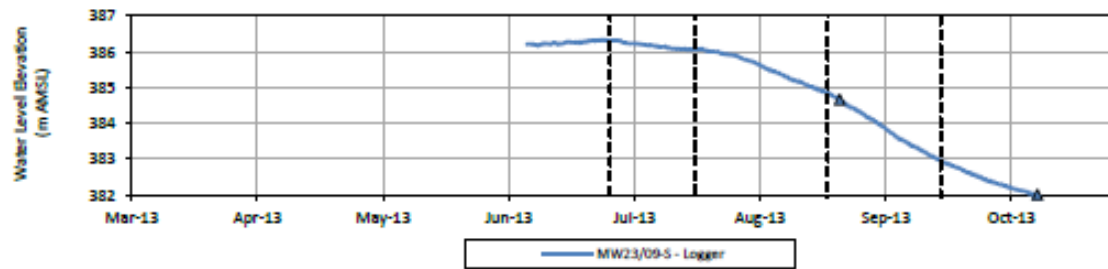
# Interpreted Zone of Pumping Influence

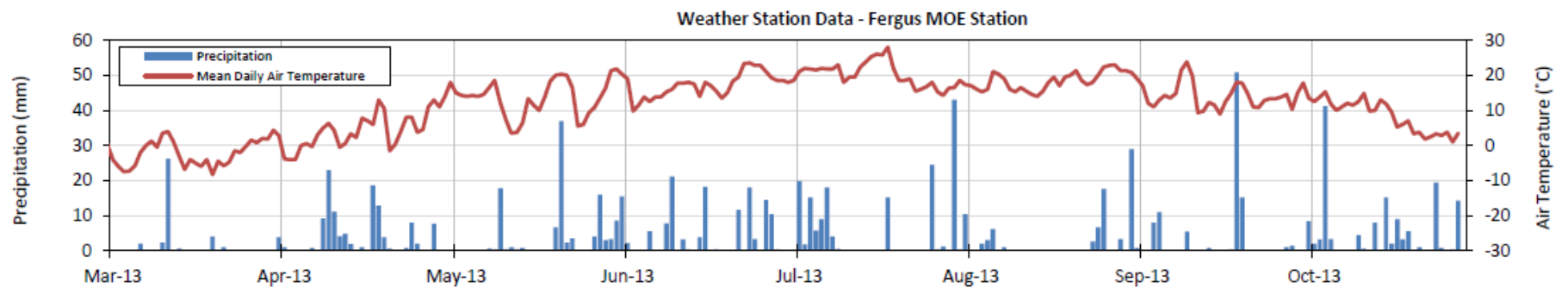
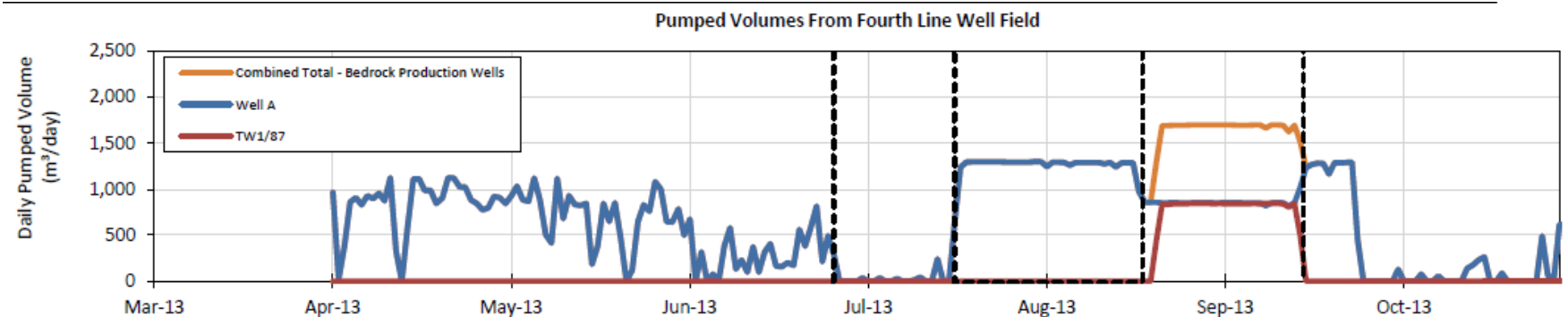
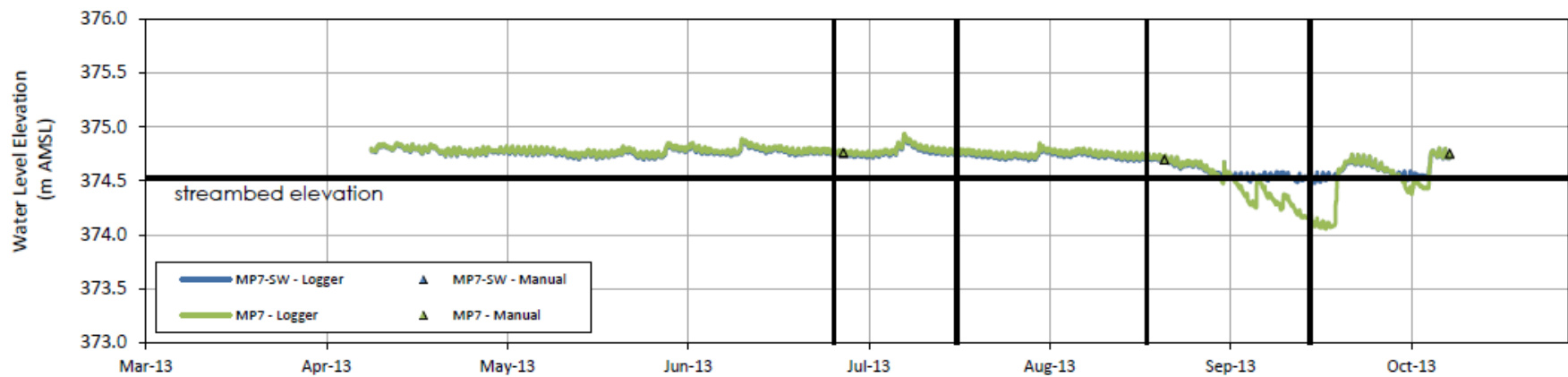


