

January 24, 2022

Steve Oliver
Director of Public Works
Township of Zorra
274620 27th Line
P.O. Box 306
Ingersoll, ON
N5C 3K5

sent by email: soliver@zorra.ca

Dear Mr. Oliver:

**RE: Township of Zorra Robinson Pit (Licence #602642)
2021 Annual Monitoring Report**

As requested, this letter provides a summary of the water level monitoring data collected to date at the above referenced site in accordance with Site Plan conditions. Several figures and tables are attached to this letter for reference. We are also including some analysis and discussion to provide context to the monitoring results.

1.0 Background

Site operations began in 2010 and the first three years of operation occurred in 2010, 2011 and 2012. As part of the Site Plan conditions (Technical Recommendations) a specific hydrogeologic monitoring program and reporting schedule was specified for the first three years of operation. These conditions were satisfied through monitoring completed, and reporting provided, over that period.

Subsequent on-going (i.e. 2013 and onward) monitoring conditions are summarized as follows:

- water levels at the monitoring wells and drive-point locations be measured once each monthly during the operational season, to include measurements prior to and after excavation activities, and,
- surface water temperatures be measured at the drive-point locations once each monthly during the operational season, to include measurements prior to and after excavation activities, and,
- records of these measurements be kept on-site.

In addition, a general condition of the Site Plan (no. 15, page 2 of 4) states:

The water table elevation within these properties is estimated to be at $\pm 340.0 - 343.5$ m above sea level (A.S.L.), refer to hydrogeological report (see above). At any time should the water table be encountered at levels higher than 343.5 to 340mASL the pit floor elevations will be adjusted to remain at minimum of 1.5 metres above the highest water table elevation. Any required backfilling will be performed with native on-site material only.

The condition refers to measured groundwater elevations of 340 mASL at BH5 and 343.5 mASL at BH4 in May 2009, representing historical high water level conditions. The specified groundwater level

elevations are “action thresholds” for BH5 and BH4 to ensure extraction remains 1.5 m (or more) above the high water table. The thresholds correspond to water level measurements of 13.61 mBTOW (metres below top of well) and 19.54 mBTOW at BH5 and BH4 respectively.

This report summarizes the monitoring results to date and includes a comparison to the above referenced thresholds. A copy of this report should be kept “on-site” and provided to the Ministry of Natural Resources and Forestry (MNRF) on request.

2.0 Monitoring Results

Monitoring locations are shown on the attached **Figure 1** (attached). In 2021, monitoring occurred monthly from April to December.

All of the water level elevations measured to date are summarized in **Table 1** (attached). **Table 2** (attached) summarizes the water temperature measurements obtained to date.

The water level monitoring results are illustrated on the two attached hydrographs. **Figure 2** shows monitoring well groundwater level elevations around the extraction area. **Figure 3** shows drive-point piezometer water level elevations near the wetland complex.

3.0 Discussion

Site monitoring began in 2006. Baseline water level and temperature conditions were established through measurements obtained from 2006 to 2009.

Water table elevations to date within the extraction area have remained below the defined “thresholds” at BH5 and BH4. Therefore, compared to the monitoring record available, the current planned pit floor elevation (as shown on the approved Site Plan) is appropriate and remains 1.5 m or more above the maximum water table observed at the site.

As illustrated by the hydrographs, in 2021 groundwater levels at the site remained generally within the annual ranges historically observed over the 15+ year monitoring period (including baseline conditions). However due to very dry spring conditions in early 2021, seasonal maximum levels were unusually low.

The overall monitoring period includes a variety of climate conditions from relatively “wet” years (higher precipitation) to relatively “dry” years. The monitoring record indicates that, as expected, groundwater levels around the extraction area have increased slightly during “wet” years (e.g. 2019) and decreased slightly during “dry” years (e.g. 2020, 2021). This is consistent with the primary site function as a groundwater recharge area.

Surface water and groundwater levels and temperatures within the wetland area (at drive-point monitoring locations) also remained within historical ranges (including baseline conditions).

The seasonal and annual variations observed in water levels within the wetland are relatively moderate (as compared to groundwater fluctuations around the extraction area). This is consistent with the classification of the wetland as a discharge area.

4.0 Conclusions and Recommendations

Based on the results of the monitoring program we conclude that there has been no significant or measurable impact on groundwater conditions due to extraction operations at the pit. In addition, no surface water level or temperature impacts are observed within the wetland area.

To date water level fluctuation at the site is primarily a result of seasonal and annual climate conditions.

Continued monitoring is recommended to ensure compliance with Site Plan conditions and determine if any future action is required with respect to water level thresholds at the site.

It is our understanding that site operations will resume in 2022, and the monitoring program as specified on the Site Plan will also be implemented.

If you have any questions, or require further information, please do not hesitate to call.

Sincerely,



Dave Nahrgang, P.Geo.
Project Hydrogeologist.



Andrew Pentney, P.Geo
Senior Hydrogeologist

Attached:

