APPENDIX

B HYDROGEOLOGY REPORT

MILL CREEK AGGREGATES PIT HYDROGEOLOGY

APPENDIX B OF THE 2022 COORDINATED MONITORING REPORT

DUFFERIN AGGREGATES, A DIVISION OF CRH CANADA INC.

PROJECT NO.: 111-52958-14-100
DATE: MARCH 29, 2023

WSP
SUITE 700
55 KING STREET
ST. CATHARINES, ON, CANADA L2R 3H5

T: +1 905 687-1771
F: +1 905 687-1773
WSP.COM

March 29, 2023

DUFFERIN AGGREGATES, A DIVISION OF CRH CANADA INC.
3300 Steeles Avenue West
4th Floor
Concord, ON L4K 5X6

Attention: **Martin Bradley, Site Manager**
Mill Creek Pit

Dear Sirs,

Subject: **Mill Creek Aggregates Pit Hydrogeology**
Appendix B of the 2022 Coordinated Monitoring Report

We are pleased to submit our 2022 Annual Groundwater Monitoring Report for the Mill Creek Aggregates Pit. This report was prepared in accordance with the requirements of the original 1993 approved groundwater monitoring program, and as subsequently modified in 2002, 2004, and 2006 in consultation with the Ministry of Northern Development, Mines, Natural Resources & Forestry (Guelph office).

The report provides the results of the groundwater monitoring program for 2022 and an interpretation of those results within the context of previously collected data at the property. The report also integrates the results of the groundwater monitoring program with monitoring results from other disciplines. Technical data are appended to the report for reference purposes.

We trust that this annual report is satisfactory at this time. Please contact our office if there are any questions.

Yours truly,
WSP Canada Inc.

[redacted]

Greg R. Siiskonen, P.Eng.
Director, Earth & Environment

WSP ref.: 111-52958-14-100

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SUITE 700
55 KING STREET
ST. CATHARINES, ON, CANADA L2R 3H5

T: +1 905 687-1771
F: +1 905 687-1773
wsp.com

SIGNATURES

PREPARED BY

[redacted]

Rebecca Warrack, P.Eng.
Project Engineer, Earth & Environment

REVIEWED BY

[redacted]

Greg R. Siiskonen, P.Eng.
Director, Earth & Environment

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This limitations statement is considered an integral part of this report.

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

1.1 BACKGROUND

The University of Guelph owns approximately 185.5 ha of land situated in Part Lot 24, Concession 1, and Part Lots 21, 22, 23, and 24, Concession 2, Township of Puslinch, in the County of Wellington. Dufferin Aggregates, a division of CRH Canada Group Inc., leases the property from the University of Guelph. The property, called the Mill Creek Aggregates Pit, is underlain by a substantial outwash deposit, which extends to the northeast and southwest of Highway 401. See Figure 1, Location and Physical Setting, for details. This deposit forms the most important aggregate resource in this area. The subject property is licenced by the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) as a Category 3 Class 'A' Pit Below Water for extraction of the aggregate resource from above and below the water table (Licence #5738).

The northwest corner of the property is traversed by Mill Creek and by two tributary creeks, Galt Creek and Pond Creek. Various reaches of Mill Creek are documented as supporting naturally sustaining brown trout and brook trout populations. Brown trout spawning is documented as occurring in the section of Mill Creek on the Mill Creek Aggregates Pit property. Approximately half of the University property on the north side of Township Road 2 is within the regulatory flood line of Mill Creek. There is also a substantial area of wetland adjacent to Mill Creek and the tributary streams, which is part of the larger Galt Creek Swamp, an area that is designated as a Provincially Significant Wetland (formerly a Class 1 Wetland) by the NDMNRF.

It was predicted and accepted by the approving agencies at the time of approval of the Mill Creek Aggregates Pit that sub-aqueous extraction of the sand and gravel and the progressive formation of large ponds would modify groundwater flow patterns and discharge conditions near Mill Creek. Predicted effects were greatest in the reach of Mill Creek upstream from the Hanlon interchange to north of Highway 401. The approved aggregate extraction operation was designed to limit the impacts on the western reach of Mill Creek and its two tributaries, and the wetland area adjacent to the creek.

Extraction below the water table commenced in Phase 1 in 1995 (see Figure 3), and occurred each year through to October 2002. In late 2002, extraction activities were undertaken in Phase 2, and continued through to 2012. Between 2007 and 2012, extraction activities were undertaken in Phases 2 and 3, and in 2013 extraction occurred in Phases 3 and 4. Approval for extraction in the area formerly designated on previous Site Plans as "Area To Be Monitored", located northwest of Phase 3, was obtained in 2010. Extraction in 2016 and 2017 occurred above the water table along the east (2016 only), west, and south boundaries of the Phase 2 pond as a result of obtaining NDMNRF approval to extract the setbacks. Below the water table extraction occurred in 2016 and 2017 near the east (2016 only) and west boundaries of the Phase 2 pond within the original licensed area. Extraction occurred in 2018 above and below the water table at the east and south boundaries of the Phase 1 pond because extraction had not previously been completed to the approved limit. Extraction within the setback on the east side of the Phase 1 pond also took place as a result of obtaining NDMNRF approval to extract the above-water table material within the setback, per the approved Site Plans. In 2019, extraction continued within the Phase 1 pond setback along the east side of the Site, and occurred above and below the water table at the northeast corner of Phase 5 and silt pond SP4. Extraction in 2020 occurred above the water table in Phase 6, while extraction in 2021 occurred both above and below the water table in Phase 6. In 2022, extraction occurred both above and below the water table in Phase 2, Phase 5 and Phase 6, as well as below the water table in Silt Pond 4 (SP4).

1.2 GROUNDWATER THRESHOLDS

On June 27, 2001 and following detailed negotiations with MNR and other regulatory agencies, Dufferin Aggregates issued a document entitled Mill Creek Aggregates Interim Groundwater Threshold and Action Response Plan. Interim thresholds and early warning values were set at six locations across the site, and each location includes a pair of groundwater monitors. The thresholds are based on maintaining positive seasonal hydraulic head differences on the water table between the monitor pairs, such that a hydraulic gradient will continue to exist from the site toward Mill Creek. The thresholds and early warning values have been developed to ensure that the quantity of groundwater that discharges to Mill Creek does not decline below a minimum level, and they are based on seasonal historic low water level data. The threshold values were revised in 2002, 2004 and 2006 and the 2006 thresholds now form the basis of the environmental monitoring program that is undertaken at the Mill Creek Aggregates Pit.

Various additional threshold monitor pairs and threshold values for the on-Site ponds have been added to the program since 2003. In addition, due to well replacements and loss of access to wells, threshold pairs have been periodically replaced or revised, as required.

Drive point monitor DP5B was vandalized in the summer of 2012, and a replacement monitor, DP5C, was installed slightly upstream of DP5B in August 2012, as shown on Figure 2. New preliminary seasonal threshold values were established for the OW5-84 to DP5C threshold pair in the fall of 2012 based on the limited data available at that time for DP5C. In August 2013, drive point, DP5D was installed slightly downstream of DP5C, but thresholds were not established at this location. In Spring 2017, both drive points DP5C and DP5D were found removed from Mill Creek, and assumed to be removed by a vandal. Replacement drive point DP5CR was installed at the location of DP5C in May 2017. Revised early warning and threshold values were developed for the OW5-84 to DP5CR pair in 2021 and were approved for implementation by the NDMNRF in June 2022.

1.3 OBJECTIVE AND SCOPE

The principal objectives of the 2022 Annual Monitoring Program are:

- To comply with the pertinent terms of the 2022 water monitoring program;
- To provide an assessment of the effects of on-site aggregate extraction activities on the local groundwater and surface water setting;
- To determine and assess any changes in the groundwater quality;
- To document results in an annual monitoring report as part of a coordinated report; and
- To recommend a monitoring program for implementation in 2023.

The annual monitoring report includes the collation of the monitoring data collected since 1986, a presentation of the results, and an analysis and discussion of the 2022 monitoring data. The discussion includes aspects from the companion monitoring document on surface water (Technical Appendix A). The accompanying summary document entitled “Mill Creek Coordinated Monitoring Report January 1 to December 31, 2022” integrates the monitoring results from the hydrogeology, surface water, and fisheries monitoring programs.

Prior to the 2019 annual report, the full available dataset of historic monitoring results was presented in tabular form in the report appendices. The tabulated data presented in the appendices of the Hydrogeology Reports from 2019 onward have been reduced to show only the previous five (5) years of data, while the full available dataset continues

to be presented in the appended figures and graphs. Tabulated data from 1986 to 2016 can be found in previous annual reports or provided upon request.

2 ROUTINE GROUNDWATER MONITORING PROGRAM

Figure 2, Groundwater Monitor Locations, identifies the location of the monitors in the network. Details of the monitor installations are presented in Tables A-1 to A-5, Appendix A. The 2022 monitoring program consisted of the following tasks that are outlined in the subsequent sections.

WATER LEVELS

Manually Recorded Monitors

Table 1, Monitor Groupings, presents the monitors grouped within the different hydrostratigraphic units and physical settings at the property. Monitoring was performed monthly at the following locations:

1. Monitors BH1-R, BH2-R, BH3 to BH6, BH11, BH13, and BH14; OW1-84 OW2-84, OW4-84, OW5-84, and OW16A-78, TW16-78, and TW16-79, which are adjacent to Mill Creek near the southwest corner of the site; and 92-1R, 92-5, 92-8, 92-12, 92-13, 92-27 to 92-29, 92-32, and 92-33, which were installed at select locations in the 1992 resource boreholes across the property.
2. In-stream drive point monitors DP1 to DP4R; DP5CR, and DP17R to DP22. Monitoring was performed monthly at the Mill Creek in-stream drive point monitors. Measurements at the Mill Creek drive point monitors included groundwater levels and temperatures, and surface water levels and temperatures. In addition, surface water levels are monitored manually at stations SW1 and SW2, both of which are located in Mill Creek.
3. Shallow water table drive point monitors DP6 to DP12 and DP16, which are established in the wetland areas on the Mill Creek Aggregates Pit property.

Additionally, weekly threshold monitoring was completed at Monitors BH13, BH92-12, BH92-27, BH92-29, OW5-84, DP1, DP2, DP3, DP5CR, DP6, DP17R, and DP21.

Multi-Level Monitors Equipped with Data Loggers

Several multi-level monitors are installed at the Site, as listed in Table A-2, Appendix A. Where multi-level monitors are present, the deepest monitor is designated ‘I’, the intermediate monitor is designated ‘II’ and the shallowest monitor is designated ‘III’.

Monitors:

- 92-13 – east side of the property adjacent to the southwest corner of the Phase 1 pond. A replacement shallow data logger was installed at this monitor in May 2013.
- 92-28, 92-29, and 92-32 – west side of the property adjacent to Mill Creek – installed in November 2006 as part of extraction monitoring in Phase 3
- BH4, DP7, DP8, and DP9 – centre of property adjacent to Phase 4 operations. These are single level data logger installations.

Readings of water level and temperature were obtained once per day. The data were downloaded from the data loggers monthly for review.

A data logger was installed at standpipe monitor 92-33 in March 2012 for the purpose of collecting groundwater level and temperature data from the shallow part of the aquifer. The previous permanent, non-removable multi-level pressure transducer and thermistor instrumentation malfunctioned at monitor nest 92-33 in 2010. A second shallow data logger was installed at 92-33 in October 2017 at a depth similar to the previous (i.e., pre-2012) shallow data logger. The multi-level monitors have not been replaced as adjacent monitors can provide similar information, and extraction in that area is complete.

The data loggers at 92-26 were removed in December 2011 due to access safety issues. A data logger was re-installed in 92-26-III in June 2012 to provide groundwater level and temperature data in the shallow aquifer adjacent to the Phase 3 pond. Due to access safety issues, the data logger was removed in September 2013. Extraction is complete in Phase 3.

Data loggers were also installed in the following monitors in 2011/2012.

- Monitor 92-15 (shallow monitor only) – Removed in December 2013 in anticipation of the decommissioning of Monitor 92-15 in 2014.
- Monitor 92-12 (shallow monitor only)
- Monitor 92-27 (shallow monitor only)
- Drive point DP16

A data logger was installed in Monitor BH14, located between Monitor 92-12 and Mill Creek, in June 2015.

Water Wells

As in previous years, and although not part of the 1993 “official” monitoring program, water wells located on the property, and a well supplying a local resident in the vicinity of the property, were monitored monthly. Water level monitoring began in the summer of 1994 at select locations.

Pond Staff Gauges

Surveyed staff gauges were maintained in the Phase 1 pond, Phase 2 pond, Phase 3 pond, and Phase 4 pond. Measurements of pond water levels were made daily during the ice-free period through 2022. Pond temperatures were measured monthly during the ice-free period.

The 2022 and historic monitoring results are presented in Appendix B.

WATER QUALITY

In March and November 2022, groundwater samples were collected from Monitors BH1-R, 92-32-III, and 92-8, and a surface water sample was collected from the Phase 1 pond. Owing to a detection of total oil and grease in the November 2022 sample collected from the Phase 1 pond, a verification sample was collected from the pond in December 2022.

Samples were tested in the field for temperature, pH, and conductivity and then submitted to Bureau Veritas Laboratories for chemical analysis. Water samples were analyzed for major cations and anions, alkalinity,

conductivity, pH, hardness, and oil and grease. The 2022 and historic groundwater chemical results are presented in Appendix C.

QA/QC PROGRAM

The groundwater monitoring program included a Quality Assurance/Quality Control component that consisted of the following.

1. Dufferin staff performed the routine monitoring in accordance with protocols established for those tasks. The data were forwarded to WSP for review and compilation.
2. WSP collected groundwater samples in March and November 2022. The analytical laboratory, Bureau Veritas Laboratories, was required to include a QA/QC component as part of the program that included a replicate analysis. The results of the laboratory's internal QA/QC testing are included in the reporting procedure and are kept on file.
3. Through 2022, Dufferin staff reviewed the results of the routine monitoring program for consistency with historic data, seasonal trends, and precipitation data. Any significant deviations from anticipated values that could not be explained, such as an increase/decrease in excess of 125% of previously established seasonal trends, were to be re-monitored for verification. If the deviations were confirmed, the NDMNRF was then to be notified in writing with suggestions for remedial measures, as appropriate. In 2022, no significant deviations were observed during the monitoring.
4. WSP performed the routine monthly monitoring, in accordance with protocols established for those tasks, during 2022.

REPORTING

An annual hydrogeological monitoring report is submitted to the NDMNRF for their review, as part of a coordinated report, by the end of March the following year. The annual hydrogeological report provides the following information:

1. Summary of monitoring results.
2. Description of monitoring methodology and monitoring locations. Any deviation from the standard methodology and/or monitoring locations is to be reported to the NDMNRF at that time. This information is summarized in the annual report.
3. Factual descriptions of monitoring results, including tables of water levels, hydrographs, and chemical data for the monitoring locations, as appropriate.
4. Discussion of monitoring results, with specific reference to key locations across the site, such as:
    a. Adjacent to current extraction area,
    b. Multi-level (data logger) monitors,
    c. Mill Creek drive points,
    d. Wetland fringe groundwater levels,
    e. Groundwater level profile(s) across the site through the wetland area,
    f. Water table configuration across the site and trends in hydraulic gradient and groundwater discharge conditions, to demonstrate any changes with respect to pre-extraction conditions, and
    g. Assessment with respect to early warning values and action thresholds at monitor pair locations.
    h. Discussion and integration of monitoring results with respect to the other monitoring programs including:

i Surface water flow (with particular reference to base flow quantities),

ii Threshold action levels and implementation of contingency measures (if appropriate), and

iii Scope of future monitoring program, including frequency of monitoring and addition/deletion of monitoring stations.

NDMNRF requires that Dufferin submit a monthly summary checklist report, which is to be issued within ten business days of the last day of the preceding month. The summary includes water level data corresponding to threshold monitoring pairs, threshold values, and pond levels. Below water table extraction (wet tonnes extracted/day), water pumped from the Phase 1 pond, water pumped from the active silt pond, and monthly precipitation totals are also to be reported in the summary report. In the event that a threshold value/level is exceeded for any period, this would be included in the summary with appropriate comments attached. The monthly reports are included with the correspondence in Appendix F.

3 ANNUAL MONITORING RESULTS

3.1 PHYSICAL SETTING

The Mill Creek Aggregates Pit is located on the southeast side of a broad northeast-southwest trending glacial outwash spillway, as shown in Figure 1. Outwash sand and gravel materials, ranging from about seven to twenty metres in thickness, underlie the property. These outwash deposits consist of interbedded sands, gravel, and to a lesser extent, silts. Mill Creek is bottomed in these granular soils.

The surficial soils adjacent to the Creek in the west and north-central parts of the Mill Creek Aggregates Pit consist of thin organic deposits. These organic soils are developed in a wetland area because of the high groundwater table condition adjacent to the creek. Generally, the thickness of these soils ranges from 0.5 m to greater than 3 m. Granular outwash deposits underlie the organics. A layer of glacial silt till generally underlies the sand and gravel deposit. Dolostone bedrock underlies the overburden materials beneath the site. The thickness of glacial till across the property varies from 0 m to about 12 m. The thickest area of till corresponds to a drumlin landform that is exposed at ground surface on the southern edge of the main property. The bedrock beneath the subject property is dolostone of the Guelph Formation. This unit is moderately hard dolostone that is generally flat-lying and displays few irregularities that affect surface topography. The resource drilling data generally confirm the relatively moderate amount of variation in the elevation of the buried bedrock surface beneath the property. The dolostone bedrock serves as the main groundwater supply aquifer in the area, although some water supply wells are developed in the granular overburden soils.

3.2 EXTRACTION ACTIVITIES

Figure 3, Site Plan Sequencing, shows the site details based on the most current (2019) approved extraction areas. Extraction in 2022 occurred both above and below the water table in Phase 2, Phase 5 and Phase 6, as well as below the water table in Silt Pond 4 (SP4).

Similar to previous years, water was taken from the Phase 1 pond for aggregate washing and dust control during 2022. In 2022, the site operated under Amended PTTW #5557-B93NZ5, which was issued on February 7, 2019. A copy of the current PTTW is included in Appendix F.

The silty wash water from the processing plant was pumped into the extension of silt pond SP4/Phase 1 pond for settlement of the suspended silt. The detailed pumping data for 2022 are presented in Table E-1, and a summary of the monthly pumping totals is presented in Table E-2, both of which are in Appendix E.

3.3 CLIMATE DATA

Water budgets have been prepared based on 30-year climate normals from five different 30-year periods using a variety of climate stations, based on data availability. The five 30-year climate normal water budgets are based on data from: (a) Guelph Arboretum Climatological Station (1951 to 1980), (b) Preston Climatological Station (1961 to 1990), (c) Waterloo-Wellington Climatological Station (1971 to 2000), (d) Elora Climatological Station (1983 to 2012), and (e) Grand River Conservation Authority's (GRCA) Shade's Mills Climatological Station (1991 to 2020). The 30-year climate normal water budgets are presented in Tables D-1 to D-5, Appendix D. Water budget calculations are also presented for annual climate data from the GRCA Shade's Mills Climatological Station from 2018 through 2022, as shown in Tables D-6 through D-10. Water budgets were prepared for the climate data using the Thornthwaite method. Graphs depicting the annual temperature profiles and the annual precipitation and water surplus are also presented in Appendix D.

Between the start of monitoring in 1988 and 2022, the total annual precipitation in the area has averaged 897 mm. This 35-year average is 37.6 mm lower than the 30-year normal precipitation of 935 mm (1991-2020 Shade's Mills) presented in Table D-5. Since 1988, the three highest total annual precipitations occurred in 2013, 2008, and 1992, when total precipitation was 1,113 mm, 1,117 mm, and 1,121 mm, respectively. The lowest amount of total annual precipitation recorded was 657 mm in 1998, while similar lows were recorded in 2012 (679 mm) and 2022 (682 mm).

The 2022 temperature and precipitation data are presented in Figure 4 and are compared to the 30-year normal (1991 to 2020 Shade's Mills) data. Based on the data presented in Appendix D and in Figure 4, the following observations and trends are noted:

- The mean monthly temperatures in 2022 were typically warmer than the 30-year average monthly temperatures, with the exceptions of January and February which were colder (2.8°C and 0.1°C lower, respectively) than the 30-year normal for those months. The average monthly temperatures recorded in April, June, July and October 2022 were similar to the 30-year average for those months, while the monthly temperatures recorded in May and August 2022 were approximately 2°C warmer than normal. The average monthly temperatures recorded in the remaining months of 2022 (March, September, November and December) were between 1.0°C and 1.2°C warmer than normal.
- The annual average of the monthly mean temperatures in 2022 was 8.9°C, which is marginally higher than the 30-year normal annual average temperature of 8.3°C but appreciably lower than the annual average recorded in 2021 (10.1°C). A notable increase in air temperature has been observed since 2016, with annual averages ranging between 9.2°C and 10.1°C in 2016, 2017, 2018, 2020 and 2021.
- The total precipitation was 682 mm, which was lower than the 30-year average precipitation (935 mm) by 252 mm (27%).
- In the winter (January to March) months, January was considerably drier than normal, February was appreciably wetter than normal and March was similar to normal conditions.
- In the spring (April to June) months, each month was drier than normal, particularly April.
- In the summer (July to September) months, July and September were considerably drier than normal, while August was slightly wetter than normal.

- In the fall (October to December) months, October and November were drier than normal, while December was slightly wetter than normal.
- The resulting groundwater levels were generally lower than 2021 and recent years, as detailed later in this report. The decline in groundwater levels is attributed to cumulative impacts from low precipitation received in 2020, the first half of 2021 and 2022.
- The months in which precipitation differed the most from the 30-year normal were January, April, July and September (41 mm, 48 mm, 62 mm and 54 mm lower than normal, respectively) and February (52 mm higher than normal).
- As shown in Figure 4, the water surplus in 2022 generally followed the typical seasonal trend of decreasing from a peak in the spring until late summer before increasing in the fall. Due to the precipitation trends in 2022, the monthly surplus was higher than normal in February, similar to normal in March and from May to October, and lower than normal in the remaining months.
- Owing to the lower-than-average annual total precipitation, the calculated net water surplus for 2022 was 129 mm (Table D-10), which is 176 mm (58%) lower than the 30-year normal surplus of 304 mm (Table D-5). The 2022 value was 199 mm (61%) lower than the 2021 surplus of 328 mm.

Because of the permeable nature of the surficial soils at the site, the amount of precipitation received and the timing of that precipitation have a direct impact on the seasonal groundwater levels at the site. This is discussed in detail in later sections.

3.4 BEDROCK AQUIFER

As noted in Table 1, Monitor Groupings, there are two water wells on the property that are developed within the bedrock aquifer: TW16-78 and North Farmhouse Well 4794. Water level data for these wells are provided in Tables B-1 and B-2, Appendix B, and a groundwater hydrograph for the North Farmhouse Well 4794 is presented in Figure B-47, Appendix B.

Based on the 2022 groundwater level data and the hydrographs for the bedrock wells, the following observations are made.

- As in previous years, free-flowing artesian conditions were observed at TW16-78 during each of the monitoring events in 2022. The flowing conditions indicate that the vertical hydraulic gradient in the bedrock aquifer at that location (southwest corner of the site) was upwards at the time of the monitoring event, and that the magnitude of the confined pressure (piezometric) head was above grade.
- Monitoring at North Farmhouse Well 4794, which is the well for the farmhouse on the north property, began in 1994. Water levels at Well 4794 typically increase by between 0.5 m and 1.2 m in the late spring, which is attributed to recharge following the spring freshet, and then decrease through the fall or winter. In 2022, the water levels followed a similar pattern. The water levels recorded at Well 4794 in October, November and December 2022 were the lowest observed since 2002, which is attributed to the considerably dry conditions observed in 2022 (Section 3.3).

In summary, the water levels in the bedrock aquifer well TW16-78, and North Farmhouse Well (as far as could be monitored) exhibited normal seasonal trends that reflected prevailing climatic conditions and were not affected by pit operations.

3.5 SAND AND GRAVEL AQUIFER

The monitors that are screened in the sand and gravel aquifer are noted in Table 1. Water level data from the previous 5 years (2018 to 2022) for the sand and gravel aquifer monitors are documented in Table B-1, Appendix B. Groundwater hydrographs for the monitors in the sand and gravel aquifer are also presented in Figures B-1 through B-28, Appendix B. A summary of the water level data from the previous 5 years (2018 to 2022) for the monitors is provided in Table B-6, Appendix B. Groundwater hydrographs for representative sand and gravel aquifer monitors (Monitors 1, 7-II and 92-32) located from east to west across the property are presented on Figure 5. Monitor 7-II was removed in March 2015 as part of extraction activities, so Monitor 4-I, which is also located in the central portion of the site, is included on Figure 5 as well. Historic groundwater elevations at Monitors 4-I and 7-II are similar. Monitor 1-I was removed due to extraction activities in May 2019 and was reinstalled as Monitor 1-R in June 2020. Presented on Figure 6 is the relationship between the shallow groundwater level at Monitor 92-28 (located in the northwest area of the site) and daily precipitation during 2022.

Compared to 2021, water levels in the representative monitors were, on average, 0.03 m lower (92-32) to 0.02 m higher (1-I) in 2022. The average water levels remained similar from 2021 to 2022 due to the higher levels observed in spring 2022 being offset by the lower levels observed in the fall of 2022. Water levels remained generally steady throughout the year in 2021, due to the lack of spring freshet that occurred in 2021.

As observed in Table B-6, the 2022 average water levels at the individual monitors ranged from approximately 0.1 m above ground surface to 8.5 m below ground surface across the site, and fluctuations ranged from 0.3 m to 0.7 m during 2022. In 2022, the maximum and minimum water levels at the monitors were within their historical ranges, with two exceptions. In September 2022, the water level at BH14 was 0.01 m lower than the historic range of levels recorded since monitoring began in 2015 and in November 2022, the water level at 92-12 was 0.01 m lower than the historic range of levels recorded since monitoring began in 2001.

Generally, water levels on both the east and west sides of the site in 2022 exhibited typical seasonal variation observed in previous years, which is a peak in the spring due to the annual spring melt and precipitation recharge, decreasing through the summer, and an increase in the late fall.

Based on the water level data, the hydrographs (Figures B-1 through B-28), and Figures 5 and 6, the following groundwater elevation trends were observed in 2022.

- With respect to Figure 6, the shallow groundwater level at 92-28 responded to precipitation events through most of the year.
- The highest water levels in 2022 generally were recorded in (a) February in the southwest corner, (b) February or April on the west side of the site, and (c) April or May on the east side of the site. The timing of the 2022 peak water levels is generally consistent compared to historical results.
- Annual low water levels were generally recorded in (a) September in the southwest corner, (b) September or November on the west side of the site, and (c) November on the east side of the site. The low water levels in September reflect the seasonal decline commonly observed through the summer months. The lower water levels observed in November reflect the drier than normal conditions observed in September, October and November.

As in previous years, the fluctuations that were observed in groundwater elevations during 2022 were a direct response to several factors, including seasonal climatic conditions and proximity to open-water ponds. Figures 7 and 8 present interpretations of the groundwater table configuration across the property based on water level data for

April 21 and September 8, 2022, respectively. The April data are generally representative of the 2022 high water table conditions, which is typical and reflects the effects of the early spring freshet and spring precipitation. The September data are generally representative of the 2022 low water table conditions. Most water table conditions throughout the year fell between the high and low conditions shown on Figures 7 and 8, respectively, although, as indicated above, the annual high and low water levels at individual monitors occurred during various months throughout 2022.

The interpreted water table configuration illustrated on Figures 7 and 8 indicates that groundwater continues to move from east to west across the northern property. The water table contours south of Highway 401 tend to "bend back" toward the creek, indicating that the creek receives groundwater discharge from the subject property along the reach south of Highway 401. Typically, water table contours bend back further (i.e. more strongly) under high flow water table conditions, indicating an increased component of groundwater flow northwestward toward the creek near the Hanlon interchange and to the west.

The water table configuration adjacent to Mill Creek north of Highway 401, from the western limit of Slovenski Park downstream to the 401 culvert, continues to exhibit a somewhat different trend relative to the lands to the south. The water level data in that area north of Highway 401 indicate that shallow groundwater movement is to the west, essentially parallel to the creek, with a component toward the reach of Mill Creek south of Highway 401 and east of the Hanlon interchange. This trend typically is more apparent in the low groundwater conditions (Figure 8), and is a result of the buffering influence of the water levels that occur in the Phase 1 pond and to the east in the St. Marys Cement (McNally) pond south of Highway 401, and in the Reid Heritage ponds to the north.

The pattern shown by the water table contours south of Township Road 2 indicates a generally west-southwesterly groundwater flow direction beneath the Mill Creek Aggregates Pit property and the lands to the west toward Mill Creek.

Profiles of the 2022 high and low water conditions from southeast to northwest across the north property are presented in Figure 9. The alignment of cross-section X-X' is shown on Figures 7 and 8. There was more variation between the high and low water level conditions in 2022, compared to 2021, which reflects the muted seasonal fluctuation observed across the Site in 2021.

Daily automatic readings of piezometric pressure were obtained from select locations across the property, as indicated with yellow shading on Figure 2. Given the large volume of data that has been collected for these multi-level monitors, the individual readings are not included in this report; they are available in electronic format, upon request. The automated data recorded by data loggers are presented in graphical form in Appendix B, as discussed later in the report.

The depths at which the multi-level monitors are installed are summarized below, together with comments on their functionality.

MULTI-LEVEL MONITOR	DEPTH OF PROBE (M)	STRATIGRAPHY	MONITOR FUNCTIONING?	
			PRESSURE TRANSDUCER	THERMISTOR
92-12-III	3.7	Gravelly fine to coarse sand	Yes (re-installed in June 2012)	Yes (re-installed in June 2012)
92-13-III	5.0	Gravelly medium to coarse sand	Yes (re-installed in May 2013)	Yes (re-installed in May 2013)
92-27-III	5.0	Gravelly Sand	Yes	Yes
92-28-I	4.0	Sandy gravel	Yes	Yes
92-28-II	3.1	Sandy gravel	Yes	Yes
92-28-III	2.4	Sandy gravel	Yes	Yes
92-29-I	8.5	Sandy gravel	Yes	Yes
92-29-II	5.4	Sand	Yes	Yes
92-29-III	3.0	Sandy gravel	Yes	Yes
92-32-I	13.9	Silt till	Yes	Yes
92-32-II	8.8	Silty fine sand	Yes	Yes
92-32-III	3.5	Sand	Yes	Yes
92-33-III	7.6	Gravelly sand	Yes (re-installed in March 2012)	Yes (re-installed in March 2012)
92-33-III	3.0	Gravelly sand	Yes (installed October 2017)	Yes (installed October 2017)
BH4	4.3	Sand and Gravel	Yes	Yes
BH14	6.0	Sand and Gravel/Gravelly Sand	Yes	Yes
DP7	2.3	Organics/gravelly sand	Yes	Yes
DP8	2.0	Organics/gravelly sand	Yes	Yes
DP9	1.8	Organics/gravelly sand	Yes	Yes

It is noted that the functioning data loggers provide sufficient information on groundwater levels and temperatures for continued assessment of potential impacts adjacent to the extraction ponds.

HYDROGRAPHS

Groundwater hydrographs produced using the levelogger data, including the multi-level monitors, are presented in Figures B-29 to B-37, and groundwater thermographs in Figures B-38 to B-46, Appendix B. For clarity, it is noted that hydrographs presenting manual monthly water level measurements at these wells are also presented in Figures B-1 to B-28. In each case, the manual water level data began earlier than the levelogger monitoring. Based on the hydrographs of the levelogger data, the following observations were noted at the monitors in 2022.

BH4

A data logger was installed at BH4 in 2011. The automated data are presented in Figure B-29. This monitor is located adjacent to Township Road No. 2, approximately 40 m south of silt pond SP3, and outside of the licenced extraction area. The 2022 water levels were within the historic range of water levels recorded at BH4 since the data logger was installed; however, the levels recorded in the fall of 2022 approached the lowest levels previously recorded from 2012. The 2022 water levels generally increased from January through May, declined from May through November and remained stable to the end of the year.

BH14

Monitor BH14 and a data logger were installed in June 2015 and, therefore, the historic database at this location is relatively limited. The automated data are presented in Figure B-30. This monitor is located in the north-central area of the property, approximately 40 m southeast of Mill Creek and about 60 m northwest of Monitor 92-12. The 2022 water levels were within the range of water levels measured at BH14 since the data logger was installed. Any post-installation aggregate extraction influence is not apparent. Water levels at BH14 generally remained stable in January, increased from February to late March, decreased to August, remained stable from August through November and increased in December.

92-12

This monitor nest is located in the north-central area of the property, about 300 m west (downgradient) of the Phase 1 pond, and approximately 60 m and 100 m southeast (upgradient) of Monitor BH14 and Mill Creek, respectively. A data logger was installed in the shallow monitor at 92-12 in 2012. It is noted that the data logger installed in the shallow monitor 92-12 was replaced in early 2022, following a data logger malfunction in 2021. In addition, well 92-12 was struck by equipment on July 21, 2022, and was subsequently repaired by a licensed well technician. As such, the logger was removed from the well from July 21 to August 9, 2022. As shown in Figure B-31, the 2022 water levels were within the range of water levels measured at 92-12 since the data logger was installed. Any post-installation aggregate extraction influence is not apparent. The 2022 water levels generally remained stable in January, increased from February to late March, decreased from April through November and increased in December, which generally match the trends observed at adjacent Monitor BH14.

92-13

This nest of monitors is located approximately 20 m west of the pond in Phase 1. The initial pressure transducer instrumentation failed in 2001, and a data logger malfunction occurred in 2012. A data logger was re-installed in the shallow monitor at 92-13 in 2013. As shown in Figure B-32, the 2022 water levels were within the historic range of water levels measured at the shallow monitor at 92-13. Given the close proximity of 92-13 to the Phase 1 and Phase 4 ponds, the groundwater levels at 92-13 are similar to the levels of these ponds, as expected. The 2022 water levels increased from January to May, decreased from May through November and increased slightly in December.

92-32

This monitor nest was installed in November 2006 and is located about 80 m northwest (downgradient) of the western limit of the Phase 3 pond, and approximately 60 m southeast (upgradient) of Mill Creek. The automated data from the well nest are presented in Figure B-36. It is noted that the data logger installed in the shallow monitor at this location (32-III) failed on November 24, 2022 and was replaced in early 2023. The following table contains a summary of the range in vertical hydraulic gradients between the intermediate and shallow monitors and the deep and intermediate monitors from 2007 to 2022.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Intermediate/ Shallow	-0.005 to 0.019	-0.008 to 0.022	0.014 to 0.053	-0.008 to 0.022	-0.019 to 0.031	-0.003 to 0.019	0.002 to 0.024	0.006 to 0.027	0.011 to 0.026	-0.001 to 0.029	0.004 to 0.025
Deep/ Intermediate	0.007 to 0.029	0.013 to 0.037	0.011 to 0.043	0.002 to 0.040	-0.003 to 0.026	0.002 to 0.035	-0.003 to 0.042	0.000 to 0.052	0.022 to 0.050	0.030 to 0.060	0.022 to 0.053

	2018	2019	2020	2021	2022
Intermediate/ Shallow	-0.013 to 0.022	0.004 to 0.028	-0.001 to 0.035	0.005 to 0.048	0.004 to 0.016
Deep/ Intermediate	0.008 to 0.041	0.000 to 0.044	-0.004 to 0.042	-0.007 to 0.068	0.012 to 0.033

Note: "-" indicates a downward gradient

In 2022, the gradient between the intermediate and shallow monitors was upward, ranging between a slightly upward gradient to a small upward gradient. Small upward gradients were observed between the deep and intermediate monitors throughout 2022. These trends are similar to the recent results. The peak vertical gradients between the intermediate and shallow monitors in 2022 were within the range of historical results, although the maximum gradient observed in 2022 was slightly lower than the maximum observed historically. The peak vertical gradients between the intermediate and deep monitors in 2022 were within the range of historical results. An aggregate extraction influence on the vertical gradient is not apparent.