# Hydrogeological Comments



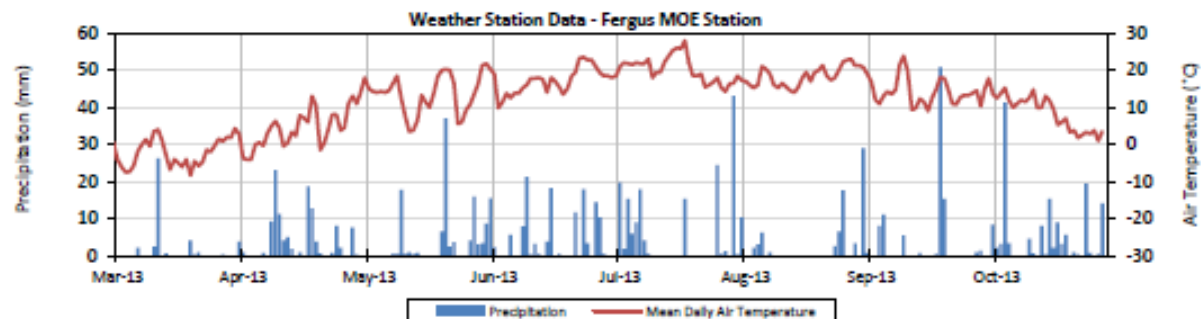
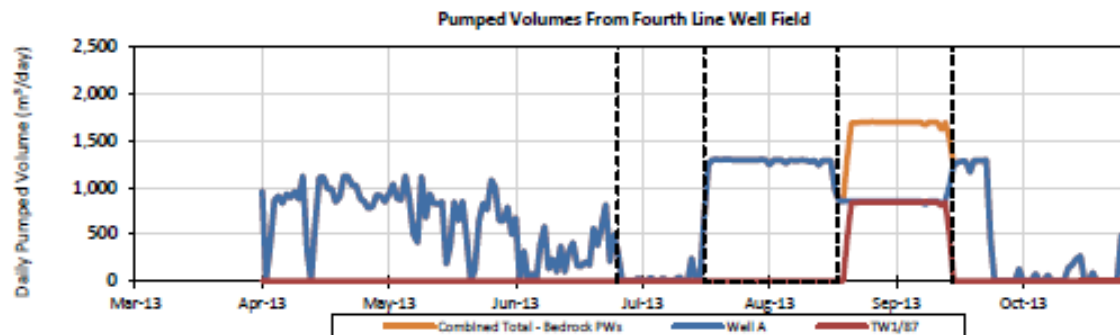
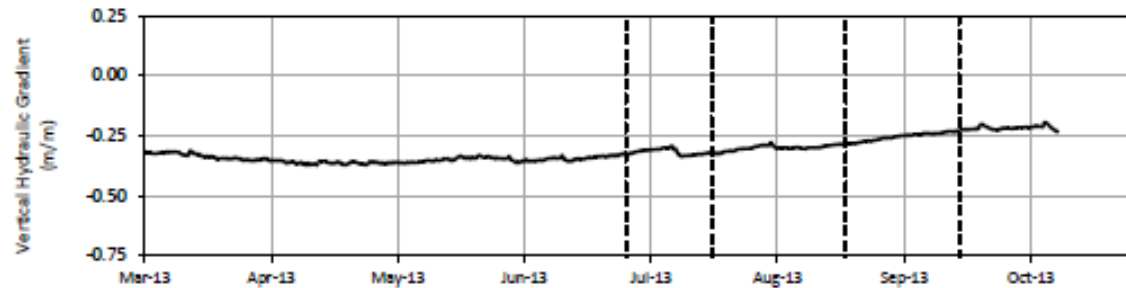
# Hydrogeological Response 1