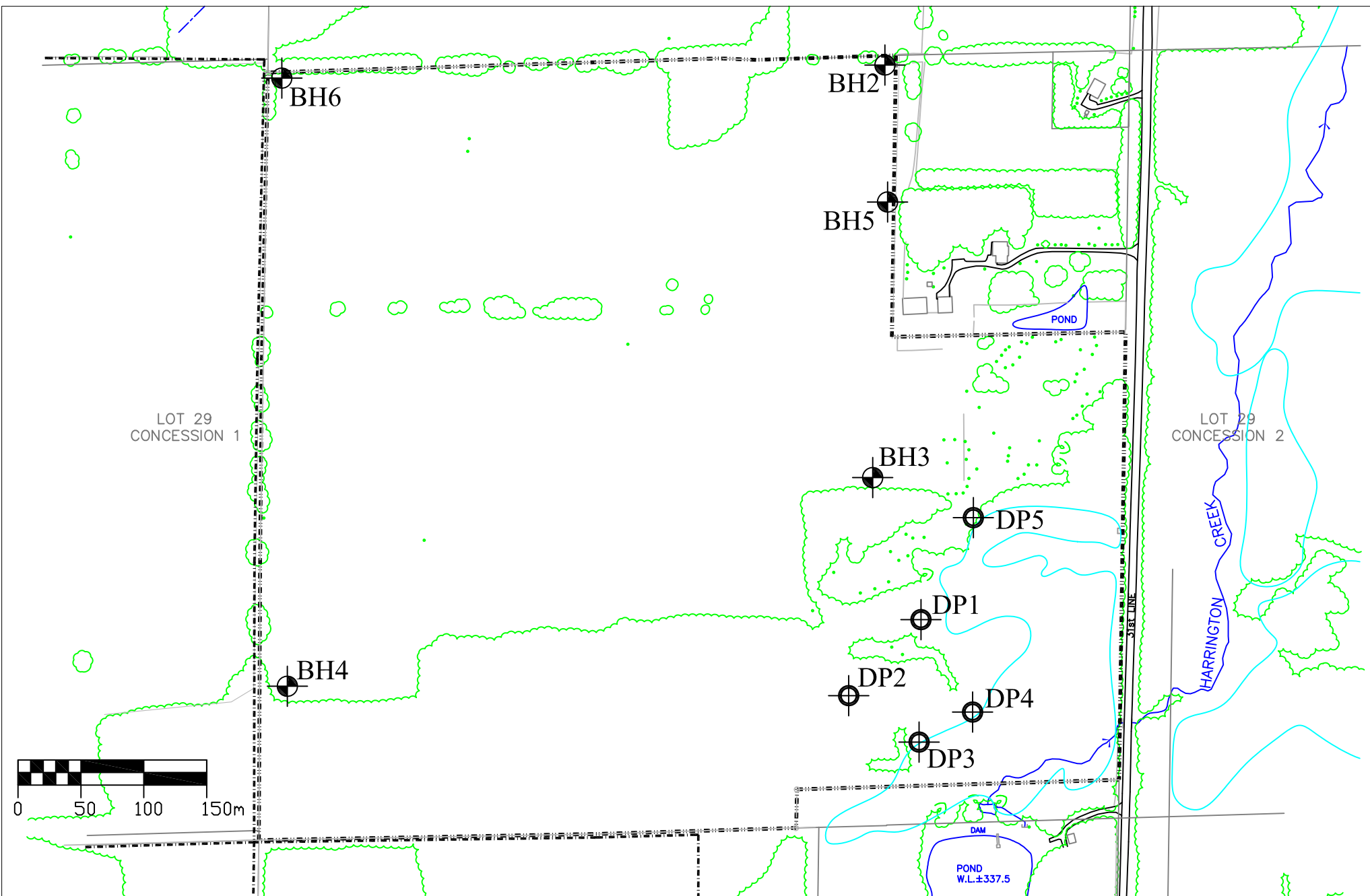
Figure 1 Monitor Locations

Figure 2 Monitoring Well Hydrograph

Figure 3 Drive-Point Piezometer Hydrograph

Table 1 Water Level Monitoring Summary

Table 2 Water Temperature Monitoring Summary



Legend	
	Property boundary
	Monitoring Well location
	Drive-point Piezometer location

Scale: as shown	Date: October 2010
Part Lot 29, Concession 1 Township of Zorra County of Oxford	
Modified From: Existing Features Plan	