The three monitors show similar responses to precipitation recharge events, although the magnitude of the response is greatest at the shallow monitor and lowest at the deep monitor. The deep probe is located in the silt till beneath the sand and above the bedrock.

It is noted that the deep monitors at 92-32 and 92-33 are set within the glacial till soils that underlie the aggregate resource. The relatively strong vertical gradients that are observed at the deep monitors are likely a reflection, at least in part, of the upward gradients present in the underlying bedrock aquifer, which result in flowing artesian conditions in monitors at some locations.

On the west side of the north property, the data loggers/leveloggers have been divided into two lines of two monitor nests. Each line is discussed below.

NORTH LINE: 92-29 AND 92-28

92-29

This monitor nest was installed in November 2006 approximately 120 m southeast (upgradient) of Mill Creek, and is within 10 m of the western limit of the Phase 3 pond. The automated data from the well nest are presented in Figure B-35. The following table contains a summary of the range in vertical hydraulic gradients between the intermediate and shallow, and the deep and intermediate monitors from 2007 to 2022.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Intermediate/ Shallow	-0.052 to 0.02	-0.118 to 0.014	-0.079 to 0.01	-0.095 to 0.052	-0.017 to 0.015	-0.087 to 0.045	-0.083 to -0.021	-0.080 to -0.019	-0.083 to -0.016	-0.083 to -0.026	-0.039 to -0.010
Deep/ Intermediate	-0.021 to 0.037	-0.009 to 0.087	-0.094 to 0.104	-0.049 to 0.052	-0.009 to 0.010	-0.059 to 0.047	-0.025 to -0.002	-0.036 to -0.001	-0.051 to -0.009	-0.035 to -0.012	-0.029 to -0.003

	2018	2019	2020	2021	2022
Intermediate/ Shallow	-0.031 to 0.018	-0.036 to 0.015	-0.031 to 0.008	-0.017 to 0.011	-0.031 to 0.014
Deep/ Intermediate	-0.019 to 0.008	-0.033 to 0.029	-0.017 to 0.014	-0.026 to 0.006	-0.020 to 0.007

Note: "-" indicates a downward gradient

In 2022, the gradient between the intermediate and shallow monitors, and between the intermediate and deep monitors, varied between a small upward gradient and a small downward gradient, which is similar to the gradients observed from 2007 to 2012 and 2018 to 2021. It is noted that positive gradients did not occur between the monitors from 2013 through 2017. The peak vertical gradients were within the historic ranges in 2022. The three monitors show similar responses to precipitation recharge events. Given that each of the three probes are located in sand and gravel within 10 m of the Phase 3 pond, small downward vertical gradients are not unexpected.

92-28

This monitor nest was installed in November 2006 and is located approximately 40 m northwest (downgradient of) 92-29, and 60 m east (upgradient) of Mill Creek. The automated data from the well nest are presented in Figure B-34. It is noted that data in the period from May 25 to July 15, 2022 are unavailable from the deep depth well at nest 92-28 due to a data logger malfunction. The following table contains a summary of the range in vertical hydraulic gradients between the intermediate and shallow monitors and the deep and intermediate monitors between 2007 and 2022.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Intermediate/ Shallow	-0.085 to 0.044	-0.080 to 0.021	-0.104 to 0.043	-0.093 to 0.026	-0.157 to 0.087	-0.252 to 0.525	-0.177 to -0.046	-0.162 to -0.031	-0.214 to 0.013	-0.044 to 0.026	-0.066 to -0.015
Deep/ Intermediate	-0.084 to 0.062	-0.017 to 0.043	-0.102 to 0.088	-0.075 to 0.101	-0.083 to 0.078	-0.538 to 0.190	-0.084 to 0.150	-0.028 to 0.011	-0.049 to 0.035	-0.068 to 0.003	-0.014 to 0.012

	2018	2019	2020	2021	2022
Intermediate/ Shallow	-0.064 to 0.009	-0.057 to 0.118	-0.098 to 0.055	-0.060 to 0.085	-0.111 to 0.036
Deep/ Intermediate	-0.017 to 0.041	-0.056 to 0.015	-0.026 to 0.025	-0.037 to 0.010	-0.024 to 0.006

Note: "-" indicates a downward gradient

In 2022, the gradient between the intermediate and shallow monitors, and between the intermediate and deep monitors, varied between a small upward gradient and a small downward gradient, which is similar to the recent results. The peak vertical gradients were within the historic ranges in 2022. The three probes are located in sandy gravel and, therefore, small gradients would be expected. The three monitors show similar responses to precipitation recharge events.

Figure 6 shows the relationship between the shallow groundwater level (water table) and precipitation events at Monitor 92-28-III in 2022. The water level responded to precipitation through most of the year.

SOUTH LINE: 92-27 AND 92-33

92-27

This monitor nest is located about 100 m east (upgradient) of Mill Creek and is adjacent to the final western limit of the Phase 3 pond. A data logger was installed in the shallow monitor at this location in December 2011. The automated data are presented in Figure B-33. It is noted that a logger malfunction occurred between April 22 and May 24, 2022. The seasonal peak water levels measured in March 2022 were similar to, but slightly lower than, the peak water levels recorded at the well location in spring 2018, 2019 and 2020, but was higher than the spring peak observed in 2021. The water levels recorded from August through December 2022 were similar to the low levels observed in the late summer/early fall of 2020 and fall of 2021. These low levels are lower than historically measured since 2011, but were similar to the pre-2011 manual water levels measured at the monitor (Figure B-23). The lower water levels are attributed to the water level decrease in the adjacent Phase 3 pond. Water levels at this location generally decreased in January, increased from February to late March, decreased to mid-August and remained stable to the end of the year.

92-33

This monitor nest is located approximately 60 m northwest (downgradient) from 92-27, and 50 m east (upgradient) of Mill Creek and was operational since 1992, but all three pressure transducers and temperature thermistors malfunctioned in July 2010. A data logger was re-installed in the shallow monitor in March 2012, and a second shallow data logger was installed in October 2017 for temperature monitoring purposes at a depth similar to the previous (i.e., pre-2012) shallow data logger. The automated data are presented in Figure B-37. In 2022, the shallow water levels at this location generally decreased in January, increased from February to March, decreased to late August, remained stable from September to mid-December and then increased to the end of the year. Similar to the trends noted above at monitor 92-27, the spring 2022 peak level was similar to, but slightly lower than, the spring peaks observed in 2018, 2019 and 2020, but was higher than the spring peak observed in 2021. The water levels recorded from August through December 2022 were similar to the low levels observed in the late summer/early fall of 2020 and fall of 2021. These low levels are lower than historically measured since the logger was re-installed in 2012, but were similar to the pre-2011 water levels at the monitor. The lower water levels recorded in 2022 are attributed to the water level decrease in the adjacent Phase 3 pond.

THERMOGRAPHS

Groundwater thermographs produced using the levelogger data, including the multi-level monitors, are presented in Figures B-38 to B-46, Appendix B. Based on these thermographs, the following observations were noted at the monitors in 2021.

BH4

A levelogger transducer was installed in BH4 in August 2011. This monitor is located approximately 40 m south of silt pond SP3, adjacent to Township Road No. 2, and outside of the licenced extraction area. As shown in Figure B-38, the seasonal groundwater temperature fluctuation observed at this location exhibits a wave-like pattern. In 2022, the maximum and minimum temperatures were similar to the peak temperatures recorded from 2011 to 2021 and within the historic range. An aggregate extraction influence is not apparent at this location. Consideration should be given to discontinuing temperature monitoring at this location as impacts from off-site aggregate extraction south of BH4 are likely occurring. The temperature decreased from 8.5°C at the beginning of January to the annual low of 5.3°C in April. The temperature then increased to the annual high of 11.1°C in October before decreasing to 8.6°C by the end of December.

The following table summarizes the temperature range in the monitor.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Shallow	9.1* to 11.4	6.3 to 11.6	5.9 to 11.5	5.3 to 11.7	5.3 to 11.1	6.1 to 11.6	5.9 to 11.3	5.8 to 11.7	5.3 to 11.2	5.5 to 11.1	5.7 to 11.3	5.3 to 11.1

Note: Temperatures are recorded in degrees Celsius
" * " indicates data logger installed in August.

BH14

Monitor BH14, and a data logger, were installed in June 2015. This monitor is located in the north-central area of the property, approximately 40 m southeast of Mill Creek and about 60 m northwest of Monitor 92-12. In 2022, the temperature decreased from 10.4°C at the start of the year to the annual low of 6.3°C in April, as shown in Figure B-39. The temperature then increased to the annual high of 11.6°C in October before decreasing to 9.7°C by the end of December. In 2022, the minimum and maximum temperatures were within the historic range recorded since 2015. The 2022 maximum temperature was slightly lower than previously observed.

The following table summarizes the temperature range in the monitor.

	2015	2016	2017	2018	2019	2020	2021	2022
Shallow	7.8* to 12.2	6.7 to 12.5	7.0 to 12.8	6.9 to 12.5	6.0 to 12.1	6.6 to 12.2	6.8 to 12.4	6.3 to 11.6

Note: Temperatures are recorded in degrees Celsius
" * " indicates data logger installed in June.

92-12

This monitor nest is located in the north-central area of the property, about 300 m west (downgradient) of the Phase 1 pond, and approximately 60 m and 100 m southeast (upgradient) of Monitor BH14 and Mill Creek, respectively. A data logger was installed in the shallow monitor at 92-12 in June 2012. It is noted that the data

logger installed in the shallow monitor 92-12 was replaced in early 2022, following a data logger malfunction in 2021. In addition, well 92-12 was struck by equipment on July 21, 2022, and was subsequently repaired by a licensed well technician. As such, the logger was removed from the well from July 21 to August 9, 2022. As shown in Figure B-40, the 2022 peak temperatures were similar to the 2012 to 2021 peaks. An aggregate extraction influence is not apparent at this location. The temperature decreased from 7.8°C at the beginning of January to the seasonal low of 3.2°C in March. Following the seasonal low recorded in March, the temperature increased to the annual high of 17.4°C in August before decreasing to 10.5°C by the end of December.

The following table summarizes the temperature range in the monitor.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Shallow	7.7* to 18.8	3.8 to 17.0	2.8 to 17.9	3.2 to 18.3	4.7 to 16.2	4.3 to 14.5	2.5 to 17.5	3.2 to 15.7	2.9 to 16.1	3.3 to 17.6	3.2 to 17.4

Note: Temperatures are recorded in degrees Celsius
" * " indicates data logger installed in June.

92-13

This monitor nest is located approximately 20 m to the west (downgradient) of the pond in Phase 1. Given the close proximity of the monitor to the pond, this monitor provides data with respect to the thermal effects resulting from the presence of the pond, wash water pumping, and silt pond water recirculation. It is noted that this monitor will eventually be removed during the extraction in Phase 5.

The groundwater temperature fluctuations at this location (Figure B-41) resemble a wave-like pattern, similar to the ambient air temperature. The air temperature exhibits a generally consistent pattern that sees annual winter lows in January/February, increasing to annual highs in the summer (July/August) and then decreasing through the fall back to the winter season. The natural pre-extraction groundwater temperatures show a reasonably similar pattern, with annual lows of 5.7°C to 8.5°C that occur in late spring/early summer, increasing to annual highs of 9.0°C to 10.7°C in the fall, followed by a progressive decrease through the fall and into the winter. The historical data illustrate the pre-extraction (1992 to 1994) natural seasonal variation at the shallow monitor at nest 92-13, followed by the thermal modifications resulting from the progressive development of the Phase 1 pond. In 2022, the temperature at 92-13 decreased from 13.4°C at the beginning of January, to the annual low of 5.4°C in June. The temperature then increased to the annual high of 15.2°C in December.

The following table summarizes the temperature ranges observed at each of the three monitor elevations since installation.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Shallow	5.7 to 19.1	2.1 to 20.5	1.1 to 18.9	1.1 to 19.9	1.9 to 14.9	2.5 to 13.5	2.7 to 14.1	6.9 to 16.3	3.3 to 18.1	2.7 to 18.9
Intermediate	7.4 to 16.8	4.2 to 18.6	3.6 to 17.0	2.6 to 17.6	4.4 to 14.2	4.0 to 12.6	3.8 to 13.6	6.4 to 15.0	4.4 to 16.8	3.0 to 17.8
Deep	8.2 to 14.1	5.8 to 16.3	5.5 to 15.3	3.7 to 15.9	6.2 to 14.3	5.3 to 11.4	4.7 to 12.4	6.4 to 12.6	5.1 to 14.7	4.1 to 15.7

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Shallow	2.3 to 20.5	5.7 to 20.1	2.7 to 20.7	5.9 to 21.7	2.9 to 21.3	8.9 to 17.7	2.9 to 22.6	N/A	3.4 to 19.0	2.4 to 20.9
Intermediate	3.2 to 17.8	5.2 to 17.6	3.2 to 16.8	5.8 to 19.0	4.4 to 18.6	7.4 to 18.8	5.0 to 16.2	N/A	N/A	N/A
Deep	4.1 to 15.3	4.7 to 14.7	2.3 to 13.6	N/A	N/A	N/A	7.9 to 15.3	N/A	N/A	N/A

	2015	2016	2017	2018	2019	2020	2021	2022
Shallow	2.3 to 21.3	3.5 to 21.9	2.8 to 20.6	4.5 to 17.5	5.6 to 15.8	4.4 to 15.7	6.1 to 15.0	5.4 to 15.2
Intermediate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Deep	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: Temperatures are recorded in degrees Celsius
"N/A" indicates temperatures not available due to data logger failure
From May 2013 onward, only a shallow data logger was present.

92-32

This monitor nest was installed in November 2006 and is located approximately 60 m southeast (upgradient) of Mill Creek and approximately 90 m downgradient of the western limit of the Phase 3 pond. It is noted that the data logger installed in shallow monitor at this location (32-III) failed on November 24, 2022, and was replaced in early 2023. As shown in Figure B-45, the seasonal groundwater temperature fluctuations observed at the shallow monitor at this location (32-III) exhibit a wave-like pattern, with the annual low in late winter/spring and highs in the late summer/fall. The shallow monitor historically responds to thermal increases and decreases a couple of months prior to the intermediate monitor and a few months earlier than the deep monitor. In recent years, however, the lag has increased. The apparent seasonal changes in groundwater temperature in the intermediate and deep monitors are very small relative to the shallow monitor and to monitors at other locations. This is likely due to the greater depth at which these two lower monitors are installed, compared to other intermediate and deep probes, and/or the finer-grained materials in which the monitors are installed (silty fine sand and silt till, respectively). A slight increasing trend in groundwater temperatures at the intermediate and deep monitors was apparent in 2013 and temperatures have since fluctuated at this higher level.

Shallow Monitor – The temperature decreased from 6.8ºC at the start of the year to the annual low of 2.6ºC in March, then increased to the annual high of 13.4ºC in September. From September to November 24, the shallow groundwater temperature decreased steadily to 9.7ºC.

Intermediate Monitor – The temperature increased from 9.0ºC at the start of the year to 9.1ºC, which was observed from late January through late March, decreased to the annual low of 8.8ºC observed from July through August, and increased to the annual high of 9.2ºC by the end of the year.

Deep Monitor – The temperature at this monitor remained steady between 8.9ºC and 9.0ºC during 2022.

The following table contains a summary of the temperature ranges at each of the three monitors. The peak minimum and maximum temperatures in the shallow, intermediate and deep monitors in 2022 were similar to the historic ranges.

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Shallow	4.0 to 12.2	3.5 to 13.6	3.6 to 13.3	3.3 to 15.3	5.6 to 14.0	6.1 to 15.2	5.3 to 15.1	5.0 to 13.6	4.6 to 14.9
Intermediate	8.2 to 8.6	8.2 to 8.6	8.2 to 8.6	8.3 to 9.1	8.1 to 9.2	8.5 to 9.1	8.7 to 9.5	8.7 to 9.5	8.6 to 9.3
Deep	8.1 to 8.2	8.1 to 8.3	8.1 to 8.3	8.1 to 8.3	8.1 to 8.7	8.2 to 8.6	8.3 to 8.9	8.4 to 8.9	8.3 to 8.7

	2016	2017	2018	2019	2020	2021	2022
Shallow	3.5 to 15.7	3.5 to 14.8	4.3 to 15.1	3.0 to 13.9	2.8 to 13.5	2.8 to 14.0	2.6 to 13.4
Intermediate	8.8 to 9.1	9.0 to 9.6	9.4 to 9.8	9.1 to 9.5	8.9 to 9.4	8.8 to 9.2	8.8 to 9.2
Deep	8.4 to 8.6	8.6 to 9.0	8.9 to 9.1	8.8 to 9.0*	8.9** to 9.1	8.8 to 9.1	8.9 to 9.0

Note: Temperatures are recorded in degrees Celsius.
* 2019 range excludes data from August 1 onward
** 2020 range excludes data from January 1 to March 12

On the west side of the north property, the data loggers have been divided into two lines of two monitor nests. Each line is discussed below.

NORTH LINE: 92-29 AND 92-28

92-29

This monitor nest was installed in November 2006 and is located within 10 m of the limit of extraction of the Phase 3 pond (completed in 2012), and approximately 120 m southeast of Mill Creek. As shown in Figure 10, historically, the seasonal groundwater temperature fluctuations observed at each of the three monitors at this location exhibited a wave-like pattern, with the annual low typically in late winter/spring and highs typically in the late summer/fall. The shallow monitor (29-III) typically responded to thermal increases and decreases a couple of months prior to the intermediate monitor and a few months earlier than the deep monitor. The temperatures recorded from 2012 to 2022, however, do not follow the general patterns observed at this location prior to 2012, and now reflect the monitor's location adjacent to the western limit of the Phase 3 pond. The groundwater temperatures at the shallow and intermediate monitors generally mirrored each other throughout 2022, and much greater fluctuations occurred at each monitor from 2012 to 2022 compared to previous years. The thermal increases at the deep monitor lagged behind the other two monitors by a couple months, as typically occurs, but from 2014 to 2016, peak high temperatures at the deep monitor were greater than in previous years. The peak high temperatures since 2016, however, were lower than 2014 to 2016. The annual peak low temperatures observed at the deep monitor since 2017 have returned to a temperature similar to pre-2014 levels. These changes in temperature trends at this monitor are attributed to the excavation of the Phase 3 pond to within 10 m of the monitor nest.

Shallow Monitor – The temperature decreased from 5.1°C at the beginning of the year to the annual low of 0.5°C in March. The temperature then increased to the annual high of 22.7°C in August before decreasing to 6.0°C by the end of the year.

Intermediate Monitor – The temperature decreased from 7.2°C at the beginning of the year to the annual low of 2.6°C in March. The temperature then increased to the annual high of 22.9°C in July/August before decreasing to 8.4°C by the end of the year.

Deep Monitor – The temperature declined from 12.4°C at the beginning of the year to the annual low of 8.0°C in May. The groundwater temperature then increased to the annual high of 15.4°C in September, and decreased to 13.5°C by the end of the year.

The following table contains a summary of the temperature ranges at each of the three monitors.

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Shallow	4.1 to 15.0	3.3 to 15.1	4.0 to 14.9	3.2 to 15.9	4.0 to 15.3	2.2 to 24.7	0.7 to 26.3	-0.2 to 23.9	-0.4 to 24.9
Intermediate	7.0 to 11.5	6.1 to 11.7	6.4 to 11.1	6.6 to 11.9	6.6 to 11.3	2.1 to 24.6	1.4 to 26.7	1.5 to 24.0	1.6 to 24.6
Deep	8.0 to 10.1	7.9 to 10.0	7.8 to 10.0	7.9 to 10.3	7.8 to 10.3	8.3 to 16.6	5.7 to 17.3	3.9 to 18.1	3.5 to 17.8

	2016	2017	2018	2019	2020	2021	2022
Shallow	-0.2 to 25.8	0.4 to 22.8	0.0 to 24.3	0.3 to 23.7	0.4 to 23.6	0.5 to 22.2	0.5 to 22.7
Intermediate	1.8 to 25.8	1.2 to 22.5	1.1 to 23.7	2.1 to 23.5	2.4 to 22.8	2.8 to 21.7	2.6 to 22.9
Deep	6.1 to 21.3	6.2 to 15.7	7.5 to 14.7	7.7 to 15.1	7.9 to 13.9	8.5 to 13.3	8.0 to 15.4

Note: Temperatures are recorded in degrees Celsius.

Figure 11 shows the relationship between the air temperature and the groundwater temperature at the three elevations in the aquifer throughout 2022. As expected, the groundwater continues to respond proportionately to seasonal air temperature changes, but it is also influenced by the water temperature in the adjacent Phase 3 pond.

92-28

This monitor nest was installed in November 2006 and is located approximately 40 m downgradient of 92-29 (which itself is within 10 m from the western limit of the Phase 3 pond), and 60 m east (upgradient) of Mill Creek. As shown in Figure B-43, the seasonal groundwater temperature fluctuations observed at each of the three monitors at this location through 2022 continue to exhibit a wave-like pattern similar to historical values, with the annual low in late winter/spring and highs in the late summer/fall. The magnitude and general timing of the seasonal temperature changes in the three monitors at this location are reasonably similar to each other, as each of the three monitors are relatively shallow (within 4 m of ground surface). Beginning in 2012, the winter low temperatures were 1 to 2°C higher than the pre-2012 results. The winter low temperatures in 2019 were lower than in 2018, and were similar to the pre-2012 results; however, the winter low temperatures in 2020, 2021 and 2022 were slightly higher than observed in 2019. The summer/fall high temperatures at the shallow monitor also continue to be slightly lower than

prior to 2012. The recent (2012 to 2022) data trends suggest that the presence of the Phase 3 pond in the northwest corner of the extraction area may have a subtle influence on groundwater temperatures at the 92-28 nest, which is located approximately 50 m downgradient from the pond, and approximately 60 m upgradient from Mill Creek. Influences to date at this location are considered minor.

Shallow Monitor – The temperature declined from 7.8°C at the beginning of the year to the annual low of 4.8°C in March. Temperatures then increased to the annual high of 13.5°C in September. It is noted that the annual high observed at the shallow monitor at 92-29 in 2022 was 9.2°C higher than the high at 92-28, which demonstrates the considerable thermal plume dissipation that occurs over the 40 m distance between the two monitors. From September to the end of the year, the shallow groundwater temperature decreased to 8.1°C.

Intermediate Monitor – The temperature decreased from 8.7°C at the beginning of the year to the annual low of 5.4°C in March. Temperatures then increased to the annual high of 13.1°C in September. From September to the end of the year, the intermediate groundwater temperature decreased to 9.4°C.

Deep Monitor – The temperature declined from 8.9°C at the beginning of the year to the annual low of 5.4°C in March. The groundwater temperature then increased to the annual high of 13.1°C in September. From September to the end of the year, the deep groundwater temperature decreased to 9.8°C.

The following table contains a summary of the temperature ranges at each of the three monitors.

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Shallow	3.8 to 14.1	3.6 to 14.7	3.6 to 14.9	3.5 to 15.5	3.5 to 14.5	4.9 to 14.1	5.3 to 14.1	5.4 to 13.6	5.6 to 13.3
Intermediate	4.3 to 13.4	3.8 to 14.2	3.9 to 14.1	3.8 to 14.6	4.0 to 14.3	5.1 to 13.9	5.5 to 13.9	5.8 to 13.4	6.2 to 12.9
Deep	5.1 to 12.5	4.6 to 13.0	4.9 to 12.7	4.6 to 13.4	4.6 to 13.2	5.7 to 12.6	6.4 to 12.5	6.8 to 12.2	6.4 to 12.1

	2016	2017	2018	2019	2020	2021	2022
Shallow	5.4 to 14.3	6.0 to 14.0	5.1 to 14.3	4.0 to 13.7	4.8 to 13.9	4.9 to 14.0	4.8 to 13.5
Intermediate	5.8 to 14.2	6.3 to 13.8	5.7 to 13.9	4.8 to 13.5	5.3 to 13.6	5.3 to 13.8	5.4 to 13.1
Deep	6.3 to 13.7	6.7 to 13.0	5.7 to 13.1	4.8 to 12.6	5.4 to 12.6	5.3 to 13.0	5.4 to 13.1

Note: Temperatures are recorded in degrees Celsius.

SOUTH LINE: 92-27 AND 92-33

92-27

This monitor nest is located about 100 m east (upgradient) of Mill Creek and is adjacent to the western limit of the Phase 3 extraction. A data logger was installed in the shallow monitor at this location in December 2011, and a

thermograph for the monitor is presented in Figure B-42. It is noted that the data logger malfunctioned between April 22 and May 24, 2022. The temperature in 2022 decreased from 9.9ºC at the beginning of the year to the annual low of 3.5ºC in April. The temperature then increased to the annual high of 19.2ºC in September before decreasing to 8.8ºC by the end of the year.

The following table contains a summary of the annual temperature range at this monitor location from 2012 to 2022. The peak minimum and maximum temperatures in 2022 were similar to the peaks recorded since 2019. The peak minimum and maximum temperatures recorded at 92-27 since 2017 have been higher and lower, respectively, compared to the pre-2017 results. Prior to 2017, the temperature pattern at 92-27 was similar to the pattern observed at 92-29, which indicated a similar pond influence at the two monitors. This similar pond influence is expected given the comparable separation distances between the monitors and the Phase 3 pond. The muted amplitude of annual temperature fluctuations observed at 92-27 since 2017 is attributed to the decrease in groundwater level observed at the monitor. Higher water levels recorded between 2013 and 2017 were typically near the ground surface, or higher than the ground surface, in the spring, which would have allowed for a greater influence from air temperatures. The decrease in groundwater levels at 92-27 since 2017, which is attributed to the water level decrease in the Phase 3 pond, has resulted in increased insulation of the groundwater at 92-27 from air temperature effects.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Shallow	3.9 to 20.2	1.7 to 22.2	0.6 to 21.8	-0.5 to 20.0	1.0 to 23.0	4.6 to 16.4	4.0 to 17.1	2.8 to 18.7	2.8 to 17.5	3.6 to 17.4	3.5 to 19.2

Note: Temperatures are recorded in degrees Celsius.

92-33

This monitor nest is located 50 m east (upgradient) of Mill Creek and was operational since 1992. All three thermistors malfunctioned in July 2010. A data logger was re-installed in the shallow monitor in March 2012. The monitor is located within approximately 70 m of the western edge of the Phase 3 pond. A second shallow data logger, denoted 'Shallow (A)' on Figure B-46, was installed in October 2017 for temperature monitoring purposes at a depth similar to the previous (i.e., pre-2012) shallow data logger. The 'Shallow (A)' data logger is installed about 4.7 m higher than the existing shallow data logger. Rather than the typical fluctuations of 2ºC to 3ºC, the temperature in 2018 at the existing shallow logger fluctuated throughout the year between 10.3ºC and 10.5ºC. Although these temperatures were within the typical range at this monitor, the muted amplitude of the thermograph was unexpected. The data logger depth remained unchanged in 2018 compared to previous years, so the decrease in amplitude was not due to an increased data logger depth. An additional data logger, denoted 'Shallow – DUP' on Figure B-46, was installed in March 2019 at the same depth as the existing shallow logger to confirm whether the temperature sensor on the existing logger is functioning properly. The 2019 and 2020 'Shallow – DUP' temperature results confirm that the existing shallow logger temperature sensor is functioning properly. In 2019, the temperature at the existing shallow logger remained stable and consistent with the temperatures recorded in late 2017 and 2018 (approximately 10.2ºC) until June, when the temperature decreased slowly to a low of 9.5ºC in September. From the low in September 2019 to May 2020, the temperature increased to 10.8ºC. Between May and September 2020, the temperature decreased to 10.0ºC and then fluctuated until the end of the year. In 2021, the annual low temperature was 9.8ºC in March/April. The temperature then increased to the annual high of 10.7ºC in the fall before decreasing to 10.6ºC by the end of the year. In 2022, the temperature fluctuated between a minimum of 10.0ºC in September and a maximum of 10.6ºC, which occurred at the beginning of January and again in June.

The temperature profile of the 'Shallow (A)' data logger, which is installed at a similar depth to the previous shallow data logger (pre-2011), showed a similar pattern in 2022 compared to the pre-2011 data logger temperature data. The temperature in 2022 decreased from 8.6°C at the beginning of the year to the annual low of 6.0°C in March, and then increased to the annual high of 11.8°C in September, and decreased to 8.0°C by the end of the year.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Shallow	4.3 to 11.9	3.5 to 11.7	3.9 to 11.5	4.5 to 12.3	5.1 to 12.9	5.9 to 13.3	4.7 to 12.7	5.3 to 13.7	5.1 to 12.7	4.9 to 12.9
Intermediate	7.3 to 8.4	7.5 to 8.4	7.5 to 8.6	7.5 to 8.8	8.0 to 9.8	8.1 to 9.6	8.3 to 9.8	8.6 to 10.6	8.3 to 9.6	8.3 to 10.2
Deep	8.1 to 9.1	8.1 to 8.3	8.1 to 9.3	8.3 to 8.7	8.5 to 9.1	8.9 to 9.9	9.1 to 10.1	9.5 to 11.9	8.6 to 9.6	9.4 to 10.6

	2005	2006	2007	2008	2009	2010*	2011	2012**	2013	2014
Shallow	4.7 to 13.9	5.3 to 13.7	5.7 to 13.3	5.1 to 13.3	5.1 to 14.1	5.3 to 13.1	N/A	8.4 to 9.8	8.2 to 10.9	7.5 to 11.0
Intermediate	8.1 to 10.6	8.6 to 10.4	8.6 to 10.4	8.6 to 10.6	8.8 to 10.6	8.6 to 10.8	N/A			
Deep	9.4 to 11.0	9.4 to 11.2	9.4 to 11.4	9.2 to 10.6	8.8 to 10.6	8.6 to 10.2	N/A			

	2015	2016	2017	2018	2019	2020	2021	2022
Shallow	8.2 to 10.5	8.9 to 12.0	10.3 to 12.4	10.3 to 10.5	9.5 to 10.2	10.0 to 10.9	9.8 to 10.7	10.0 to 10.6
Shallow (A)†			8.0*** to 12.1	6.3 to 13.5	5.8 to 11.2	7.3 to 12.4	5.0 to 13.6	6.0 to 11.8
Intermediate								
Deep								

Note: Temperatures are recorded in degrees Celsius.
"*" indicates January to July only.
"**" indicates March to December only.
"***" indicates October to December only.
"N/A" indicates temperatures not available due to data logger failure.
Blank indicates data logger not installed.
† ' Shallow (A)' logger is installed 4.7 m shallower than 'Shallow' logger

3.6 WETLAND WATER LEVELS

The drive point monitors that are located in the wetland are noted in Table 1. Monitors DP6 to DP12 are located in the large wetland area in the north-central part of the property. DP16 is located in the wetland along the western side of the property.

Monitoring of wetland drive points on the Reid Heritage property adjacent to Mill Creek north of Highway 401 commenced in August 2000, and those monitors were incorporated into the routine monitoring program. These drive points were removed by others with the exception of DP113, located immediately north of Hwy 401. Results for this monitor are discussed later in this section.

The water level data from the previous five years (2018 to 2022) for the wetland drive points are documented in Table B-3, Appendix B. Groundwater hydrographs presenting the full dataset of historic results for the wetland drive points are presented in Figures B-49 to B-58, B-60, B-62, and B-64, Appendix B. In Table B-7, Appendix B, a summary of wetland water level data from the previous five years (2018 to 2022) is provided. A groundwater hydrograph presenting the full dataset of historic results of three representative drive points in the wetland is presented in Figure 12. As shown in the hydrograph, of the three representative drive points, the groundwater elevation at DP7 is typically highest, and the lowest elevations occur at DP11. This is expected, as DP7 is located furthest upgradient from Mill Creek and DP11 is closest, and groundwater flow at the site is toward Mill Creek.

Historically, the groundwater levels within the wetland remained reasonably close to ground surface throughout the year. The water levels are typically nearest to ground surface, and in some instances, they are above ground surface, mostly during the spring melt. The groundwater levels then show a progressive decline to their maximum depth below ground surface during the summer to early fall months. The fluctuation between the spring high water levels to the summer low water levels usually ranges from 0.1 m to 1.0 m, depending on the location.

In 2022, the following groundwater elevation trends were observed in the wetland monitors, based on the monthly monitoring results.

- In 2022, water levels in the wetland drive points followed the typical seasonal fluctuation of increasing water levels during the winter/spring and decreasing through the summer and into early fall.
- The highest water levels in 2022 were typically recorded during April. The lowest water levels were typically recorded in November.
- Based on manually measured groundwater levels, the overall seasonal variation in the elevation of the water table in the wetland in 2022 (seasonal high to low), ranged from 0.33 in DP10, located near Mill Creek, to 0.71 m at DP9, located adjacent to the Phase 3 Pond.
- In 2022, based on manually measured groundwater levels, the average depth of the water table below ground surface within the wetland monitors ranged from 0.1 m above ground surface at DP16, located on the west side of the property, to 1.0 m below ground surface at DP10, adjacent to Mill Creek. The maximum depth of the water table recorded in 2022 was 1.2 m below ground surface at DP10 in February and at DP12 in April, and the minimum depth of the water table recorded was 0.4 m above ground surface, recorded at DP16 in September.

A cross-section through the wetland showing the groundwater profiles for both the high and low water table conditions is presented in Figure 13. The location of the section is shown on the Site Plan, Figure 2.

The groundwater level recorded within the wetland areas in 2022 averaged about 0.12 m below the historical average, and about 0.06 m below the 2021 average for the site. The lower levels compared to 2021 are attributed to the lower water surplus that occurred at the site in 2022 compared to historic results. The decrease in water levels within the wetland areas generally is less than the decrease experienced at other locations across the site. This is primarily due to the proximity of the wetland areas to Mill Creek, which acts as a buffer, or hinge point, for the water table that reduces the magnitude of seasonal variations. The wetland groundwater levels recorded in 2022 were within the historical maximum and minimum groundwater levels. An aggregate extraction influence is not apparent.

Daily readings of piezometric pressure and water temperature were collected at drive points DP7, DP8, and DP9 in the north-central part of the property, and at drive point DP16 at the western side of the property. The groundwater in the shallower drive points DP9 and DP16 typically responds to thermal increases and decreases a few months prior to the deeper screened drive points DP7 and DP8. The automated temperature data from the wetland drive points (DP7, DP8, DP9 and DP16) are presented in Figures B-59, B-61, B-63 and B-65, respectively. It is noted that data from January 15 to February 4, March 18 to April 7 and April 22 to May 12 are unavailable from drive point DP9 due to a data logger issue. In addition, the data from October 20 to November 25, 2022 are unavailable from drive point DP16 due to a data logger issue.

DP7 – The temperature decreased from 11.1°C at the beginning of the year to the annual low of 8.7°C in May. The temperature then increased to the annual high of 11.5°C in November, and decreased to 11.0°C by the end of the year.

DP8 – The groundwater temperature decreased from 9.5°C at the beginning of the year to the annual low of 7.7°C in April/May, then increased to the annual high of 10.7°C in November before decreasing to 9.7°C by the end of the year.

DP9 – The temperature decreased from 6.0°C at the beginning of the year to the annual low of 3.7°C in March, then increased to the annual high of 12.3°C in September. The temperature decreased to 7.2°C by the end of the year.

DP16 – The temperature decreased from 5.7°C at the beginning of the year to the annual low of 3.1°C in March. The temperature then increased to the annual high of 15.0°C in August, then decreased to 6.4°C by the end of the year.