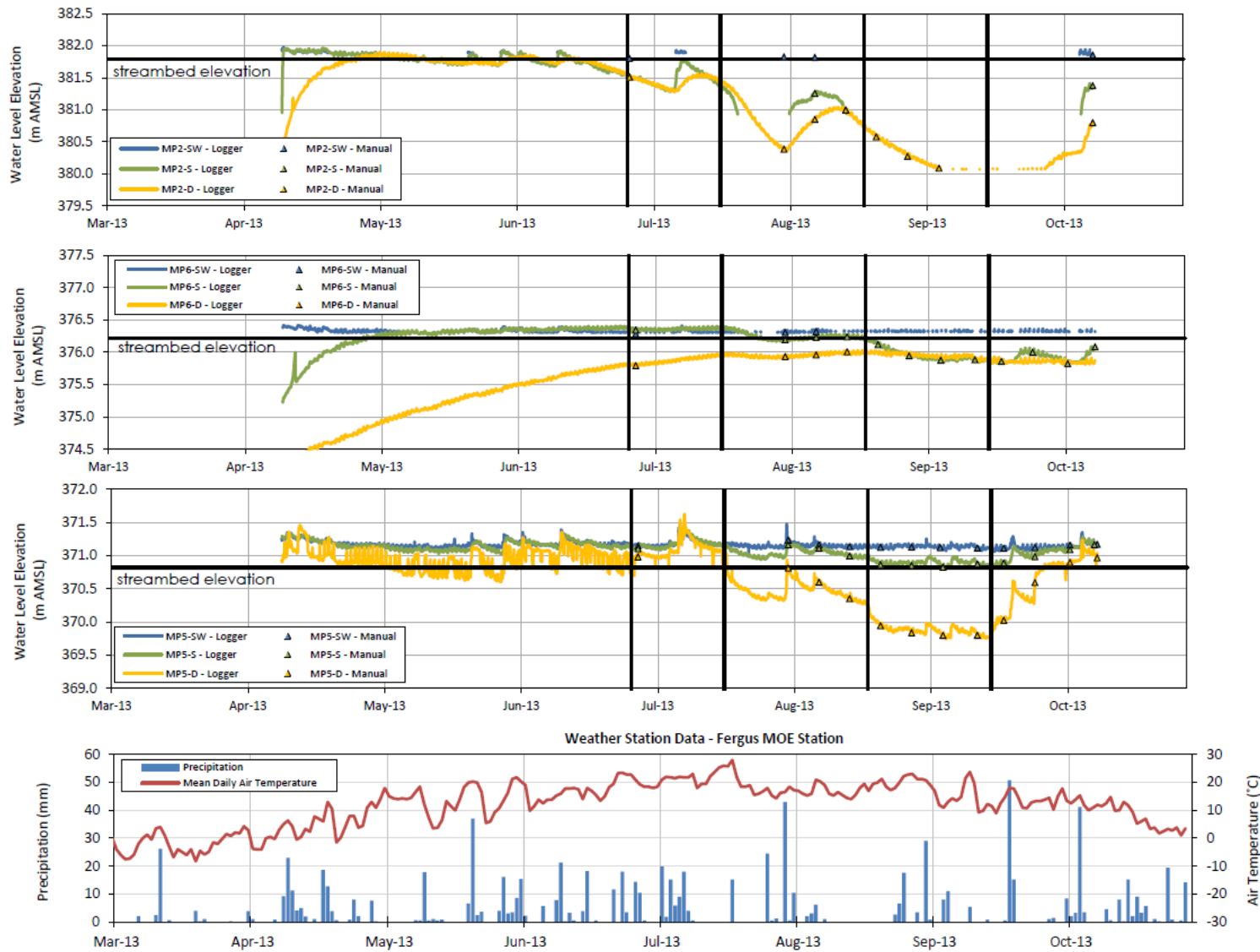


## Hydrogeological Response 2

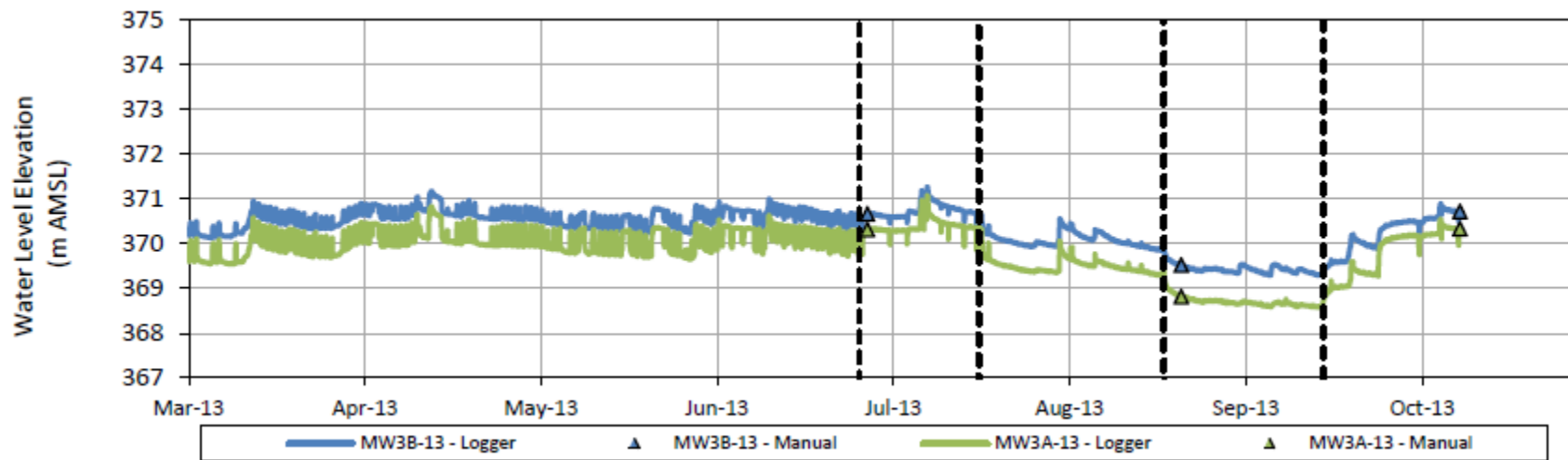
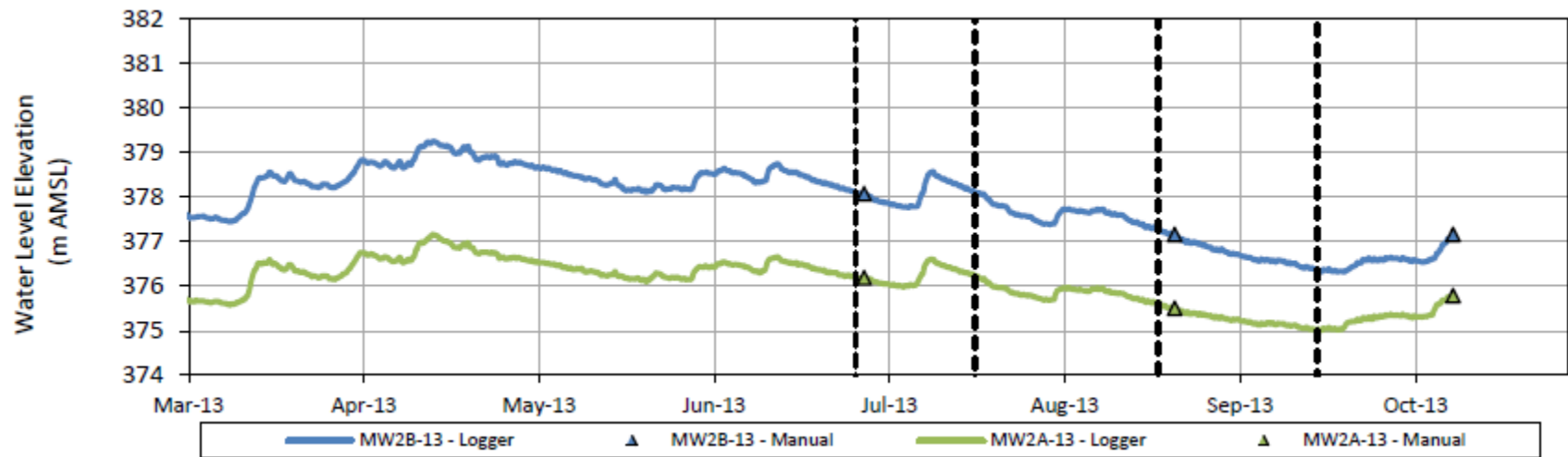
# Hydrogeological Response 3 MW2A Example



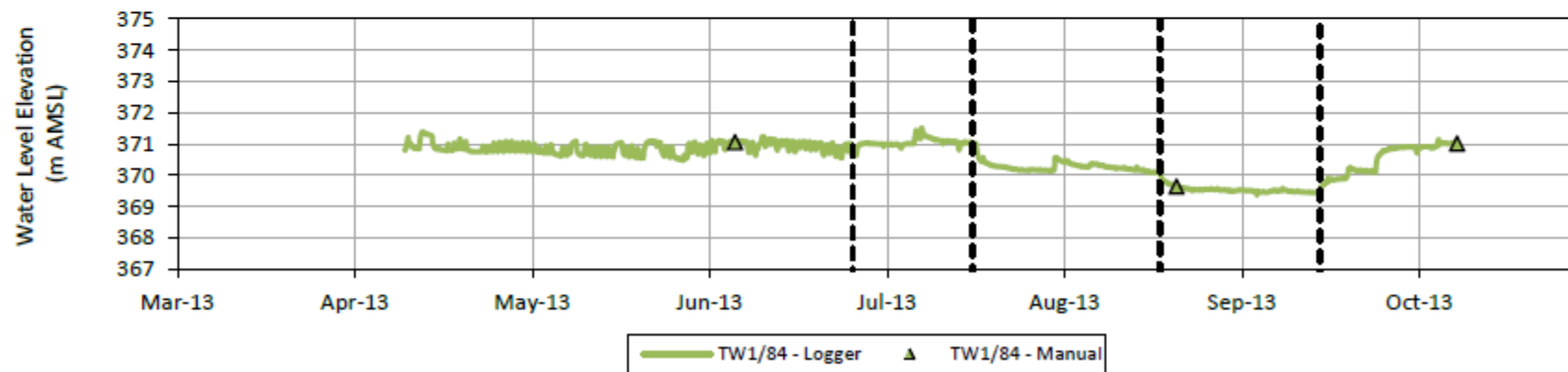
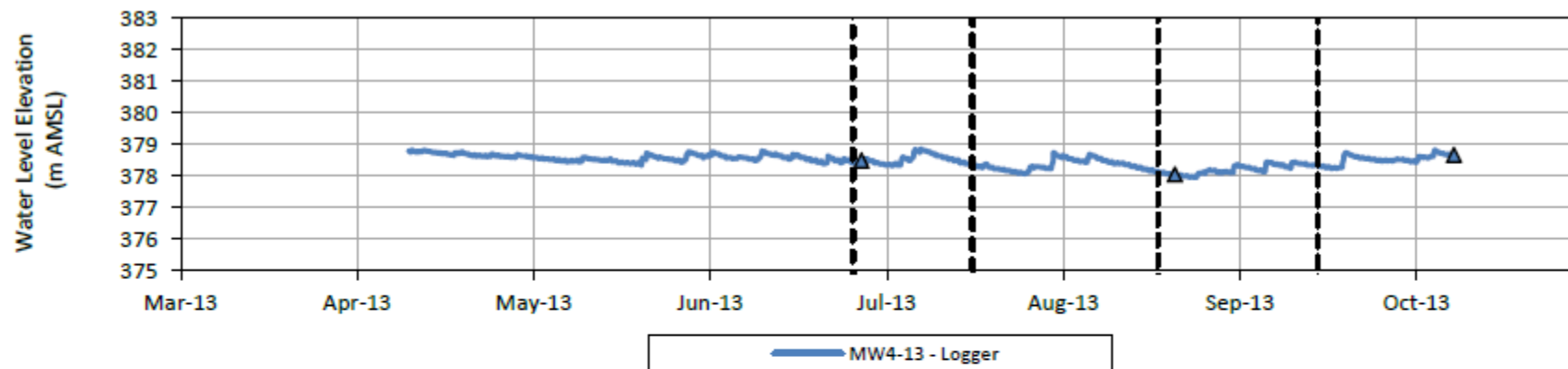