Figure 1: Monitor Locations

Township of Zorra
Robinson Pit
Monitoring Program

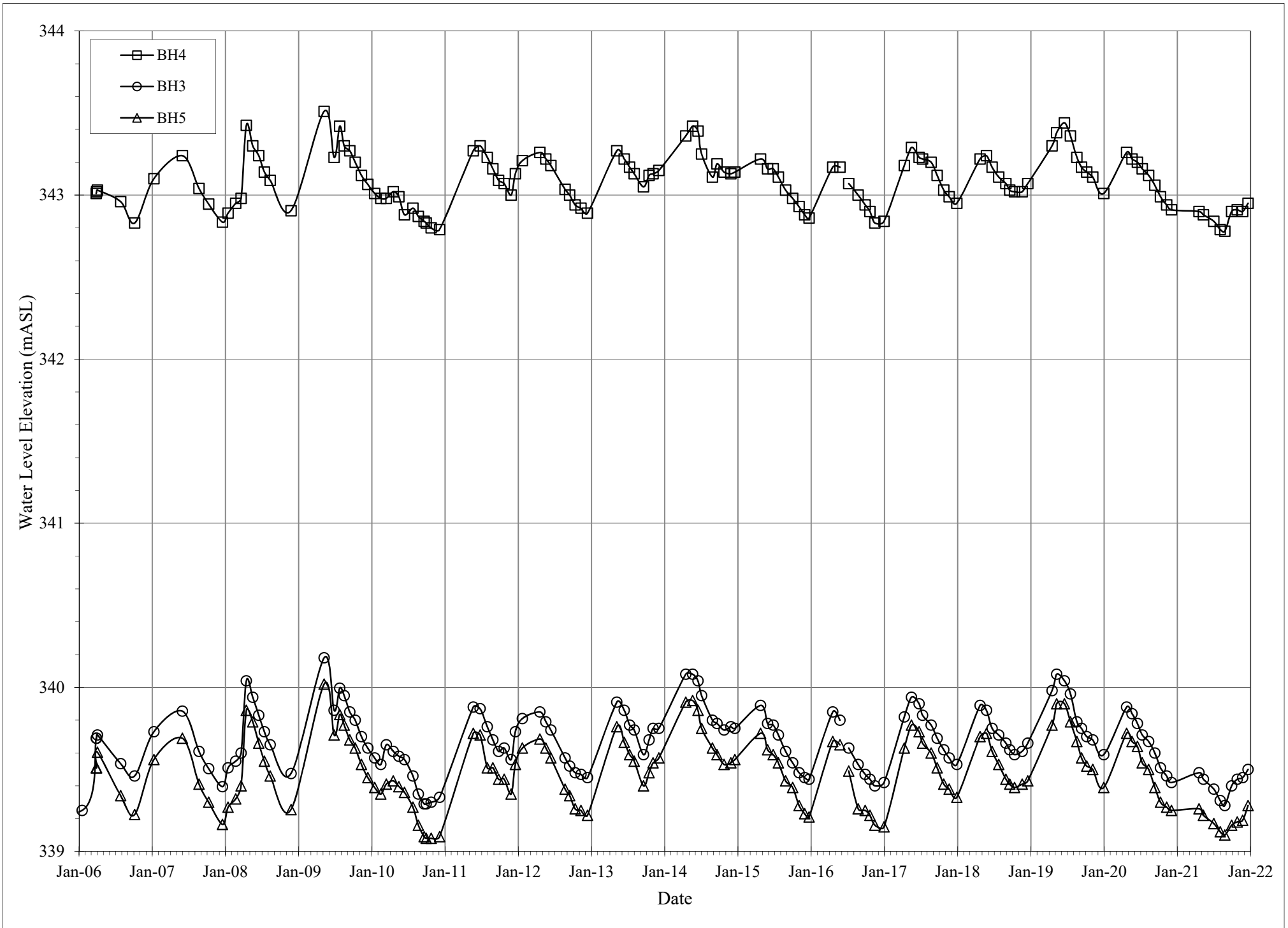


Figure 2: Monitoring Well Hydrograph

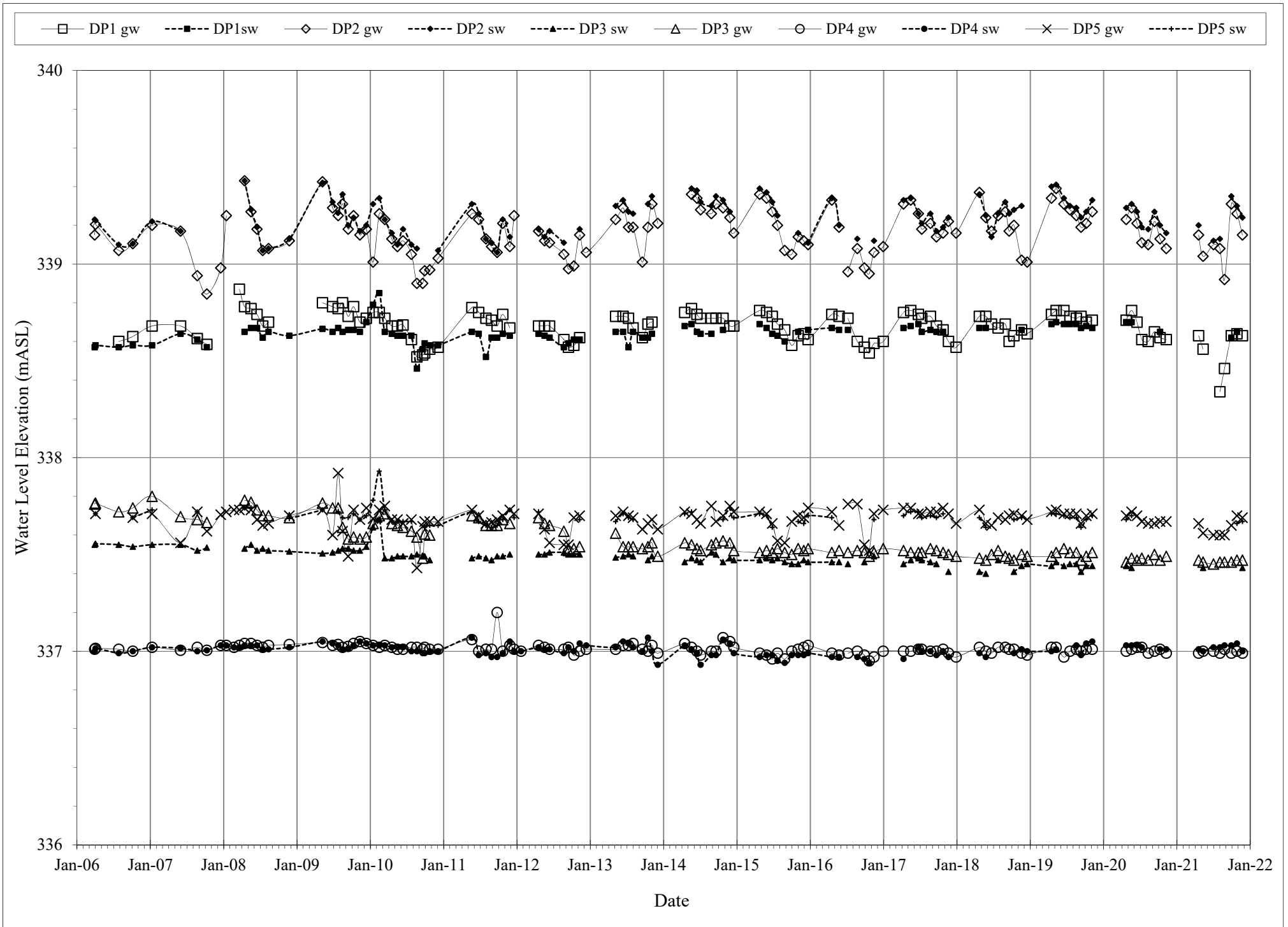


Figure 3: Drive-Point Piezometer Hydrograph

Date	Water Level Elevations (mASL)														
	BH2	BH3	BH4	BH5	BH6	DP1 gw	DP1 sw	DP2 gw	DP2 sw	DP3 gw	DP3 sw	DP4 gw	DP4 sw	DP5 gw	DP5 sw
Ref. Elev.:	359.97	343.37	363.04	353.61	374.40	339.15	339.15	339.80	339.80	338.14	338.14	337.84	337.84	338.30	338.30
03-Jun-04	dry	339.65	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
08-Nov-04	dry	339.33	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
17-Jan-06	dry	339.25	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
28-Mar-06	dry	339.69	343.01	339.51	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
30-Mar-06	dry	339.69	343.02	339.51	dry	337.81	338.57	339.15	339.23	337.76	337.55	337.01	337.00	#N/A	#N/A
03-Apr-06	dry	339.71	343.03	339.61	dry	338.13	338.58	339.21	339.23	337.77	337.56	337.02	337.02	337.71	337.71
28-Jul-06	dry	339.54	342.96	339.34	dry	338.60	338.57	339.07	339.10	337.72	337.55	337.01	336.99	#N/A	#N/A
06-Oct-06	dry	339.46	342.83	339.23	dry	338.63	338.58	339.11	339.11	337.74	337.54	337.00	337.00	337.69	337.69
10-Jan-07	dry	339.73	343.10	339.56	dry	338.68	338.58	339.20	339.22	337.80	337.55	337.02	337.02	337.71	337.73
01-Jun-07	dry	339.86	343.24	339.69	dry	338.68	338.64	339.17	339.17	337.70	337.55	337.01	337.02	337.56	dry
23-Aug-07	dry	339.61	343.04	339.41	dry	338.62	338.61	338.94	dry	337.68	337.52	337.02	337.00	337.72	337.72
10-Oct-07	dry	339.51	342.95	339.30	dry	338.59	338.57	338.85	dry	337.67	337.54	337.01	337.01	337.62	dry
18-Dec-07	dry	339.40	342.84	339.17	dry	fr	fr	338.98	fr	fr	fr	337.03	337.03	337.71	fr
15-Jan-08	dry	339.51	342.89	339.27	dry	fr	fr	339.25	fr	fr	fr	337.03	337.03	337.72	fr
22-Feb-08	dry	339.55	342.95	339.32	dry	fr	fr	fr	fr	fr	fr	337.02	337.02	337.73	fr
20-Mar-08	dry	339.60	342.98	339.40	dry	338.87	fr	fr	fr	fr	fr	337.03	337.02	337.73	fr
15-Apr-08	dry	340.04	343.43	339.86	dry	338.78	338.65	339.43	339.43	337.78	337.53	337.04	337.03	337.74	337.74
17-May-08	dry	339.94	343.30	339.79	dry	338.77	338.67	339.27	339.28	337.77	337.55	337.04	337.03	337.73	337.74
16-Jun-08	dry	339.83	343.24	339.66	dry	338.74	338.67	339.18	339.19	337.73	337.52	337.03	337.03	337.68	dry
14-Jul-08	dry	339.73	343.14	339.55	dry	338.68	338.62	339.07	339.07	337.70	337.53	337.02	337.01	337.65	dry
12-Aug-08	dry	339.65	343.09	339.46	dry	338.70	338.65	339.08	339.08	337.70	337.52	337.03	337.01	337.66	dry
24-Nov-08	dry	339.48	342.91	339.26	dry	fr	338.63	339.12	339.13	337.69	337.52	337.04	337.02	337.70	337.69
08-May-09	dry	340.18	343.51	340.02	dry	338.80	338.67	339.43	339.42	337.77	337.51	337.05	337.05	337.73	337.73
27-Jun-09	dry	339.86	343.23	339.71	dry	338.78	338.65	339.29	339.32	337.74	337.51	337.03	337.04	337.60	dry
25-Jul-09	dry	340.00	343.42	339.84	dry	338.77	338.67	339.25	339.27	337.74	337.52	337.04	337.03	337.92	337.72
16-Aug-09	dry	339.95	343.30	339.77	dry	338.80	338.65	339.31	339.36	337.64	337.53	337.02	337.01	337.62	337.69
13-Sep-09	dry	339.85	343.27	339.68	dry	338.73	338.66	339.18	339.20	337.58	337.53	337.03	337.02	337.49	337.69
10-Oct-09	dry	339.80	343.20	339.63	dry	338.78	338.66	339.25	339.24	337.59	337.52	337.04	337.03	337.73	337.71
10-Nov-09	dry	339.70	343.12	339.53	dry	338.70	338.65	339.15	339.17	337.58	337.52	337.05	337.05	337.68	337.68
12-Dec-09	dry	339.63	343.07	339.45	dry	338.72	338.70	339.18	339.20	337.59	337.54	337.04	337.04	337.74	337.70
15-Jan-10	dry	339.57	343.01	339.39	dry	338.75	338.79	339.01	339.31	337.66	337.64	337.03	337.03	337.69	337.78
15-Feb-10	dry	339.53	342.98	339.35	dry	338.75	338.85	339.26	339.34	337.70	337.68	337.02	337.03	337.73	337.93
14-Mar-10	dry	339.65	342.98	339.41	dry	338.72	338.65	339.23	339.23	337.71	337.48	337.03	337.03	337.75	337.73
18-Apr-10	dry	339.61	343.02	339.43	dry	338.68	338.64	339.13	339.16	337.66	337.48	337.02	337.02	337.68	337.67
16-May-10	dry	339.58	342.99	339.40	dry	338.68	338.63	339.09	339.10	337.65	337.49	337.01	337.02	337.68	337.67
13-Jun-10	dry	339.56	342.88	339.36	dry	338.69	338.63	339.12	339.18	337.64	337.49	337.01	337.02	337.66	337.67
25-Jul-10	dry	339.46	342.92	339.27	dry	338.61	338.63	339.05	339.10	337.62	337.49	337.02	337.00	337.68	337.67
21-Aug-10	dry	339.35	342.87	339.16	dry	338.52	338.46	338.90	339.08	337.59	337.50	337.02	337.00	337.43	dry
19-Sep-10	dry	339.29	342.84	339.09	dry	338.53	338.56	338.90	dry	337.48	337.49	337.01	336.99	337.65	dry