The following table contains a summary of the temperature range in the drive points from August 2011 to 2022. The annual minimum and maximum temperatures recorded at the drive points in 2022 were within the ranges recorded since the data loggers were installed in 2011/2012, with the exception of drive point DP9. The maximum temperature recorded at DP9 in September (12.3°C) was the lowest maximum temperature recorded to date (by 0.2°C), as shown in Figure B-63. An aggregate extraction influence is not apparent.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
DP7	10.3 to 12.6	8.5 to 12.8	9.4 to 12.5	8.6 to 11.4	8.1 to 10.9	8.5 to 11.6	9.6 to 12.2	8.1 to 11.9	7.9 to 11.7	8.1 to 12.5	8.9 to 12.4	8.7 to 11.5
DP8	N/A	7.8* to 10.3*	7.8 to 10.3	7.6 to 9.4	7.4 to 10.2	7.8 to 10.3	7.8 to 10.1	7.2 to 10.5	7.6 to 10.5	7.5 to 10.7	7.9 to 10.7	7.7 to 10.7
DP9	6.9 to 13.3	4.5 to 13.3	4.3 to 12.9	4.1 to 13.2	3.7 to 13.0	4.5 to 13.0	4.0 to 12.5	3.5 to 13.2	2.9 to 12.9	3.7 to 13.1	3.3 to 13.3	3.7 to 12.3
DP16	N/A	8.6** to 18.3**	2.7 to 17.1	1.3 to 17.1	2.3 to 17.6	6.4 to 16.9	6.1 to 14.8	4.6 to 16.3	3.6 to 15.4	4.6 to 15.4	3.5 to 15.5	3.1 to 15.0

Note: Temperatures are recorded in degrees Celsius.
"N/A" indicates data logger not installed.
* 2012 DP8 data include only April to December
** 2012 DP16 data include only June to December.

Based on the data from the data logger transducers at DP7, DP8, DP9, and DP16, the groundwater level in the wetland generally decreased in January, increased from mid-February through late March, decreased to October and

increased in December. The water levels at DP7 (Figure B-58) and DP8 (Figure B-60) were similar to the levels recorded prior to 2018, which are slightly lower than the 2018 to 2020 levels. The higher water levels recorded at DP7 and DP8 between 2018 and 2020 are attributed to the higher seasonal water levels observed in the Phase 4 pond during the same period, as shown on Figure B-68. The higher water levels in the Phase 4 pond indicate that the silt barrier is functioning as designed. The decrease in water level observed at DP7 and DP8 since 2020 correlates with the decrease in water level observed at the Phase 4 pond, which is partially attributed to dry climatic conditions since 2020. The water levels at DP9 (Figure B-62) have been relatively stable over the long term, although the fall 2022 levels reached lows not previously observed since 2012. The low levels observed at DP9 in the fall of 2022 are attributed to dry climatic conditions. An aggregate extraction influence at DP9 is not apparent.

It is noted that, similar to the water levels at Monitor 92-32, located about 140 m north of DP16, the water levels at DP16 showed an overall downward trend from 2014 to 2020. The declining water levels at DP16 are attributed to the declining seasonal water levels observed in the Phase 3 pond during the same period, as shown on Figure B-68. The higher water levels in the Phase 4 pond relative to the lower water levels in the Phase 3 pond indicate that the silt barrier is functioning as designed. In 2021 and 2022, the water levels at DP16 and the Phase 3 pond remained similar to the levels measured in 2020, indicating that impacts from the silt barrier have stabilized.

3.7 MILL CREEK DRIVE POINTS

The drive point monitors that are installed in the creek bed are listed in Table 1. The drive point locations are shown on Figure 2. The drive point monitors are used to provide groundwater and surface water temperature data. As well, the drive points provide a measure of the hydraulic head within the groundwater system beneath the creek, as well as providing a surface water level in the creek. These data are used to calculate the magnitude and direction (i.e., upward or downward) of the vertical hydraulic gradient at the creek.

Drive points DP18 to DP20 are located north of Highway 401, upstream from the property. Drive points DP3, DP4, DP17/R, DP21, and DP22 are located in the northeast section of the creek, from south of the Hanlon interchange upstream to Highway 401. Drive points DP1 and DP2 are located in the northwest section of the creek, downstream from the Galt Creek and Pond Creek tributaries, and DP5CR (formerly DP5A then DP5B then DP5C) is located just beyond the southwest corner of the site, where Mill Creek flows beneath the bridge at Concession Road 2.

The previous 5 years of water level data for the creek drive points are presented in Table B-5, and groundwater/ surface water hydrographs presenting the full historic dataset for the creek drive points are presented in Figures B-70 to B-100, Appendix B. Additionally, the previous 5 years of water level data for the original surface water monitoring stations SW1 and SW2 are presented in Table B-4, and full historic hydrographs are provided in Figures B-66 and B-67, respectively. A summary of the previous five years of creek drive point data, including temperature, vertical hydraulic gradients, and calculated discharge fluxes for each monitor, is presented in Table B-5. Thermographs of the groundwater and surface water temperatures at each drive point are presented in Figures B-71 to B-104, Appendix B.

The hydrographs for the drive point monitors show the seasonal changes in elevation of the groundwater at each monitor, together with the surface water elevation data for the creek. The yearly average vertical hydraulic gradients for the in-stream drive points, starting at the downstream location DP5A/B/C/CR and moving upgradient to DP18, from 2022 back to 2005, and historically from the start of data collection (1988 to 1993) up to 2005, are shown below.

Average Vertical Hydraulic Gradient

DRIVE POINT	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
DP5A/B/C/CR	0.68	0.66	0.55	0.52*	0.54	0.47	0.18	0.21	0.28	0.18
DP2	0.24	0.25	0.24	0.25	0.26	0.25	0.33	0.34	0.29	0.33
DP1	0.28	0.23	0.20	0.25	0.27	0.25	0.33	0.33	0.37	0.37
DP3	0.06	0.06	0.05	0.04	0.07	0.04	0.06	0.05	0.05	0.05
DP17/R	0.04	0.04	0.06	0.05	0.07	0.06	0.04	0.05	0.03	0.03
DP22	0.04	0.04	0.06	0.07	0.07	0.08	0.05	0.05	0.08	0.05
DP4/R	0.03	0.02	0.06	0.13	0.13	0.16	0.10	0.14	0.17	0.11
DP21	0.08	0.07	0.12	0.08	0.06	0.11	0.03	0.06	0.08	0.07
DP20	-0.07	0.08	0.11	0.13	0.08	0.14	0.10	0.12	0.12	0.14
DP19	-0.20	0.03	0.06	0.05	0.02	0.01	-0.03	-0.01	0.06	0.03
DP18	-0.09	0.15	0.10	0.10	0.06	0.12	0.08	0.11	0.09	0.10

DRIVE POINT	2012	2011	2010	2009	2008	2007	2006	2005	HISTORIC AVERAGE (UP TO 2005)
DP5A/B/C/CR	0.40	0.19	0.18	0.12	0.12	0.09	0.09	0.11	0.09
DP2	0.32	0.30	0.30	0.24	0.22	0.22	0.21	0.14	0.17
DP1	0.30	0.31	0.27	0.21	0.22	0.19	0.21	0.23	0.22
DP3	0.06	0.06	0.07	0.06	0.06	0.06	0.06	0.05	0.04
DP17/R	0.03	0.04	0.06	0.05	0.06	0.04	0.04	0.04	0.02
DP22	0.04	0.06	0.06	0.09	0.09	0.06	0.07	0.06	0.03
DP4/R	0.08	0.12	0.15	0.22	0.20	0.12	0.12	0.09	0.04
DP21	0.05	0.09	0.10	0.14	0.16	0.11	0.11	0.08	0.06
DP20	0.08	0.10	0.11	0.19	0.15	0.14	0.14	0.12	0.00
DP19	0.00	0.04	0.04	0.12	0.09	0.04	0.05	0.07	-0.06
DP18	0.07	0.08	0.07	0.13	0.12	0.06	0.07	0.08	0.03

NOTES:

1) (-) = downward vertical gradient
2) Because of several drive point replacements due to vandalism, DP5 data from 2012 onward are interpreted with caution.
3) * Due to the presence of a beaver dam downstream of DP5CR, DP5CR data for 2019 are interpreted with caution.

The following patterns and trends were observed in 2022.

— Based on the average condition through 2022, upward gradients between the groundwater and the creek occurred from where Mill Creek crosses highway 401 (DP21) downstream to DP5CR. Groundwater discharge continues to provide base flow to these reaches of Mill Creek.

- As shown in the preceding table, the magnitude of the average vertical hydraulic gradient is variable from DP21 downstream to DP5A/B/C/CR, with the strongest upward gradients being observed at DP1, DP2, and DP5A/B/C/CR, and the weakest upward gradients in the creek between DP4/R, DP22 and DP17/R.
- Based on the average condition through 2022, downward gradients between the groundwater and the creek occurred at the drivepoints located north of Highway 401 (DP18, DP19 and DP20).
- Between 1998 and 2005, downward vertical gradients persisted in the reach north of Highway 401, from DP18 down to about DP20, for much of each year. From 2005 to June 2022, the vertical gradients at these drive points remained upward, with the exception of neutral and downward vertical gradient conditions on average over the course of the year at DP19 in 2012 and in 2015 and 2016, respectively (varied between downward and upward gradient conditions). Beginning in July 2022, strong upward gradients were consistently observed within the reach north of Highway 401, which is caused by a notable decrease in groundwater level recorded at the drive point locations. The cause of the sudden change in gradient is not apparent; however, it is interpreted to be related to upgradient activities.
- In 2022, the average vertical hydraulic gradients were higher than the 2021 values at DP1, DP4/R, DP5CR and DP21; equal to the 2021 values at DP3, DP17/R and DP22; and lower than the 2021 values at the remaining in-stream drive points. The difference between the 2022 average and the 2021 average at the locations north of Highway 401 was -0.24 m, -0.23 m and -0.15 m at DP18, DP19 and DP20, respectively. The difference between the 2022 average and the 2021 average at the remaining locations ranged between -0.01 at DP2 and 0.05 at DP1. The 2022 average vertical hydraulic gradients at the creek drive points were generally higher than the pre-2005 averages, with the exceptions of the locations north of Highway 401. This overall increase in hydraulic gradients likely reflects a buffering effect due to the presence of the Phase 1, Phase 3, and Phase 4 ponds, and translates into a proportional increase in the groundwater discharge to Mill Creek. This is discussed in further detail later in this section.
- Generally, the seasonal fluctuation of the surface water elevation in Mill Creek at the drive point monitors was similar to the variation of the groundwater elevation in 2022. Historically, greater seasonal groundwater fluctuations have been observed compared to surface water fluctuations.

The drive point hydrographs typically show clear seasonal patterns consisting of:

- A rise early in the year due to snowmelt and other groundwater discharge;
- A decline through the summer months;
- An increase in the late fall; and
- A gradual decline through the winter when the precipitation is generally bound up in the snow pack.

In 2022, the groundwater levels increased in January/February, fluctuated with an overall decrease until July and then fluctuated through the end of the year. The pattern was consistent with precipitation data and Phase 1, 2, 3 and 4 pond levels, which show that February was a wet month and the remaining months were similar to, or drier than, normal conditions. Frozen conditions in groundwater were encountered at most creek drive points in January and February. The groundwater levels were within the historical ranges at each creek drive point in 2022, with the exceptions of DP18, DP19 and DP20. As previously mentioned, the groundwater levels at DP18, DP19 and DP20 decreased appreciably in July 2022 and remained lower than normal through the end of the year.

The surface water levels at the creek drive points typically increased in February, decreased through July and fluctuated to the end of the year. Frozen conditions in surface water were encountered at DP2, DP5CR and DP20 in February. Surface water levels at the creek drive points were within their historic ranges in 2022. It is noted that, owing to various reasons over the years, such as access issues and vandalism, the DP5 drive point has had to be re-

installed a number of times in several different locations in this reach of Mill Creek. These different locations have had different stream bed elevations and hydrogeological properties, resulting in varying groundwater and surface water elevations being reported over time, as observed on Figure B-82. The data should be interpreted with caution.

THERMOGRAPHS

The in-creek drive point monitors are also used to provide a measure of the temperature of the groundwater discharge and the surface water at each location. As presented in the thermographs, Figures B-71 to B-101, the groundwater and surface water temperature data show the trends noted below. These surface water temperatures are based on manual measurements recorded once per month; therefore, surface water "maximum" temperatures differ from those recorded by the surface water data loggers, which are reported in Technical Appendices A and C of this annual report. The trends are as follows.

- A wide seasonal variation in the surface water temperatures, which are low in the winter and high in the summer. In 2022, the surface water temperature ranged from 0.0ºC to 21.3ºC, which was within the historical range.
- Whereas there is a somewhat smaller seasonal variation in groundwater temperatures recorded (historically between 2ºC and 21ºC when all drive point monitors are considered), this is still considered to be a wide seasonal variation for typical groundwater. It is noted, however, that thermal transfer from the creek surface water will affect the shallow groundwater temperatures at the drive points. In addition, the amount of monitor development that is completed before a groundwater temperature reading is taken can affect the value. The groundwater temperature in 2022 ranged from 2.5ºC to 21.5ºC.
- Along Mill Creek downstream of Highway 401 in 2022, vertical gradients were generally upward, and groundwater discharge provided a cooling influence on creek temperatures during the warm summer months, and a warming influence during the cold winter months.
- The temperature patterns for 2022 shown on the thermographs are generally consistent with historic patterns. At the Mill Creek drive points, average 2022 groundwater temperatures were higher than the historical averages. The surface water temperatures downstream of Highway 401 were lower in 2022 compared to the historical averages, while surface water temperatures upstream of Highway 401 were equal to, or higher in 2022 compared to the historical averages. Compared to the historical averages (start of monitoring to 2021), the 2022 groundwater temperature averages differed by between 0.5ºC and 1.6ºC, and the surface water temperature averages differed by between -1.4ºC and 0.7ºC.

In Figures B-103 and B-104, Appendix B, groundwater thermographs are presented for each of the Mill Creek drive points. Included on the thermographs are 100-period moving average trendlines. The moving average trendlines serve to enable long-term trend analyses. The following observations are noted regarding the thermographs.

- From 2003 to between 2011 and 2013, an increasing long-term trend of the 100-period moving average is observed at each of the drive points, ranging from approximately 1°C to 2°C. Greater temperature increases occurred between DP18 and DP17 (upstream of the site to the Hanlon interchange) (2°C) than between DP17 and DP5A/B/C (Hanlon interchange to downstream of site) (1°C). At DP1 and DP2, at which temperature data were first recorded in 1988, increasing trends are observed along the entire length of the moving average trendline for DP1, which begins in 1998, and up to 2015 for DP2; a minor fluctuating trend has occurred at DP2 since 2015.
- While the 100-period moving average generally stabilized at the Mill Creek drive points since 2013, a recent upward trend can be observed at several locations, including upstream station DP20. The increasing trend may be attributed to a recent increase in air temperature, as discussed in Section 3.3 of this report. It is noted that

these increasing trends appear to have now stabilized, but ongoing monitoring will confirm this observation. It is also noted that a recent increase in groundwater temperature has not been observed in the logger data at monitoring wells BH14, 92-12, 92-28, 92-32 and 92-33, located between the ponds and Mill Creek, which is further evidence that the increasing temperatures observed at the creek drive points are not related to the pit operations.

— Overall, the average groundwater temperatures at the Mill Creek drive points upstream of the Site (DP18, DP19 and DP20) have been approximately 12°C over the long term. The temperature recorded at the drive point locations on the Site are typically cooler than observed upstream of the Site, and the temperature at the farthest downstream drive point DP5A/B/C/CR has remained similar to, or cooler than, upstream conditions. As such, the data indicate that groundwater temperatures at the Mill Creek drive points have not been measurably affected by pit operations.

GROUNDWATER DISCHARGE

Table B-5, Appendix B, includes the calculated groundwater discharge, or influx, to the creek bed at each in-creek drive point monitor location. Tables 2 and 3 incorporate the calculated influx at each drive point location and provide an estimate of the distribution of groundwater influx into the creek, for various conditions. Table 2 includes the distribution of groundwater influx for the 2022 average, winter low flow, and summer low flow conditions from DP18 downstream to DP5CR. Table 3 includes the distribution for the overall historic average, historic winter low flow average, and the historic summer low flow average conditions. Locations of the monitoring stations and their separation distances are shown on Figure 14. The distribution of groundwater influx for each monitoring period from 2018 to 2022 is presented in Table B-8, Appendix B.

Figures 15, 16, and 17 show the distribution of groundwater influx for the 2022 summer low flow, winter low flow, and average conditions, respectively. Under summer low flow conditions, Figure 15, the 2022 groundwater flux from the Mill Creek Aggregates property to the creek is estimated at about 22.5 L/s, compared to about 23.6 L/s for the historical average summer low flow conditions. The 2022 value was 5% lower than the average condition. The 2022 summer low flow groundwater flux was 19% lower than the 2021 estimation of 27.7 L/s.

Under winter low flow conditions, Figure 16, the 2022 groundwater flux from the Mill Creek Aggregates Property to the creek is estimated at about 23.4 L/s, compared to about 25.6 L/s for the historical average winter low flow condition. The 2022 value was 9% lower than the average condition. The 2022 winter low flow groundwater flux was 10% lower than the 2021 estimation of 26.1 L/s.

As shown in Figure 17, the groundwater flux from the property is estimated to be about 26.4 L/s for the 2022 average condition, or less than 1% lower compared to about 26.5 L/s for the overall historical average condition. The 2022 estimation was 2% lower than the 2021 estimation of 25.9 L/s.

As shown in Table B-8, Appendix B, the calculated event-based groundwater influx in 2022 was higher in certain months, and lower in others, compared to the same months in 2021. In 2022, the maximum event-based estimated groundwater influx to the creek from the Mill Creek Aggregates Pit property (Highway 401 downstream to DP5CR) occurred in June and was about 31.7 L/s.

The minimum event-based estimated groundwater influx from the property (Highway 401 downstream to DP5CR) was about 22.5 L/s in September 2022. The historical average minimum event-based groundwater influx from the property is 18.9 L/s, with individual values varying from 15 L/s to 27 L/s (based on the average of the yearly summer low flow data for each drive point for the period 1989 to 1999).

As observed through comparison of Tables 2 and 3, the overall average groundwater influx to Mill Creek from the Site in 2022 was similar to the average historic conditions. An impact from aggregate operations at the Site on groundwater influx to the creek is not apparent. As previously noted, downward gradients were observed at the three drive points located north of Highway 401 during the second half of 2022. As shown in Table 2, the result is that negative influx was calculated in the reaches of Mill Creek north of the Site, which means that surface water from the creek was discharging to the ground during this period in those reaches.

3.8 SURFACE WATER

WSP staff undertake stream flow monitoring on-site, and Stantec completed the monitoring prior to 2019. The results of historic pre-extraction stream flow measurements conducted by others are presented in the May 1989 Existing Conditions Consolidated Report, prepared by Gartner Lee Limited and Jagger Hims Limited (now WSP). The elevation data from the previous five years (2018 to 2022) for the water levels in the creek at the drive points are presented in Table B-5, Appendix B, while the full dataset of historic results is presented graphically in Figures B-70 to B-102, Appendix B. In addition, the elevations of the creek at the original surface water monitoring stations SW1 and SW2 from the previous five years (2018 to 2022) are provided in Table B-4. Graphs presenting the full dataset of historic results are also provided in Figures B-66 and B-67, Appendix B.

The stages of Mill Creek and the two tributaries historically were monitored on a continuous basis at the four surface water monitoring stations SWM1 to SWM4 to provide an estimate of stream flow during the year (see Technical Appendix A of the Coordinated Monitoring Report). Commencing in 2013, with the approval of the NDMNRF, stream flow estimations are now only provided for stations SWM1 and SWM2. Estimates of stream flow are calculated using the stage-discharge curves that have been established for each station. The data illustrate that Mill Creek and the tributary streams exhibit typical seasonal variation in flow. High flows occur for a relatively short period in the spring and during occasional winter thaw events, and relatively low flows occur during the winter when precipitation is usually bound up in the snow pack and frozen ground conditions prevail. The lowest flows occur during the summer, reflecting high evapotranspiration rates.

A summary of the 2022 instantaneous flow and temperature extremes at the surface water monitoring locations is provided below. It is noted that the high flow values are interpreted to be overestimated due to the lower accuracy of the rating curve formula at higher flows. The maximum daily average flow at SWM1 in 2022 occurred on March 20, after a notable increase in air temperature occurred on March 19, which likely resulted in snowmelt conditions. The maximum daily overage flow at SMW2 in 2022 occurred on February 24, after 72 mm of precipitation fell in the week prior. It is noted that this date differs from the high flow indicated at SWM1 in the following table, as the table presents the instantaneous flow calculated using the hourly data logger data.

	SWM1 AT HWY 401 UPSTREAM	SWM4 GALT CREEK	SWM3 POND CREEK	SWM2 AT TWP. RD. 2 DOWNSTREAM
High Flow (L/s)	1,464	N/A	N/A	5,350
	March 24			February 24
Low Flow (L/s)	38	N/A	N/A	90
	January 14			December 15
High Temperature (°C) (Manual)	19.6	16.4	17.3	18.4
	August 25	August 25	August 25	August 25
High Temperature (°C) (Data logger)	23.9	14.8	16.7	22.8
	August 7	July 21	June 22	June 22
Low Temperature (°C) (Manual)	0.0	1.2	0.7	0.4
	January 14	February 24	February 24	February 24
Low Temperature (°C) (Data logger)	-0.3	0.3	-0.3	-0.3
	December 21	February 20	January 21	January 7

Notes: Data logger values shown are based on hourly data (i.e. instantaneous).
N/A indicates data not available.
High flow values are interpreted with caution due to the flow calculation method.

A comparison between the manually recorded open water temperatures (groundwater program) and the water temperatures recorded electronically (surface water program) illustrates the notable effect of solar warming within a given day. As indicated by temperatures recorded electronically, the creek temperature at SWM1 can fluctuate by as much as 7°C during a day (as indicated by historical data from the Surface Water Monitoring Program). Temperature data collected by WSP, which are in-stream manual measurements taken at the time of groundwater monitoring, are incorporated into this assessment.

Staff gauges are installed in the Phase 1 to Phase 4 ponds, and the former recharge trench at the northern limit of Phase 1. Water level and temperature data from the past five years are presented in Table B-4. The full dataset is presented in a pond hydrograph, Figure B-68 and pond thermograph, Figure B-69, in Appendix B. The thermograph indicates that the temperature of the shallow water in the ponds generally ranges from frozen (or near frozen) conditions in the winter to a peak temperature of between 24°C to 29°C in the summer. The temperature then decreases through the fall, to near frozen conditions again in December.

3.9 GROUNDWATER – SURFACE WATER INTERACTION

Seasonal variation in stream flow is a reflection of normal long-term climatic seasonal variation, as well as specific climatic events. The high flows, which typically occur in the spring, are the result of the annual spring melt and rainfall events. The low flows, which typically occur during the latter part of the summer season, and to a lesser extent during mid-winter, are the result of moderately lower rainfall, and in the case of the summer, increased temperatures and evapotranspiration losses. In the mid-winter period, precipitation is generally bound up in the snow pack, except when thaws occur periodically.

During low flow periods, and in the absence of rainfall, stream flow is sustained by groundwater discharge to the creek. The groundwater discharge component of stream flow is termed base flow. Since base flow is derived from the groundwater flow system, which shows subdued seasonal changes compared to surface waters, the magnitude of

the seasonal variation under base flow conditions will be less than that of the surface runoff component. In addition, since the temperature of groundwater, and particularly the deeper groundwater, does not fluctuate seasonally to anywhere near the same degree as does the surface water, the temperature of the groundwater discharge to the creek remains relatively more consistent.

Thus, groundwater discharge to the creek provides two important functions:

1. It provides base flow to maintain stream flow during low flow periods, and
2. It provides a cooling effect on the creek temperatures during the warm summer season, and a warming effect during the cold winter season.

Given the diffuse nature of groundwater movement, it is not possible to directly measure the magnitude of the groundwater discharge component to Mill Creek from the Mill Creek Aggregates property. Groundwater influx to Mill Creek is estimated at each drive point location for different flow conditions and the measurement is interpolated for the stream sections between drive points. These calculations are presented in Tables 2 and 3, and the data are shown in plan view on Figures 15 to 17. The results of these calculations are summarized in the following table.

Groundwater Influx from the Mill Creek Aggregates Pit Property

	HISTORIC RANGE (1989-1999)	HISTORIC AVERAGE (1989-1999)	2022	2021	2020	2019	2018	2017	2016
Summer Low Flow Conditions (May to October)	15 - 24 L/s	18.9 L/s	22.5 L/s (Sept)	27.7 L/s (May)	23.8 L/s (July)	23.1 L/s (Aug)	26.9 L/s (July)	28.2 L/s (Sept)	27.8 L/s (Aug)
Winter Low Flow Conditions (November to April)	18 - 28 L/s	22.2 L/s	23.4 L/s (Nov)	26.1 L/s (Nov)	25.3 L/s (Mar)	29.2 L/s (Apr)	26.0 L/s (Feb)	19.8 L/s (Dec)	26.2 L/s (Nov)
Average		22.8 L/s	26.4 L/s	25.9 L/s	25.2 L/s	23.7 L/s *	28.9 L/s	27.3 L/s	27.5 L/s

* Data are interpreted with caution due to reduced flux values in the fall of 2019 due to beaver dam downstream of DP5CR

	2015	2014	2013	2012	2011	2010	2009	2008	2007
Summer Low Flow Conditions (May to October)	29.2 L/s (Sept)	33.9 L/s (Aug)	24.1 L/s (Oct)	27.2 L/s (Aug)	33.0 L/s (July)	30.6 L/s (Aug)	26.4 L/s (Sept)	29.5 L/s (June)	22.1 L/s (Sept)
Winter Low Flow Conditions (November to April)	26.3 L/s (Dec)	25.2 L/s (Dec)	28.5 L/s (Apr)	21.6 L/s (Nov)	26.7 L/s (Mar)	35.1 L/s (Nov)	32.5 L/s (Nov)	31.7 L/s (Mar)	Not Available
Average	29.0 L/s	30.3 L/s	28.3 L/s	25.6 L/s	34.6 L/s	35.7 L/s	33.0 L/s	31.5 L/s	26.9 L/s

	2006	2005	2004	2003	2002	2001	2000
Summer Low Flow Conditions (May to October)	24.7 L/s (Aug)	22.0 L/s (Oct)	23.8 L/s (Sept)	12.5 L/s (Aug)	16.1 L/s (Sept)	17.0 L/s (Aug)	21.7 L/s (May)
Winter Low Flow Conditions (November to April)	25.2 L/s (Jan)	23.6 L/s (Nov)	22.1 L/s (Nov)	22.1 L/s (Apr)	24.5 L/s (Nov)	22.4 L/s (Apr)	26.5 L/s (Nov)
Average	27.6 L/s	26.7 L/s	27.3 L/s	19.9 L/s	22.6 L/s	24.1 L/s	25.5 L/s

The summer low flow groundwater influx values have fluctuated from 2004 to 2022. The calculated 2022 summer low flow groundwater influx (22.5 L/s) was about 19% higher than the historical average yearly summer low flow influx (18.9 L/s), which is based on the average of the yearly summer low flow data for each drive point for the period 1989 to 1999.

The winter low flow groundwater influx values increased from 2003 to 2010, decreased to 2012, and fluctuated from 2013 to 2022. The calculated 2022 winter low flow groundwater influx (23.4 L/s) was about 5% higher than the historical average yearly winter low flow influx (22.2 L/s), which is based on the average of the yearly winter low flow data for each drive point for the period 1989 to 1999.

From 2004 to 2007, the calculated average influx values fluctuated annually. From 2007 to 2010, the values increased, and the values have fluctuated since 2010. The 2022 annual average influx (26.4 L/s) was about 16% higher than the pre-1999 historic long-term average influx (22.8 L/s). The higher values of groundwater discharge from 2004 to 2022 compared to the pre-1999 historic average are attributed to the consistently higher water level in the Phase 1 pond since 2004, and in the Phase 3 and Phase 4 ponds in recent years, and the resulting higher groundwater levels across the site.

In 2022, twelve routine monthly monitoring events were conducted. The groundwater influx to Mill Creek was calculated using the drive point data from ten of the events, excluding the January and February events due to frozen conditions. A summary of the estimated influxes and the temperature data from the four surface water monitoring stations is presented in the table below.

DATE		SWM1 @ Hwy 401 Upstream	SWM4 Galt Creek	SWM3 Pond Creek	SWM2 @ Twp. Rd. 2 Downstream	Influx (L/s) (Both sides of Creek)*	Influx (L/s) (South of Creek Only)*
14-Jan-22	Flow (L/s)	49	NA	NA	138	Frozen	Frozen
	Temp. (°C)	0.0(-0.2)	1.5(2.3)	2.7(3.1)	0.7(0.5)	Frozen	
24-Feb-22	Flow (L/s)	286	NA	NA	2646	Frozen	Frozen
	Temp. (°C)	0.7(-0.3)	1.2(NA)	0.7(1.7)	0.4(-0.1)	Frozen	
17-Mar-22	Flow (L/s)	279	NA	NA	314	56.4	30.1
	Temp. (°C)	3.2(2.8)	4.6(2.2)	4.0(4.7)	5.1(3.0)	6.3	
21-Apr-22	Flow (L/s)	186	NA	NA	218	57.5	30.6
	Temp. (°C)	7.8(7.3)	6.5(6.0)	6.4(6.7)	8.2(7.1)	8.4	
24-May-22	Flow (L/s)	84	NA	NA	114	56.5	29.8
	Temp. (°C)	16.3(13.9)	13.2(9.8)	11.7(10.4)	14.5(13.0)	13.0	
15-Jun-22	Flow (L/s)	92	NA	NA	147	59.9	31.7
	Temp. (°C)	18.4(19.3)	15.2(12.2)	13.2(13.1)	17.3(17.4)	15.2	
14-Jul-22	Flow (L/s)	66	NA	NA	121	48.6	26.1
	Temp. (°C)	16.5(17.6)	15.8(12.3)	15.6(11.8)	16.6(15.7)	14.9	
25-Aug-22	Flow (L/s)	75	NA	NA	127	44.3	23.7
	Temp. (°C)	19.6(19.9)	16.4(13.4)	17.3(12.5)	18.4(17.7)	17.8	
08-Sep-22	Flow (L/s)	59	NA	NA	123	42.4	22.5
	Temp. (°C)	17.1(17.3)	15.3(12.6)	15.0(11.5)	15.7(15.4)	15.2	
13-Oct-22	Flow (L/s)	122	NA	NA	166	42.6	22.8
	Temp. (°C)	13.1(12.4)	11.0(10.6)	12.4(10.1)	12.4(12.0)	12.1	

DATE		SWM1 @ Hwy 401 Upstream	SWM4 Galt Creek	SWM3 Pond Creek	SWM2 @ Twp. Rd. 2 Downstream	Influx (L/s) (Both sides of Creek)*	Influx (L/s) (South of Creek Only)*
24-Nov-22	Flow (L/s)	71	NA	NA	127	43.7	23.4
	Temp. (°C)	2.5(1.6)	4.0(5.0)	3.8(4.9)	4.4(2.3)	6.1	
16-Dec-22	Flow (L/s)	109	NA	NA	120	42.8	22.9
	Temp. (°C)	1.2(0.7)	4.9(4.0)	2.4(4.0)	2.5(1.4)	5.3	

Notes:
(1) Flow values are daily averages.
(2) NA = not available.
(3) Temperature in brackets is approximate daily average from mid-creek data logger.
(4) * - Groundwater influx calculated from drive point data.
(5) Flow data no longer recorded at SWM3 and SWM4 as approved by the NDMNRF.

Surface water temperatures are recorded using in-stream temperature probes as part of the surface water monitoring program. The temperature data from those data loggers are collected from mid-stream at one-hour intervals. Since surface water temperatures fluctuate throughout the day, Dufferin Aggregates and WSP temperature data are presented, which are in-stream measurements collected manually at the time of groundwater monitoring. Available temperature values in brackets are from the data logger data.

Prior to 2013, the groundwater influx was estimated using the surface water data based on the following equation.

$$\text{Groundwater Influx} = [\text{SWM2} - (\text{SWM1} + \text{SWM3} + \text{SWM4})]$$

As stated in previous reports, however, estimating groundwater influx at this site based on stage-discharge relationships is considered inaccurate. Following the discontinuation of surface water flow rate estimations at stations SWM3 and SWM4 in 2013, evaluating groundwater influx to the creek is no longer undertaken using that methodology. A higher degree of accuracy is achieved by estimating groundwater influx based on drive point data, and these estimates are presented in the above table.

The September 8, 2022 summer low flow drive point data estimate of groundwater influx from the Mill Creek Aggregates Pit (i.e., from the south side of the creek) of 22.5 L/s represents about 18% of the total estimated stream flow in Mill Creek at SWM2 under base flow conditions, which is estimated to be 123 L/s at that time. The combined groundwater discharge from both sides of the creek (42.4 L/s) represents about 34% of total stream flow. It is noted that in March 2022, when the flow in Mill Creek was higher, the groundwater discharge component from the property was estimated to be 30.1 L/s; however, since the flow in Mill Creek at that time was recorded as 314 L/s at SWM2, the groundwater influx from the pit property (south side of the creek) represented only about 10% of the total stream flow. The combined groundwater discharge from both sides of the creek (56.4 L/s) represented approximately 18% of the total stream flow under the higher flow conditions.

The thermal effects on Mill Creek temperatures from the two tributaries, as well as the groundwater discharge component, are relatively significant during much of the year, based on the observed temperature differences between SWM1 (upstream) and SWM2 (downstream). Generally, during the summer low flow, those three sources of input water provide a cooling effect on Mill Creek. It is noted that canopy cover along some reaches also provides a cooling effect in Mill Creek during the summer months.

In 2022, the largest summer temperature difference between SWM1 and SWM2 (using average daily temperatures from data loggers) during routine monitoring events was noted on August 25, 2022. The mean temperature of the water entering the Mill Creek Aggregates Pit property at Highway 401 (SWM1) on August 25 was measured at

19.9ºC. The mean water temperature in the creek leaving the property at SWM2 on August 25 was 17.7ºC, which is 2.2ºC lower than at SWM1. On August 25, the mean water temperature of Galt Creek (SWM4) and Pond Creek (SWM3) was 13.4ºC and 12.5ºC, respectively, which is strongly indicative of groundwater discharge into those tributaries. The temperature of the groundwater discharge component to Mill Creek was estimated to be about 17.8ºC, based on average temperatures recorded at the in-stream drive points. Historically (from 2005 to 2012), approximately 33% to 66% of the total temperature differential has been estimated to be attributed to the two tributaries, whereas approximately 34% to 67% has been attributed to the combined groundwater discharge from both sides of Mill Creek. As noted above, it is recognized that the vegetation canopy and riparian cover will also serve to reduce surface water temperatures across the property.

3.10 GROUNDWATER CONDITIONS ADJACENT TO EXTRACTION ACTIVITIES

Aggregate extraction from below the water table in Phase 1 began in 1995 and was completed in 2002. The operations were moved to Phase 2 in late 2002 and continued there throughout 2003 to 2012. In 2013, aggregate extraction from above and below the water table occurred in the central area of Phase 3 and in the western area of Phase 4. Extraction from above and below the water table occurred in the south-central and eastern area of Phase 4 in 2014 and 2015, respectively. Extraction in 2016 and 2017 occurred above and below the water table along the east (2016 only) and west boundaries and above the water table on the south boundary of the Phase 2 pond as a result of obtaining NDMNRF approval to extract the setbacks. Extraction in 2018 occurred above and below the water table along the east and south boundaries of the Phase 1 pond, for material that was not previously extracted up to the below water table extraction limit. In addition, extraction occurred above the water table in Phase 1, as a result of obtaining NDMNRF approval to extract the former excavation setback area above the water table, as per the approved Site Plans. In 2019, extraction continued within the Phase 1 pond setback along the east side of the Site, and occurred above and below the water table at the northeast corner of Phase 5 and silt pond SP4. Extraction in 2020 occurred above the water table in Phase 6, while extraction in 2021 occurred both above and below the water table in Phase 6. In 2022, extraction occurred both above and below the water table in Phase 2, Phase 5 and Phase 6, as well as below the water table in Silt Pond 4 (SP4).