## Hydrogeological Response 4



Hydrogeological Response 5

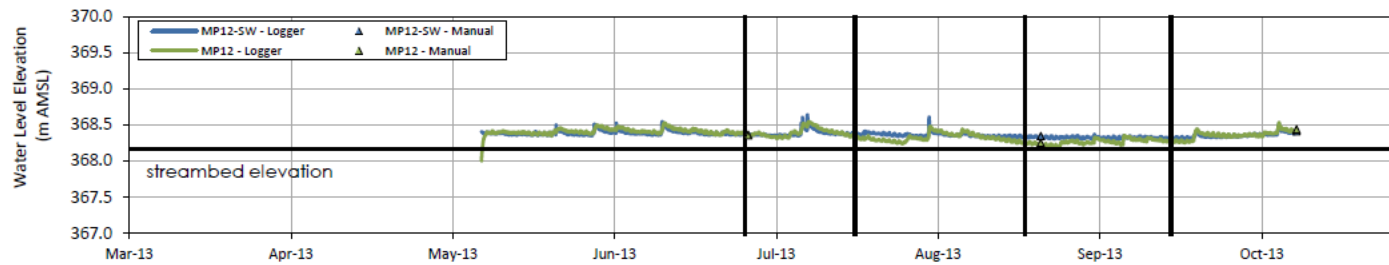
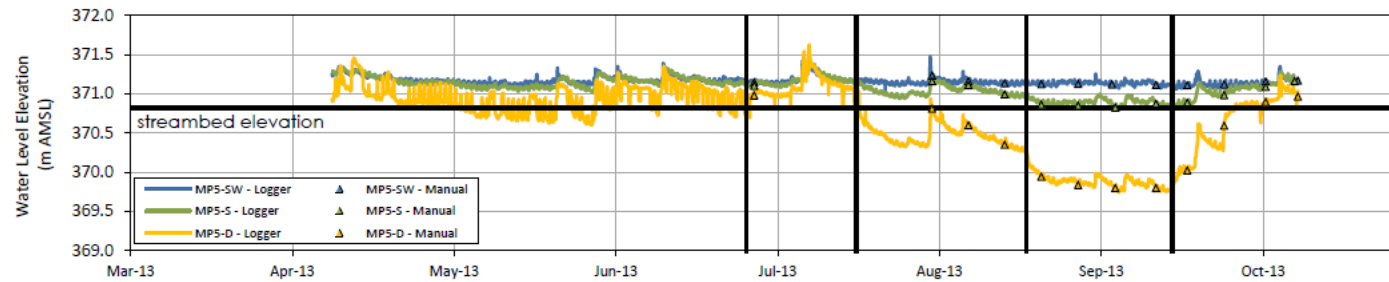


Hydrogeological Response 5 (Con't)

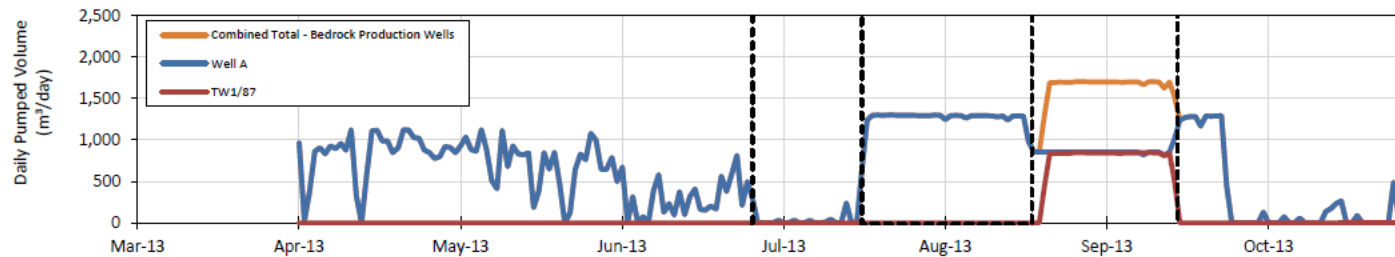


# Fisheries Response

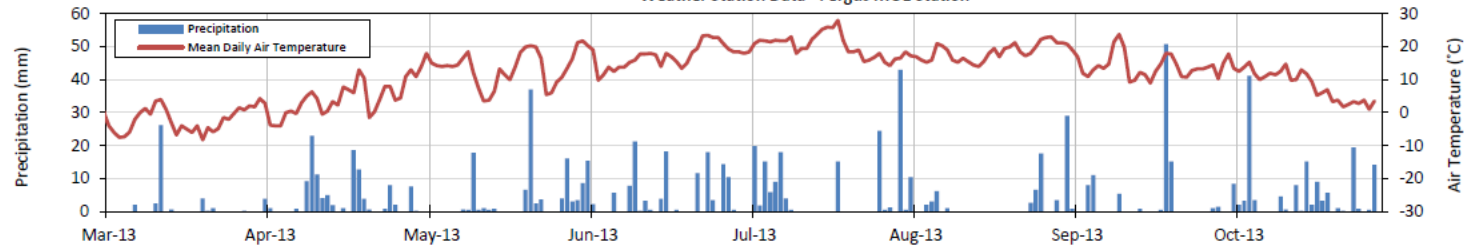
# Fisheries Response 3



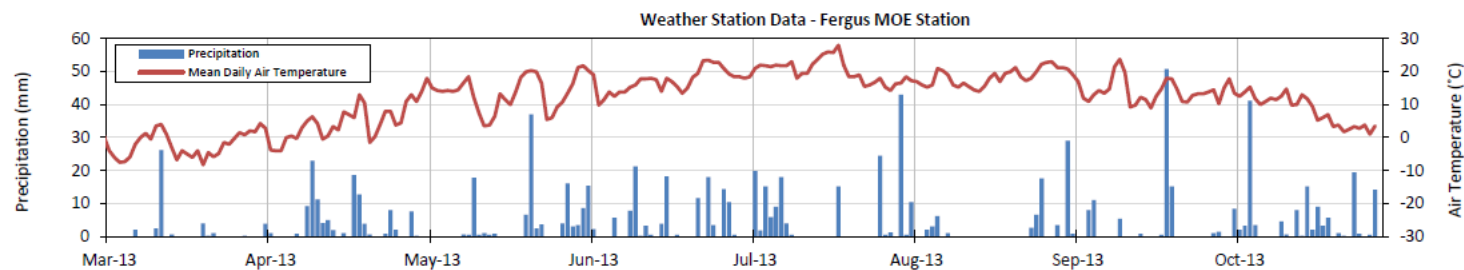
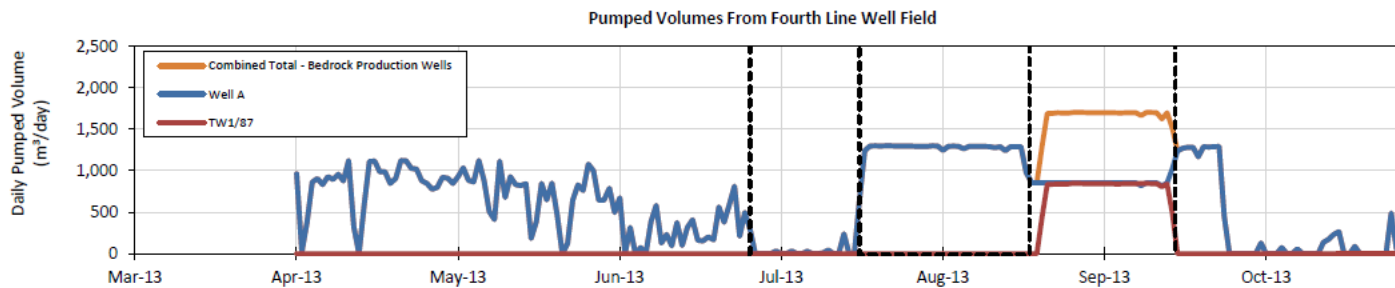
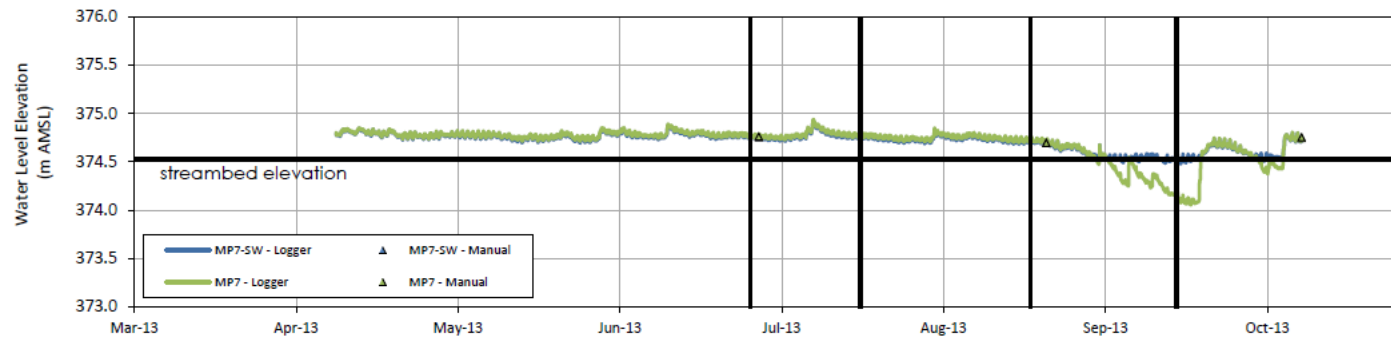
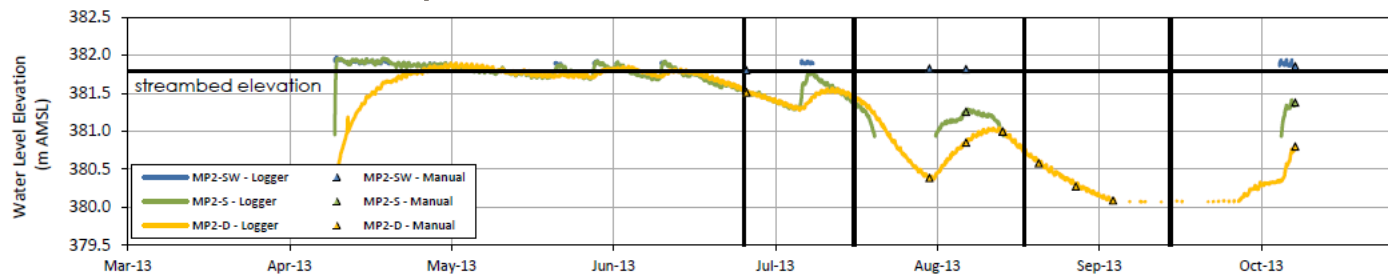
Pumped Volumes From Fourth Line Well Field