Date	Water Level Elevations (mASL)														
	BH2	BH3	BH4	BH5	BH6	DP1 gw	DP1 sw	DP2 gw	DP2 sw	DP3 gw	DP3 sw	DP4 gw	DP4 sw	DP5 gw	DP5 sw
Ref. Elev.:	359.97	343.37	363.04	353.61	374.40	339.15	339.15	339.80	339.80	338.14	338.14	337.84	337.84	338.30	338.30
29-Sep-10	dry	339.29	342.83	339.08	dry	338.54	338.59	338.97	dry	337.61	337.49	337.02	336.99	337.67	337.64
24-Oct-10	dry	339.30	342.80	339.08	dry	338.56	338.58	338.97	dry	337.60	337.47	337.01	337.00	337.67	337.65
05-Dec-10	dry	339.33	342.79	339.09	dry	338.57	338.58	339.03	339.07	fr	fr	337.01	337.00	337.67	337.65
22-May-11	dry	339.88	343.27	339.72	dry	338.78	338.65	339.26	339.31	337.70	337.48	337.06	337.07	337.73	337.72
25-Jun-11	dry	339.87	343.30	339.71	dry	338.75	338.64	339.23	339.26	337.69	337.49	337.00	336.98	337.70	337.67
31-Jul-11	dry	339.76	343.23	339.51	dry	338.72	338.52	339.13	339.13	337.65	337.48	337.01	336.99	337.66	337.65
28-Aug-11	dry	339.68	343.16	339.51	dry	338.71	338.62	339.09	339.11	337.65	337.47	337.01	336.97	337.67	337.64
25-Sep-11	dry	339.61	343.09	339.44	dry	338.68	338.62	339.06	339.06	337.65	337.49	337.20	336.97	337.68	337.65
23-Oct-11	dry	339.63	343.07	339.44	dry	338.74	338.64	339.21	339.23	337.68	337.49	337.00	336.99	337.70	337.68
27-Nov-11	dry	339.56	343.00	339.35	dry	338.67	338.63	339.09	339.14	337.66	337.50	337.03	337.05	337.73	337.73
18-Dec-11	dry	339.73	343.13	339.53	dry	fr	fr	339.25	fr	fr	fr	337.01	337.00	337.71	337.69
22-Jan-12	dry	339.81	343.21	339.63	dry	fr	fr	fr	fr	fr	fr	337.00	337.00	fr	fr
18-Apr-12	dry	339.85	343.26	339.69	dry	338.68	338.64	339.17	339.18	337.69	337.50	337.03	337.02	337.71	337.72
18-May-12	dry	339.79	343.22	339.63	dry	338.68	338.63	339.12	339.14	337.66	337.50	337.02	337.01	337.63	dry
12-Jun-12	dry	339.74	343.18	339.57	dry	338.68	338.62	339.11	339.17	337.65	337.51	337.01	337.01	337.56	dry
22-Aug-12	dry	339.57	343.04	339.38	dry	338.61	338.57	339.05	339.11	337.62	337.51	337.01	336.99	337.55	dry
14-Sep-12	dry	339.52	343.00	339.34	dry	338.57	338.59	338.98	dry	337.52	337.50	337.02	337.02	337.55	dry
11-Oct-12	dry	339.48	342.94	339.26	dry	338.58	338.61	338.99	dry	337.53	337.50	336.98	337.00	337.69	dry
09-Nov-12	dry	339.47	342.92	339.25	dry	338.62	338.61	339.15	339.18	337.54	337.50	337.00	337.04	337.70	337.68
12-Dec-12	dry	339.45	342.89	339.22	dry	fr	fr	339.06	fr	fr	fr	337.01	337.03	fr	dry
07-May-13	dry	339.91	343.27	339.76	dry	338.73	338.65	339.23	339.30	337.61	337.48	337.01	337.02	337.70	337.67
13-Jun-13	dry	339.86	343.22	339.67	dry	338.73	338.65	339.29	339.33	337.54	337.49	337.03	337.05	337.72	337.71
10-Jul-13	dry	339.77	343.17	339.59	dry	338.72	338.57	339.19	339.27	337.54	337.50	337.03	337.04	337.70	337.69
02-Aug-13	dry	339.74	343.13	339.55	dry	338.67	338.65	339.19	339.26	337.54	337.49	337.04	337.02	337.69	337.68
17-Sep-13	dry	339.59	343.05	339.40	dry	338.62	338.62	339.01	dry	337.53	dry	337.01	337.00	337.63	dry
15-Oct-13	dry	339.68	343.12	339.48	dry	338.69	338.62	339.19	339.31	337.54	337.47	337.00	337.07	337.66	dry
04-Nov-13	dry	339.75	343.13	339.54	dry	338.70	338.64	339.31	339.35	337.56	337.49	337.03	337.00	337.68	dry
03-Dec-13	dry	339.75	343.15	339.57	dry	fr	fr	339.21	fr	337.49	fr	336.99	336.93	337.63	dry
16-Apr-14	dry	340.08	343.36	339.91	dry	338.75	338.68	#N/A	#N/A	337.56	337.46	337.04	337.03	337.72	337.71
20-May-14	dry	340.08	343.42	339.92	351.16	338.77	338.69	339.36	339.39	337.55	337.48	337.02	337.01	337.71	337.72
16-Jun-14	dry	340.04	343.39	339.86	dry	338.74	338.65	339.34	339.38	337.53	337.47	337.00	336.99	337.68	dry
04-Jul-14	dry	339.95	343.25	339.75	dry	338.72	338.64	339.28	339.32	337.52	337.46	336.98	336.93	337.66	dry
27-Aug-14	dry	339.80	343.11	339.63	dry	338.72	338.64	339.26	339.30	337.55	337.51	337.00	336.98	337.75	dry
19-Sep-14	dry	339.78	343.19	339.59	dry	338.72	dry	339.31	339.35	337.56	337.50	337.00	336.98	337.67	dry
24-Oct-14	dry	339.74	343.14	339.53	dry	338.72	338.66	339.29	339.33	337.57	337.46	337.07	337.06	337.70	337.68
27-Nov-14	dry	339.76	343.13	339.54	dry	338.68	dry	339.24	339.27	337.56	337.48	337.05	337.04	337.75	337.74
17-Dec-14	dry	339.75	343.14	339.56	dry	338.68	fr	339.16	fr	337.52	337.47	337.02	336.99	337.72	337.69
24-Apr-15	dry	339.89	343.22	339.72	dry	338.76	338.69	339.36	339.39	337.51	337.47	336.99	336.97	337.72	337.71
29-May-15	dry	339.78	343.16	339.62	dry	338.75	338.67	339.34	339.37	337.52	337.48	336.98	336.98	337.71	337.70