Previous monitoring results at locations adjacent to the Phase 1 pond (Monitors 92-1, 92-5, 92-8, 92-13, 92-14, 92-15, BH1, BH5, and BH6) have indicated that operational activities, including the pumping of process water out of the pond, have an effect on local groundwater levels and temperatures. In 2022, pumping from the Phase 1 pond and the return of process water back to SP4/Phase 1 pond occurred between April 1 and December 8, as shown in Tables E-1 and E-2, Appendix E.

Until they malfunctioned in 2011, groundwater temperatures were measured daily by means of electronic temperature probes set at three horizons in the sand and gravel profile in Monitor nest 92-13. A new shallow data logger was installed at this monitor in May 2013. This monitor nest is located approximately 20 m to the west of the open water in the Phase 1 pond. The data have shown that groundwater temperatures at each of the three elevations are affected by the presence of open water in the Phase 1 pond.

The following observations are noted for the monitors located west of Phase 3, at the western limit of the Site, which are currently equipped with multiple data loggers.

— At Monitor 92-28, the vertical gradients remained similar to the 2007 gradients until 2012, when much larger gradients occurred. It is interpreted that extraction activities in the northwest corner of the Phase 3 pond resulted in localized influences on the groundwater levels observed at monitor nest 92-28, giving rise to the

apparent higher vertical gradient conditions. The vertical gradients have decreased since 2012, which supports this interpretation as extraction activities in the northwest corner of the Phase 3 pond did not occur after 2012. Similar to the 2013 to 2021 period, smaller seasonal groundwater level fluctuations occurred in 2022 compared to previous years, resulting in higher average elevations at each of the three monitors. These smaller fluctuations are attributed to the buffering effect of the Phase 3 pond. Groundwater levels fluctuated with an overall declining trend at each of the three 92-28 monitors between 2016 and 2020, which is attributed to the declining water levels in the Phase 3 pond during the same period. In 2021 and 2022, water levels at monitor 92-28 remained similar to 2020, which is consistent with the water levels trends measured at the Phase 3 pond. The peak groundwater temperatures measured at the three monitors were slightly lower (i.e., higher annual low, lower annual high) than in previous years, as observed since 2012.

- At Monitor 92-29, which is now located adjacent to the Phase 3 pond, the vertical gradients in 2022 were similar to the 2007 to 2021 gradients. The magnitude of water level fluctuations, however, was lower at the three monitors in 2022 compared to the fluctuations from 2007 to 2012, and were similar to the fluctuations recorded from 2013 to 2021, and at Monitor 92-28. The increased average groundwater levels from 2013 to 2016 compared to pre-2012 levels, which occurred at Monitor 92-28, also occurred at Monitor 92-29, and are also attributed to the buffering effect of the Phase 3 pond. The decrease in water levels observed at each of the three 92-28 monitors since 2016 compared to the 2013 to 2016 period also occurred at 92-29, and is also attributed to the lower water levels in the Phase 3 pond since 2016 compared to that earlier period. In 2022, water levels at monitor 92-29 remained similar to 2021, which is consistent with the water level trends measured at the Phase 3 pond. The groundwater temperatures at Monitor 92-29, which had been consistent from 2007 to 2011, have fluctuated much more since 2012. The typical time lag in temperatures between the shallow and intermediate monitors has not been observed since 2011, as the temperatures at the two monitors generally mirrored each other. These temperature trend changes are attributed to the advancement of the excavation/pond development to within a few metres of Monitor 92-29.
- At Monitor 92-32, the vertical gradients in 2022 were generally consistent with the gradients measured from 2007 to 2021. The decrease in water levels observed at 92-28 and 92-29 since 2016 compared to the 2013 to 2016 period also occurred at 92-32 within each of the three monitors (shallow, intermediate, and deep), and is also attributed to water levels in the Phase 3 pond since 2016. The groundwater temperature trends at the three monitors were similar to previous years, although a slight increase in temperature at the intermediate and deep monitors was observed between 2010 and 2018. The groundwater temperatures have stabilized, or decreased, since 2018. The vertical gradients and groundwater temperatures at Monitor 92-32 do not appear to be measurably affected by the Phase 3 pond; however, the groundwater levels do appear to be influenced by the water levels in the Phase 3 pond.

3.11 WATER QUALITY

Chemical analyses of groundwater and surface water were completed in March and November 2022 for samples collected from BH1-R, 92-32-III, and 92-8, and the Phase 1 pond. The field chemical results are presented in Table C-1, and the laboratory chemical results are presented in Tables C-2 and C-3, Appendix C. The laboratory chemical results and Quality Assurance/Quality Control (QA/QC) reports for the current year are included in Appendix C.

The groundwater and surface water temperatures, as measured in the field, fluctuate in response to the ambient air temperature. The pH and conductivity values were within their respective historical ranges at 92-32-III and 92-8 and at BH1-R when compared to the historical results from original well BH1.

The 2022 chemical results are generally similar to historic values, with some exceptions. Based on the 2022 chemical data, the following observations are made.

- For comparison purposes, groundwater quality was assessed versus the Ontario Drinking Water Quality Standards (ODWQS). Groundwater quality generally complies with the ODWQS for the parameters tested, except as outlined below.
  - BH1-R – hardness (March and November)
  - 92-8 – hardness (March and November) and manganese (March and November)
  - 92-32-III – hardness (March and November) and manganese (March and November)

  Hardness and manganese are not considered to be health-related parameters. The standard for hardness is a guideline, which is established for parameters that need to be controlled to ensure efficient treatment of water supplies. The standard for manganese is an aesthetic objective, which is established for parameters that may impair the taste, odour, or colour of water. Hardness and manganese exceedances were observed historically at the property, both before and after extraction commenced. The elevated concentrations of hardness and manganese are attributed to natural conditions at the site.
- Over the short term, in 2022 the parameter concentrations were generally similar to the 2021 concentrations. The 2022 results from replacement well BH1-R were similar to the historical results from the original well (BH1).
- The concentrations of most parameters have been fluctuating slightly or have been relatively consistent over the long-term. Exceptions are (a) conductivity values (laboratory) and sodium and chloride concentrations at BH1/BH1-R (located at the eastern, upgradient, boundary of the property) and BH92-8, which have exhibited an overall increasing trend since the mid-1990s, and (b) sodium and chloride concentrations at Monitor BH8-I/92-32-III, which increased sharply in 2009, but have been stable or decreased in recent years. It is noted, however, that the following historically high concentrations were detected in 2022.
  - BH1/1-R: chloride (190 mg/L) and conductivity (laboratory) (990 µS/cm) (each in November)
  - 92-8: sodium (82 mg/L) and chloride (160 mg/L) (each in November)
  - Phase 1 pond: sodium (91 mg/L), potassium (3.6 mg/L), magnesium (38 mg/L), chloride (170 mg/L), conductivity (laboratory) (950 µS/cm) and total oil and grease (2.6 mg/L) (each in November)

  The increasing sodium, chloride and conductivity concentrations may reflect road salting activities along Highway 401 and/or along the Township roads. As these increasing trends are observed at locations both upgradient and downgradient of the property, they are not attributed to operations at the Mill Creek Pit.
- Historically, and in 2022, with increasing distance downgradient across the site (from Monitor BH1/1-R/92-5 to 92-8 to BH8/92-32-III), detected parameter concentrations generally tend to either increase or fluctuate. Exceptions include sodium, potassium and chloride, which decreased across the site in 2022.
- Parameter concentrations in the Phase 1 pond are generally similar to values detected at Monitor BH1/1-R/92-5. The surface water quality complies with the Provincial Water Quality Objectives for the parameters tested in 2022, with the exception of zinc in November. Similar zinc exceedances have occurred historically.
- A concentration of total oil and grease (2.6 mg/L) was detected at the Phase 1 pond in November 2022, which was the highest concentration reported to date at that location. A verification sample was collected in December 2022, along with a blind duplicate sample, to confirm the oil and grease detection. Oil and grease was not detected in the December 2022 original or duplicate sample, and, therefore, the November 2022 result

should be interpreted with caution. Occasional detections of oil and grease (up to 1.6 mg/L) have previously been reported at the Phase 1 pond.

- Trace concentrations of total oil and grease (0.7 mg/L – 1.5 mg/L) were detected at each of the three groundwater wells during at least one of the sampling events in 2022. Similar detections have occurred historically.

3.12 COMPLIANCE WITH INTERIM THRESHOLD VALUES

The early warning and interim threshold values, which came into effect on June 30, 2001, are based on maintaining positive seasonal hydraulic head gradients across the water table between specific monitor pairs, such that a positive hydraulic gradient continues to exist from the site toward Mill Creek. In other words, the groundwater levels should be lower at locations closer to Mill Creek. The thresholds were developed to ensure that the quantity of groundwater discharging to Mill Creek does not decline below a minimum level. The creek drive point monitors tie the thresholds to groundwater level/discharge at the creek. Surface water elevations in the Phase 1 to Phase 4 ponds are also included with the compliance monitoring. Maximum and minimum elevations with associated early warning values are defined for each pond. The interim threshold and early warning values generally are based on a review of historic pre-extraction low water level data (where available) and are defined seasonally; pond threshold water level values do not change seasonally. Where necessary, threshold pairs have been modified over time to reflect current extraction conditions and the removal of individual monitor locations.

It is noted that the groundwater levels in the in-stream drive points typically respond more rapidly to precipitation and snowmelt events than the deeper groundwater monitors. As such, occasionally, early warning and threshold value exceedances can occur due to these natural events.

A summary of the head differences and pond elevations recorded since 2021 is included in Tables G-1 to G-10, and the full dataset of historic results is shown graphically in Figures G-1 to G-16, Appendix G. A summary of the early warning and threshold value compliance for 2022 is provided in the following table, and the monitor pairs and ponds are discussed below. In general, the early warning and threshold value exceedance observed in 2022 are not attributed to extraction activities at the Site.

MONITOR PAIR / LOCATION	EARLY WARNING VALUE EXCEEDANCE IN 2022?	THRESHOLD VALUE EXCEEDANCE IN 2022?
BH13 to DP21	No	No
BH92-12 to DP17R	No	No
DP6 to DP3	No	No
BH92-29 to DP1	No	No
BH92-27 to DP2	Yes	No
OW5-84 to DP5CR	Yes	Yes
Phase 1 Pond	No	No
Phase 2 Pond	No	No

MONITOR PAIR / LOCATION	EARLY WARNING VALUE EXCEEDANCE IN 2022?	THRESHOLD VALUE EXCEEDANCE IN 2022?
Phase 3 Pond	No	No
Phase 4 Pond	No	No
Silt Pond SP3	No	No

BH13 to DP21

BH13 is located adjacent to the northern boundary of the property (north of Phase 5) and to the east of DP21. DP21 is an in-creek drive point monitor located immediately downstream of the property line, south of Highway 401. There were no exceedances of the threshold values or the early warning values at this pair in 2022 (see Table G-1 and Figures G-1 and G-2).

BH92-12 to DP17R

BH92-12 was established in 2001 just outside the licensed area of extraction, west of Phase 5 (extraction began in the northeast corner of Phase 5 at the end of 2019). Monitor DP17R is an in-creek drive point located at the Hanlon interchange, upstream from DP3. The threshold values have not been exceeded since its implementation on June 30, 2001 (see Table G-2 and Figures G-3 and G-4). The early warning and threshold values were not exceeded at this pair in 2022.

DP6 to DP3

DP6 is located at the eastern limit of the central wetland area, adjacent to Phase 5, and DP3 is an in-creek drive point monitor located directly south of the Hanlon interchange. There were no exceedances of the threshold values or the early warning values at this pair in 2022 (see Table G-3 and Figures G-5 and G-6).

BH92-29 TO DP1

This monitor pair replaced the BH92-30 to BH92-28 threshold pair in May 2012, as BH92-30 was removed during extraction activities in April 2012. This pair is located in the northwest corner of the site, south of the confluence between the Pond Creek tributary and Mill Creek. DP1 is an in-creek drive point located in Mill Creek near the western property boundary. There were no exceedances of the threshold values or the early warning values at this pair in 2022 (see Table G-4 and Figures G-7 and G-8).

BH92-27 to DP2

This pair of monitors is located in the western part of the site, west of the Phase 3 extraction area, and replaced BH92-26 to DP2 after November 2011 when BH92-26 became inaccessible due to its proximity to the extraction area. DP2 is an in-creek drive point located in Mill Creek at the western property boundary. There were no exceedances of the threshold values at this pair in 2022; however, the early warning value was exceeded on four occasions (see Table G-5 and Figures G-9 and G-10). Early warning value exceedances were observed on February 2, October 21, October 25 and November 4, 2022. Several weekly measurements before and after the February 2 event could not be measured at DP2 due to frozen conditions. As such, the February 2 exceedance was likely caused by a lag in groundwater level response following snowmelt conditions. Early warning threshold exceedance have occurred at this well pair during the fall in 2019, 2020, 2021 and 2022. The early warning value

exceedances are generally attributed to the lag in groundwater level response following an increase in precipitation that typically occurs in the fall. In 2022, a total of 51 mm of precipitation was recorded between October 13 and November 1.

OW5-84 to DP5CR

This pair of monitors is located in the southwest corner of the site, adjacent to Mill Creek. OW5-84 is a groundwater monitor screened to about full depth in the aquifer, and is situated just inside the property line. The location of DP5 has been modified several times due to vandalism and access issues. DP5A was an in-creek drive point situated in Mill Creek just north of the bridge at Township Road 2. DP5B replaced DP5A in this threshold pair in December 2011 when DP5A became inaccessible due to landowner permission being withdrawn. DP5B, located south of the bridge, was vandalized in July 2012, and replaced with DP5C, which was installed slightly upstream from DP5B, but still south of the bridge. New (preliminary) threshold values were implemented for the OW5-84 to DP5C pair in September 2012. Based on hydraulic conductivity testing, it is interpreted that DP5C was installed in lower-conductivity soil that is not reflective of the sand/gravel aquifer in which DP5A and DP5B were developed. This condition would result in groundwater levels that do not respond to climatic conditions as quickly as nearby drive points screened in more representative soils with higher hydraulic conductivities.

DP5C was vandalised in Spring 2017 and replaced with DP5CR, which was installed at the location of DP5C. The early warning and threshold values were not exceeded at DP5C prior to the vandalism. Frequent exceedances of the early warning and threshold values at the OW5-84 to DP5CR pair occurred between the DP5CR installation in 2017 and 2021, which were considered to be "false" exceedances that are the result of the observed hydrogeological variability at this location in Mill Creek. Revised early warning and threshold values were developed by WSP in 2021 and were submitted to by Dufferin Aggregates to the NDMNRF in early 2022. The NDMNRF provided written approval to implement the revised early warning and threshold values in mid-2022. As such, the revised values are now used to assess compliance (Table G-6 and Figures G-11 and G-12).

As shown in Table G-6, the head difference at the OW5-84 to DP5CR pair exceeded the revised early warning value on four occasions in 2022 (March 17, September 15, September 22 and September 30) and exceeded the revised threshold value on one occasion (September 30, 2022). Based on a review of the 2022 daily climate data, melting conditions were present on March 17. As such, the lower head difference measured on March 17 is attributed to the lag in groundwater level response to snowmelt conditions. The head difference increased by 0.11 m between March 17 and March 24. In September 2022, rainfall events ranging from 5 to 15 mm occurred in the days prior to each of the September 15, 22 and 30 monitoring events. It is interpreted that a more rapid groundwater level increase occurred at DP5CR following the precipitation events than at OW5-84, which temporarily reduced the head difference at this well pair. The head difference returned to a value greater than the early warning and threshold values in October 2022.

ON-SITE PONDS

As shown in Tables G-7 through G-10 and Figures G-13 through 16, the early warning and threshold values established for the Phase 1, 2, 3 and 4 ponds were not exceeded in 2022. It is noted that the constant water levels recorded during the winter months between 2000 and 2015 indicate that the extraction pond or silt pond was frozen. From 2015 onward, frozen conditions are better represented by a gap in the data.

A hydrograph presenting water levels at each of the ponds is provided in Figure B-68. As observed in the hydrograph, the pond water levels typically decreased in 2020, 2021 and 2022, which reflects the lower precipitation amounts observed during that period. In 2022, the pond levels remained within their respective historic range.

As indicated above, the water levels in the Phase 3 pond were lower in 2017 through 2022 compared to the 2013 to 2016 period. The water levels, however, were similar to the 2009 to 2012 levels and remained well above the early warning value. The lower water levels observed in 2017 through 2022 are attributed to the effect of the fully developed silt barrier between the Phase 3 and Phase 4 ponds. The lower hydraulic conductivity of the silt barrier results in a reduction in the rate of movement of water from the Phase 4 pond westerly through the silt barrier and into the Phase 3 pond. As such, water that (a) naturally moves from east to west through the granular subsurface soil that remains in place between the Phase 1 pond and the Phase 4 pond, and (b) water that accumulates in the Phase 4 pond as direct precipitation, is "held back" by the silt barrier in the Phase 4 pond (as designed), resulting in higher water levels in the Phase 4 pond compared to the Phase 3 pond, as intended.

4 SUMMARY

Groundwater monitoring has been conducted at the Mill Creek Aggregates Pit property since late 1986. Aggregate extraction from below the water table has been ongoing at the property since 1995. The 2022 monitoring program included five components which were: (a) the monitoring of water levels and temperature conditions in the groundwater monitors, the multi-level monitors and the water wells, (b) groundwater quality monitoring, (c) quality assurance/quality control aspects, (d) assessment of compliance with the interim action thresholds, and (e) annual reporting.

The annual average of the monthly mean temperatures in 2022 was 8.9°C, which is higher than the 30-year normal annual average temperature of 8.3°C but is appreciably lower than the annual average recorded in 2021 (10.1°C). A notable increase in air temperature has been observed since 2016, with annual averages ranging between 9.2°C and 10.1°C in 2016, 2017, 2018, 2020 and 2021. The 30-year average total annual precipitation in this area is 935 mm, and the long-term average water surplus is estimated to be about 304 mm per year. In 2022, the corresponding values were 682 mm and 129 mm, respectively, which represent a decrease of 27% in precipitation and 58% in the annual water surplus with respect to long-term average conditions. The total precipitation recorded in 2022 (682 mm) was only slightly higher than the lowest annual precipitation recorded since 1991 (657 mm in 1998) and was the third lowest total recorded since 1991. Persistent dry conditions have generally been observed since early 2020.

In 2022, extraction occurred both above and below the water table in Phase 2, Phase 5 and Phase 6, as well as below the water table in Silt Pond 4 (SP4). Monitoring results adjacent to the pond in Phase 1 indicate an effect on the pond levels and local groundwater levels resulting from seasonal climatic variation, the pumping of water from the pond for aggregate processing, and the recirculation discharge of clean water back into the Phase 1 pond.

Shallow groundwater monitoring immediately downgradient of the pit ponds shows groundwater temperatures quickly dissipate a short distance from the ponds.

Groundwater conditions in 2022 generally were consistent with historic monitoring data, with groundwater flowing from east to west through the site toward, and discharging into, Mill Creek, except as discussed in the main text. The water table in the wetland areas adjacent to Mill Creek continues to be at or near ground surface during the spring melt high groundwater conditions, with seasonal decreases in the order of 0.5 m over the course of the year.

Groundwater discharge continues to provide a relatively consistent seasonal base flow component to Mill Creek, from Highway 401 downstream to Concession Road 2, resulting in a cooling influence on creek temperatures during the warm and dry summer months, and a warming influence during the late fall, winter, and early spring period.

The estimated groundwater contribution from the Mill Creek Aggregates Pit property located north of Township Road 2 in 2022 was similar to the historic average and the values in recent years.

In 2020, 2021 and 2022, groundwater levels in several monitors were lower compared to those recorded in 2019. Given the precipitation patterns described above, these lower groundwater levels experienced across the central and eastern areas of the site are not unexpected. The groundwater levels were generally similar in 2022 compared to historical averages, although there were some exceptions. It is noted that water levels at most locations monitored remained above the minimum levels recorded historically, despite the persistent dry climate conditions discussed above.

In 2022, vertical gradients observed at the creek drive points were consistent with historical results, with the exceptions of the drive point locations located within the reach north of Highway 401. Beginning in July 2022, strong upward gradients were consistently observed within the reach north of Highway 401, which is caused by a notable decrease in groundwater level recorded at the drive point locations. From 2005 to June 2022, the vertical gradients at these drive points have remained upward, with the exception of neutral and downward vertical gradient conditions on average over the course of the year at DP19 in 2012 and in 2015 and 2016, respectively (varied between downward and upward gradient conditions). The sudden change in gradient is attributed to upgradient activities.

The multi-level monitors within the sand and gravel aquifer continued to exhibit the general pattern of upward to neutral gradients, which is consistent with historic trends. Several observations of downward gradients also occurred in 2022, which is also consistent with historic trends. The groundwater temperatures at the multi-level monitors showed a pattern similar to historic trends, with the shallow water temperatures exhibiting the greatest, and the deep temperatures showing the least, seasonal fluctuations. The multi-level monitor temperatures also show a time lag response pattern between the shallow, intermediate and deep profiles, which also is consistent with historic patterns.

Overall, the average groundwater temperatures at the Mill Creek drive points upstream of the Site (DP18, DP19 and DP20) have been approximately 12°C over the long term. The temperature recorded at the drive point locations on the Site are typically cooler than observed upstream of the Site, and the temperature at the farthest downstream drive point DP5A/B/C/CR has remained similar to, or cooler than, upstream conditions. As such, the data indicate that groundwater temperatures at the Mill Creek drive points have not been measurably affected by pit operations.

Results of the two sets of groundwater quality chemical analyses completed in 2022 are generally consistent with historical values. Groundwater quality within on-site monitors complies with the Ontario Drinking Water Quality Standards for the parameters tested, except for hardness at each of the monitors tested, and manganese at some locations. Conductivity values and sodium and chloride concentrations have demonstrated an overall long-term increasing trend at upgradient well BH1/1-R and at Monitor BH92-8. These increases may be attributable to road salting on Highway 401 and/or along the Township roads.

Exceedances of the Action Threshold Values established for the monitoring pairs located adjacent to Mill Creek occurred on occasion at one location (OW5-84 to DP5CR) in 2022. The exceedance is not attributed to extraction activities at the Site, as discussed in Section 3.12, but is attributed to a lag in groundwater level response following precipitation events. Revised early warning and threshold values were developed for the OW5-84 to DP5CR pair by WSP in 2021 and were submitted by Dufferin Aggregates to the NDMNRF in early 2022. The NDMNRF provided written approval to implement the revised early warning and threshold values in mid-2022. As such, the revised values are now used to assess compliance.

Phase 1, 2, 3 and 4 pond water levels typically decreased in 2020, 2021 and 2022, which reflects the lower precipitation amounts observed during that period. In 2022, the pond levels remained within their respective historic range.

5 2023 MONITORING PROGRAM

The current monitoring program, as detailed in Section 2 of this report, will be continued through 2023.

6 CONCLUSIONS AND RECOMMENDATIONS

Based on the findings presented in this report, the following conclusions are provided.

- The 2022 monitoring program was completed in accordance with the groundwater monitoring program that was recommended in the original 1993 Coordinated Report on Monitoring Programs and as updated in July 2002, October 2004, and January 2006.
- The annual average of the monthly mean temperatures in 2022 was slightly elevated compared to the 30-year normal values. A notable increase in air temperature has been observed since 2016.
- The total annual precipitation in 2022 was 682 mm, which was 252 mm (27%) lower than the 30-year normal value of 935 mm. The total precipitation recorded in 2022 (682 mm) was only slightly higher than the lowest annual precipitation recorded since 1991 (657 mm in 1998) and was the third lowest total recorded since 1991.
- The calculated annual water surplus for 2022 was 129 mm. This value is 58% lower than the 30-year normal surplus of 304 mm.
- Low precipitation levels since 2020 resulted in lower groundwater levels at various locations in 2022 compared to 2019 levels; however, water levels were typically within historical ranges.
- Results from Monitors 92-28, 92-29, and 92-32, located between the Phase 3 pond and Mill Creek, indicate that the vertical gradients in 2022 were generally similar to the 2021 results, with minor exceptions. Maximum and minimum temperatures at 92-28 and 92-32 in 2022 were similar to the historic values. Temperature effects at 92-29 are attributed to the extraction of the Phase 3 pond to within a few metres of 92-29 in 2012.
- In 2022, the multi-level monitors continued to exhibit the general pattern of upward to neutral vertical gradients at the base of the sand and gravel, which is consistent with historic trends. Occasional downward gradients were also observed, which is also consistent with historic trends.
- Phase 1, 2, 3 and 4 pond water levels typically decreased in 2020, 2021 and 2022, which reflects the lower precipitation amounts observed during that period. In 2022, the pond levels remained within their respective historic range and did not exceed their respective threshold values.
- The 2022 groundwater discharge was similar along Mill Creek compared to historical results.
- Overall, the average groundwater temperatures at the Mill Creek drive points upstream of the Site (DP18, DP19 and DP20) have been approximately 12°C over the long term. The temperature recorded at the drive point

locations on the Site are typically cooler than observed upstream of the Site, and the temperature at the farthest downstream drive point DP5A/B/C/CR has remained similar to, or cooler than, upstream conditions. As such, the data indicate that groundwater temperatures at the Mill Creek drive points have not been measurably affected by pit operations.

- Results of the groundwater quality chemical analyses completed in 2022 are generally consistent with historical data, except for conductivity values and sodium and chloride concentrations which have demonstrated a long-term increasing trend at upgradient Monitor BH1/BH1-R and at Monitor BH92-8. These increases may be attributed to road salting along Highway 401 and/or along the Township roads, and are not attributed to extraction activities at the Site.
- The Action Threshold Values established for the monitoring pairs located adjacent to Mill Creek occurred on one occasion at the OW5-84 to DP5CR well pair. The exceedance is not attributed to extraction activities at the Site. Revised early warning values and threshold values were developed by WSP in 2021 and approved by the NDMNRF in mid-2022.

We respectfully submit the following recommendations, based on the study findings, for your consideration.

- The groundwater monitoring program should be continued in 2023.

TABLES

TABLE 1
MONITOR GROUPINGS
MILL CREEK AGGREGATES PIT

Bedrock	Sand and Gravel			Wetland	Creek
TW16-78	1*	TW16-79	92-33	DP6	DP1
Well 4794	1-R	OW1-84	OW5-84	DP7	DP2
	2*	OW2-84		DP8	DP3
	2-R	OW4-84		DP9	DP4*
	3	92-1*		DP10	DP4R
	4	92-1R		DP11	DP5A**
	5	92-5		DP12	DP5B***
	6	92-8		DP16	DP5C***
	7-I*	92-12		DP113	DP5CR
	7-II*	92-13			DP17*
	11	92-14*			DP17R
	12*	92-15*			DP18
	13	92-15a*			DP19
	14	92-26			DP20
	OW16A-78	92-27			DP21
		92-28			DP22
		92-29			
		92-32			

NOTES:
- * Indicates monitor was decommissioned.
- ** Indicates monitor is no longer accessible.
- *** Indicates monitor was removed by vandals.

TABLE 2
DISTRIBUTION OF GROUNDWATER INFLUX, 2022 CONDITIONS
MILL CREEK AGGREGATES PIT

FROM	TO	LENGTH	AVERAGE WIDTH	AVERAGE INFLUX (L/s/m²)			TOTAL GROUNDWATER INFLUX (L/s)			ESTIMATED GROUNDWATER FLUX FROM NORTH SIDE OF CREEK (L/s)			ESTIMATED GROUNDWATER FLUX FROM SOUTH SIDE OF CREEK (L/s)		
		(m)	(m)	2022 Average	2022 Winter Low Flow	2022 Summer Low Flow	2022 Average	2022 Winter Low Flow	2022 Summer Low Flow	2022 Average	2022 Winter Low Flow	2022 Summer Low Flow	2022 Average	2022 Winter Low Flow	2022 Summer Low Flow
DP18	**DP19**	670	6.5	-2.3E-03	-6.0E-03	-3.8E-03	-10.0	-26.3	-16.6	-5.0	-13.1	-8.3	-5.0	-13.1	-8.3
DP19	**DP20**	310	6.5	-1.8E-03	-3.3E-03	-3.8E-03	-3.7	-6.6	-7.8	-1.5	-2.6	-3.1	-2.2	-4.0	-4.7
DP20	**Hwy 401**	270	6.5	-8.0E-04	-2.0E-03	-1.5E-03	-1.4	-3.5	-2.6	-0.6	-1.4	-1.0	-0.8	-2.1	-1.5
Hwy 401	**DP21**	60	7.1	1.6E-03	9.8E-04	7.1E-04	0.7	0.4	0.3	0.3	0.2	0.1	0.4	0.2	0.2
DP21	**DP4/R**	100	7.3	1.2E-03	4.9E-04	6.6E-04	0.9	0.4	0.5	0.3	0.1	0.2	0.5	0.2	0.3
DP4/R	**DP22**	50	7.1	1.8E-03	1.3E-03	1.4E-03	0.6	0.5	0.5	0.3	0.2	0.2	0.4	0.3	0.3
DP22	**DP17/R**	100	6.6	1.6E-03	1.5E-03	1.1E-03	1.1	1.0	0.7	0.4	0.4	0.3	0.7	0.6	0.4
DP17/R	**DP3**	165	7.1	1.6E-03	1.5E-03	8.9E-04	1.9	1.8	1.0	0.7	0.7	0.4	1.1	1.1	0.6
DP3	**Galt Creek**	420	6.0	2.0E-03	2.0E-03	1.5E-03	5.0	5.0	3.9	2.0	2.0	1.5	3.0	3.0	2.3
Galt Creek	**Pond Creek**	255	8.1	3.0E-03	3.0E-03	3.0E-03	6.2	6.2	6.2	2.5	2.5	2.5	3.7	3.7	3.7
Pond Creek	**DP1**	250	8.0	7.9E-03	7.2E-03	7.3E-03	15.8	14.3	14.6	7.9	7.2	7.3	7.9	7.2	7.3
DP1	**DP2**	100	6.7	6.6E-03	5.4E-03	5.9E-03	4.4	3.6	4.0	2.2	1.8	2.0	2.2	1.8	2.0
DP2	**DP5CR**	800	7.6	2.1E-03	1.7E-03	1.8E-03	13.0	10.6	10.8	6.5	5.3	5.4	6.5	5.3	5.4
TOTALS							34.4	7.3	15.5	16.1	3.2	7.5	18.3	4.2	8.0

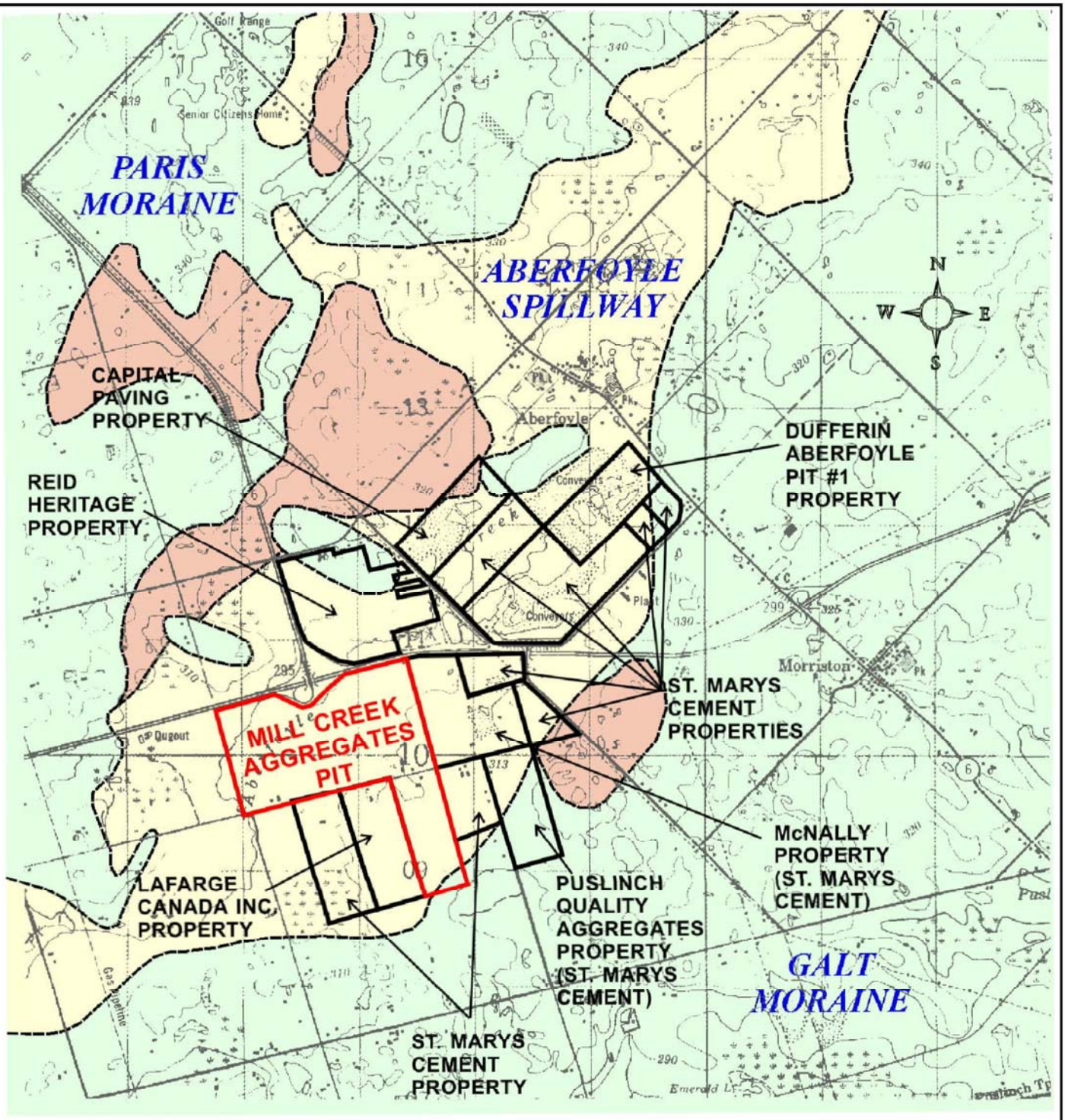
NOTES:
- Groundwater influx at Galt Creek and Pond Creek based on seepage meter data from May/June 1992.
- 2022 Average - Average of all 2022 data at each drive point.
- 2022 Winter Low Flow - Based on November 24, 2022 data.
- 2022 Summer Low Flow - Based on September 8, 2022 data.