Weather Station Data - Fergus MOE Station

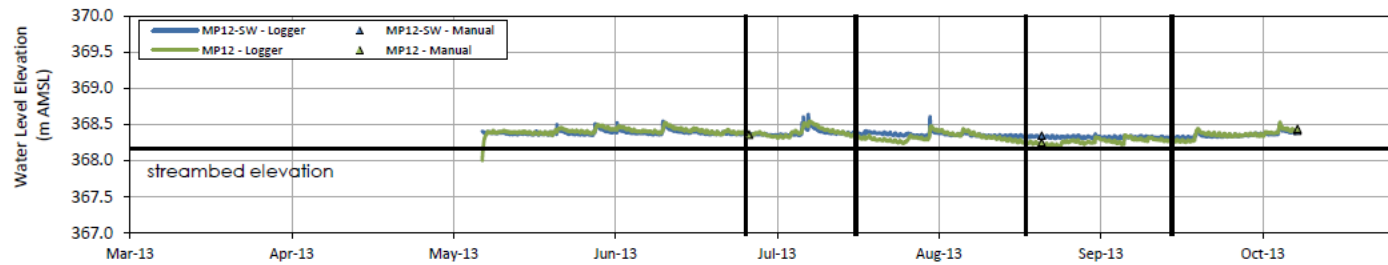
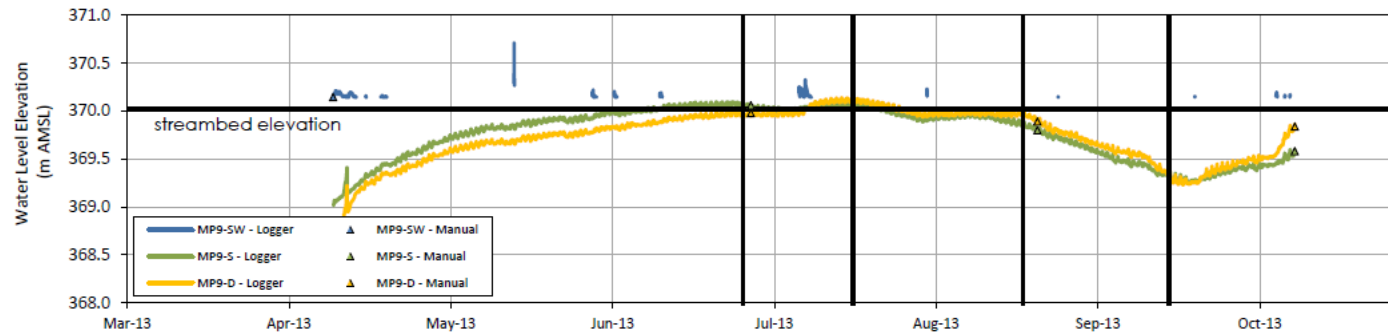


# Fisheries Response 5

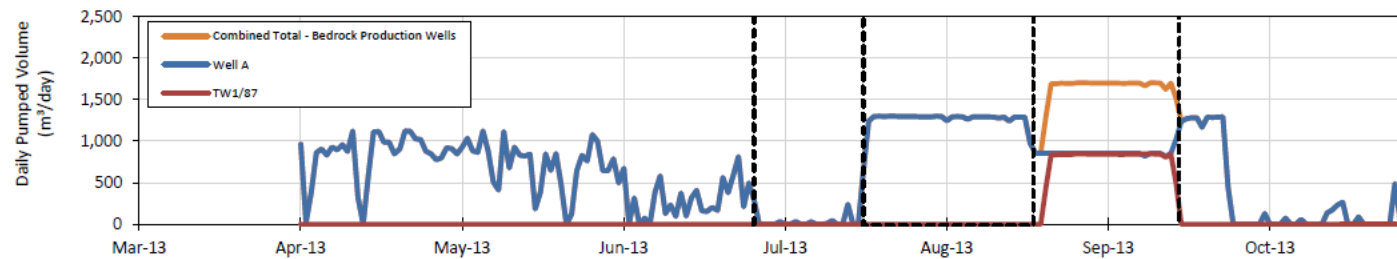




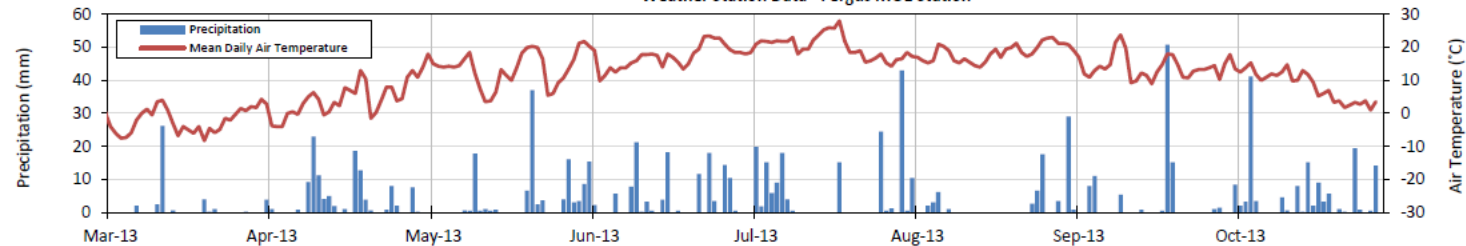
# Fisheries Response 6



Pumped Volumes From Fourth Line Well Field



Weather Station Data - Fergus MOE Station



# Discussion

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**From:** Freymond, Roger  
**Sent:** Monday, December 01, 2014 10:38 AM  
**To:** Wiersma, Robert  
**Subject:** FW: 4th Line Well Field - Environmental Impact Assessment Report

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**From:** Marray, Liam [<mailto:L.Marray@creditvalleyca.ca>]  
**Sent:** Thursday, June 26, 2014 12:00 PM  
**To:** Freymond, Roger  
**Cc:** Renic, Tom ([Tom.Renic@halton.ca](mailto:Tom.Renic@halton.ca))  
**Subject:** RE: 4th Line Well Field - Environmental Impact Assessment Report

Roger

Here are some preliminary/draft comments for the 4<sup>th</sup> Line well. Not all staff have completed their review and there has been no consolidation of the comments.