Date	Water Level Elevations (mASL)														
	BH2	BH3	BH4	BH5	BH6	DP1 gw	DP1 sw	DP2 gw	DP2 sw	DP3 gw	DP3 sw	DP4 gw	DP4 sw	DP5 gw	DP5 sw
Ref. Elev.:	359.97	343.37	363.04	353.61	374.40	339.15	339.15	339.80	339.80	338.14	338.14	337.84	337.84	338.30	338.30
26-Jun-15	dry	339.77	343.16	339.59	dry	338.73	338.64	339.27	339.32	337.51	337.47	336.96	336.98	337.66	337.64
22-Jul-15	dry	339.71	343.11	339.54	dry	338.69	338.63	339.20	339.25	337.53	337.48	336.99	336.95	337.57	dry
27-Aug-15	dry	339.61	343.03	339.43	dry	338.66	338.60	339.07	dry	337.51	337.46	336.96	336.94	337.56	dry
01-Oct-15	dry	339.54	342.98	339.39	dry	338.58	dry	339.05	dry	337.50	337.45	337.00	336.98	337.67	dry
02-Nov-15	dry	339.48	342.93	339.28	dry	338.63	338.65	339.14	339.16	337.53	337.45	337.01	336.98	337.70	337.67
30-Nov-15	dry	339.45	342.88	339.23	dry	338.64	fr	339.12	fr	337.52	337.47	337.02	336.98	337.69	337.66
22-Dec-15	dry	339.44	342.86	339.21	dry	338.61	338.66	339.10	339.11	337.53	337.46	337.03	336.99	337.74	337.70
18-Apr-16	dry	339.85	343.17	339.67	dry	338.74	338.67	339.33	339.34	337.51	337.46	336.99	336.97	337.72	337.69
24-May-16	dry	339.80	343.17	339.65	dry	338.73	338.66	339.19	339.20	337.52	337.46	336.98	336.97	337.65	dry
07-Jul-16	dry	339.63	343.07	339.49	dry	338.72	338.66	338.96	dry	337.51	337.45	336.99	dry	337.76	dry
23-Aug-16	dry	339.53	343.00	339.26	dry	338.60	dry	339.08	339.13	337.52	dry	337.00	336.97	337.76	dry
27-Sep-16	dry	339.47	342.94	339.25	dry	338.57	dry	338.98	dry	337.51	337.46	336.98	336.96	337.55	dry
21-Oct-16	dry	339.44	342.90	339.22	dry	338.54	dry	338.95	dry	337.49	dry	336.95	336.94	337.52	dry
14-Nov-16	dry	339.40	342.83	339.16	dry	338.59	dry	339.06	339.12	337.51	337.49	336.97	dry	337.71	337.68
30-Dec-16	dry	339.42	342.84	339.15	dry	338.60	fr	339.09	fr	337.53	fr	337.00	fr	337.73	fr
10-Apr-17	dry	339.82	343.18	339.63	dry	338.75	338.67	339.31	339.33	337.52	337.45	337.00	336.96	337.74	337.70
16-May-17	dry	339.94	343.29	339.77	dry	338.76	338.68	339.33	339.34	337.51	337.47	337.00	dry	337.74	337.72
23-Jun-17	dry	339.90	343.23	339.73	dry	338.74	338.69	339.26	339.26	337.51	337.48	337.01	337.02	337.71	337.72
10-Jul-17	dry	339.83	343.22	339.66	dry	338.72	338.65	339.18	339.21	337.51	337.47	337.01	337.00	337.71	337.69
22-Aug-17	dry	339.77	343.20	339.60	dry	338.73	338.66	339.21	339.26	337.53	337.46	337.00	337.00	337.72	337.70
21-Sep-17	dry	339.69	343.12	339.51	dry	338.68	338.65	339.14	339.17	337.52	337.45	337.00	336.98	337.72	337.69
24-Oct-17	dry	339.62	343.03	339.41	dry	338.66	338.65	339.16	339.19	337.51	dry	337.01	337.00	337.74	337.71
20-Nov-17	dry	339.57	342.99	339.38	dry	338.60	dry	339.22	339.24	337.50	337.41	336.99	336.97	337.71	dry
28-Dec-17	dry	339.53	342.95	339.33	dry	338.57	fr	339.16	fr	337.49	fr	336.97	fr	337.66	fr
23-Apr-18	dry	339.89	343.22	339.70	dry	338.73	338.67	339.37	339.36	337.48	337.41	337.02	336.99	337.73	337.69
25-May-18	dry	339.86	343.24	339.72	dry	338.73	338.67	339.24	339.25	337.47	337.40	337.00	336.97	337.66	337.64
22-Jun-18	dry	339.75	343.17	339.61	dry	338.69	dry	339.17	339.14	337.50	dry	336.99	dry	337.65	dry
25-Jul-18	dry	339.71	343.11	339.53	dry	338.67	dry	339.25	339.26	337.52	337.47	337.02	dry	337.69	dry
30-Aug-18	dry	339.66	343.07	339.44	dry	338.69	dry	339.27	339.32	337.49	dry	337.02	dry	337.68	dry
18-Sep-18	dry	339.62	343.03	339.41	dry	338.60	dry	339.17	339.26	337.48	dry	337.01	dry	337.70	dry
12-Oct-18	dry	339.59	343.02	339.39	dry	338.63	dry	339.20	339.28	337.47	337.41	337.01	336.99	337.71	337.68
19-Nov-18	dry	339.61	343.02	339.41	dry	338.66	338.66	339.02	339.30	337.50	337.44	336.99	337.01	337.70	337.69
17-Dec-18	dry	339.66	343.07	339.43	dry	338.64	fr	339.01	fr	337.49	337.45	336.98	337.00	337.68	fr
17-Apr-19	dry	339.98	343.30	339.77	dry	338.74	338.69	339.34	339.40	337.49	337.44	337.02	337.00	337.72	337.71
10-May-19	dry	340.08	343.38	339.90	dry	338.76	338.70	339.39	339.41	337.51	337.46	337.02	337.01	337.73	337.71
18-Jun-19	dry	340.04	343.44	339.90	dry	338.76	338.69	339.31	339.34	337.53	337.44	336.97	dry	337.71	337.70
18-Jul-19	dry	339.96	343.36	339.79	dry	338.73	338.69	339.28	339.30	337.51	337.45	337.00	dry	337.71	337.69
19-Aug-19	dry	339.79	343.23	339.67	dry	338.72	338.69	339.25	339.29	337.51	337.45	337.01	337.03	337.71	337.69
11-Sep-19	dry	339.75	343.17	339.57	dry	338.73	338.67	339.19	339.24	337.47	337.41	337.00	336.98	337.66	337.64