TABLE 3
DISTRIBUTION OF GROUNDWATER INFLUX, AVERAGE HISTORIC CONDITIONS (1993-2021)
MILL CREEK AGGREGATES PIT

FROM	TO	LENGTH	AVERAGE WIDTH	AVERAGE INFLUX (L/s/m²)			TOTAL GROUNDWATER INFLUX (L/s)			ESTIMATED GROUNDWATER FLUX FROM NORTH SIDE OF CREEK (L/s)			ESTIMATED GROUNDWATER FLUX FROM SOUTH SIDE OF CREEK (L/s)		
		(m)	(m)	Overall Average	Winter Low Flow Average	Summer Low Flow Average	Overall Average	Winter Low Flow Average	Summer Low Flow Average	Overall Average	Winter Low Flow Average	Summer Low Flow Average	Overall Average	Winter Low Flow Average	Summer Low Flow Average
DP18	**DP19**	670	6.5	8.8E-04	3.9E-04	6.2E-04	3.8	1.7	2.7	1.9	0.9	1.3	1.9	0.9	1.3
DP19	**DP20**	310	6.5	5.9E-04	2.3E-04	2.0E-04	1.2	0.5	0.4	0.5	0.2	0.2	0.7	0.3	0.2
DP20	**Hwy 401**	270	6.5	1.2E-03	9.0E-04	8.1E-04	2.2	1.6	1.4	0.9	0.6	0.6	1.3	1.0	0.9
Hwy 401	**DP21**	60	7.1	1.6E-03	1.2E-03	1.4E-03	0.7	0.5	0.6	0.3	0.2	0.2	0.4	0.3	0.4
DP21	**DP4/R**	100	7.3	2.6E-03	1.8E-03	2.2E-03	1.9	1.3	1.6	0.8	0.5	0.6	1.1	0.8	1.0
DP4/R	**DP22**	50	7.1	3.8E-03	2.8E-03	3.3E-03	1.4	1.0	1.2	0.5	0.4	0.5	0.8	0.6	0.7
DP22	**DP17/R**	100	6.6	2.6E-03	2.1E-03	2.2E-03	1.7	1.4	1.4	0.7	0.5	0.6	1.0	0.8	0.9
DP17/R	**DP3**	165	7.1	1.4E-03	1.4E-03	1.3E-03	1.6	1.7	1.5	0.7	0.7	0.6	1.0	1.0	0.9
DP3	**Galt Creek**	420	6.0	1.7E-03	1.7E-03	1.7E-03	4.4	4.4	4.2	1.7	1.7	1.7	2.6	2.6	2.5
Galt Creek	**Pond Creek**	255	8.1	3.0E-03	3.0E-03	3.0E-03	6.2	6.2	6.2	2.5	2.5	2.5	3.7	3.7	3.7
Pond Creek	**DP1**	250	8.0	7.0E-03	6.8E-03	6.5E-03	14.1	13.6	13.0	7.0	6.8	6.5	7.0	6.8	6.5
DP1	**DP2**	100	6.7	5.6E-03	5.4E-03	5.0E-03	3.8	3.6	3.4	1.9	1.8	1.7	1.9	1.8	1.7
DP2	**DP5A/B/C/D/CR**	800	7.6	2.3E-03	2.4E-03	1.8E-03	13.8	14.3	10.9	6.9	7.1	5.5	6.9	7.1	5.5
TOTALS							56.6	51.7	48.4	26.2	24.0	22.4	30.4	27.7	26.1

NOTES:
- Groundwater influx at Galt Creek and Pond Creek based on seepage meter data from May/June 1992.
- Overall Average - Average of year-round historic data at each drive point.
- Winter Low Flow Average - Based on historic winter data at each drive point.
- Summer Low Flow Average - Based on historic summer data at each drive point.

FIGURES



Legend

- SANDY SILT TILL
- ICE-CONTACT STRATIFIED DRIFT SAND, SILT, GRAVEL
- OUTWASH SAND AND GRAVEL

SOURCE:
GENERALIZED AFTER KARROW, 1987.

500 0 1000 metres

LOCATION AND PHYSICAL SETTING

2022 ANNUAL GROUNDWATER MONITORING REPORT
MILL CREEK AGGREGATES PIT
Township Of Puslinch
for Dufferin Aggregates

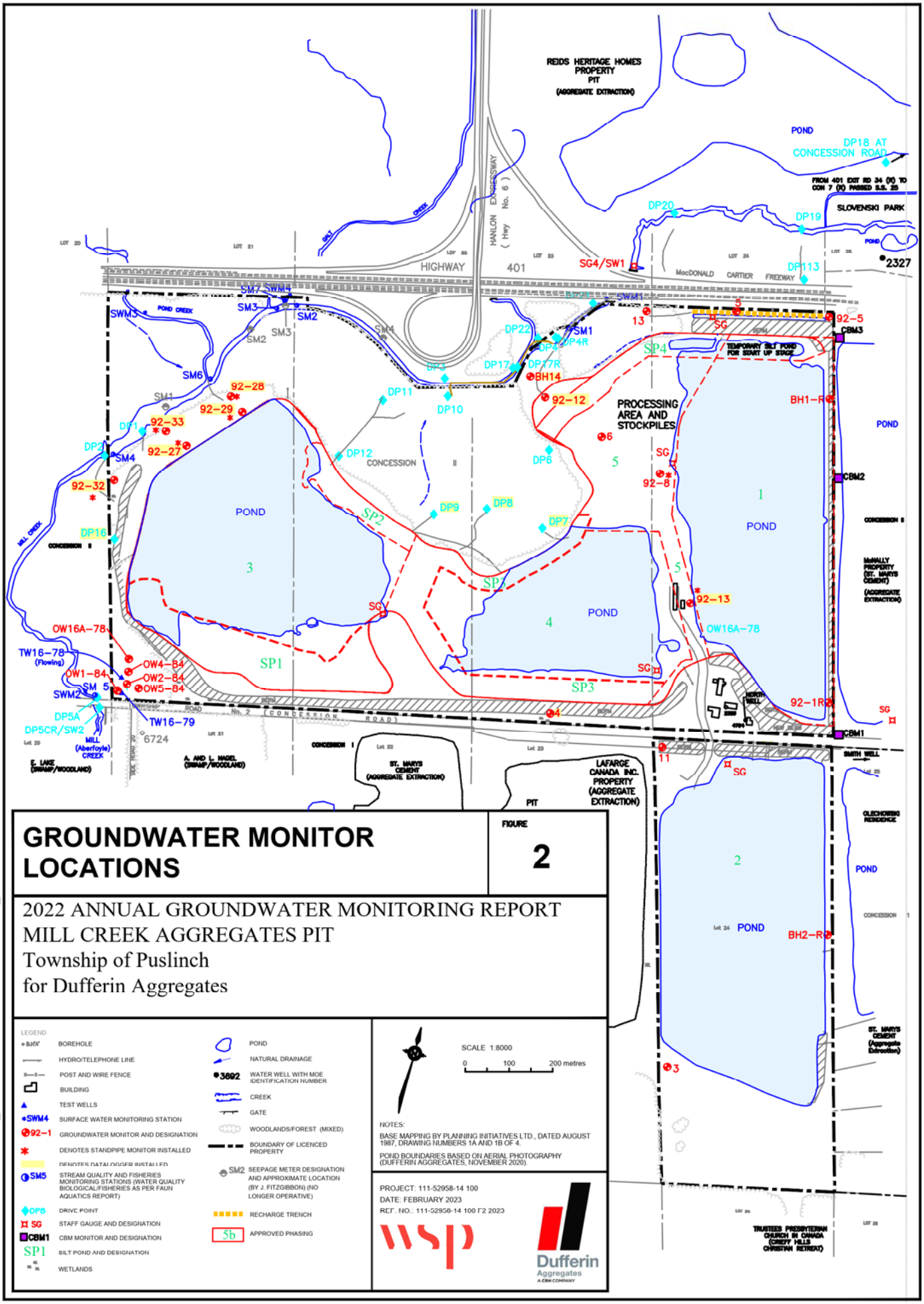
Dufferin Aggregates
A CRH COMPANY

DATE: FEBRUARY 2023	SCALE: 1:50000
PROJECT: 111-52958-14 100	REF. NO.: 111-52958-14 100 F1 2023

wsp

FIGURE 1

\\CORP.PBWAN.NET\CA\ENV_GIS\PROJECTS\ICRC CAD\ON\2023_PROJECTS\111-52958-14 MILL CREEK PIT 2022 AMR\4 MODELS AND DRAWINGS\41 XX\04 WIP\01 CAD\111-52958-14-100 F1 2023.DWG



GROUNDWATER MONITOR LOCATIONS

FIGURE 2

2022 ANNUAL GROUNDWATER MONITORING REPORT
MILL CREEK AGGREGATES PIT
Township of Puslinch
for Dufferin Aggregates

LEGEND

- BOREHOLE
- HYDRO/TELEPHONE LINE
- POST AND WIRE FENCE
- BUILDING
- TEST WELLS
- SWM4 SURFACE WATER MONITORING STATION
- 92-1 GROUNDWATER MONITOR AND DESIGNATION
- DENOTES STANDPIPE MONITOR INSTALLED
- DENOTES DATALOGGER INSTALLED
- SM5 STREAM QUALITY AND FISHERIES MONITORING STATIONS (WATER QUALITY BIOLOGICAL/FISHERIES AS PER FAUN AQUATICS REPORT)
- DP6 DRIVE POINT
- SG STAFF GAUGE AND DESIGNATION
- CBM1 CBM MONITOR AND DESIGNATION
- SP1 SILT POND AND DESIGNATION
- WETLANDS
- POND
- NATURAL DRAINAGE
- 3892 WATER WELL WITH MOE IDENTIFICATION NUMBER
- CREEK
- GATE
- WOODLANDS/FOREST (MIXED)
- BOUNDARY OF LICENCED PROPERTY
- SM2 SEEPAGE METER DESIGNATION AND APPROXIMATE LOCATION (BY J. FITZGIBBON) (NO LONGER OPERATIVE)
- RECHARGE TRENCH
- 5b APPROVED PHASING

SCALE 1:8000
0 100 200 metres

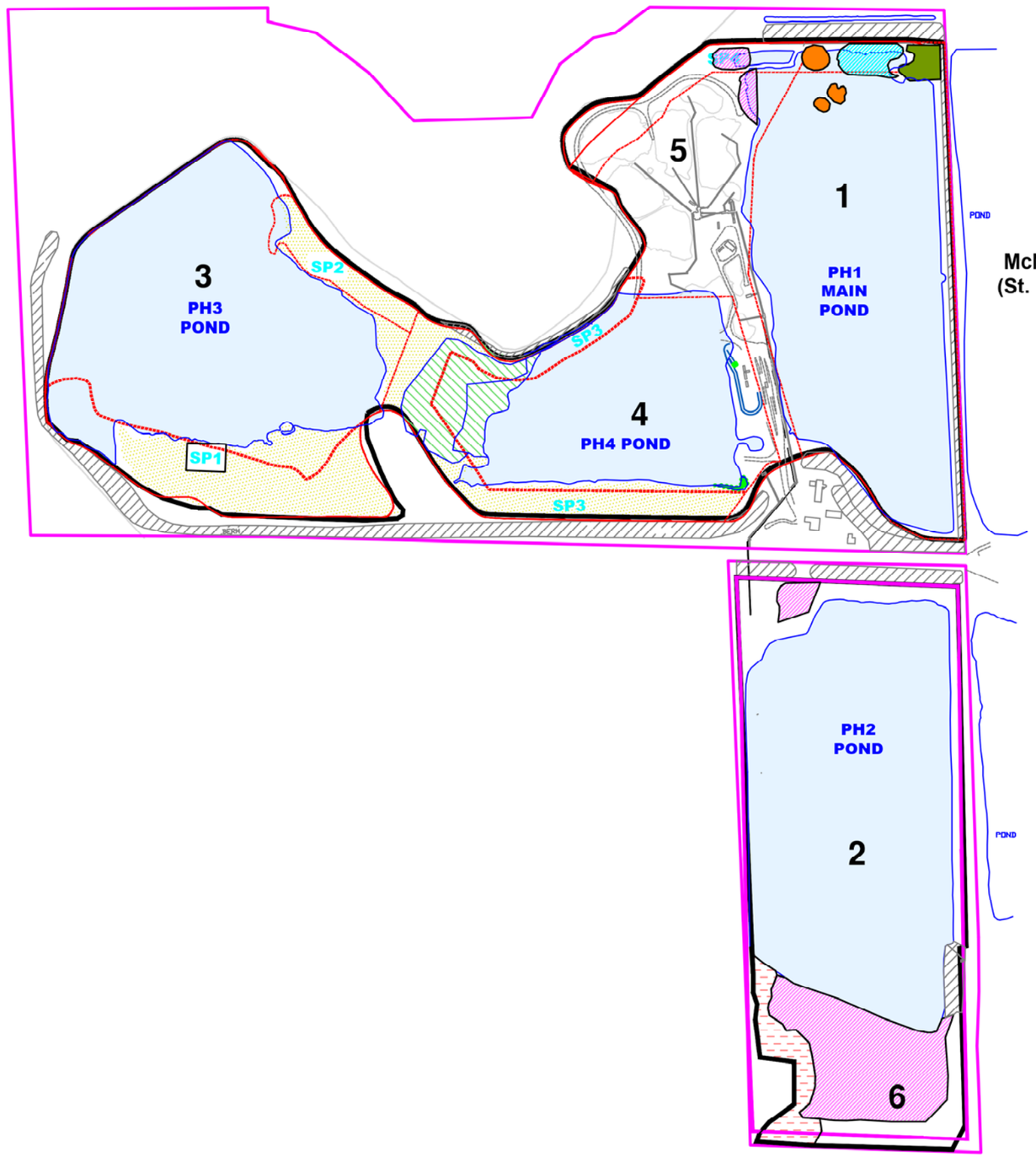
NOTES:
BASE MAPPING BY PLANNING INITIATIVES LTD., DATED AUGUST 1987, DRAWING NUMBERS 1A AND 1B OF 4.
POND BOUNDARIES BASED ON AERIAL PHOTOGRAPHY (DUFFERIN AGGREGATES, NOVEMBER 2020).

PROJECT: 111-52958-14 100
DATE: FEBRUARY 2023
RCT. NO.: 111-52958-14 100 F2 2023

wsp

Dufferin Aggregates
A CRH COMPANY

\\CORP.PBWAN.NET\CA\ENV_GIS\PROJECTS\ICRC CAD\ON\2023_PROJECTS\111-52958-14 MILL CREEK PIT 2022 AMR\4 MODELS AND DRAWINGS\41 XX\06 DRAWING\111-52958-14-100 F2 2023.DWG



McNALLY
(St. Marys Cement)

LEGEND

- BOUNDARY OF LICENSED PROPERTY
- LICENCED LIMIT OF EXTRACTION PER SITE PLANS
- BOUNDARY OF EXTRACTION AREA PER G.R.C.A. FILL PERMIT APPLICATION
- 3 — PHASE DESIGNATION
- SP3 — SILT POND DESIGNATION
- BERM
- INFILLED SILT POND
- PARTIALLY INFILLED SILT POND
- EXTRACTED AREA TO BE SLOPED
- 2022 DEPOSITION AREA
- 2020 DEPOSITION AREA
- 2022 EXTRACTED AREA
- 2021 DEPOSITION AREA

NOTES:

BASE MAPPING BY PLANNING INITIATIVES LTD., DATED AUGUST 1987, DRAWING NUMBERS 1A AND 1B OF 4.

POND BOUNDARIES BASED ON AERIAL PHOTOGRAPHY (DUFFERIN AGGREGATES, NOVEMBER 2020).

SITE PLAN SEQUENCING

2022 ANNUAL GROUNDWATER
MONITORING REPORT
MILL CREEK AGGREGATES PIT
Township of Puslinch
for Dufferin Aggregates

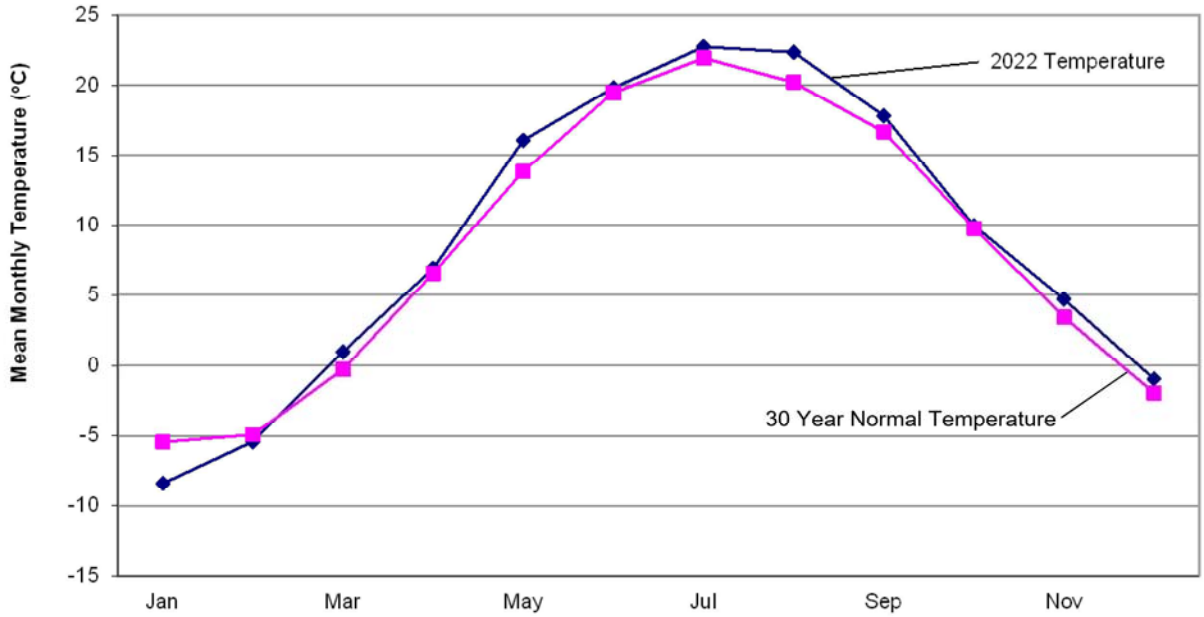
Dufferin Aggregates
A CRH COMPANY

wsp

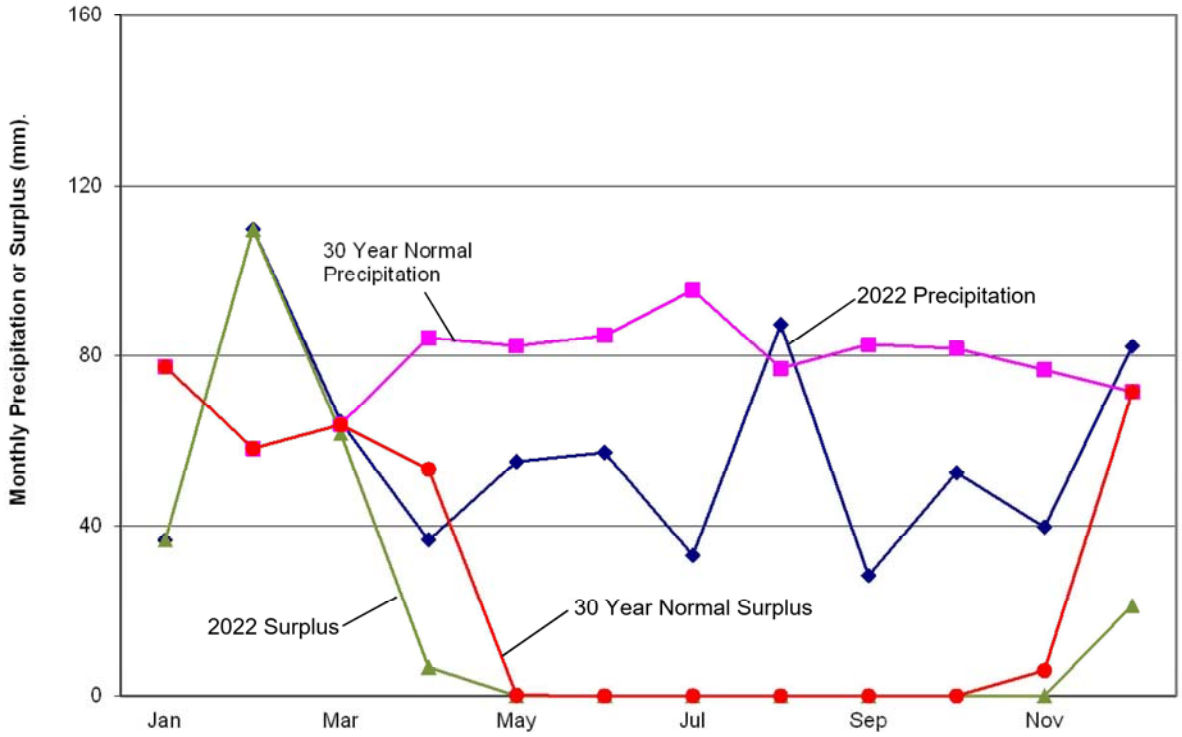
SCALE: NOT TO SCALE
PROJECT: 111-52958-14 100
DATE: FEBRUARY 2023
REF. NO.: 111-52958-14 100 F3 2023

FIGURE

2022 TEMPERATURE DATA
SHADE'S MILLS CLIMATE STATION



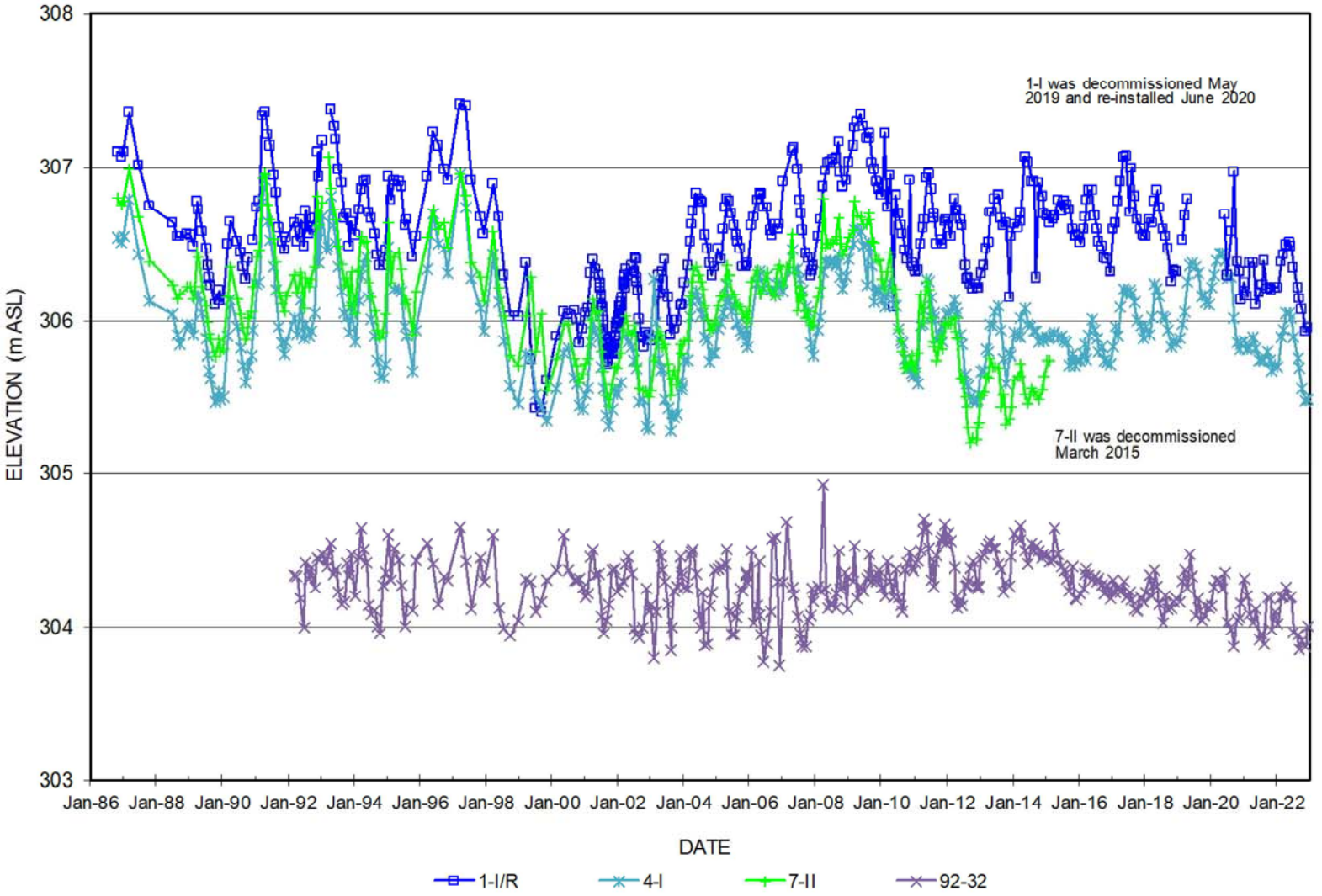
2022 PRECIPITATION DATA
SHADE'S MILLS CLIMATE STATION



SCALE: AS SHOWN	**2022 TEMPERATURE AND PRECIPITATION DATA**
REF. NO.: 111-52958-14 100 F4 2023	
DATE: FEBRUARY 2023	2022 ANNUAL GROUNDWATER MONITORING REPORT MILL CREEK AGGREGATES PIT Township of Puslinch for Dufferin Aggregates
PROJECT: 111-52958-14 100	FIGURE 4

wsp

Dufferin Aggregates
A CRH COMPANY



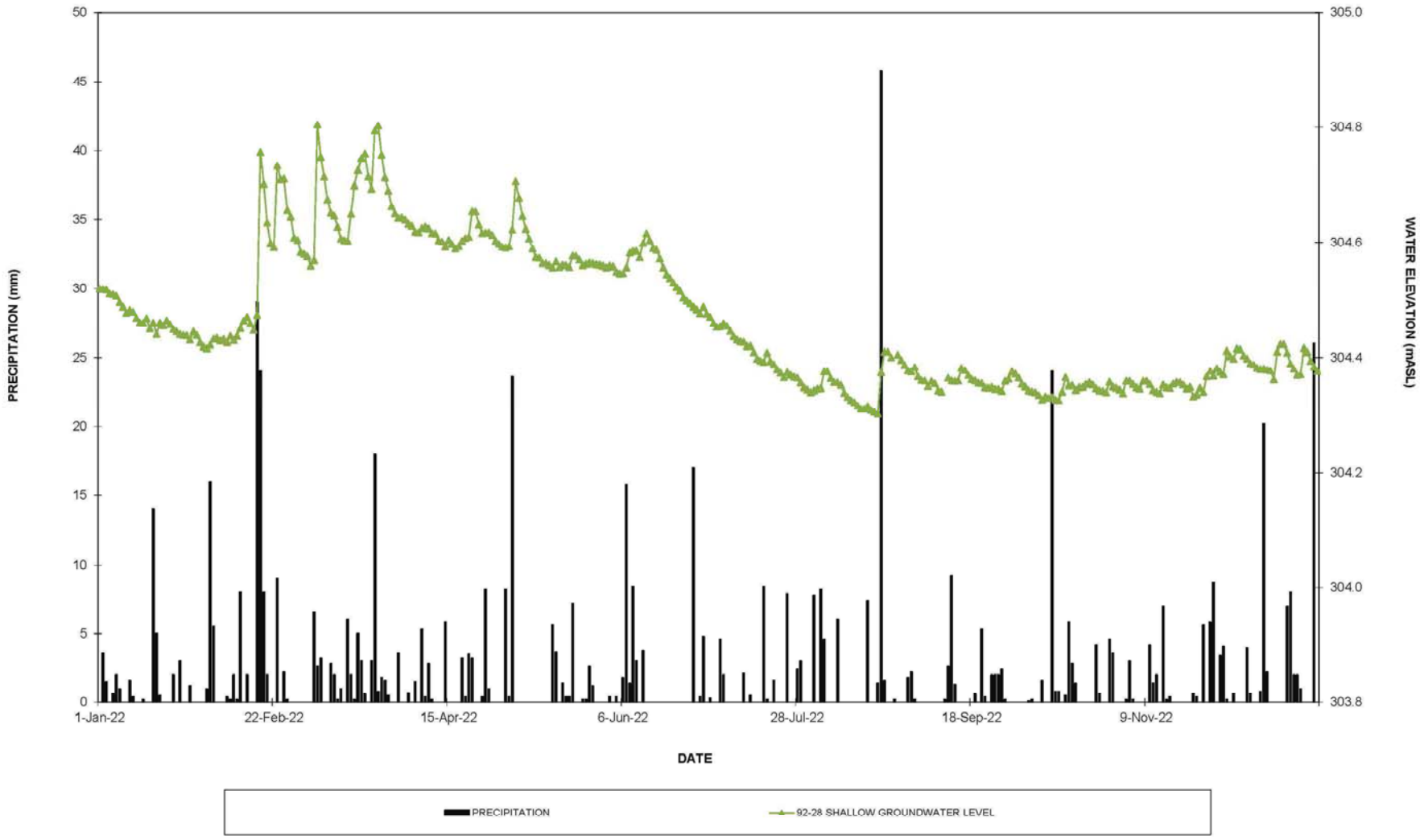
NOTE:
THESE MONITORS ARE WATER TABLE STANDPIPES ESTABLISHED IN THE BH-SERIES OF MONITORS ACROSS THE PROPERTY.

SCALE: AS SHOWN	**GROUNDWATER HYDROGRAPH OF REPRESENTATIVE MONITORS IN THE SAND AND GRAVEL AQUIFER**
REF. NO.: 111-52958-14 100 F5 2023	
DATE: FEBRUARY 2023	2022 ANNUAL GROUNDWATER MONITORING REPORT MILL CREEK AGGREGATES PIT Township of Puslinch for Dufferin Aggregates
PROJECT: 111-52958-14 100	FIGURE 5

wsp

Dufferin Aggregates

\\CORP.PBWAN.NET\CA\ENV_GIS\PROJECTS\ICRC CAD\ON\2023_PROJECTS\111-52958-14 MILL CREEK PIT 2022 AMR\4 MODELS AND DRAWINGS\41 XX\04 WIP\01 CAD\111-52958-14-100 F5 2023.DWG

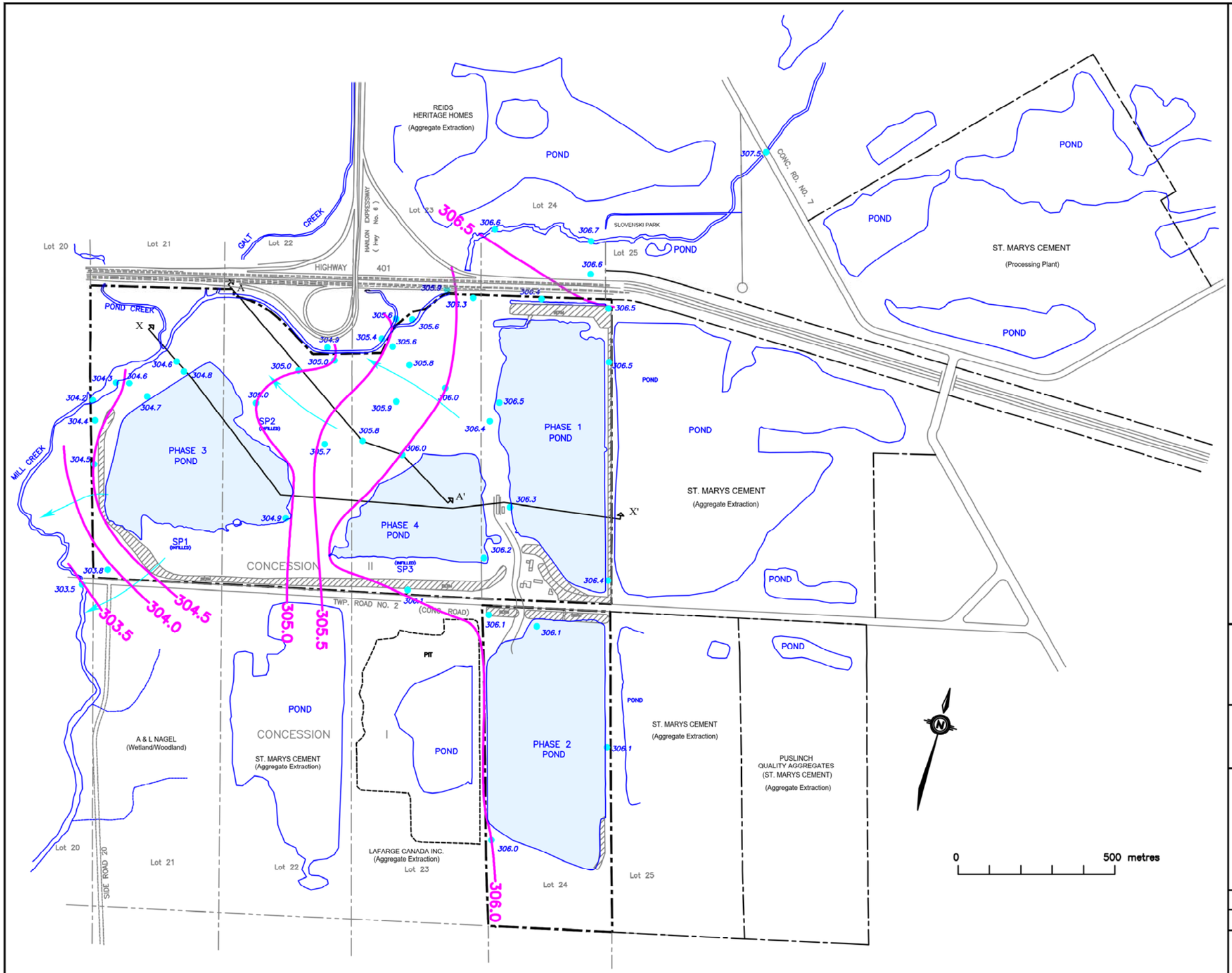


SCALE: AS SHOWN	**SHALLOW GROUNDWATER ELEVATION AND DAILY PRECIPITATION AT MONITOR 92-28**
REF. NO.: 111-52958-14 100 F6 2023	
DATE: JANUARY 2022	2022 ANNUAL GROUNDWATER MONITORING REPORT MILL CREEK AGGREGATES PIT Township of Puslinch for Dufferin Aggregates
PROJECT: 111-52958-14 100	FIGURE 6

wsp

Dufferin Aggregates

I:\PROJECTS\ICRC CAD\ON\2023_PROJECTS\111-52958-14 MILL CREEK PIT 2022 AMR\4 MODELS AND DRAWINGS\41 XX\04 WIP\01 CAD\111-52958-14-100 F6 2023.DWG



LEGEND

- BOUNDARY OF LICENCED PROPERTY
- 305.7 — WATER TABLE ELEVATION (mASL) APRIL 21, 2022
- 306.0 — INTERPRETED WATER TABLE CONTOUR (mASL)
- INFERRED DIRECTION OF GROUNDWATER FLOW
- A — GEOLOGIC CROSS SECTION LOCATION

NOTES:

BASE MAPPING BY PLANNING INITIATIVES LTD., DATED AUGUST 1987, DRAWING NUMBERS 1A AND 1B OF 4.

POND BOUNDARIES BASED ON AERIAL PHOTOGRAPHY (DUFFERIN AGGREGATES, NOVEMBER 2020).