### Hydrogeological Comments

1. Drawdown of 0.5m (Figure 16) is significant for the hydrology of wetland and fisheries. Considering the hyperbola form of the influence cone, the pumping may influence larger area. The monitoring coverage should extend beyond the 0.5m drawdown contour. It is especially so for wetland monitoring stations. The drawdown of Figure F-10 (hydrograph of MW23) has shown this fact. Further analysis is required or explanation of why 0.5 m level was selected.

Page 4.18 (Figure 16): The page 21 of PTTW Manual requires that the influence are “defined by the radius of influence projected after 20 years of pumping at the maximum daily rate for the maximum requested number of days”. Since the report will be used for PTTW application, the influence zone should have been defined / calculated in accordance with the manual.

2. Page 4.3 (Figure 12b, Figure F-3a): The change of levels for MP7 during pumping was assumed to be caused by weather conditions, but no expression was recorded in the surface water at MP 7, although surficial groundwater levels became lower. Given this, it does not appear that low precipitation is the sole factor at play. Further analysis or explanation is required.
3. Page 4.12 – 4.13(Figure F-6, 9, 10): The report concludes that that decline in the water levels in bedrock wells MW2A, MW5A and MW23 was not a response to the pumping test, but to low precipitation. Additional explanation is required.

Page 4.14 – 4.15 (Figure F-6, 8, 9, 10): The report concludes that decline in the water levels in overburden wells MW2B, MW4, MW5B and MW23S was not a response to



pumping, but to low precipitation conditions. MW23S is the only well that had not reached quasi-steady state during pumping. Over 3m drawdown for this well was attributed to low summer precipitation during pumping test. The response to changes in precipitation is expected to be similar for all shallow groundwater monitors. Since several of these monitors show no noticeable response to lower rainfall, the possibility that there may be other factors influencing the drying /declines at some locations. Additional analyses / discussion is required.

4. Page 4.17: The change of levels for MP2, MP3, MP6, MP7, MP9 during pumping test were all deemed to be caused by “drying up” despite that the hydrographs for the five piezometers are all similar to the hydrograph for MP5 which was the only one considered the respond to pumping. The “drying up” condition depends on many factors such as air temperature, precipitation, soil moisture, vegetation coverage, surficial geology and shallow groundwater condition, and their trend. So it is very hard to tell whether “drying up” condition occurs unless there is long term of soil moisture monitoring data and regional correlation of monitoring data in soil moisture, air temperature and precipitation. Further discussion is required regarding this discrepancy.
5. Page 4.17 and hydrographs for monitoring wells (Figure F-5 – F-10): Among the monitoring wells only MW1 shows that overburden groundwater is well isolated from bedrock groundwater. All the other wells show that the overburden groundwater is highly correlated with bedrock groundwater. This means that the pumping of supply well will have a direct influence on the shallow/overburden groundwater. Further discussion is required.
6. Time-drawdown and distance-drawdown analysis were not found in the report. This analysis might be used to determine if and how much the aquifer receives water from vertical leakage, and can also used to predict how shallow groundwater system (in wetland and along the creek) is affected by the pumping.
7. A discussion on monitoring will be required once the above comments have been addressed.

## **Ecology comments**

1. CVC staff visited the site on April 11, 2014. The landowner upstream of the pumping station allowed access and determined that the watercourse mapping upstream of the pumping station is incorrect. The landowner also indicated that Brook Trout are present in an old hatchery pond upstream of the pumping station. Fish are freely able to enter and leave this pond. He uses groundwater to heat and cool his house.
2. Please provide a copy of the 2012 Spring Field Survey Results (Dillon, 2012).
3. Section 4.5.5 – at Site MP5-13, under Stage 3 pumping conditions, an increase in the downward vertical hydraulic gradient was found. An increase in downward gradients may impact Brook Trout directly through lowered watered levels or increases in water temperatures. Furthermore, as this site is just upstream of suspected Brook Trout spawning, CVC is concerned that the proposed pumping will reduce upwelling at the site and therefore spawning. Please clarify if impacts to this site may occur if pumping rates are increased.

4. Further review of impacts on Brook Trout will be provided upon confirmation of hydrologic impacts.
5. WM 2 (MP 7-13), and Fisheries Monitors MP 2-13 and MP 5-13 during the mid August to October 2013 period is attributed to “low precipitation” without supporting evidence. Please additional discussion
- Spring 2013 was relatively wet when compared to similar periods in recent history. Therefore pre- summer antecedent conditions in the ground would likely have been favourable;
  - The shallow monitors at MP 1, 4, 8, 10, DP 1-10 and 12 do not show noticeable responses over the pumping period;
  - The vertical gradient at MP 8 remains positive throughout. It shows a constant increase until mid-Sept, with a small drop thereafter, but a positive gradient is maintained, and
  - Shallow groundwater levels at MP 3 and 9 showed similar responses to that of MP 6. MP 3 is situated very close to wetland monitor MP 7, while MP 9 is located on Beeney Creek Tributary.

The response to changes in precipitation is expected to be similar for all shallow groundwater monitors. Since several of these monitors show no noticeable response to lower rainfall, this begs the possibility that there may be other factors influencing the drying /declines at some locations.

6. Tributaries to Beeney Creek and Fairy Lake (MP- 9 and MP-12, respectively):
- The shallow groundwater plot at MP-9 reflects the declines observed in the plots for MP-5 or MP-6 to the end of September. Deeper groundwater plots show a similar trend over this time period. The plot shows that the flow in the river appear to dry up at some points also.
  - The shallow groundwater plot at MP-12 does not reflect the decline seen in the plots for MP-5 or MP-6.

Both monitors are located about the same distance from the wellfield. Beeney Creek is a coldwater stream, so the decline in flow/surface groundwater level does raise concerns.

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**From:** Freymond, Roger [<mailto:roger.freymond@stantec.com>]  
**Sent:** June 23, 2014 4:27 PM  
**To:** Marray, Liam  
**Cc:** Renic, Tom ([Tom.Renic@halton.ca](mailto:Tom.Renic@halton.ca))  
**Subject:** RE: 4th Line Well Field - Environmental Impact Assessment Report

Hi Liam,

I would like to start preparing a slide deck for our meeting on Friday and was wondering if you could forward me your comments. Thanks.

-----Original Appointment-----

**From:** Marray, Liam [<mailto:L.Marray@creditvalleyca.ca>]

**Sent:** Friday, June 13, 2014 12:11 PM

**To:** Freymond, Roger

**Subject:** Accepted: 4th Line Well Field - Environmental Impact Assessment Report

**When:** Friday, June 27, 2014 10:00 AM-12:00 PM (UTC-05:00) Eastern Time (US & Canada).

**Where:** CVC - Meeting Room TBD

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## **Meeting Notes**



**Stantec**

### **CVCA Pre-Consultation Meeting**

Fourth Line Well Field Municipal Class EA  
1611-11105/45

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Date/Time: October 22, 2012 / 10:00 AM  
Place: CVC Office, 1255 Old Derry Road, Meadowvale, ON  
Next Meeting: n/a  
Attendees: Liam Marray, CVC  
Dan Banks, CVC  
Kerry Mulchansingh, CVC  
Michelle Gillespie, Halton  
Tom Renic, Halton  
Robert Wiersma, Stantec  
Roger Freymond, Stantec  
Steve Berg, Stantec  
Sean Spisani, Stantec  
Absentees: Nancy Hartrup, Stantec  
Mark Brobbel, Stantec  
Distribution: All Attendees and Absentees

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#### **Item:**

#### **Action:**

#### **Introductions**

All parties and their respective project roles were introduced.