Date	Water Level Elevations (mASL)														
	BH2	BH3	BH4	BH5	BH6	DP1 gw	DP1 sw	DP2 gw	DP2 sw	DP3 gw	DP3 sw	DP4 gw	DP4 sw	DP5 gw	DP5 sw
Ref. Elev.:	359.97	343.37	363.04	353.61	374.40	339.15	339.15	339.80	339.80	338.14	338.14	337.84	337.84	338.30	338.30
07-Oct-19	dry	339.70	343.14	339.52	dry	338.70	338.68	339.21	339.27	337.49	337.44	337.01	337.04	337.70	337.68
06-Nov-19	dry	339.68	343.11	339.50	dry	338.71	338.67	339.27	339.33	337.51	337.44	337.01	337.05	337.71	337.70
31-Dec-19	dry	339.59	343.01	339.39	dry	fr	fr	fr	fr	fr	fr	fr	fr	fr	fr
23-Apr-20	dry	339.88	343.26	339.72	dry	338.71	338.70	339.23	339.29	337.46	337.44	337.00	337.03	337.70	337.68
20-May-20	dry	339.84	343.22	339.67	dry	338.76	338.70	339.29	339.31	337.48	337.43	337.01	337.03	337.72	337.70
16-Jun-20	dry	339.78	343.20	339.64	dry	338.70	dry	339.21	339.27	337.47	dry	337.02	337.03	337.70	dry
10-Jul-20	dry	339.71	343.16	339.54	dry	338.61	dry	339.11	339.19	337.48	dry	337.02	337.02	337.67	dry
11-Aug-20	dry	339.67	343.12	339.50	dry	338.60	dry	339.10	339.18	337.47	dry	336.99	dry	337.66	dry
11-Sep-20	dry	339.60	343.06	339.39	dry	338.65	dry	339.22	339.27	337.50	dry	337.00	dry	337.66	dry
09-Oct-20	dry	339.51	342.99	339.30	dry	338.62	338.65	339.13	339.20	337.47	dry	337.01	337.01	337.67	dry
09-Nov-20	dry	339.46	342.94	339.27	dry	338.61	dry	339.08	339.16	337.49	dry	336.99	337.01	337.67	dry
03-Dec-20	dry	339.42	342.91	339.25	dry	fr	fr	fr	fr	fr	fr	fr	fr	fr	fr
19-Apr-21	dry	339.48	342.90	339.26	dry	338.63	dry	339.15	339.20	337.47	dry	336.99	337.01	337.66	dry
11-May-21	dry	339.44	342.88	339.22	dry	338.56	dry	339.04	dry	337.46	337.43	337.00	337.00	337.61	dry
02-Jul-21	dry	339.38	342.84	339.17	dry	dry	dry	339.10	339.12	337.45	dry	337.00	337.02	337.60	dry
03-Aug-21	dry	339.31	342.79	339.12	dry	338.34	dry	339.08	339.13	337.46	dry	336.99	337.02	337.60	dry
26-Aug-21	dry	339.28	342.78	339.10	dry	338.46	dry	338.92	dry	337.46	dry	337.01	337.03	337.60	dry
29-Sep-21	dry	339.40	342.90	339.16	dry	338.63	338.62	339.31	339.35	337.46	dry	336.99	337.03	337.65	dry
27-Oct-21	dry	339.44	342.91	339.18	dry	338.64	338.65	339.26	339.30	337.47	dry	337.00	337.04	337.70	337.66
23-Nov-21	dry	339.45	342.90	339.19	dry	338.63	dry	339.15	339.24	337.47	337.43	336.99	337.00	337.69	337.67
20-Dec-21	dry	339.50	342.95	339.28	dry	fr	fr	fr	fr	fr	fr	fr	fr	fr	fr
notes:	at drive-point piezometers (DP series) gw = groundwater, sw = surface water #N/A = no measurement available (monitor not yet installed or no measurement obtained) fr = frozen, no measurement possible														

Date	Temperature (Celcius)										
	Air	DP1 gw	DP1 sw	DP2 gw	DP2 sw	DP3 gw	DP3 sw	DP4 gw	DP4 sw	DP5 gw	DP5 sw
03-Apr-06	12.0	12.3	14.0	9.0	9.0	6.1	8.0	6.1	6.1	#N/A	13.6
28-Jul-06	25.0	#N/A	24.2	#N/A	23.7	#N/A	20.3	#N/A	19.5	#N/A	#N/A
06-Oct-06	8.3	12.1	7.4	10.1	7.5	10.8	9.1	9.9	9.4	10.2	9.9
10-Jan-07	-2.5	#N/A	0.1	4.5	1.9	#N/A	1.0	5.5	8.2	3.8	0.3
01-Jun-07	#N/A	12.2	23.9	13.2	19.2	10.2	0.516.0	12.0	13.5	13.7	dry
23-Aug-07	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
10-Oct-07	#N/A	14.0	13.5	15.3	12.6	13.6	13.0	12.6	13.4	12.8	dry
18-Dec-07	-2.0	#N/A	#N/A	1.3	#N/A	#N/A	#N/A	1.6	2.1	2.6	#N/A
15-Jan-08	-1.0	#N/A	#N/A	1.2	#N/A	#N/A	#N/A	1.0	2.1	1.8	#N/A
22-Feb-08	-4.3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	1.6	1.4	1.4	#N/A
20-Mar-08	-2.0	0.6	#N/A	#N/A	#N/A	#N/A	#N/A	3.8	1.0	2.4	#N/A
15-Apr-08	6.0	1.7	0.8	4.6	5.1	1.9	1.9	5.9	3.4	6.3	2.7
17-May-08	14.0	9.3	13.0	9.6	14.3	8.1	9.6	9.3	9.7	9.5	13.0
16-Jun-08	18.0	15.6	19.1	15.3	16.3	12.8	15.6	14.3	14.4	15.0	#N/A
14-Jul-08	20.0	14.8	19.8	15.2	16.6	12.3	16.8	12.1	13.1	13.9	#N/A
12-Aug-08	22.0	16.0	23.5	15.1	17.7	13.1	15.1	12.3	12.9	14.3	#N/A
24-Nov-08	0.6	#N/A	0.3	4.4	1.5	2.3	0.6	5.8	3.4	6.2	0.5
09-May-09	19.0	11.0	17.8	11.6	14.5	10.2	13.2	11.7	12.4	11.6	15.4
27-Jun-09	24.3	#N/A	21.1	#N/A	18.4	#N/A	15.3	#N/A	15.6	#N/A	#N/A
25-Jul-09	24.0	15.6	18.7	14.1	16.1	12.1	14.2	12.9	14.9	13.9	14.9
16-Aug-09	26.0	16.8	16.9	16.3	17.8	13.1	15.9	15.1	15.7	15.3	#N/A
13-Sep-09	23.0	15.2	15.2	14.3	13.8	13.0	13.5	12.9	13.7	14.1	#N/A
10-Oct-09	12.0	10.8	8.8	9.9	9.2	9.8	9.2	9.3	9.3	10.8	9.4
15-Nov-09	8.0	7.2	6.1	7.4	7.1	7.6	7.8	7.9	7.5	6.8	#N/A
12-Dec-09	-5.0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	3.5	2.5	#N/A	#N/A
15-Jan-10	0.0	#N/A	#NA	2.1	#NA	#N/A	#NA	2.9	3.4	#N/A	#NA
15-Feb-10	-2.0	#N/A	#NA	#N/A	#NA	#N/A	#NA	2.9	2.6	#N/A	#NA
14-Mar-10	2.0	2.6	2.1	0.6	0.6	0.4	0.7	0.8	0.8	0.6	0.6
18-Apr-10	6.0	8.2	9.2	8.2	7.8	6.9	6.8	7.3	7.2	7.7	7.9
16-May-10	16.0	10.6	18.6	9.7	15.8	8.4	12.9	9.4	8.6	9.6	14.4
13-Jun-10	20.0	14.3	18.5	14.4	17.0	12.8	14.8	13.1	12.7	13.5	15.4
25-Jul-10	26.0	17.5	20.9	18.5	20.1	16.1	18.9	16.1	16.9	16.9	19.3
21-Aug-10	24.0	16.8	#NA	17.8	#NA	16.1	18.8	15.5	16.9	16.8	#NA
19-Sep-10	19.0	14.1	#NA	13.6	#NA	12.5	13.8	12.0	12.1	14.1	#NA
24-Oct-10	12.0	10.5	12.7	10.3	N/A	9.7	11.8	10.2	11.1	10.4	11.0
05-Dec-10	-6.0	3.8	0.0	3.0	0.0	#N/A	#NA	3.1	0.0	5.6	0.0
22-May-11	22.0	12.6	17.5	12.7	15.1	10.6	12.8	12.3	10.8	12.7	15.7
25-Jun-11	18.0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
31-Jul-11	27.0	17.4	22.2	18.2	20.3	14.8	17.3	14.0	14.7	17.2	18.9
28-Aug-11	19.2	16.3	17.5	16.6	17.0	14.5	16.5	13.8	15.0	15.5	16.2