2022 'HIGH FLOW' WATER TABLE CONFIGURATION (APRIL)

2022 ANNUAL GROUNDWATER MONITORING REPORT
MILL CREEK AGGREGATES PIT
Township of Puslinch
for Dufferin Aggregates

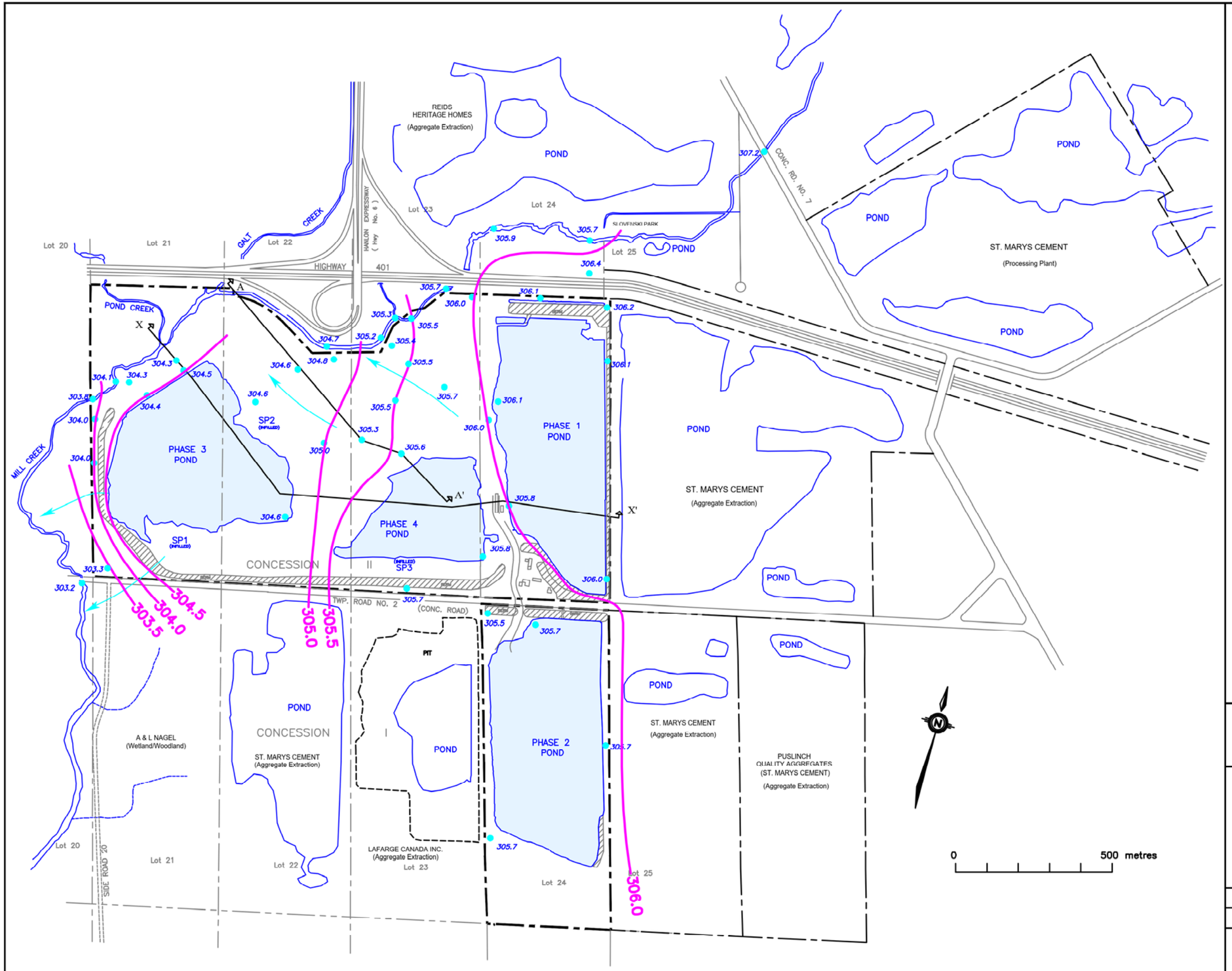
Dufferin Aggregates
A CRH COMPANY

DATE: FEBRUARY 2023	SCALE: 1:12500
PROJECT: 111-52958-14 100	FILE NO.: 111-52958-14 100 F7 2023

WSP

FIGURE 7

\\CORP.PBWAN.NET\CA\ENV_GIS\PROJECTS\ICRC CAD\ON\2023_PROJECTS\111-52958-14 MILL CREEK PIT 2022 AMR\4 MODELS AND DRAWINGS\41 XX\04 WIP\01 CAD\111-52958-14-100 F7 2023.DWG



LEGEND

- BOUNDARY OF LICENCED PROPERTY
- 305.7 — WATER TABLE ELEVATION (mASL) SEPTEMBER 8, 2022
- 306.0 — INTERPRETED WATER TABLE CONTOUR (mASL)
- INFERRED DIRECTION OF GROUNDWATER FLOW
- A — GEOLOGIC CROSS SECTION LOCATION

2022 'LOW FLOW' WATER TABLE CONFIGURATION (SEPTEMBER)

2022 ANNUAL GROUNDWATER MONITORING REPORT
MILL CREEK AGGREGATES PIT
Township of Puslinch
for Dufferin Aggregates

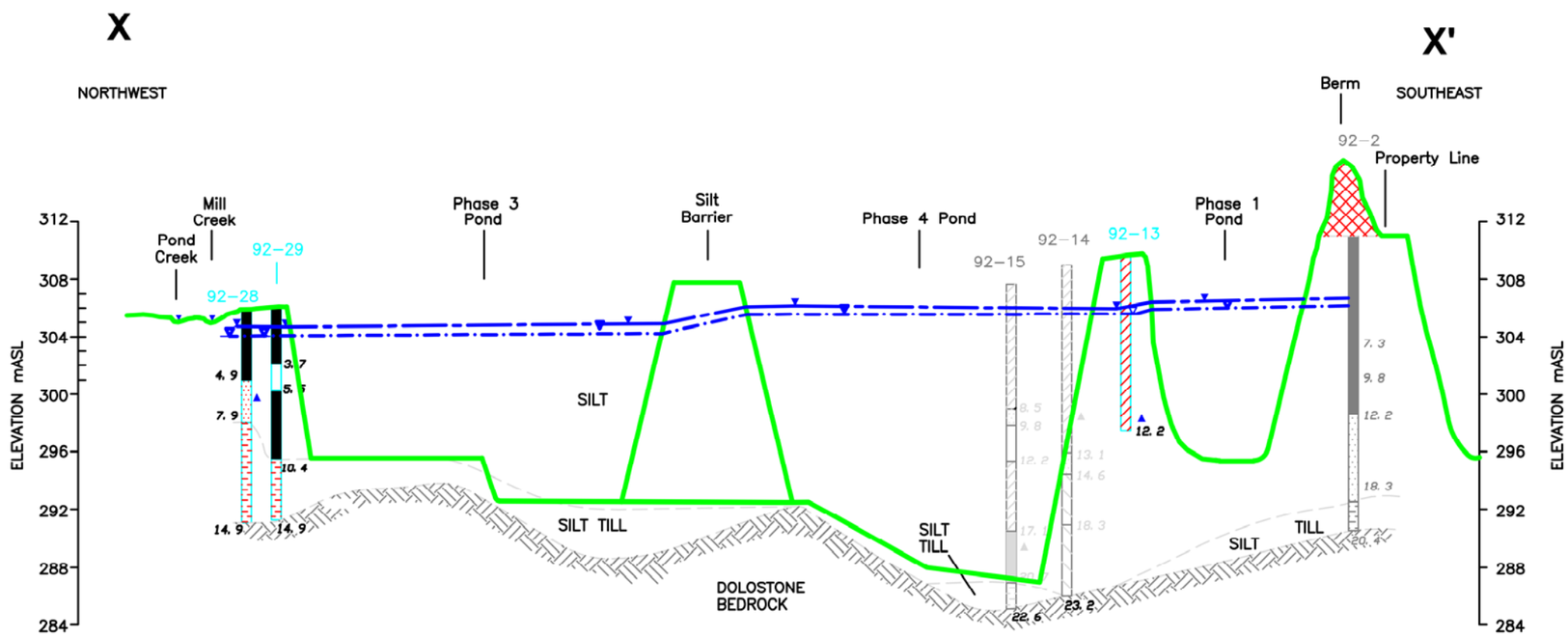
Dufferin Aggregates
A CRH COMPANY

DATE: FEBRUARY 2023	SCALE: 1:12500
PROJECT: 111-52958-14 100	FILE NO.: 111-52958-14 100 F8 2023

wsp

FIGURE 8

\\CORP.PBWAN.NET\CA\ENV_GIS\PROJECTS\ICRC CAD\ON\2023_PROJECTS\111-52958-14 MILL CREEK PIT 2022 AMR\4 MODELS AND DRAWINGS\41 XX\04 WIP\01 CAD\111-52958-14-100 F8 2023.DWG



LEGEND

- GRAVEL, SANDY GRAVEL, SAND AND GRAVEL
- GRAVELLY, FINE TO COARSE, SAND
- SAND
- SILT, SILTY FINE SAND, FINE SAND
- SILT TILL
- ASSUMED BEDROCK

92–28 BOREHOLE DESIGNATION
(GREYED OUT BOREHOLE = DECOMMISSIONED MONITOR)

2022 ``HIGH FLOW'' WATER TABLE PROFILE
(APRIL 2022)

2022 ``LOW FLOW'' WATER TABLE PROFILE
(SEPTEMBER 2022)

5. 5 DEPTH TO CHANGE IN STRATA (m)

GROUNDWATER MONITOR

14. 9 BOTTOM OF BOREHOLE (m)

SCALES:

Horizontal 1:8000
Vertical 1:400

0 200 400 metres

NOTE:
THE ACTUAL SOIL STRATIFICATION HAS BEEN VERIFIED FROM DATA OBTAINED AT THE BOREHOLE LOCATIONS ONLY. THE INFERRED CONTACTS SHOWN ARE BASED ON GEOLOGICAL EVIDENCE AND THESE MAY VARY FROM THOSE SH0WN BETWEEN BORINGS.

WATER TABLE PROFILE

2022 ANNUAL GROUNDWATER MONITORING REPORT
MILL CREEK AGGREGATES PIT
Township of Puslinch
for Dufferin Aggregates

Dufferin Aggregates
A CRH COMPANY

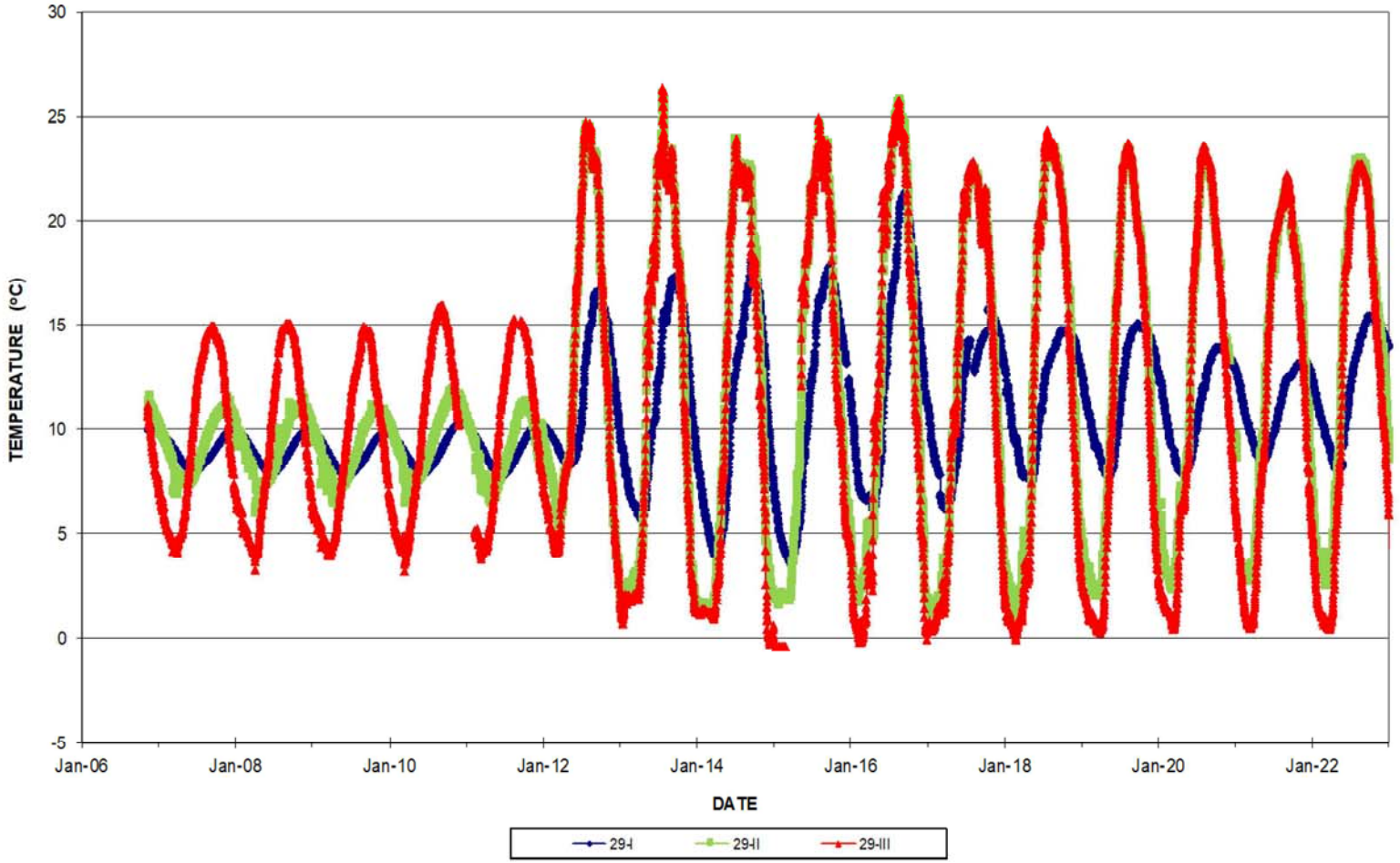
DATE: FEBRUARY 2023	SCALES: AS SHOWN
PROJECT: 111-52958-14 100	FILE NO.: 111-52958-14 100 F9 2023

wsp

FIGURE 9

\\CORP.PBWAN.NET\CA\ENV_GIS\PROJECTS\ICRC CAD\ON\2023_PROJECTS\111-52958-14 MILL CREEK PIT 2022 AMR\4 MODELS AND DRAWINGS\41 XX\04 WIP\01 CAD\111-52958-14-100 F9 2023.DWG

GROUNDWATER THERMOGRAPH
MULTI-LEVEL MONITOR 92-29

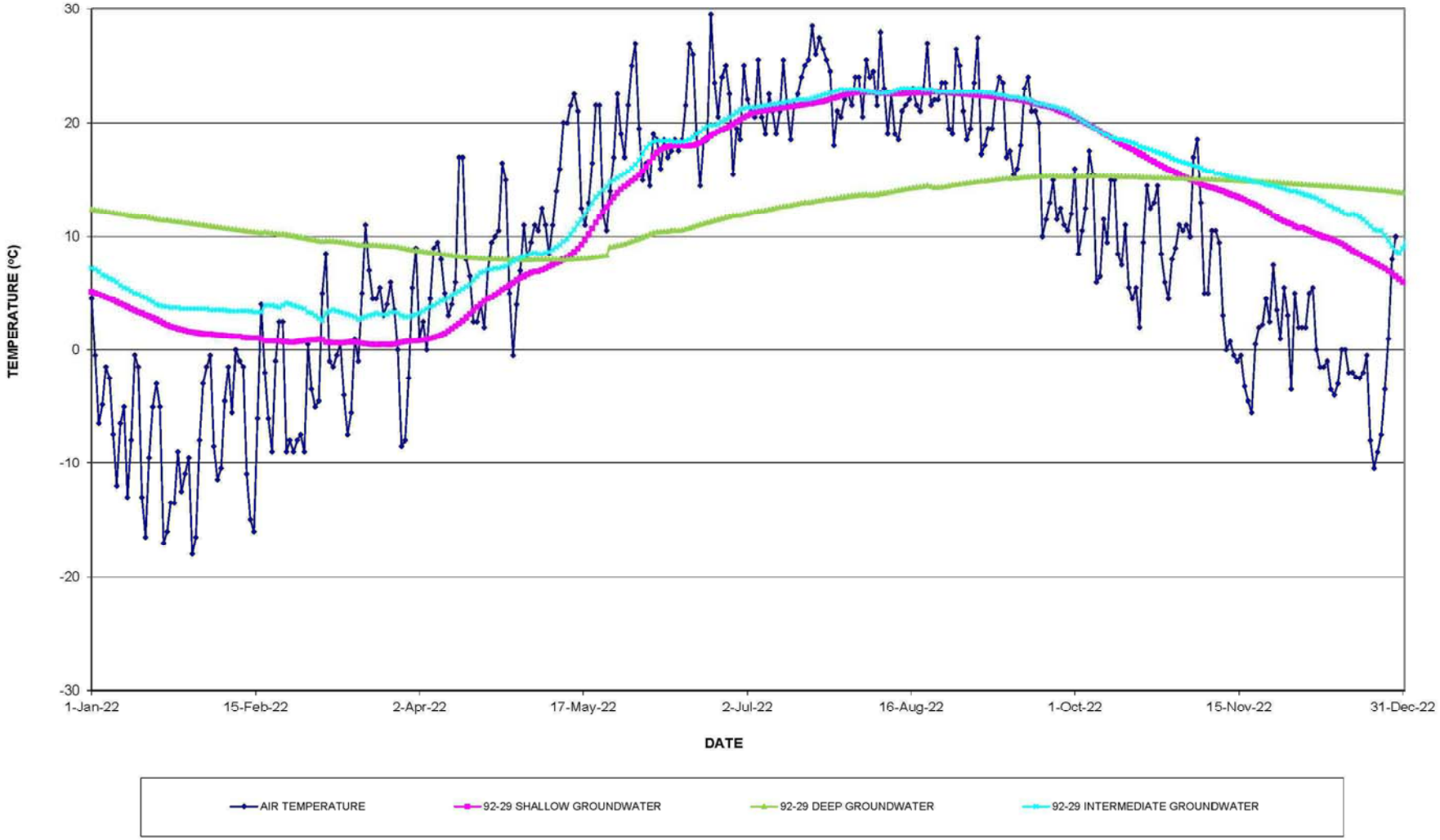


SCALE: AS SHOWN	**GROUNDWATER TEMPERATURE PROFILE MULTI-LEVEL MONITOR 92-29**
REF. NO.: 111-52958-14 100 F10 2023	
DATE: FEBRUARY 2023	2022 ANNUAL GROUNDWATER MONITORING REPORT MILL CREEK AGGREGATES PIT Township of Puslinch for Dufferin Aggregates
PROJECT: 111-52958-14 100	FIGURE 10

wsp

Dufferin Aggregates

\\CORP.PBWAN.NET\CA\ENV_GIS\PROJECTS\ICRC CAD\ON\2023_PROJECTS\111-52958-14 MILL CREEK PIT 2022 AMR\4 MODELS AND DRAWINGS\41 XX\06 DRAWING\111-52958-14-100 F10 2023.DWG



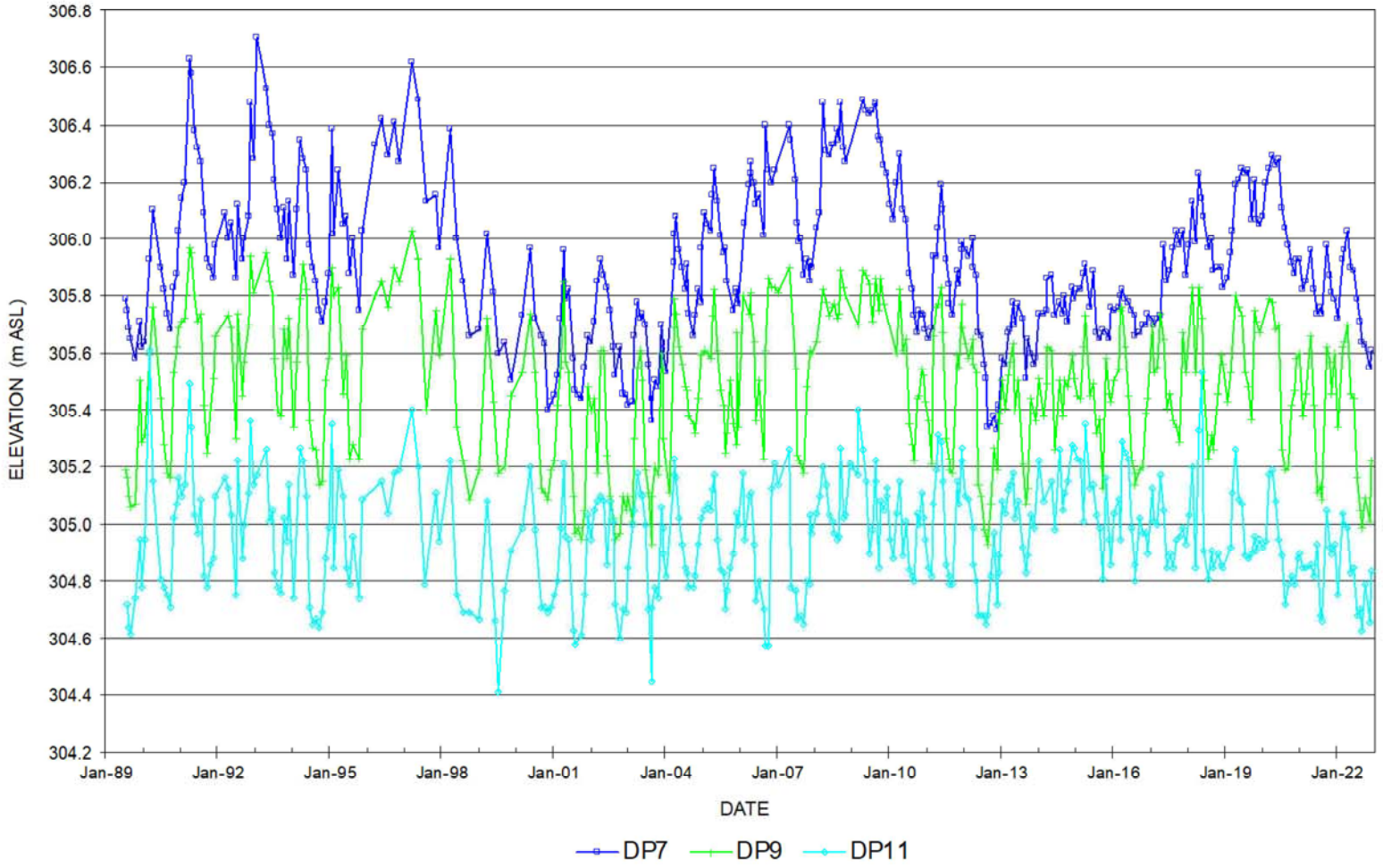
SCALE: AS SHOWN	**GROUNDWATER VS AIR TEMPERATURE AT MULTI-LEVEL MONITOR 92-29**
REF. NO.: 111-52958-14 100 F11 2023	
DATE: FEBRUARY 2023	2022 ANNUAL GROUNDWATER MONITORING REPORT MILL CREEK AGGREGATES PIT Township of Puslinch for Dufferin Aggregates
PROJECT: 111-52958-14 100	FIGURE **11**

wsp

Dufferin Aggregates

I:\PROJECTS\ICRC CAD\ON\2023_PROJECTS\111-52958-14 MILL CREEK PIT 2022 AMR\4 MODELS AND DRAWINGS\41 XX\04 WIP\01 CAD\111-52958-14-100 F11 2023.DWG

GROUNDWATER HYDROGRAPH
REPRESENTATIVE WETLAND DRIVE POINTS

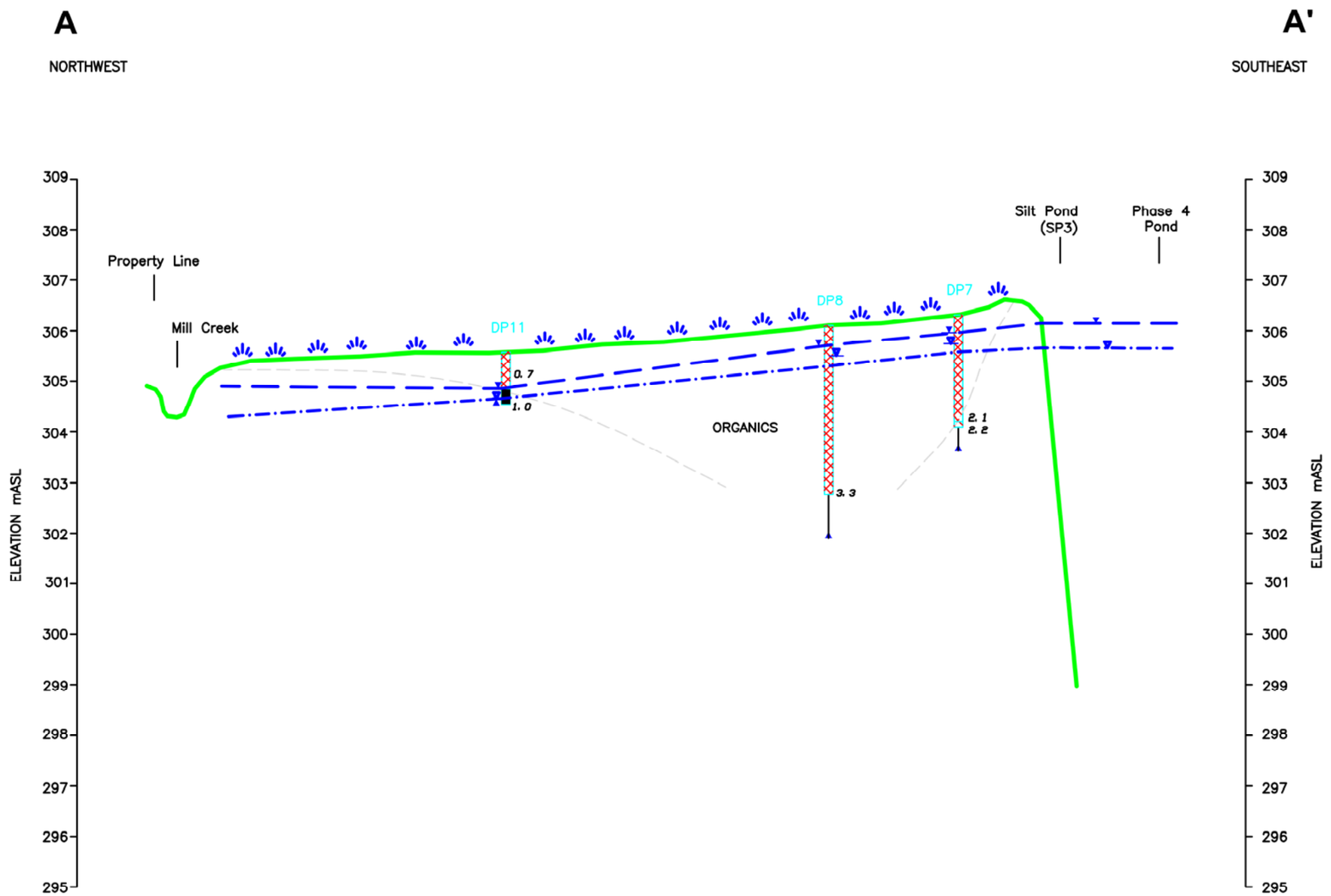


SCALE: AS SHOWN	**GROUNDWATER HYDROGRAPH OF REPRESENTATIVE DRIVE POINTS IN THE WETLAND**
REF. NO.: 111-52958-14 100 F12 2023	
DATE: FEBRUARY 2023	2022 ANNUAL GROUNDWATER MONITORING REPORT MILL CREEK AGGREGATES PIT Township of Puslinch for Dufferin Aggregates
PROJECT: 111-52958-14 100	FIGURE 12

wsp

Dufferin Aggregates

\\CORP.PBWAN.NET\CA\ENV_GIS\PROJECTS\ICRC CAD\ON\2023_PROJECTS\111-52958-14 MILL CREEK PIT 2022 AMR\4 MODELS AND DRAWINGS\41 XX\06 DRAWING\111-52958-14-100 F12 2023.DWG



LEGEND

- ORGANICS
- SAND AND GRAVEL
- GRAVELLY SAND
- SAND
- CLAYEY SILT
- SILT TILL

DP11 BOREHOLE DESIGNATION

BUSH/WETLAND DESIGNATION

2022 ``HIGH FLOW" WATER TABLE PROFILE (APRIL 2022)

2022 ``LOW FLOW" WATER TABLE PROFILE (SEPTEMBER 2022)

0.7 DEPTH TO CHANGE IN STRATA (m)

GROUNDWATER MONITOR

1.0 BOTTOM OF BOREHOLE (m)

SCALES:

Horizontal 1:5000
Vertical 1:100

0 100 200 metres

NOTE:
THE ACTUAL SOIL STRATIFICATION HAS BEEN VERIFIED FROM DATA OBTAINED AT THE BOREHOLE LOCATIONS ONLY. THE INFERRED CONTACTS SHOWN ARE BASED ON GEOLOGICAL EVIDENCE AND THESE MAY VARY FROM THOSE SH0WN BETWEEN BORINGS.

GROUNDWATER LEVEL PROFILES THROUGH THE WETLAND

2022 ANNUAL GROUNDWATER MONITORING REPORT
MILL CREEK AGGREGATES PIT
Township of Puslinch
for Dufferin Aggregates

Dufferin Aggregates
A CRH COMPANY

DATE: FEBRUARY 2023	SCALES: AS SHOWN
PROJECT: 111-52958-14 100	FILE NO.: 111-52958-14 100 F13 2023

wsp

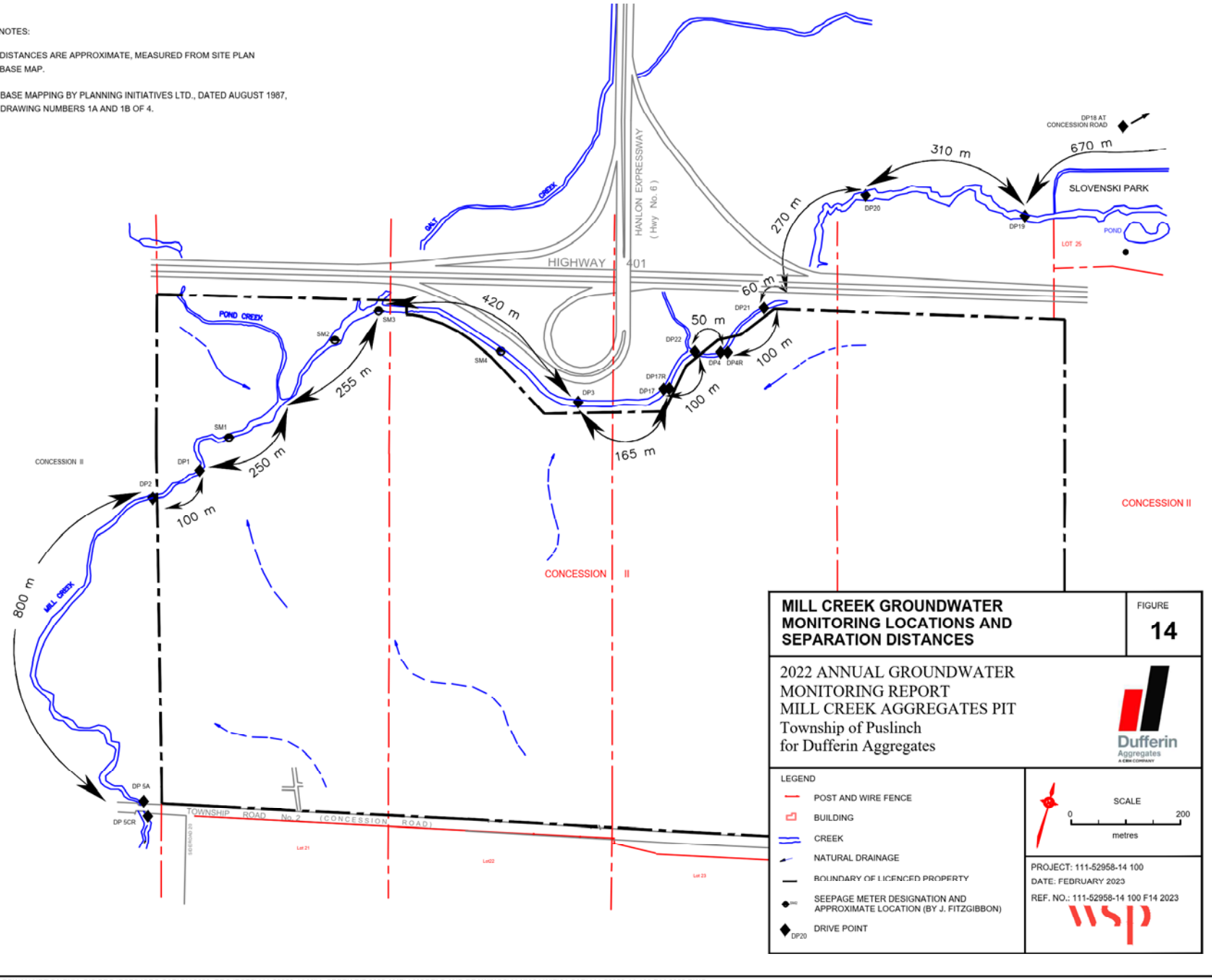
FIGURE 13

\\CORP.PBWAN.NET\CA\ENV_GIS\PROJECTS\ICRC CAD\ON\2023_PROJECTS\111-52958-14 MILL CREEK PIT 2022 AMR\4 MODELS AND DRAWINGS\41 XX\04 WIP\01 CAD\111-52958-14-100 F13 2023.DWG

NOTES:

DISTANCES ARE APPROXIMATE, MEASURED FROM SITE PLAN BASE MAP.

BASE MAPPING BY PLANNING INITIATIVES LTD., DATED AUGUST 1987, DRAWING NUMBERS 1A AND 1B OF 4.