Agenda was reviewed.

Stantec had previously sent its draft Quality Assurance Project Plan (QAPP) to CVC staff for their review and information. It summarizes the proposed investigations and protocols in more detail.

#### **Background**

Michelle Gillespie reviewed the background of the project, as well as the background on the Fourth Line Well, specifically (see attached slides).

It was noted that there is currently a capital construction project at Fourth Line Wells to connect the standby well and expand the treatment building.

The project objective is to conduct the necessary field work and Class EA requirements to expand the permitted groundwater taking at Fourth Line from 1309 m<sup>3</sup>/day to 1709 m<sup>3</sup>/day.

#### **Proposed Terrestrial Field Program**

The proposed terrestrial field program was presented by Sean

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Spisani (see attached slides).

Discussion points and actions included:

- CVC is interested in reviewing monitoring locations again once our field review of proposed monitoring stations is complete. Stantec to forward these.

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### **Proposed Aquatic Environment Field Program**

The proposed aquatic field program was presented by Sean Spisani (see attached slides).

Discussion points and actions included:

- CVC was particularly focused on the aquatic side of ecology, offering fish community and spawning data, and also requesting Stantec's aquatic staff review the Black Creek Subwatershed Study. Natural Heritage data requests are to be addressed to Liam Marray.
- CVC requested that Stantec develop a trigger system for the pump test related to fish habitat, including thresholds to address gradient changes during non-spawning periods. The group discussed a phased approach whereby early warning thresholds trigger detailed assessment.
- The reach at Flow Monitoring Station 5 has ongoing land owner access issues (i.e., landowner has a history of not granting access) and minimal data may be available in the Subwatershed Study. If access is available and conditions are suitable, Stantec will attempt to examine this watercourse for spawning activity
- It was noted that the likely source of precipitation data for this project would be a station in Georgetown.

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### **Proposed Hydrogeological Field Program**

The proposed aquatic field program was presented by Roger Freymond (see attached slides).

Discussion points and actions included:

- Trigger system as noted above.
- Minimal drawdown is observed historically in this well field and the groundwater monitoring stations have been set up within a close radius to the wells.
- Roger Freymond noted that the testing program is assuming that the current 1309 m<sup>3</sup>/day flowrate constitutes the existing condition and that the flow test is designed only to test the impact of the additional 400 m<sup>3</sup>/day taking. The test is not designed to evaluate the impact of a 1709

m3/day taking against a zero flow.

- Stantec to show the new North Acton production well (drilled but not connected) on its figures.

**Schedule**

Field installations of monitoring wells scheduled in the Fall of this year. Any comments by the CVC on these proposed locations is requested as soon as possible as installations are scheduled to take place soon.

CVC

Pumping tests scheduled for late Spring/Summer 2013. This will be scheduled to occur well after the capital construction is completed at Fourth Line Wells.

**Other Business**

Stantec will provide Project Sharepoint portal access to CVC for transfer of large data files. Liam Marray to provide the names and contact email of the CVC staff requiring access.

CVC/Stantec

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Stantec to forward the recent Fourth Line Wells pumping test report completed for Halton.

Dan Banks asked if Halton has ever prepared an annual monitoring report for the Fourth Line Well Field. Tom Renic indicated that these are usually prepared at MOE request and thus far only the Prospect Park Well Field has had such reports prepared. Halton could provide relevant data about Fourth Line Wells (just not an annual report) to CVC if requested.

The meeting adjourned at 10:40 AM

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

**STANTEC CONSULTING LTD.**



Robert Wiersma, P. Eng.  
Senior Project Manager, Water  
robert.wiersma@stantec.com

Attachment: Presentation Slides

c. Cc List

One Team. Infinite Solutions.





## Agenda

- Background
- Problem Statement
- Class EA Objectives
- Proposed Field Program
- Questions/Discussion

## Background

- *Sustainable Halton's Water and Wastewater Master Plan (Master Plan), 2011*, outlines long term strategies to service the existing and approved growth areas of Halton Region (Halton).
- The Master Plan addresses the need to accommodate population and employment growth forecasts to the year 2031, as identified in *Ontario's Places to Grow Growth Plan, 2006*.
- **The Master Plan includes an increase in groundwater capacity at the Fourth Line Well Field, which services the community of Acton, located in the Town of Halton Hills.**