Date	Temperature (Celcius)										
	Air	DP1 gw	DP1 sw	DP2 gw	DP2 sw	DP3 gw	DP3 sw	DP4 gw	DP4 sw	DP5 gw	DP5 sw
25-Sep-11	12.4	13.7	11.5	13.2	11.9	12.4	11.4	11.4	11.1	12.9	11.5
23-Oct-11	13.7	10.5	7.2	9.9	6.4	9.7	7.3	8.8	8.8	10.5	7.2
27-Nov-11	11.0	7.0	7.6	6.9	7.8	7.1	8.2	7.7	8.3	6.9	7.8
18-Dec-11	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
22-Jan-12	2.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	3.5	2.5	#N/A	#N/A
18-Apr-12	13.6	7.6	10.8	8.3	17.1	6.9	5.6	8.1	7.3	6.4	8.1
18-May-12	21.5	11.3	23.3	10.9	13.2	9.3	10.3	9.9	10.0	10.3	#N/A
12-Jun-12	#N/A	13.2	23.5	13.2	17.4	11.4	15.1	11.5	13.8	12.6	#N/A
22-Aug-12	20.0	15.7	#N/A	14.8	#N/A	15.1	#N/A	14.6	#N/A	14.4	#N/A
12-Sep-12	14.9	15.3	#N/A	15.0	#N/A	14.5	#N/A	13.7	#N/A	14.2	#N/A
11-Oct-12	6.9	9.1	#N/A	8.8	#N/A	0.6	#N/A	8.8	#N/A	8.8	#N/A
09-Nov-12	6.6	3.8	1.3	6.8	3.2	5.2	3.3	6.2	4.4	6.3	3.9
12-Dec-12	1.2	#N/A	#N/A	4.3	#N/A	#N/A	#N/A	5.3	3.3	#N/A	#N/A
07-May-13	22.2	11.8	18.6	11.8	15.3	12.4	13.0	10.2	11.0	10.1	17.5
13-Jun-13	22.3	12.8	25.8	13.1	15.3	12.5	13.9	11.5	14.4	12.5	16.2
10-Jul-13	27.4	19.1	25.3	17.2	20.8	18.9	19.8	14.6	17.3	12.6	17.5
02-Aug-13	25.9	16.5	24.3	16.1	16.4	13.4	15.8	12.8	15.6	12.7	19.1
17-Sep-13	13.8	13.5	13.6	13.3	#N/A	11.4	#N/A	11.1	10.8	11.5	#N/A
15-Oct-13	14.8	11.9	11.4	11.9	9.5	11.3	11.0	10.6	10.5	10.9	#N/A
04-Nov-13	10.4	7.8	2.8	8.1	4.2	7.8	4.6	7.6	5.7	6.7	#N/A
03-Dec-13	4.4	#N/A	#N/A	2.3	#N/A	4.7	#N/A	5.7	1.2	2.3	#N/A
16-Apr-14	2.1	3.4	7.4	#N/A	5.1	4.6	2.7	4.9	3.6	4.5	7.4
20-May-14	12.2	7.5	13.2	7.8	13.1	7.4	10.3	7.2	11.2	7.5	12.9
16-Jun-14	25.6	9.0	15.4	9.2	16.2	8.9	11.3	9.1	15.9	9.0	#N/A
04-Jul-14	18.1	12.8	17.4	11.8	17.9	12.0	13.1	12.6	16.9	12.3	#N/A
27-Aug-14	22.4	12.3	#N/A	15.1	17.3	13.1	16.4	12.4	15.1	17.0	20.7
19-Sep-14	15.6	12.8	#N/A	12.1	10.4	11.1	10.6	10.4	10.5	13.4	#N/A
24-Oct-14	15.4	10.7	9.3	10.4	7.3	9.4	8.6	9.2	8.8	10.4	8.8
27-Nov-14	4.1	6.3	5.1	6.0	4.1	6.3	4.8	6.1	4.9	6.5	#N/A
17-Dec-14	-0.3	4.6	#N/A	3.9	#N/A	4.6	2.9	4.8	3.6	4.1	1.8
24-Apr-15	4.2	5.8	15.3	5.3	6.7	5.4	4.4	6.8	4.8	5.6	10.9
29-May-15	21.1	9.1	16.8	9.0	12.0	9.2	9.1	9.2	10.1	9.0	11.9
26-Jun-15	17.8	14.0	17.1	13.0	15.5	11.3	12.7	11.9	13.9	12.7	13.8
22-Jul-15	18.3	15.6	17.3	13.8	15.8	12.0	13.8	13.1	14.6	13.8	#N/A
27-Aug-15	15.2	16.1	18.8	14.9	#N/A	12.9	15.2	14.0	18.1	14.8	#N/A
01-Oct-15	10.0	13.0	#N/A	12.8	#N/A	11.8	11.2	13.1	11.3	12.9	#N/A
02-Nov-15	13.9	10.1	7.9	10.3	9.8	9.5	8.1	8.6	7.9	9.7	8.0
30-Nov-15	2.8	6.6	#N/A	6.0	#N/A	6.5	2.5	6.3	4.4	6.5	2.7
22-Dec-15	10.1	6.9	5.6	5.9	5.4	6.8	6.1	6.8	5.6	7.1	6.0
18-Apr-16	16.7	9.3	24.3	8.6	16.1	7.3	10.3	8.9	10.6	9.0	16.3