MILL CREEK GROUNDWATER MONITORING LOCATIONS AND SEPARATION DISTANCES

FIGURE **14**

2022 ANNUAL GROUNDWATER MONITORING REPORT
MILL CREEK AGGREGATES PIT
Township of Puslinch
for Dufferin Aggregates

Dufferin Aggregates
A CRH COMPANY

LEGEND

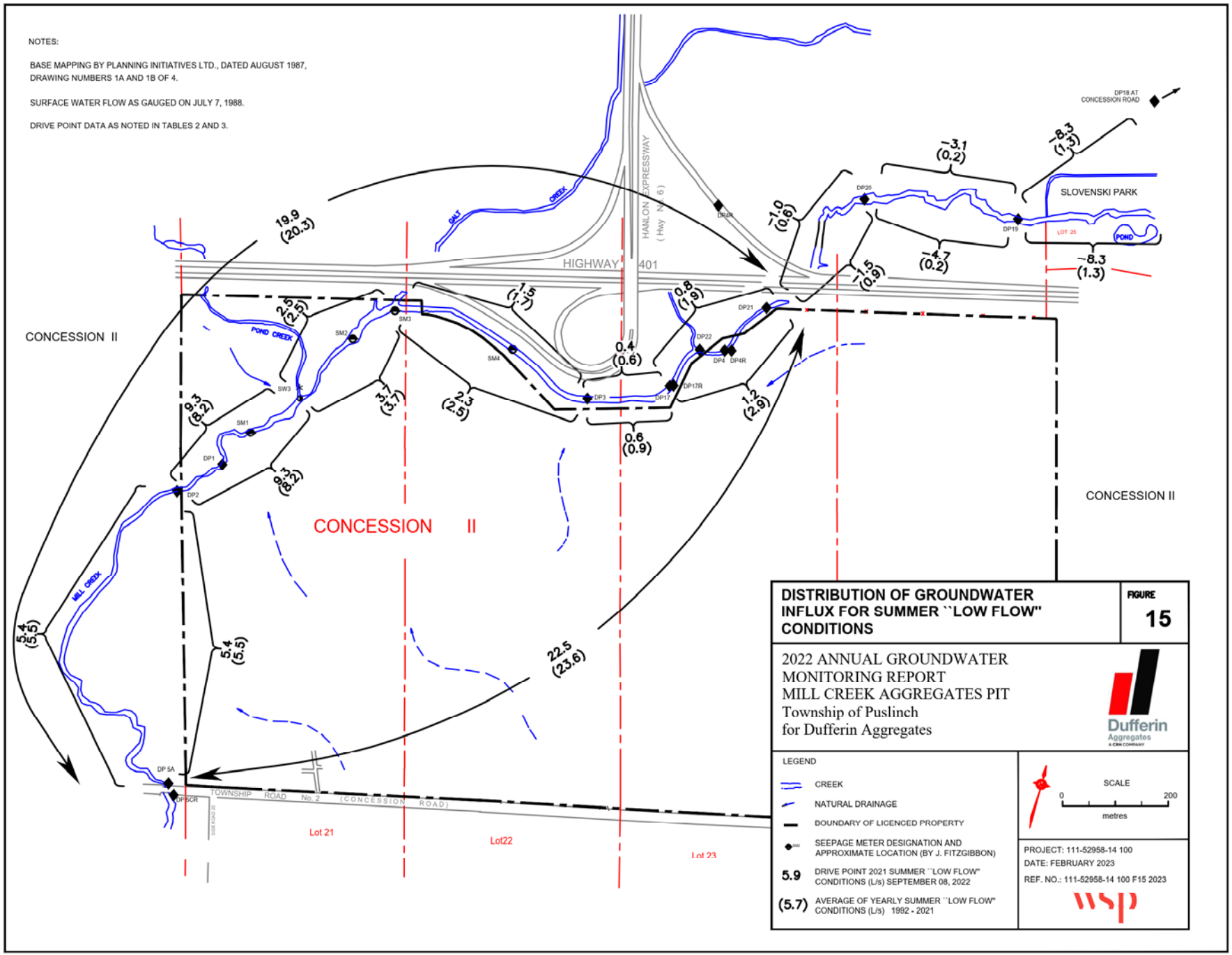
- POST AND WIRE FENCE
- BUILDING
- CREEK
- NATURAL DRAINAGE
- BOUNDARY OF LICENCED PROPERTY
- SEEPAGE METER DESIGNATION AND APPROXIMATE LOCATION (BY J. FITZGIBBON)
- DRIVE POINT DP20

SCALE
0 200
metres

PROJECT: 111-52958-14 100
DATE: FEBRUARY 2023
REF. NO.: 111-52958-14 100 F14 2023

wsp

\\CORP.PBWAN.NET\CA\ENV_GIS\PROJECTS\ICRC CAD\ON\2023_PROJECTS\111-52958-14 MILL CREEK PIT 2022 AMR\4 MODELS AND DRAWINGS\41 XX\04 WIP\01 CAD\111-52958-14-100 F14 2023.DWG



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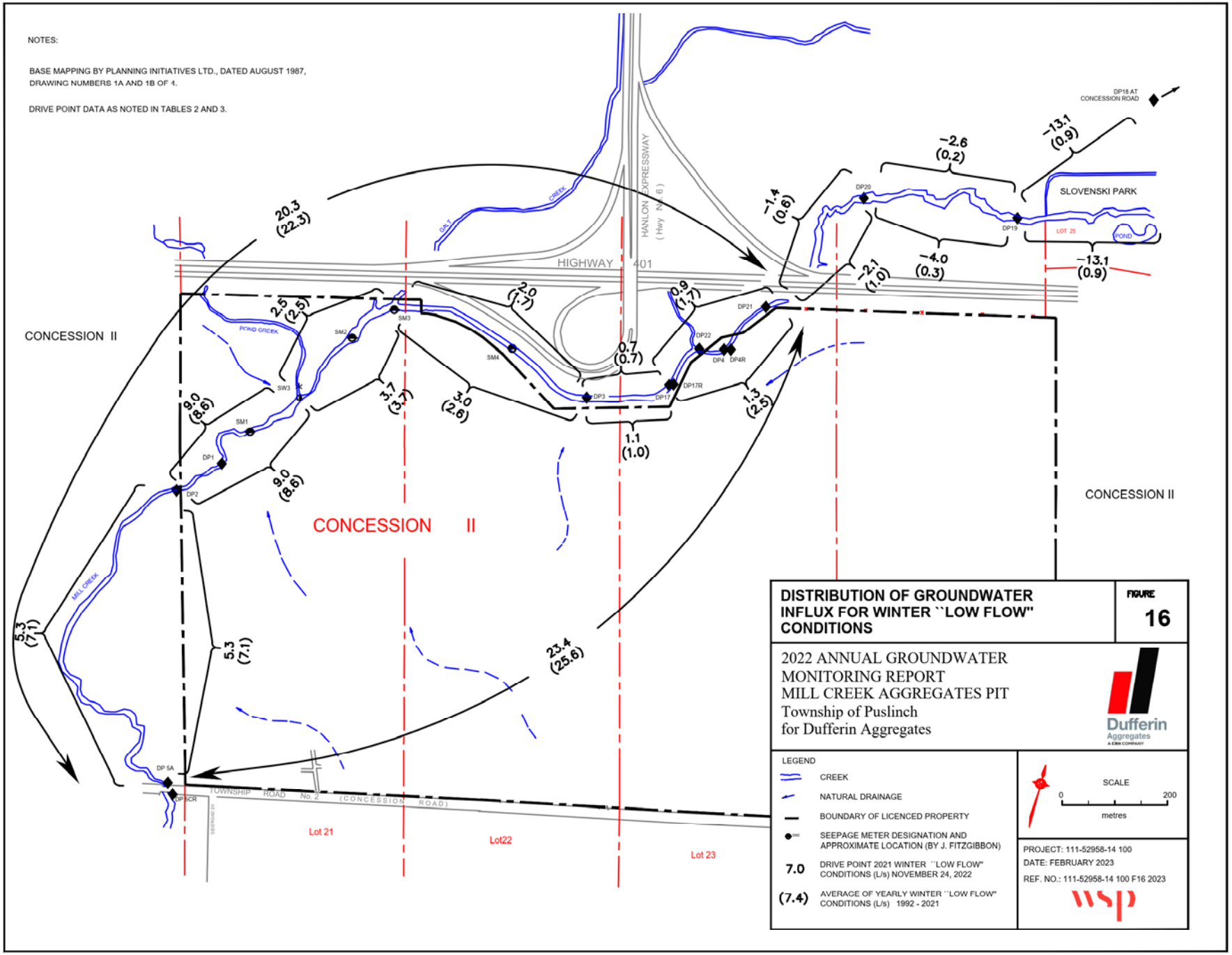

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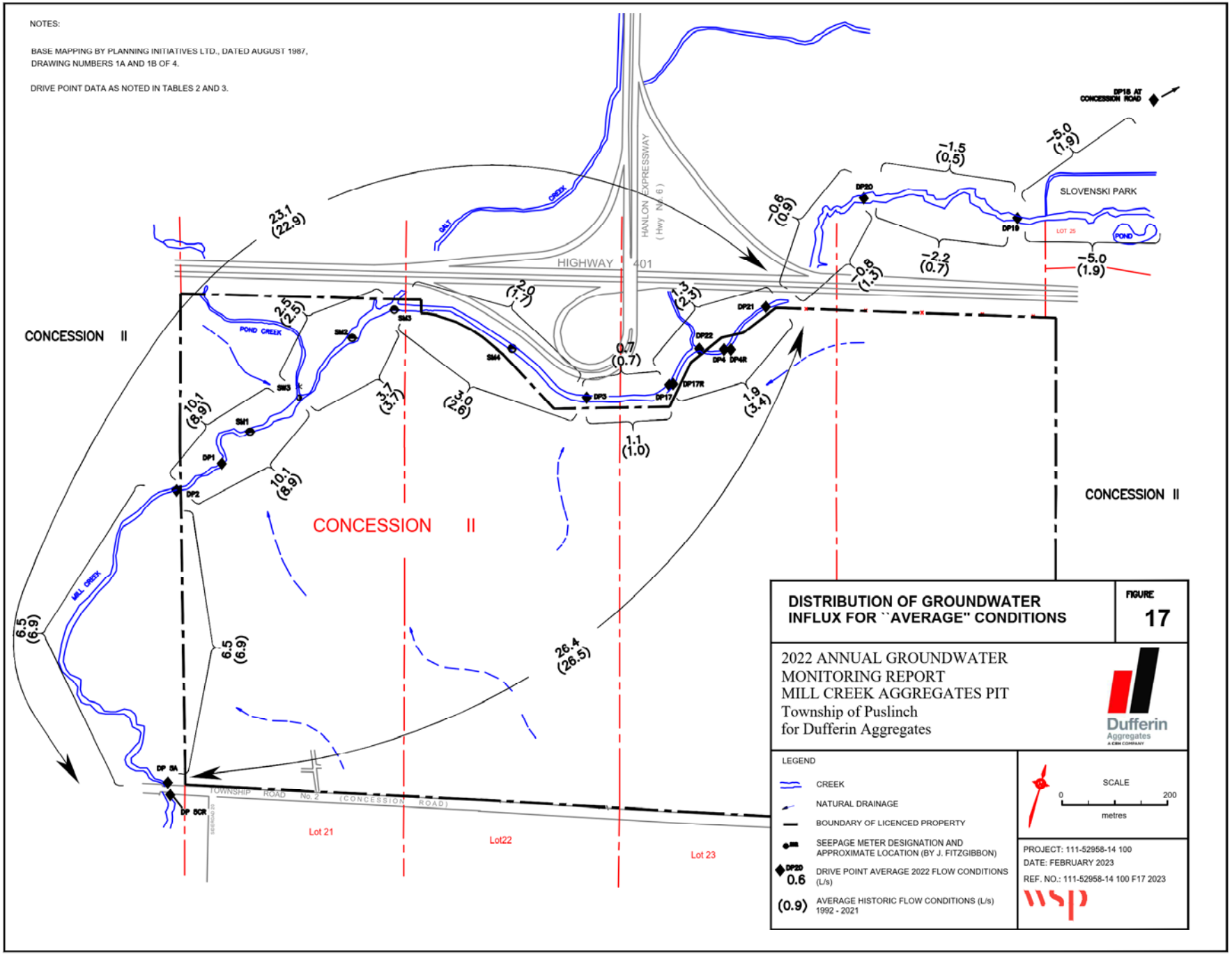

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APPENDIX

TECHNICAL APPENDIX B – 2022 HYDROGEOLOGY REPORT

A MONITOR DETAILS

TABLE A-1
GROUNDWATER MONITOR DETAILS
MILL CREEK AGGREGATES PIT

BOREHOLE NO.	MONITOR NO.	MONITOR TYPE	MONITOR DIAMETER (mm)	MONITOR ELEVATION (T.O.P.) (mASL)	SCREENED INTERVAL ELEVATION (mASL)	FILTER PACK ELEVATION (mASL)	SEAL ELEVATION (mASL)	BACKFILL ELEVATION (mASL)
1		S	51	309.86	303.4 - 304.9		307.9 - 308.8	303.4 - 307.9
1-R		S	51	311.25	304.13 - 307.18	303.82 - 307.48	307.48 - 310.83	310.83 - 311.44
2A		S	51	313.41	297.08 - 300.82		309.61 - 312.66	296.76 - 309.61
2-R		S	51	315.19	304.46 - 307.51	304.26 - 307.92	307.92 - 313.71	313.71 - 314.32
3A		S	51	315.62	296.38 - 300.12		311.66 - 314.82	296.06 - 311.66
4		S	51	308.85	304.2 - 305.8		307.3 - 308.2	304.2 - 307.3
5		S	51	309.19	303.5 - 305.0		307.0 - 307.9	303.5 - 307.0
6		S	51	308.34	303.5 - 305.1		306.2 - 307.1	303.5 - 306.2
7	I	P	51	308.46	292.4 - 294.0		294.4 - 295.2	292.4 - 294.4
							306.5 - 307.4	295.2 - 306.5
7	II	S	51	308.4	303.0 - 304.5		306.5 - 307.4	303.0 - 306.5
11		S	51	310.09	300.28 - 306.38		308.58 - 309.28	300.18 - 308.58
12		S	51	311.61	301.23 - 307.43		310.43 - 311.13	300.43 - 310.43
13		S	51	307.59	299.26 - 305.77		306.17 - 306.87	306.17 - 299.26
14		S	51	308.14	302.84 - 304.36		304.67 - 307.41	
CBM1		S	51	312.85				
CBM2		S	51	310.83				
CBM3		S	51	312.17				
TW16-78		P	152	304.0	271.3 - 282.1 [1]		Cased from 282.1 - 303.6	
TW16-79		P	146	304.2	295.1 - 296.5 [2]		Cased from 296.5 - 303.7	
OW1-84		S	51	304.8	294.9 - 295.8		303.5 - 303.8	294.9 - 303.5
OW2-84		S	51	304.8	295.4 - 295.9		303.6 - 303.9	295.4 - 303.6
OW4-84		S	51	304.6	294.6 - 295.7		303.4 - 303.7	294.6 - 303.4
OW5-84		S	51	304.41	294.8 - 295.6		303.3 - 303.6	294.8 - 303.3
OW16A-78		S	38	304.5	295.5 - 296.7		302.6 - 303.5	295.5 - 302.6
92-1		S	51	313.0	303.0 - 306.0			303.0 - 312.2
92-1R		S	51	314.62	303.48 - 306.53	303.03 - 307.29	307.29 - 313.08	313.08 - 313.69
92-5		S	51	308.20	300.0 - 303.0			300.0 - 308.0
92-8		S	51	309.65	300.3 - 303.3			300.3 - 308.1
92-12		S	51	308.41	303.05 - 304.57			303.05 - 307.26
92-13		S [3]	76	310.0	297.8 - 309.5			297.8 - 309.5
92-14		S [3]	76	309.8	297.6 - 308.8			297.6 - 308.8
92-15		S [3]	76	309.1	289.7 - 308.4			289.7 - 308.4
92-15a		S	51	309.27	296.90 - 297.66			296.90 - 308.55
92-26		S [3]	76	306.3	295.9 - 305.4			295.9 - 305.4
92-27		S [3]	76	305.9	292.9 - 305.1			292.9 - 305.1
92-28		S [3]	76	306.6	299.3 - 305.8			299.3 - 305.8
92-29		S [3]	76	306.9	297.1 - 306.1			297.1 - 306.1
92-32		S [3]	76	305.4	290.1 - 304.9			290.1 - 304.9
92-33		S [3]	76	306.2	291.0 - 305.5			291.0 - 305.5

NOTES:
- P - Piezometer
- S - Standpipe
- mASL - Metres above sea level
- T.O.P. - Top of pipe
- (1) - Open hole
- (2) - Well Screen in an open hole
- (3) - Equipped with multi-level transducers
- * - Bedrock well; well completion details not available

TABLE A-2
MULTI-LEVEL MONITOR DETAILS
MILL CREEK AGGREGATES PIT

BOREHOLE NO.	MONITOR NO.	GROUND ELEVATION (mASL)	MONITOR ELEVATION (T.O.P.) (mASL)	PROBE DESIGNATION	PROBE ELEVATION (mASL)
92-13	I	309.5	310.0	Deep	299.3
	II			Intermediate	301.8
	III			Shallow	304.5
92-15	I	308.4	309.1	Deep	290.0
92-15 a	II		309.3	Intermediate	297.7
92-15	III		309.1	Shallow	305.4
92-26	I	305.48	306.36	Deep	296.30
	II		306.36	Intermediate	299.46
	III		306.30	Shallow	302.39
92-27	I	305.1	305.9	Deep	295.9
	II			Intermediate	299.2
	III			Shallow	302.7
92-28	I	305.83	306.73	Deep	301.81
	II		306.72	Intermediate	302.70
	III		306.60	Shallow	303.45
92-29	I	306.05	306.97	Deep	297.53
	II		306.97	Intermediate	300.61
	III		306.90	Shallow	303.10
92-32	I	304.93	305.58	Deep	290.90
	II		305.58	Intermediate	296.02
	III		305.40	Shallow	301.42
92-33	I	305.5	306.2	Deep	294.4
	II			Intermediate	298.5
	III			Shallow	303.5 / 298.5
	III			Shallow (A)	303.3

NOTES:
- Each probe is a combination water level pressure transducer and temperature thermistor.
- mASL - Metres above sea level
- T.O.P. - Top of pipe

TABLE A-3
DRIVE POINT MONITOR DETAILS
MILL CREEK AGGREGATES PIT

MONITOR	DRIVE POINT DIAMETER (mm)	GROUND ELEVATION (m ASL)	TOP OF PIPE ELEVATION (m ASL)	SCREENED INTERVAL ELEVATION (m ASL)	MID-POINT OF SCREEN BELOW GRADE (m)
DP1	32	303.55 [1]	304.86	301.86 - 302.46	1.39
DP2A	32	303.15 [1]	304.52	301.05 - 301.55	1.85
DP3	32	304.46 [1]	305.68	302.49 - 303.39	1.52
DP4	32	305.23 [1]	306.81	303.80 - 304.40	1.13
DP4R	32	305.29 [1]	306.46	304.53 - 304.83	0.61
DP5A	32	302.56 [1]	303.59	301.60 - 302.00	0.76
DP5B	32	302.43 [1]	303.50	301.51 - 301.91	0.72
DP5C	32	302.67 [1]	304.11	301.81 - 302.42	0.57
DP5CR	32	302.66 [1]	303.71	301.77 - 302.07	0.76
DP6	32	306.2	306.82	304.5 - 305.1	1.4
DP7	32	306.3	307.63	303.7 - 304.3	2.1
DP8	32	306.1	307.2	301.9 - 302.5	3.9
DP9	32	305.9	306.8	304.6 - 305.2	1.0
DP10	32	306.0	307.4	303.7 - 304.3	1.9
DP11	32	305.6	306.8	304.5 - 305.6	0.6
DP12	32	305.6	306.7	303.8 - 305.2	1.1
DP16	32	304.1	305.0	302.4 - 303.3	1.3
DP17	32	305.04 [1]	306.26	303.69 - 304.59	0.90
DP17R	32	305.07 [1]	306.38	304.45 - 304.80	0.45
DP18	32	307.07 [1]	307.74	306.04 - 306.64	0.73
DP19	32	306.33 [1]	307.53	303.93 - 304.43	2.15
DP20	32	306.02 [1]	307.14	303.64 - 304.04	2.18
DP21	32	305.47 [1]	306.77	303.98 - 304.48	1.24
DP22	32	304.89 [1]	306.01	302.41 - 302.91	2.23

NOTES:
- mASL - Metres above sea level
- (1) - Elevation of creek bed
- DP5B replaced DP5A when resident denied access to creek
- DP5C replaced DP5B when DP5B was removed by unauthorized personnel
- DP5D added to monitoring program
- DP5C and DP5D were removed by unauthorized personnel
- DP5CR added to monitoring program to replace DP5C
- DP17R replaced DP17 due to corrosion
- DP4R replaced DP4 due to corrosion

TABLE A-4
SURFACE WATER MONITOR DETAILS
MILL CREEK AGGREGATES PIT

MONITOR	TOP OF MONITOR ELEVATION (mASL)	MONITOR TYPE
SW1	306.65	1 metre staffing gauge
SW2	303.71	Drive Point
RT	307.44	2 metre staffing gauge in recharge trench
P1	306.85	1 metre staffing gauge in Phase 1 pond
P2	306.26	1 metre staffing gauge in Phase 2 pond
P3	305.23	1 metre staffing gauge in Phase 3 pond
P4	306.61	1 metre staffing gauge in Phase 4 pond

NOTE:
- SW1 resurveyed on May 16, 2013
- SW2 is measured from the top of DP5CR
- P1, P2, P3 and P4 surveyed on April 1, 2022

TABLE A-5
REID HERITAGE DRIVE POINT MONITOR DETAILS
MILL CREEK AGGREGATES PIT

MONITOR	TOP OF MONITOR ELEVATION (mASL)	GRADE ELEVATION (mASL)	MONITOR LENGTH (m)	BOTTOM OF MONITOR ELEVATION (mASL)	MONITOR TYPE
DP113	307.87	307.08	4.08	303.84	near creek drive point

APPENDIX

TECHNICAL APPENDIX B – 2022 HYDROGEOLOGY REPORT

B MONITORING RESULTS

TABLE B-1
WATER LEVEL DATA - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

BH1-I/BH1-R			BH2-I/BH2B/BH2-R			BH3-I/BH3B		
DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)
16-Jan-18	3.31	306.55				16-Jan-18	(F)	
26-Feb-18	3.20	306.66	Decommissioned and re-installed			26-Feb-18	9.60	306.02
26-Mar-18	3.22	306.64				26-Mar-18	9.67	305.95
24-Apr-18	3.08	306.78	11-Jun-20	8.77	306.42	24-Apr-18	9.24	306.38
18-May-18	3.01	306.85	08-Jul-20	8.82	306.37	18-May-18	9.44	306.18
12-Jun-18	3.12	306.74	19-Aug-20	9.04	306.15	12-Jun-18	9.50	306.12
27-Jul-18	3.26	306.60	17-Sep-20	9.19	306.00	27-Jul-18	9.65	305.97
22-Aug-18	3.31	306.55	23-Oct-20	9.29	305.90	22-Aug-18	9.68	305.94
12-Sep-18	3.39	306.47	19-Nov-20	9.34	305.85	12-Sep-18	9.75	305.87
30-Oct-18	3.60	306.26	18-Dec-20	9.37	305.82	30-Oct-18	9.89	305.73
21-Nov-18	3.53	306.33	08-Jan-21	9.31	305.88	21-Nov-18	9.87	305.75
20-Dec-18	3.54	306.32	10-Feb-21	9.35	305.84	20-Dec-18	9.70	305.92
28-Jan-19	NA		10-Mar-21	9.35	305.84	28-Jan-19	NA	
27-Feb-19	3.33	306.53	21-Apr-21	9.33	305.86	27-Feb-19	9.77	305.85
19-Mar-19	3.17	306.69	19-May-21	9.42	305.77	19-Mar-19	9.68	305.94
24-Apr-19	3.06	306.80	25-Jun-21	9.40	305.79	24-Apr-19	9.48	306.14
			27-Jul-21	9.44	305.75	22-May-19	9.29	306.33
Decommissioned and re-installed			12-Aug-21	9.46	305.73	19-Jun-19	9.28	306.34
			23-Sep-21	9.46	305.73	26-Jul-19	9.35	306.27
11-Jun-20	4.56	306.69	27-Oct-21	9.48	305.71	20-Aug-19	9.32	306.30
08-Jul-20	4.96	306.29	10-Nov-21	9.55	305.64	25-Sep-19	NA	
19-Aug-20	4.67	306.58	16-Dec-21	9.53	305.66	29-Oct-19	9.60	306.02
17-Sep-20	4.28	306.97	14-Jan-22	9.45	305.74	13-Nov-19	9.64	305.98
23-Oct-20	4.87	306.38	24-Feb-22	9.33	305.86	16-Dec-19	9.65	305.97
19-Nov-20	4.93	306.32	17-Mar-22	9.28	305.91	09-Jan-20	NA	
03-Dec-20	5.12	306.13	21-Apr-22	9.12	306.07	10-Feb-20	NA	
08-Jan-21	5.00	306.25	24-May-22	9.09	306.10	09-Mar-20	9.34	306.28
10-Feb-21	5.09	306.16	15-Jun-22	9.13	306.06	14-Apr-20	9.26	306.36
10-Mar-21	4.87	306.38	14-Jul-22	9.27	305.92	13-May-20	9.32	306.30
21-Apr-21	4.87	306.38	25-Aug-22	9.40	305.79	11-Jun-20	9.33	306.29
19-May-21	5.14	306.11	08-Sep-22	9.48	305.71	08-Jul-20	9.48	306.14
25-Jun-21	5.07	306.18	13-Oct-22	9.62	305.57	19-Aug-20	9.58	306.04
27-Jul-21	5.02	306.23	24-Nov-22	9.77	305.42	17-Sep-20	9.74	305.88
12-Aug-21	4.86	306.39	16-Dec-22	9.73	305.46	23-Oct-20	9.86	305.76
23-Sep-21	5.04	306.21				19-Nov-20	9.92	305.70
27-Oct-21	5.03	306.22				18-Dec-20	9.95	305.67
10-Nov-21	5.05	306.20				08-Jan-21	(F)	
16-Dec-21	5.03	306.22				10-Feb-21	9.92	305.70
14-Jan-22	5.04	306.22				10-Mar-21	9.93	305.69
24-Feb-22	4.87	306.38				21-Apr-21	9.83	305.79
17-Mar-22	4.83	306.43				19-May-21	9.92	305.70
21-Apr-22	4.76	306.49				25-Jun-21	9.90	305.72
24-May-22	4.74	306.51				27-Jul-21	9.94	305.68
15-Jun-22	4.77	306.48				12-Aug-21	9.94	305.68
14-Jul-22	4.91	306.34				23-Sep-21	9.93	305.69
25-Aug-22	5.04	306.21				27-Oct-21	9.93	305.69
08-Sep-22	5.11	306.14				10-Nov-21	10.00	305.62
13-Oct-22	5.18	306.07				16-Dec-21	9.98	305.64
24-Nov-22	5.33	305.93				14-Jan-22	9.98	305.64
16-Dec-22	5.30	305.95				24-Feb-22	9.83	305.79
						17-Mar-22	9.76	305.86
						21-Apr-22	9.61	306.01
						24-May-22	9.58	306.04
						15-Jun-22	9.61	306.01
						14-Jul-22	9.75	305.87
						25-Aug-22	9.87	305.75
						08-Sep-22	9.94	305.68
						13-Oct-22	10.06	305.56
						24-Nov-22	10.17	305.46
						16-Dec-22	10.17	305.45

NOTES:
- BTOP — Below top of pipe
- NA — Not available
- m ASL — metres above sea level
- (F) — Frozen

TABLE B-1
WATER LEVEL DATA - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

BH4-I			BH5-I			BH6-I		
DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)
16-Jan-18	2.89	305.96	16-Jan-18	2.83	306.36	16-Jan-18	(F)	
26-Feb-18	2.94	305.91	26-Feb-18	2.74	306.45	26-Feb-18	2.18	306.16
26-Mar-18	2.82	306.03	26-Mar-18	2.83	306.36	26-Mar-18	2.32	306.02
24-Apr-18	2.61	306.24	24-Apr-18	2.65	306.54	24-Apr-18	2.04	306.30
18-May-18	2.64	306.21	18-May-18	2.64	306.55	18-May-18	2.10	306.24
12-Jun-18	2.69	306.16	12-Jun-18	2.76	306.43	12-Jun-18	2.20	306.14
27-Jul-18	2.82	306.03	27-Jul-18	2.90	306.29	27-Jul-18	2.31	306.03
22-Aug-18	2.83	306.02	22-Aug-18	2.88	306.31	22-Aug-18	2.26	306.08
12-Sep-18	2.91	305.94	12-Sep-18	2.98	306.21	12-Sep-18	2.36	305.98
30-Oct-18	3.02	305.83	30-Oct-18	3.17	306.02	30-Oct-18	2.49	305.85
21-Nov-18	2.98	305.87	21-Nov-18	3.07	306.12	21-Nov-18	2.43	305.91
20-Dec-18	3.00	305.85	20-Dec-18	3.15	306.04	20-Dec-18	2.40	305.94
28-Jan-19	2.97	305.88	28-Jan-19	2.99	306.20	28-Jan-19	2.46	305.88
27-Feb-19	2.87	305.98	27-Feb-19	2.91	306.28	27-Feb-19	2.42	305.92
19-Mar-19	2.79	306.06	19-Mar-19	2.81	306.38	19-Mar-19	2.29	306.05
24-Apr-19	2.59	306.26	24-Apr-19	2.68	306.51	24-Apr-19	2.11	306.23
22-May-19	2.49	306.36	22-May-19	2.60	306.59	22-May-19	2.07	306.27
19-Jun-19	2.47	306.38	19-Jun-19	2.57	306.62	19-Jun-19	2.04	306.30
26-Jul-19	2.50	306.35	26-Jul-19	2.59	306.60	26-Jul-19	2.08	306.26
20-Aug-19	2.54	306.31	20-Aug-19	2.69	306.50	20-Aug-19	2.13	306.21
25-Sep-19	2.69	306.16	25-Sep-19	2.85	306.34	25-Sep-19	2.28	306.06
29-Oct-19	2.68	306.17	29-Oct-19	2.80	306.39	29-Oct-19	2.21	306.13
13-Nov-19	2.73	306.12	13-Nov-19	2.78	306.41	13-Nov-19	2.26	306.08
16-Dec-19	2.74	306.11	16-Dec-19	2.75	306.44	16-Dec-19	2.26	306.08
09-Jan-20	2.63	306.22	09-Jan-20	2.75	306.44	09-Jan-20	2.25	306.09
10-Feb-20	2.55	306.30	10-Feb-20	2.68	306.51	10-Feb-20	2.12	306.22
09-Mar-20	2.46	306.39	09-Mar-20	2.50	306.69	09-Mar-20	2.02	306.32
14-Apr-20	2.41	306.44	14-Apr-20	2.46	306.73	14-Apr-20	1.99	306.35
13-May-20	2.41	306.44	13-May-20	2.52	306.67	13-May-20	2.04	306.30
11-Jun-20	2.46	306.39	11-Jun-20	2.46	306.73	11-Jun-20	1.97	306.37
08-Jul-20	2.57	306.28	08-Jul-20	2.67	306.52	08-Jul-20	2.16	306.18
19-Aug-20	2.56	306.29	19-Aug-20	2.76	306.43	19-Aug-20	2.24	306.10
17-Sep-20	2.83	306.02	17-Sep-20	2.88	306.31	17-Sep-20	2.35	305.99
23-Oct-20	2.99	305.86	23-Oct-20	2.88	306.31	23-Oct-20	2.35	305.99
19-Nov-20	3.04	305.81	19-Nov-20	2.95	306.24	19-Nov-20	2.39	305.95
03-Dec-20	3.01	305.84	18-Dec-20	2.90	306.29	18-Dec-20	2.45	305.89
08-Jan-21	2.98	305.87	08-Jan-21	2.87	306.32	08-Jan-21	2.41	305.93
10-Feb-21	3.04	305.81	10-Feb-21	2.95	306.24	10-Feb-21	2.50	305.84
10-Mar-21	3.03	305.82	10-Mar-21	2.89	306.30	10-Mar-21	2.45	305.89
21-Apr-21	2.96	305.89	21-Apr-21	2.90	306.29	21-Apr-21	2.40	305.94
19-May-21	3.03	305.82	19-May-21	3.16	306.03	19-May-21	2.50	305.84
25-Jun-21	3.11	305.74	25-Jun-21	3.11	306.08	25-Jun-21	2.35	305.99
27-Jul-21	3.10	305.75	27-Jul-21	3.05	306.14	27-Jul-21	2.53	305.81
12-Aug-21	3.11	305.74	12-Aug-21	3.09	306.10	12-Aug-21	2.57	305.77
23-Sep-21	3.05	305.80	23-Sep-21	2.89	306.30	23-Sep-21	2.39	305.95
27-Oct-21	3.11	305.74	27-Oct-21	2.98	306.21	27-Oct-21	2.46	305.88
10-Nov-21	3.17	305.68	10-Nov-21	3.06	306.13	10-Nov-21	2.52	305.82
16-Dec-21	3.13	305.72	16-Dec-21	3.05	306.14	16-Dec-21	2.51	305.83
14-Jan-22	3.15	305.70	14-Jan-22	3.05	306.14	14-Jan-22	2.59	305.75
24-Feb-22	2.96	305.89	24-Feb-22	2.82	306.37	24-Feb-22	2.36	305.98
17-Mar-22	2.91	305.94	17-Mar-22	2.82	306.37	17-Mar-22	2.37	305.97
21-Apr-22	2.80	306.05	21-Apr-22	2.78	306.41	21-Apr-22	2.33	306.01
24-May-22	2.80	306.05	24-May-22	2.59	306.60	24-May-22	2.36	305.98
15-Jun-22	2.83	306.02	15-Jun-22	2.83	306.36	15-Jun-22	2.34	306.00
14-Jul-22	2.96	305.89	14-Jul-22	2.98	306.21	14-Jul-22	2.46	305.88
25-Aug-22	3.09	305.76	25-Aug-22	3.06	306.13	25-Aug-22	2.52	305.82
08-Sep-22	3.16	305.69	08-Sep-22	3.13	306.06	08-Sep-22	2.61	305.73
13-Oct-22	3.29	305.56	13-Oct-22	3.18	306.01	13-Oct-22	2.67	305.67
24-Nov-22	3.38	305.48	24-Nov-22	3.29	305.90	24-Nov-22	2.75	305.60
16-Dec-22	3.37	305.49	16-Dec-22	3.24	305.95	16-Dec-22	2.73	305.61

NOTES:
- · BTOP — Below top of pipe
- · NA — Not available
- · m ASL — metres above sea level
- · (F) — Frozen

TABLE B-1
WATER LEVEL DATA - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

BH 11			BH 12			BH 13		
DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)
16-Jan-18	4.08	306.01				16-Jan-18	1.33	306.26
26-Feb-18	3.97	306.12		Decommissioned		26-Feb-18	1.22	306.37
26-Mar-18	3.99	306.10				26-Mar-18	1.38	306.21
24-Apr-18	3.81	306.28				24-Apr-18	1.22	306.37
18-May-18	3.82	306.27				18-May-18	1.23	306.36
12-Jun-18	3.86	306.23				12-Jun-18	1.33	306.26
27-Jul-18	3.98	306.11				27-Jul-18	1.42	306.17
22-Aug-18	4.01	306.08				22-Aug-18	1.35	306.24
12-Sep-18	4.09	306.00				12-Sep-18	1.45	306.14
30-Oct-18	4.20	305.89				30-Oct-18	1.56	306.03
21-Nov-18	4.16	305.93				21-Nov-18	1.47	306.12
20-Dec-18	4.75	305.34				20-Dec-18	1.48	306.11
28-Jan-19	NA					28-Jan-19	1.45	306.14
27-Feb-19	4.65	305.44				27-Feb-19	1.39	306.20
19-Mar-19	3.96	306.13				19-Mar-19	1.26	306.33
24-Apr-19	3.81	306.28				24-Apr-19	1.16	306.43
22-May-19	3.62	306.47				22-May-19	1.20	306.39
19-Jun-19	3.63	306.46				19-Jun-19	1.20	306.39
26-Jul-19	3.66	306.43				26-Jul-19	1.23	306.36
20-Aug-19	3.71	306.38				20-Aug-19	1.28	306.31
25-Sep-19	3.87	306.22				25-Sep-19	1.33	306.26
29-Oct-19	3.86	306.23				29-Oct-19	1.26	306.33
13-Nov-19	3.99	306.10				13-Nov-19	1.28	306.31
16-Dec-19	4.00	306.09				16-Dec-19	1.26	306.33
09-Jan-20	3.99	306.10				09-Jan-20	1.27	306.32
10-Feb-20	3.80	306.29				10-Feb-20	1.23	306.36
09-Mar-20	3.63	306.46				09-Mar-20	1.06	306.53
14-Apr-20	3.60	306.49				14-Apr-20	1.07	306.52
13-May-20	3.69	306.40				13-May-20	1.12	306.47
11-Jun-20	3.68	306.41				11-Jun-20	1.02	306.57
08-Jul-20	3.85	306.24				08-Jul-20	1.20	306.39
19-Aug-20	3.88	306.21				19-Aug-20	1.30	306.29
17-Sep-20	3.96	306.13				17-Sep-20	1.37	306.22
23-Oct-20	4.20	305.89				23-Oct-20	1.30	306.29
19-Nov-20	4.21	305.88				19-Nov-20	1.41	306.18
18-Dec-20	4.22	305.87				18-Dec-20	1.45	306.14
08-Jan-21	4.15	305.94				08-Jan-21	1.40	306.19
10-Feb-21	4.32	305.77				10-Feb-21	1.37	306.22
10-Mar-21	4.21	305.88				10-Mar-21	1.70	305.89
21-Apr-21	4.16	305.93				21-Apr-21	1.37	306.22
19-May-21	4.37	305.72				19-May-21	1.48	306.11
25-Jun-21	4.26	305.83				25-Jun-21	1.28	306.31
27-Jul-21	4.28	305.81				27-Jul-21	1.51	306.08
12-Aug-21	4.30	305.79				12-Aug-21	1.54	306.05
23-Sep-21	4.24	305.85				23-Sep-21	1.23	306.36
27-Oct-21	4.28	305.81				27-Oct-21	1.39	306.20
10-Nov-21	4.37	305.72				10-Nov-21	1.48	306.11
16-Dec-21	4.34	305.75				16-Dec-21	1.44	306.15
14-Jan-22	4.34	305.75				14-Jan-22	1.53	306.06
24-Feb-22	4.17	305.92				24-Feb-22	1.26	306.33
17-Mar-22	4.12	305.97				17-Mar-22	1.29	306.30
21-Apr-22	3.99	306.10				21-Apr-22	1.25	306.34
24-May-22	3.94	306.15				24-May-22	1.34	306.25
15-Jun-22	3.96	306.13				15-Jun-22	1.34	306.25
14-Jul-22	4.17	305.92				14-Jul-22	1.47	306.12
25-Aug-22	4.28	305.81				25-Aug-22	1.51	306.08
08-Sep-22	4.36	305.73				08-Sep-22	1.58	306.01
13-Oct-22	4.47	305.63				13-Oct-22	1.58	306.01
24-Nov-22	4.58	305.52				24-Nov-22	1.67	305.92
16-Dec-22	4.57	305.52				16-Dec-22	1.61	305.99

NOTES:
- BTOP — Below top of pipe
- NA — Not available
- m ASL — metres above sea level
- (F) — Frozen

TABLE B-1
WATER LEVEL DATA - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