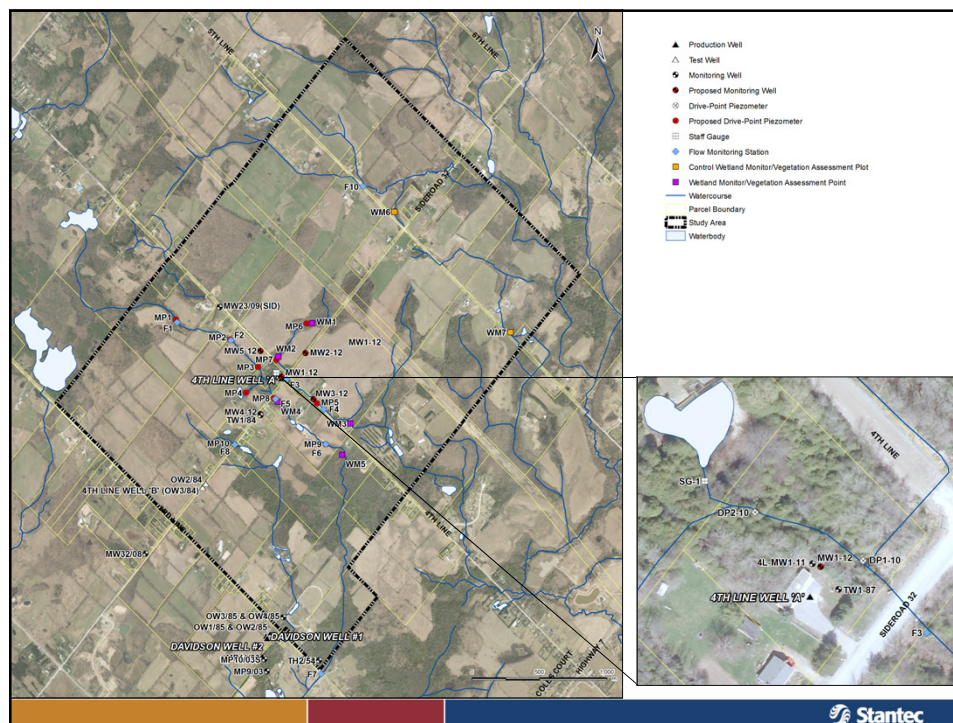
## Fourth Line Well Field

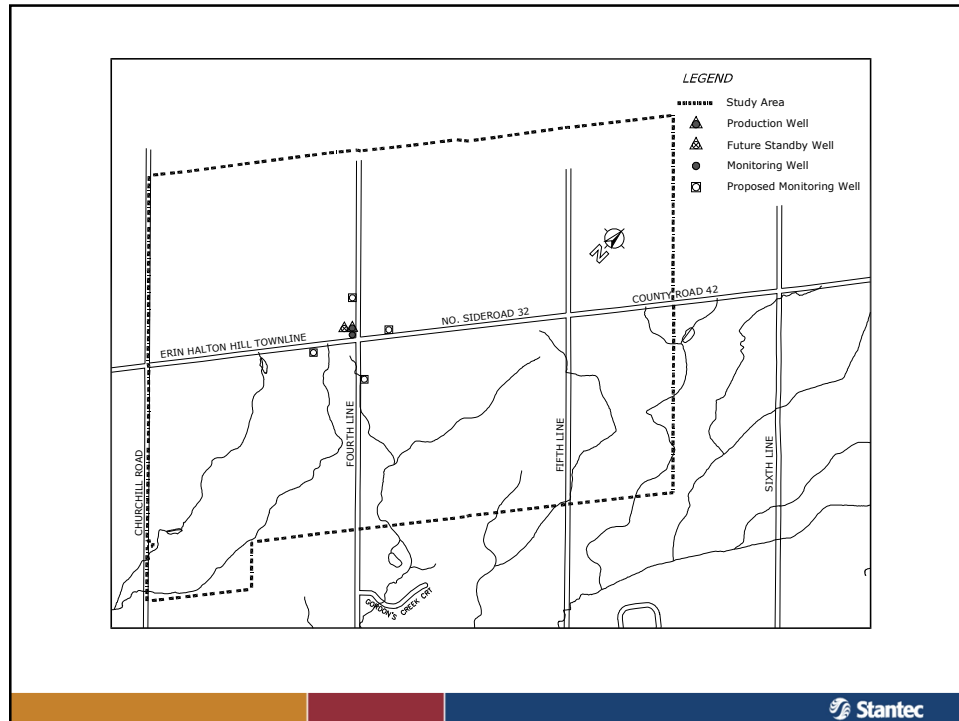
- Halton operates three well fields to supply potable water to Acton.
- Approximately one third of the Town's water supply comes from the Fourth Line Well Field.
- The Fourth Line Well Field consists of a production well (Fourth Line Well), a standby well (TW1-87), and an onsite treatment facility.
- The existing well house is being expanded under a separate capital project to connect the standby well (TW1-87) to the existing infrastructure and to upgrade the treatment process.



## Problem Statement

- To meet the water servicing needs of the projected population, Halton is investigating the potential **to expand the taking from the Fourth Line Well Field, from it's current permitted capacity of 1,309 m<sup>3</sup>/day to 1,709 m<sup>3</sup>/day.**





## Class EA Objectives

- Satisfy all of the requirements of the Municipal Class EA Process
- Conduct an aquifer testing program (pumping test) and the required ecological monitoring to assess the impact of an increase in groundwater taking from 1,309 m<sup>3</sup>/day to 1,709 m<sup>3</sup>/day on the natural environment and existing water users in the area;
- Prepare an impact assessment for the proposed increase in taking; and
- Satisfy all of the requirements for the submission of an application for a Permit to Take Water (PTTW) to increase the permitted well rating.



## Proposed Field Program - Terrestrial

- Key designated natural areas include the Acton – Silver Creek Wetland Complex Provincially Significant Wetland (PSW), the Eramosa River – Blue Springs Creek Wetland PSW and the Acton Swamp Environmentally Significant Area.
- Other hydrological sensitive features include unevaluated wetlands, groundwater seeps, and amphibian breeding habitat. These features may qualify as Significant Wildlife Habitat as per the OMNR Technical Guide (2000).
- Potential species of conservation concern include butternut, jefferson salamander, western chorus frog, snapping turtle, and eastern ribbon snake (Dillon 2012).



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## Proposed Field Program - Terrestrial

- Background review and agency consultation to determine sensitive features, including known locations of species of conservation concern, and confirm study scope.
- ELC field investigations and assessment of Significant Wildlife Habitat, and habitat features for species of conservation concern (Fall 2012 and forward).
- Breeding amphibian surveys (Spring 2013).
- Shallow groundwater monitoring to assess wetland hydrology (Fall 2012 and forward).



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## Proposed Field Program Aquatic Environment

- Primary features include coldwater tributary to Beeney Creek, and tributary that conveys flow to Fairy Lake
- Key aquatic field program components include:
  - Fish habitat survey (conducted in tributary to Beeney Creek in Fall 2012);  
*continued...*



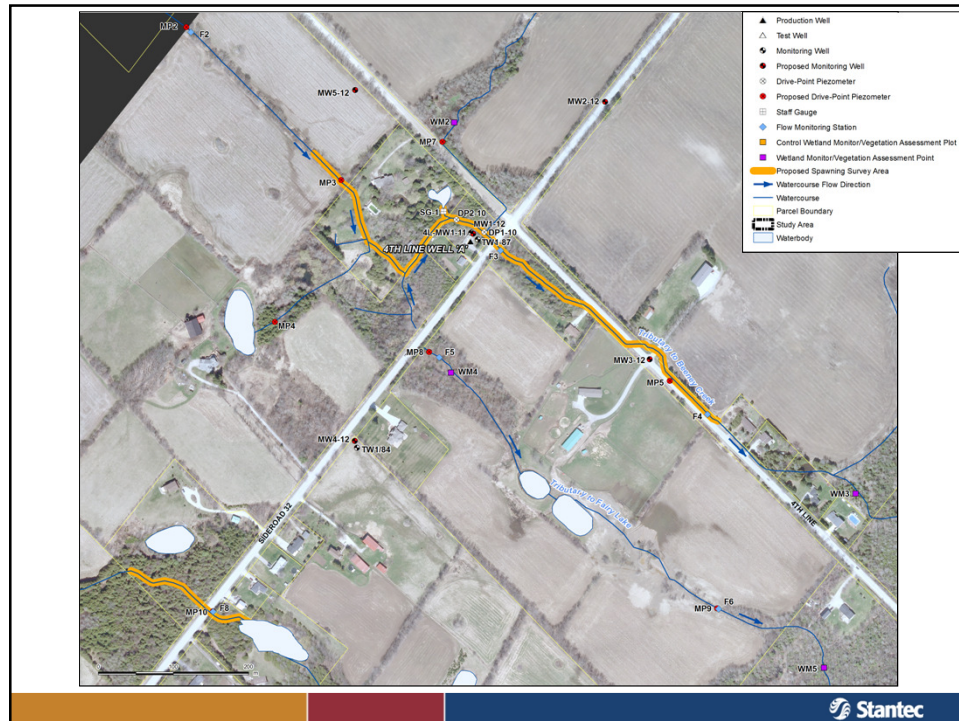
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## Proposed Field Program Aquatic Environment

- Spawning redd survey within tributary to Beeney Creek (scheduled for October/November 2012);
- Fish community survey (not currently planned pending results of fish community survey conducted by others in the spring of 2012);
- Monitoring of surface water levels, flow, and water temperature



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## Proposed Field Program Hydrogeology

- Groundwater flow in the vicinity of the Fourth Line Well Field is from the northwest to the southeast
- Production occurs from the bedrock aquifer (Eramosa Formation)
- The modeled 25 year capture zone from the Fourth Line Well extends approximately 2 km to the north west along Fourth Line



## Proposed Field Program Hydrogeology

- The groundwater monitoring program will consist of:
  - 9 additional monitoring wells
  - 10 additional mini-piezometers (shallow and deep)
  - Residential Well Monitoring
  - All locations instrumented with pressure transducers
- Surface water levels and stream flows will be measured at a number of locations within the Study Area to assess surface water/groundwater interaction



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## Class EA Schedule

- Fall 2012
  - Installation/instrumentation of monitoring network to collect baseline data prior to pumping test
- January 2013
  - Submission of PTTW for pumping test
- Early Summer 2013
  - Residential Well Survey and Instrumentation

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## Class EA Schedule

- Early Summer 2013
  - Pre-Pumping Test Data Download and Monitoring
- Summer 2013
  - 4 Stage Pumping Test (subject to change based on demand)

Stage	Well 1		TW1/87	
	Rate (L/s)	Duration (days)	Rate (L/s)	Duration (days)
Stage 1: Shutdown	0	21	0	21
Stage 2: Pumping Well 1	15.2	28	0	28
Stage 3: Pumping Well 1 and TW1/87	9.9	28	9.9	28
Stage 4: Recovery	15.2	21	0	21

- Late Summer/Early Fall 2013
  - Post-Pumping Test Data Download and Monitoring