Date	Temperature (Celcius)										
	Air	DP1 gw	DP1 sw	DP2 gw	DP2 sw	DP3 gw	DP3 sw	DP4 gw	DP4 sw	DP5 gw	DP5 sw
24-May-16	23.1	12.2	28.7	12.9	14.7	10.0	12.8	10.1	10.8	12.5	#N/A
07-Jul-16	24.3	12.9	25.2	15.5	#N/A	11.8	14.2	12.8	#N/A	15.4	#N/A
23-Aug-16	26.0	13.6	#N/A	17.4	17.4	14.5	#N/A	13.7	15.9	16.8	#N/A
27-Sep-16	16.1	14.6	#N/A	15.3	#N/A	14.0	15.1	14.1	15.3	13.8	#N/A
21-Oct-16	9.1	11.2	#N/A	11.5	#N/A	10.9	#N/A	11.1	8.3	11.0	#N/A
14-Nov-16	11.8	9.4	#N/A	8.4	6.3	8.7	7.3	8.3	#N/A	9.2	7.3
30-Dec-16	-2.2	5.1	#N/A	4.8	#N/A	4.9	#N/A	4.7	#N/A	5.1	#N/A
18-Apr-17	16.7	9.3	24.3	8.6	16.1	7.3	10.3	8.9	10.6	9.0	16.3
10-Apr-17	17.5	7.6	16.5	6.3	11.6	7.1	8.7	8.6	8.5	8.0	14.1
16-May-17	18.2	10.4	19.7	10.6	11.5	9.0	9.6	9.2	#N/A	10.2	14.0
23-Jun-17	22.3	14.5	18.4	13.9	16.9	11.7	13.3	12.4	16.4	14.4	16.5
10-Jul-17	23.5	16.0	19.5	16.2	18.9	13.4	14.6	13.4	15.8	14.9	16.6
22-Aug-17	21.1	15.9	19.1	16.2	18.2	13.1	14.2	13.0	15.1	14.6	16.0
21-Sep-17	23.8	15.5	18.9	15.9	18.1	12.1	14.1	12.2	14.5	12.6	15.2
24-Oct-17	11.9	11.6	11.7	12.0	11.6	10.7	#N/A	10.2	10.2	11.4	11.5
20-Nov-17	2.6	6.7	#N/A	6.8	3.0	6.6	4.3	6.6	4.5	6.4	#N/A
28-Dec-17	-3.1	4.6	fr	4.5	fr	4.4	fr	4.4	fr	4.2	fr
23-Apr-18	17.1	8.7	15.8	8.5	10.8	8.6	10.7	9.3	8.0	8.9	15.0
25-May-18	23.8	14.1	25.9	13.5	17.9	14.9	16.3	17.0	14.3	14.2	15.9
22-Jun-18	22.8	15.8	#N/A	17.5	19.8	15.9	#N/A	17.1	#N/A	18.2	#N/A
25-Jul-18	24.9	17.5	#N/A	20.3	23.0	16.9	16.4	17.1	#N/A	19.8	#N/A
30-Aug-18	18.3	17.7	#N/A	19.4	23.9	19.3	#N/A	17.8	#N/A	19.2	#N/A
18-Sep-18	22.1	18.2	#N/A	16.1	18.8	18.7	#N/A	17.2	#N/A	19.0	#N/A
12-Oct-18				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19-Nov-18	2.2	5.7	1.3	6.5	1.1	4.9	3.5	5.0	3.8	4.5	0.8
17-Dec-18	0.4	4.5	#N/A	3.7	#N/A	4.1	2.8	4.3	3.1	3.8	#N/A
17-Apr-19	12.1	7.0	11.1	8.0	8.1	7.3	6.9	7.2	6.9	7.6	11.2
10-May-19	7.1	8.6	11.6	10.9	11.3	8.1	9.2	9.0	10.5	8.6	10.7
18-Jun-19	25.8	13.7	20.1	14.5	15.4	11.7	12.2	12.1	#N/A	12.7	14.6
18-Jul-19	24.6	16.6	21.2	15.0	18.7	15.0	16.9	14.0	#N/A	15.9	18.0
19-Aug-19	19.4	16.8	19.4	17.1	17.9	16.0	17.1	15.9	17.4	17.0	18.1
11-Sep-19	21.0	15.3	18.1	15.8	16.1	15.7	16.8	15.6	17.1	15.5	17.4
07-Oct-19	14.8	13.2	13.6	13.4	12.2	12.3	11.9	11.6	11.6	13.1	12.9
06-Nov-19	1.4	7.9	4.8	8.1	4.8	7.6	4.9	6.2	5.5	7.4	4.9
31-Dec-19	-2.1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
23-Apr-20	0.8	4.6	3.9	6.4	5.8	4.4	3.0	4.2	2.9	5.0	4.6
20-May-20	18.8	9.8	15.6	11.7	16.8	10.1	10.7	9.8	10.6	10.8	15.4
16-Jun-20	25.9	13.3	#N/A	13.5	13.5	13.1	#N/A	12.1	12.2	13.2	#N/A
10-Jul-20	29.2	18.9	#N/A	18.0	21.3	19.9	#N/A	19.0	19.0	18.8	#N/A
11-Aug-20	28.7	16.2	#N/A	16.6	19.2	16.7	#N/A	16.4	#N/A	16.3	#N/A

Date	Temperature (Celcius)										
	Air	DP1 gw	DP1 sw	DP2 gw	DP2 sw	DP3 gw	DP3 sw	DP4 gw	DP4 sw	DP5 gw	DP5 sw
11-Sep-20	17.2	14.4	#N/A	14.3	14.6	14.5	#N/A	14.3	#N/A	14.4	#N/A
09-Oct-20	10.6	12.0	10.4	11.0	9.8	10.6	#N/A	9.9	9.2	10.8	#N/A
09-Nov-20	18.8	10.4	#N/A	11.9	12.6	10.3	#N/A	10.1	9.8	10.2	#N/A
03-Dec-20	-3.1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
19-Apr-21	12.8	8.8	#N/A	9.2	12.7	8.9	#N/A	8.9	8.5	9.0	#N/A
11-May-21	6.8	8.3	#N/A	7.9	#N/A	7.3	7.0	7.6	7.2	8.8	#N/A
02-Jul-21	21.8	18.2	25.1	16.6	17.7	14.3	#N/A	13.7	15.2	16.5	#N/A
03-Aug-21	22.2	17.4	#N/A	16.6	17.3	15.3	#N/A	14.5	14.7	16.2	#N/A
26-Aug-21	21.5	15.2	17.3	18.2	#N/A	16.7	#N/A	15.2	17.3	18.1	#N/A
29-Sep-21	21.8	14.4	15.8	15.3	14.0	13.4	#N/A	12.7	12.7	15.5	#N/A
27-Oct-21	10.1	11.6	10.4	11.3	8.4	10.1	#N/A	9.4	8.9	11.2	10.2
23-Nov-21	-0.4	6.2	#N/A	6.1	2.1	6.2	3.4	6.1	3.5	8.3	5.0
20-Dec-21	0.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
notes:	air temperature obtained at time of first piezometer measurement that day at drive-point piezometers (DP series) gw = groundwater, sw = surface water #N/A = no measurement available (frozen, dry or equipment issues)										