BH 14			TW16-78			TW16-79		
DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)
16-Jan-18	2.54	305.60	16-Jan-18		FLOWING	16-Jan-18	0.47	303.73
26-Feb-18	2.44	305.70	26-Feb-18		FLOWING	26-Feb-18	0.39	303.81
26-Mar-18	2.63	305.51	26-Mar-18		FLOWING	26-Mar-18	0.55	303.65
24-Apr-18	2.39	305.75	24-Apr-18		FLOWING	24-Apr-18	0.39	303.81
18-May-18	2.52	305.62	18-May-18		FLOWING	18-May-18	0.52	303.68
12-Jun-18	2.60	305.54	12-Jun-18		FLOWING	12-Jun-18	0.65	303.55
27-Jul-18	2.64	305.50	27-Jul-18		FLOWING	27-Jul-18	0.73	303.47
22-Aug-18	2.53	305.61	22-Aug-18		FLOWING	22-Aug-18	0.59	303.61
12-Sep-18	2.63	305.51	12-Sep-18		FLOWING	12-Sep-18	0.67	303.53
30-Oct-18	2.63	305.51	30-Oct-18		FLOWING	30-Oct-18	0.61	303.59
21-Nov-18	2.61	305.53	21-Nov-18		FLOWING	21-Nov-18	0.54	303.66
20-Dec-18	2.63	305.51	20-Dec-18		FLOWING	20-Dec-18	0.58	303.62
28-Jan-19	2.65	305.49	28-Jan-19		FLOWING	28-Jan-19	0.55	303.65
27-Feb-19	2.58	305.56	27-Feb-19		FLOWING	27-Feb-19	0.46	303.75
19-Mar-19	2.47	305.67	19-Mar-19		FLOWING	19-Mar-19	0.38	303.82
24-Apr-19	2.41	305.73	24-Apr-19		FLOWING	24-Apr-19	0.40	303.80
22-May-19	2.51	305.63	22-May-19		FLOWING	22-May-19	0.48	303.72
19-Jun-19	2.56	305.58	19-Jun-19		FLOWING	19-Jun-19	0.49	303.71
26-Jul-19	2.56	305.58	26-Jul-19		FLOWING	26-Jul-19	0.64	303.56
20-Aug-19	2.57	305.57	20-Aug-19		FLOWING	20-Aug-19	0.65	303.55
25-Sep-19	2.61	305.53	25-Sep-19		FLOWING	25-Sep-19	0.69	303.51
29-Oct-19	2.49	305.65	29-Oct-19		FLOWING	29-Oct-19	0.46	303.74
13-Nov-19	2.55	305.59	13-Nov-19		FLOWING	13-Nov-19	0.50	303.70
16-Dec-19	2.53	305.61	16-Dec-19		FLOWING	16-Dec-19	0.48	303.72
09-Jan-20	2.60	305.54	09-Jan-20		FLOWING	09-Jan-20	0.50	303.70
10-Feb-20	2.51	305.63	10-Feb-20		FLOWING	10-Feb-20	0.50	303.70
09-Mar-20	2.42	305.72	09-Mar-20		FLOWING	09-Mar-20	0.37	303.83
14-Apr-20	2.48	305.66	14-Apr-20		FLOWING	14-Apr-20	0.45	303.75
13-May-20	2.51	305.63	13-May-20		FLOWING	13-May-20	0.52	303.68
11-Jun-20	2.43	305.71	11-Jun-20		FLOWING	11-Jun-20	0.49	303.71
08-Jul-20	2.60	305.54	08-Jul-20		FLOWING	08-Jul-20	0.78	303.42
19-Aug-20	2.69	305.45	19-Aug-20		FLOWING	19-Aug-20	0.75	303.45
17-Sep-20	2.63	305.51	17-Sep-20		FLOWING	17-Sep-20	0.81	303.39
23-Oct-20	2.61	305.53	23-Oct-20		FLOWING	23-Oct-20	0.54	303.66
19-Nov-20	2.62	305.52	19-Nov-20		NO FLOW	19-Nov-20	0.62	303.58
03-Dec-20	2.57	305.57	18-Dec-20		NO FLOW	18-Dec-20	0.64	303.56
08-Jan-21	2.57	305.57	08-Jan-21		NO FLOW	08-Jan-21	0.59	303.61
10-Feb-21	2.65	305.49	10-Feb-21		NO FLOW	10-Feb-21	0.69	303.51
10-Mar-21	2.60	305.54	10-Mar-21		FLOWING	10-Mar-21	0.47	303.73
21-Apr-21	2.56	305.58	21-Apr-21		FLOWING	21-Apr-21	0.54	303.66
19-May-21	2.68	305.46	19-May-21		FLOWING	19-May-21	0.79	303.41
25-Jun-21	2.69	305.45	25-Jun-21		FLOWING	25-Jun-21	0.62	303.58
27-Jul-21	2.69	305.45	27-Jul-21		FLOWING	27-Jul-21	0.74	303.46
12-Aug-21	2.72	305.42	12-Aug-21		FLOWING	12-Aug-21	0.72	303.48
23-Sep-21	2.34	305.80	23-Sep-21		FLOWING	23-Sep-21	0.37	303.83
27-Oct-21	2.54	305.60	27-Oct-21		FLOWING	27-Oct-21	0.50	303.70
10-Nov-21	2.62	305.52	10-Nov-21		FLOWING	10-Nov-21	0.61	303.59
16-Dec-21	2.59	305.55	16-Dec-21		NO FLOW	16-Dec-21	0.51	303.69
14-Jan-22	2.69	305.45	14-Jan-22		FLOWING	14-Jan-22	0.54	303.66
24-Feb-22	2.49	305.65	24-Feb-22		FLOWING	24-Feb-22	0.35	303.85
17-Mar-22	2.52	305.62	17-Mar-22		FLOWING	17-Mar-22	0.39	303.81
21-Apr-22	2.54	305.60	21-Apr-22		FLOWING	21-Apr-22	0.41	303.79
24-May-22	2.61	305.53	24-May-22		FLOWING	24-May-22	0.56	303.64
15-Jun-22	2.61	305.53	15-Jun-22		FLOWING	15-Jun-22	0.56	303.64
14-Jul-22	2.70	305.44	14-Jul-22		FLOWING	14-Jul-22	0.78	303.42
25-Aug-22	2.69	305.45	25-Aug-22		FLOWING	25-Aug-22	0.73	303.47
08-Sep-22	2.75	305.39	08-Sep-22		FLOWING	08-Sep-22	0.83	303.37
13-Oct-22	2.69	305.45	13-Oct-22		FLOWING	13-Oct-22	0.64	303.56
24-Nov-22	2.74	305.40	24-Nov-22		FLOWING	24-Nov-22	0.68	303.52
16-Dec-22	2.69	305.45	16-Dec-22		FLOWING	16-Dec-22	0.53	303.67

NOTES:
- · BTOP Below top of pipe
- · NA Not available
- · m ASL metres above sea level
- · (F) Frozen

TABLE B-1
WATER LEVEL DATA - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

OW1-84			OW2-84			OW4-84		
DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)
16-Jan-18	1.08	303.73	16-Jan-18	1.10	303.70	16-Jan-18	(F)	
26-Feb-18	1.00	303.81	26-Feb-18	1.03	303.77	26-Feb-18	0.78	303.83
26-Mar-18	1.17	303.64	26-Mar-18	1.19	303.61	26-Mar-18	(F)	
24-Apr-18	1.01	303.80	24-Apr-18	1.03	303.77	24-Apr-18	0.78	303.83
18-May-18	1.13	303.68	18-May-18	1.15	303.65	18-May-18	0.94	303.67
12-Jun-18	1.28	303.53	12-Jun-18	1.27	303.53	12-Jun-18	1.03	303.58
27-Jul-18	1.35	303.46	27-Jul-18	1.37	303.43	27-Jul-18	1.13	303.48
22-Aug-18	1.21	303.60	22-Aug-18	1.23	303.57	22-Aug-18	0.98	303.63
12-Sep-18	1.29	303.52	12-Sep-18	1.31	303.49	12-Sep-18	1.07	303.54
30-Oct-18	1.23	303.58	30-Oct-18	1.25	303.55	30-Oct-18	1.10	303.51
21-Nov-18	1.17	303.64	21-Nov-18	1.18	303.62	21-Nov-18	0.95	303.66
20-Dec-18	1.19	303.62	20-Dec-18	1.20	303.60	20-Dec-18	0.96	303.65
28-Jan-19	1.17	303.64	28-Jan-19	1.20	303.60	28-Jan-19	(F)	
27-Feb-19	1.15	303.66	27-Feb-19	1.10	303.70	27-Feb-19	(F)	
19-Mar-19	1.00	303.81	19-Mar-19	(F)		19-Mar-19	(F)	
24-Apr-19	1.03	303.78	24-Apr-19	1.05	303.75	24-Apr-19	0.80	303.81
22-May-19	1.09	303.72	22-May-19	1.12	303.68	22-May-19	0.87	303.74
19-Jun-19	1.11	303.70	19-Jun-19	1.13	303.67	19-Jun-19	0.88	303.73
26-Jul-19	1.25	303.56	26-Jul-19	1.28	303.52	26-Jul-19	1.01	303.60
20-Aug-19	1.24	303.57	20-Aug-19	1.27	303.53	20-Aug-19	1.02	303.59
25-Sep-19	1.32	303.49	25-Sep-19	1.34	303.46	25-Sep-19	1.08	303.53
29-Oct-19	1.08	303.73	29-Oct-19	1.10	303.70	29-Oct-19	0.85	303.76
13-Nov-19	1.21	303.60	13-Nov-19	1.15	303.65	13-Nov-19	0.89	303.72
16-Dec-19	NA		16-Dec-19	1.13	303.67	16-Dec-19	0.88	303.73
09-Jan-20	NA		09-Jan-20	1.14	303.66	09-Jan-20	0.88	303.73
10-Feb-20	1.12	303.69	10-Feb-20	1.15	303.65	10-Feb-20	0.89	303.72
09-Mar-20	0.97	303.84	09-Mar-20	1.00	303.80	09-Mar-20	0.74	303.87
14-Apr-20	1.08	303.73	14-Apr-20	1.10	303.70	14-Apr-20	0.85	303.76
13-May-20	1.15	303.66	13-May-20	1.17	303.63	13-May-20	0.92	303.69
11-Jun-20	1.10	303.71	11-Jun-20	1.13	303.67	11-Jun-20	0.87	303.74
08-Jul-20	1.40	303.41	08-Jul-20	1.41	303.39	08-Jul-20	1.16	303.45
19-Aug-20	1.37	303.44	19-Aug-20	1.39	303.41	19-Aug-20	1.13	303.48
17-Sep-20	1.42	303.39	17-Sep-20	1.38	303.42	17-Sep-20	1.19	303.42
23-Oct-20	1.16	303.65	23-Oct-20	1.17	303.63	23-Oct-20	0.94	303.67
19-Nov-20	1.24	303.57	19-Nov-20	1.27	303.53	19-Nov-20	1.01	303.60
18-Dec-20	(F)		18-Dec-20	1.25	303.55	18-Dec-20	1.05	303.56
08-Jan-21	(F)		08-Jan-21	1.18	303.62	08-Jan-21	0.97	303.64
10-Feb-21	1.30	303.51	10-Feb-21	1.34	303.46	10-Feb-21	1.08	303.53
10-Mar-21	1.09	303.72	10-Mar-21	1.10	303.70	10-Mar-21	0.85	303.76
21-Apr-21	1.16	303.65	21-Apr-21	1.19	303.61	21-Apr-21	0.94	303.67
19-May-21	1.39	303.42	19-May-21	1.41	303.39	19-May-21	1.15	303.46
25-Jun-21	1.19	303.62	25-Jun-21	1.21	303.59	25-Jun-21	0.98	303.63
27-Jul-21	1.36	303.45	27-Jul-21	1.39	303.41	27-Jul-21	1.15	303.46
12-Aug-21	1.34	303.47	12-Aug-21	1.37	303.43	12-Aug-21	1.12	303.49
23-Sep-21	0.99	303.82	23-Sep-21	1.01	303.79	23-Sep-21	0.76	303.85
27-Oct-21	1.07	303.74	27-Oct-21	1.14	303.66	27-Oct-21	0.89	303.72
10-Nov-21	1.22	303.59	10-Nov-21	1.25	303.55	10-Nov-21	1.00	303.61
16-Dec-21	1.14	303.67	16-Dec-21	1.16	303.64	16-Dec-21	0.89	303.72
14-Jan-22	1.25	303.56	14-Jan-22	1.28	303.52	14-Jan-22	1.02	303.59
24-Feb-22	1.00	303.81	24-Feb-22	0.96	303.84	24-Feb-22	0.71	303.90
17-Mar-22	1.01	303.80	17-Mar-22	0.93	303.87	17-Mar-22	0.73	303.88
21-Apr-22	1.03	303.78	21-Apr-22	1.05	303.75	21-Apr-22	0.80	303.81
24-May-22	1.20	303.61	24-May-22	1.18	303.62	24-May-22	0.95	303.66
15-Jun-22	1.19	303.62	15-Jun-22	1.21	303.59	15-Jun-22	0.95	303.66
14-Jul-22	1.42	303.39	14-Jul-22	1.43	303.37	14-Jul-22	1.18	303.43
25-Aug-22	1.34	303.47	25-Aug-22	1.37	303.43	25-Aug-22	1.12	303.49
08-Sep-22	1.44	303.37	08-Sep-22	1.46	303.34	08-Sep-22	1.21	303.40
13-Oct-22	1.31	303.50	13-Oct-22	1.33	303.47	13-Oct-22	1.08	303.53
24-Nov-22	1.30	303.52	24-Nov-22	1.31	303.49	24-Nov-22	1.06	303.55
16-Dec-22	1.15	303.67	16-Dec-22	1.17	303.64	16-Dec-22	0.91	303.70

NOTES:
- BTOP — Below top of pipe
- NA — Not available
- m ASL — metres above sea level
- (F) — Frozen

TABLE B-1
WATER LEVEL DATA - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

OW5-84			OW16A-78			BH92-1/BH92-1R		
DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)
16-Jan-18	(F)		16-Jan-18	(F)		16-Jan-18	6.83	306.17
26-Feb-18	0.64	303.76	26-Feb-18	(F)		28-Feb-18	6.69	306.31
26-Mar-18	0.81	303.59	26-Mar-18	(F)		26-Mar-18	6.68	306.32
24-Apr-18	0.64	303.76	24-Apr-18	0.67	303.83	24-Apr-18	6.54	306.46
18-May-18	0.76	303.64	18-May-18	0.79	303.71	18-May-18	6.45	306.55
12-Jun-18	0.89	303.51	12-Jun-18	0.91	303.59	12-Jun-18	6.54	306.46
27-Jul-18	0.99	303.41	27-Jul-18	1.02	303.48	27-Jul-18	6.71	306.29
22-Aug-18	0.84	303.56	22-Aug-18	0.87	303.63	22-Aug-18	6.76	306.24
12-Sep-18	0.93	303.47	12-Sep-18	0.95	303.55	12-Sep-18	6.77	306.23
30-Oct-18	0.87	303.53	30-Oct-18	0.90	303.60			
21-Nov-18	0.80	303.60	21-Nov-18	0.83	303.67	Decommissioned and re-installed		
20-Dec-18	0.83	303.57	20-Dec-18	0.85	303.65			
28-Jan-19	0.81	303.59	28-Jan-19	(F)		11-Jun-20	7.92	306.70
27-Feb-19	(F)		27-Feb-19	(F)		08-Jul-20	8.03	306.59
19-Mar-19	(F)		19-Mar-19	(F)		19-Aug-20	8.20	306.42
24-Apr-19	0.67	303.73	24-Apr-19	0.68	303.82	17-Sep-20	8.31	306.31
22-May-19	0.72	303.68	22-May-19	0.75	303.75	23-Oct-20	8.47	306.15
19-Jun-19	0.74	303.66	19-Jun-19	0.77	303.73	19-Nov-20	8.50	306.12
26-Jul-19	0.87	303.53	26-Jul-19	0.90	303.60	03-Dec-20	8.50	306.12
20-Aug-19	0.87	303.53	20-Aug-19	0.90	303.60	08-Jan-21	8.46	306.16
25-Sep-19	0.94	303.46	25-Sep-19	0.93	303.57	10-Feb-21	8.50	306.12
29-Oct-19	0.71	303.69	29-Oct-19	0.73	303.77	10-Mar-21	8.49	306.13
13-Nov-19	0.76	303.64	13-Nov-19	0.78	303.72	21-Apr-21	8.45	306.17
16-Dec-19	0.74	303.66	16-Dec-19	0.75	303.75	19-May-21	8.53	306.09
09-Jan-20	0.76	303.64	09-Jan-20	NA		25-Jun-21	8.61	306.01
10-Feb-20	0.76	303.64	10-Feb-20	NA		27-Jul-21	8.59	306.03
09-Mar-20	0.60	303.80	09-Mar-20	0.63	303.87	12-Aug-21	8.63	305.99
14-Apr-20	0.71	303.69	14-Apr-20	0.73	303.77	23-Sep-21	8.61	306.01
13-May-20	0.78	303.62	13-May-20	0.80	303.70	27-Oct-21	8.62	306.00
11-Jun-20	0.74	303.66	11-Jun-20	0.76	303.74	10-Nov-21	8.68	305.94
08-Jul-20	1.02	303.38	08-Jul-20	1.07	303.43	16-Dec-21	8.64	305.98
19-Aug-20	1.01	303.39	19-Aug-20	1.03	303.47	14-Jan-22	8.67	305.95
17-Sep-20	1.06	303.34	17-Sep-20	1.08	303.42	24-Feb-22	8.47	306.15
23-Oct-20	0.81	303.59	23-Oct-20	0.82	303.68	17-Mar-22	8.39	306.23
19-Nov-20	0.88	303.52	19-Nov-20	0.89	303.61	21-Apr-22	8.27	306.35
18-Dec-20	0.87	303.53	18-Dec-20	0.89	303.61	24-May-22	8.25	306.37
08-Jan-21	0.80	303.60	08-Jan-21	(F)		15-Jun-22	8.28	306.34
10-Feb-21	0.94	303.46	10-Feb-21	(F)		14-Jul-22	8.44	306.18
10-Mar-21	0.73	303.67	10-Mar-21	(F)		25-Aug-22	8.57	306.05
21-Apr-21	0.80	303.60	21-Apr-21	0.82	303.68	08-Sep-22	8.65	305.97
19-May-21	1.02	303.38	19-May-21	1.04	303.46	13-Oct-22	8.78	305.84
25-Jun-21	0.84	303.56	25-Jun-21	0.95	303.55	24-Nov-22	8.90	305.72
27-Jul-21	0.99	303.41	27-Jul-21	1.02	303.48	16-Dec-22	8.91	305.71
12-Aug-21	0.98	303.42	12-Aug-21	1.00	303.50			
23-Sep-21	0.62	303.78	23-Sep-21	0.65	303.85			
27-Oct-21	0.75	303.65	27-Oct-21	0.78	303.72			
10-Nov-21	0.88	303.52	10-Nov-21	0.90	303.60			
16-Dec-21	0.77	303.63	16-Dec-21	0.80	303.70			
14-Jan-22	0.90	303.50	14-Jan-22	0.91	303.59			
24-Feb-22	0.78	303.62	24-Feb-22	0.89	303.61			
17-Mar-22	0.76	303.65	17-Mar-22	0.88	303.62			
21-Apr-22	0.64	303.76	21-Apr-22	0.68	303.82			
24-May-22	0.82	303.58	24-May-22	0.85	303.65			
15-Jun-22	0.83	303.57	15-Jun-22	0.86	303.64			
14-Jul-22	1.04	303.36	14-Jul-22	1.08	303.42			
25-Aug-22	0.98	303.42	25-Aug-22	1.01	303.49			
08-Sep-22	1.08	303.32	08-Sep-22	1.11	303.39			
13-Oct-22	0.95	303.45	13-Oct-22	0.97	303.53			
24-Nov-22	0.93	303.47	24-Nov-22	0.95	303.55			
16-Dec-22	0.89	303.52	16-Dec-22	0.80	303.70			

NOTES:
- · BTOP — Below top of pipe
- · NA — Not available
- · m ASL — metres above sea level
- · (F) — Frozen

TABLE B-1
WATER LEVEL DATA - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

BH92-5			BH92-8			BH92-12A		
DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)
16-Jan-18	(F)		16-Jan-18	(F)		16-Jan-18	2.37	305.79
26-Feb-18	1.66	306.54	26-Feb-18	3.22	306.43	26-Feb-18	2.26	305.90
26-Mar-18	1.62	306.58	26-Mar-18	3.27	306.38	26-Mar-18	2.45	305.71
24-Apr-18	1.48	306.72	24-Apr-18	3.07	306.58	24-Apr-18	2.15	306.01
18-May-18	1.43	306.77	18-May-18	3.09	306.56	18-May-18	2.28	305.88
12-Jun-18	1.50	306.70	12-Jun-18	3.14	306.51	12-Jun-18	2.39	305.77
27-Jul-18	1.68	306.52	27-Jul-18	3.26	306.39	27-Jul-18	2.44	305.72
22-Aug-18	1.71	306.49	22-Aug-18	3.29	306.36	22-Aug-18	2.38	305.78
12-Sep-18	1.81	306.39	12-Sep-18	3.40	306.25	12-Sep-18	2.44	305.72
30-Oct-18	2.01	306.19	30-Oct-18	3.48	306.17	30-Oct-18	2.50	305.66
21-Nov-18	1.92	306.28	21-Nov-18	3.46	306.19	21-Nov-18	2.47	305.69
20-Dec-18	1.71	306.49	20-Dec-18	3.48	306.17	20-Dec-18	2.48	305.68
28-Jan-19	1.83	306.37	28-Jan-19	3.45	306.20	28-Jan-19	2.49	305.67
27-Feb-19	NA		27-Feb-19	3.37	306.28	27-Feb-19	2.44	305.72
19-Mar-19	1.66	306.54	19-Mar-19	3.28	306.37	19-Mar-19	2.30	305.86
24-Apr-19	1.52	306.68	24-Apr-19	3.11	306.54	24-Apr-19	2.19	305.97
22-May-19	1.40	306.80	22-May-19	2.99	306.66	22-May-19	2.25	305.91
19-Jun-19	1.36	306.84	19-Jun-19	2.93	306.72	19-Jun-19	2.26	305.90
26-Jul-19	1.38	306.82	26-Jul-19	2.94	306.71	26-Jul-19	2.31	305.85
20-Aug-19	1.51	306.69	20-Aug-19	2.99	306.66	20-Aug-19	2.33	305.83
25-Sep-19	1.65	306.55	25-Sep-19	3.18	306.47	25-Sep-19	2.41	305.75
29-Oct-19	1.69	306.51	29-Oct-19	3.08	306.57	29-Oct-19	2.30	305.86
13-Nov-19	1.64	306.56	13-Nov-19	3.18	306.47	13-Nov-19	2.36	305.80
16-Dec-19	1.62	306.58	16-Dec-19	3.21	306.44	16-Dec-19	2.35	305.81
09-Jan-20	1.58	306.62	09-Jan-20	3.18	306.47	09-Jan-20	2.41	305.75
10-Feb-20	NA		10-Feb-20	NA		10-Feb-20	2.24	305.92
09-Mar-20	1.34	306.86	09-Mar-20	2.93	306.72	09-Mar-20	2.18	305.98
14-Apr-20	1.29	306.91	14-Apr-20	2.87	306.78	14-Apr-20	2.19	305.97
13-May-20	1.35	306.85	13-May-20	2.92	306.73	13-May-20	2.25	305.91
11-Jun-20	1.30	306.90	11-Jun-20	2.88	306.77	11-Jun-20	2.18	305.98
08-Jul-20	1.48	306.72	08-Jul-20	3.05	306.60	08-Jul-20	2.36	305.80
19-Aug-20	1.39	306.81	19-Aug-20	3.11	306.54	19-Aug-20	2.42	305.74
17-Sep-20	1.72	306.48	17-Sep-20	3.26	306.39	17-Sep-20	2.48	305.68
23-Oct-20	1.74	306.46	23-Oct-20	3.32	306.33	23-Oct-20	2.37	305.79
19-Nov-20	1.82	306.38	19-Nov-20	3.38	306.27	19-Nov-20	2.46	305.70
18-Dec-20	(F)		18-Dec-20	3.41	306.24	03-Dec-20	2.50	305.66
08-Jan-21	(F)		08-Jan-21	3.38	306.27	08-Jan-21	2.42	305.74
10-Feb-21	1.80	306.40	10-Feb-21	3.44	306.21	10-Feb-21	2.51	305.65
10-Mar-21	1.76	306.44	10-Mar-21	3.41	306.24	10-Mar-21	2.46	305.70
21-Apr-21	1.78	306.42	21-Apr-21	3.34	306.31	21-Apr-21	2.39	305.77
19-May-21	1.87	306.33	19-May-21	3.50	306.15	19-May-21	2.59	305.57
25-Jun-21	1.81	306.39	25-Jun-21	3.40	306.25	25-Jun-21	2.32	305.84
27-Jul-21	1.91	306.29	27-Jul-21	3.48	306.17	27-Jul-21	2.56	305.60
12-Aug-21	1.95	306.25	12-Aug-21	3.51	306.14	12-Aug-21	2.59	305.57
23-Sep-21	1.84	306.36	23-Sep-21	3.40	306.25	23-Sep-21	2.23	305.93
27-Oct-21	1.88	306.32	27-Oct-21	3.44	306.21	27-Oct-21	2.41	305.75
10-Nov-21	1.94	306.26	10-Nov-21	3.49	306.16	10-Nov-21	2.49	305.67
16-Dec-21	1.90	306.30	16-Dec-21	3.54	306.11	16-Dec-21	2.47	305.69
14-Jan-22	1.93	306.28	14-Jan-22	3.57	306.08	14-Jan-22	2.57	305.59
24-Feb-22	1.72	306.48	24-Feb-22	3.39	306.26	24-Feb-22	2.33	305.83
17-Mar-22	1.71	306.50	17-Mar-22	3.34	306.31	17-Mar-22	2.36	305.80
21-Apr-22	1.66	306.54	21-Apr-22	3.24	306.41	21-Apr-22	2.32	305.84
24-May-22	1.65	306.55	24-May-22	3.31	306.34	24-May-22	2.44	305.72
15-Jun-22	1.68	306.52	15-Jun-22	3.33	306.32	15-Jun-22	2.43	305.73
14-Jul-22	1.83	306.37	14-Jul-22	3.44	306.21	14-Jul-22	2.55	305.61
25-Aug-22	1.94	306.26	25-Aug-22	3.54	306.11	25-Aug-22	2.82	305.59
08-Sep-22	2.00	306.20	08-Sep-22	3.62	306.03	08-Sep-22	2.89	305.52
13-Oct-22	2.08	306.12	13-Oct-22	3.68	305.97	13-Oct-22	2.89	305.52
24-Nov-22	2.19	306.01	24-Nov-22	3.77	305.88	24-Nov-22	2.96	305.45
16-Dec-22	2.16	306.04	16-Dec-22	3.74	305.91	16-Dec-22	2.89	305.52

NOTES:
- BTOP — Below top of pipe
- NA — Not available
- m ASL — metres above sea level
- (F) — Frozen

TABLE B-1
WATER LEVEL DATA - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

BH92-13			BH92-27			BH92-28		
DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)
16-Jan-18	3.85	306.15	16-Jan-18	1.22	304.68	16-Jan-18	1.98	304.62
26-Feb-18	3.73	306.27	26-Feb-18	1.10	304.80	26-Feb-18	1.89	304.71
26-Mar-18	3.76	306.24	26-Mar-18	1.23	304.67	26-Mar-18	2.05	304.55
24-Apr-18	3.59	306.41	24-Apr-18	1.07	304.83	24-Apr-18	1.85	304.75
18-May-18	3.61	306.39	18-May-18	1.13	304.77	18-May-18	1.97	304.63
12-Jun-18	3.65	306.35	12-Jun-18	1.27	304.63	12-Jun-18	2.08	304.52
27-Jul-18	3.76	306.24	27-Jul-18	1.41	304.49	27-Jul-18	2.18	304.42
22-Aug-18	3.82	306.18	22-Aug-18	1.34	304.56	22-Aug-18	2.13	304.47
12-Sep-18	3.93	306.07	12-Sep-18	1.42	304.48	12-Sep-18	2.19	304.41
30-Oct-18	3.99	306.01	30-Oct-18	1.42	304.48	30-Oct-18	2.18	304.42
21-Nov-18	3.97	306.03	21-Nov-18	1.33	304.57	21-Nov-18	2.11	304.49
20-Dec-18	4.01	305.99	20-Dec-18	1.33	304.57	20-Dec-18	2.10	304.50
28-Jan-19	3.94	306.06	28-Jan-19	1.30	304.60	28-Jan-19	2.09	304.51
27-Feb-19	3.98	306.02	27-Feb-19	1.21	304.69	27-Feb-19	2.05	304.55
19-Mar-19	3.78	306.22	19-Mar-19	1.15	304.75	19-Mar-19	1.95	304.65
24-Apr-19	3.62	306.38	24-Apr-19	1.07	304.83	24-Apr-19	1.96	304.64
22-May-19	3.48	306.52	22-May-19	1.09	304.81	22-May-19	2.01	304.59
19-Jun-19	3.42	306.58	19-Jun-19	1.07	304.83	19-Jun-19	1.93	304.67
26-Jul-19	3.43	306.58	26-Jul-19	1.22	304.68	26-Jul-19	2.04	304.56
20-Aug-19	3.46	306.54	20-Aug-19	1.29	304.61	20-Aug-19	2.08	304.52
25-Sep-19	3.65	306.35	25-Sep-19	1.40	304.50	25-Sep-19	2.18	304.42
29-Oct-19	3.58	306.42	29-Oct-19	1.29	304.61	29-Oct-19	2.04	304.56
13-Nov-19	3.69	306.31	13-Nov-19	1.28	304.62	13-Nov-19	2.07	304.53
16-Dec-19	3.71	306.29	16-Dec-19	1.22	304.68	16-Dec-19	2.01	304.59
09-Jan-20	3.71	306.29	09-Jan-20	1.24	304.66	09-Jan-20	2.04	304.56
10-Feb-20	3.48	306.52	10-Feb-20	1.13	304.77	10-Feb-20	1.97	304.63
09-Mar-20	3.43	306.57	09-Mar-20	1.08	304.82	09-Mar-20	1.94	304.66
14-Apr-20	3.35	306.65	14-Apr-20	1.10	304.80	14-Apr-20	1.94	304.66
13-May-20	3.38	306.62	13-May-20	1.17	304.73	13-May-20	2.00	304.60
11-Jun-20	3.36	306.64	11-Jun-20	1.19	304.71	11-Jun-20	1.99	304.61
08-Jul-20	3.50	306.50	08-Jul-20	1.39	304.51	08-Jul-20	2.18	304.42
19-Aug-20	3.62	306.38	19-Aug-20	1.48	304.42	19-Aug-20	2.30	304.30
17-Sep-20	3.73	306.27	17-Sep-20	1.53	304.37	17-Sep-20	2.26	304.34
23-Oct-20	3.85	306.15	23-Oct-20	1.43	304.47	23-Oct-20	2.21	304.39
19-Nov-20	3.91	306.09	19-Nov-20	1.43	304.47	19-Nov-20	2.30	304.30
03-Dec-20	3.89	306.11	03-Dec-20	1.36	304.54	03-Dec-20	2.10	304.50
08-Jan-21	3.85	306.15	08-Jan-21	1.30	304.60	08-Jan-21	2.07	304.53
10-Feb-21	3.92	306.08	10-Feb-21	1.38	304.52	10-Feb-21	2.15	304.45
10-Mar-21	3.92	306.08	10-Mar-21	1.27	304.63	10-Mar-21	2.09	304.51
21-Apr-21	3.86	306.14	21-Apr-21	1.26	304.64	21-Apr-21	2.10	304.50
19-May-21	3.92	306.08	19-May-21	1.38	304.52	19-May-21	2.17	304.43
25-Jun-21	4.04	305.96	25-Jun-21	1.49	304.41	25-Jun-21	2.24	304.36
27-Jul-21	3.96	306.04	27-Jul-21	1.48	304.43	27-Jul-21	2.24	304.36
12-Aug-21	4.03	305.97	12-Aug-21	1.48	304.42	12-Aug-21	2.26	304.34
23-Sep-21	3.97	306.03	23-Sep-21	1.26	304.65	23-Sep-21	1.95	304.65
27-Oct-21	3.98	306.02	27-Oct-21	1.31	304.59	27-Oct-21	2.05	304.55
10-Nov-21	4.03	305.97	10-Nov-21	1.37	304.53	10-Nov-21	2.14	304.46
16-Dec-21	4.10	305.90	16-Dec-21	1.25	304.65	16-Dec-21	2.02	304.58
14-Jan-22	4.09	305.91	14-Jan-22	1.32	304.58	14-Jan-22	2.14	304.46
24-Feb-22	3.93	306.07	24-Feb-22	1.17	304.73	24-Feb-22	1.89	304.71
17-Mar-22	3.86	306.14	17-Mar-22	1.17	304.73	17-Mar-22	1.95	304.65
21-Apr-22	3.73	306.27	21-Apr-22	1.16	304.74	21-Apr-22	1.99	304.61
24-May-22	3.82	306.18	24-May-22	1.17	304.73	24-May-22	2.03	304.57
15-Jun-22	3.84	306.16	15-Jun-22	1.19	304.71	15-Jun-22	2.01	304.59
14-Jul-22	3.94	306.06	14-Jul-22	1.41	304.49	14-Jul-22	2.18	304.42
25-Aug-22	4.08	305.92	25-Aug-22	1.46	304.44	25-Aug-22	2.20	304.40
08-Sep-22	4.16	305.84	08-Sep-22	1.51	304.39	08-Sep-22	2.26	304.34
13-Oct-22	4.23	305.77	13-Oct-22	1.49	304.41	13-Oct-22	2.26	304.34
24-Nov-22	4.32	305.68	24-Nov-22	1.51	304.39	24-Nov-22	2.26	304.34
16-Dec-22	4.29	305.72	16-Dec-22	1.44	304.46	16-Dec-22	2.19	304.41

NOTES:
- · BTOP — Below top of pipe
- · NA — Not available
- · m ASL — metres above sea level
- · (F) — Frozen

TABLE B-1
WATER LEVEL DATA - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

BH92-29			BH92-32			BH92-33		
DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)
16-Jan-18	2.10	304.80	16-Jan-18	1.17	304.23	16-Jan-18	1.64	304.56
26-Feb-18	1.98	304.92	26-Feb-18	1.06	304.34	26-Feb-18	1.53	304.67
26-Mar-18	2.05	304.85	26-Mar-18	1.19	304.21	26-Mar-18	1.66	304.54
24-Apr-18	1.92	304.98	24-Apr-18	1.03	304.37	24-Apr-18	1.50	304.70
18-May-18	1.93	304.97	18-May-18	1.13	304.27	18-May-18	1.57	304.63
12-Jun-18	2.05	304.85	12-Jun-18	1.25	304.15	12-Jun-18	1.70	304.50
27-Jul-18	2.25	304.65	27-Jul-18	1.37	304.03	27-Jul-18	1.84	304.36
22-Aug-18	2.27	304.63	22-Aug-18	1.19	304.21	22-Aug-18	1.77	304.43
12-Sep-18	2.34	304.56	12-Sep-18	1.28	304.12	12-Sep-18	1.84	304.36
30-Oct-18	2.38	304.52	30-Oct-18	1.27	304.13	30-Oct-18	1.84	304.36
21-Nov-18	2.28	304.62	21-Nov-18	1.23	304.17	21-Nov-18	1.75	304.45
20-Dec-18	2.24	304.66	20-Dec-18	1.21	304.19	20-Dec-18	1.73	304.47
28-Jan-19	2.21	304.69	28-Jan-19	1.23	304.17	28-Jan-19	1.72	304.48
27-Feb-19	2.14	304.76	27-Feb-19	1.10	304.30	27-Feb-19	1.65	304.55
19-Mar-19	2.07	304.83	19-Mar-19	1.03	304.37	19-Mar-19	1.58	304.62
24-Apr-19	1.96	304.94	24-Apr-19	1.14	304.26	24-Apr-19	1.50	304.70
22-May-19	1.94	304.96	22-May-19	0.92	304.48	22-May-19	1.61	304.59
19-Jun-19	1.91	304.99	19-Jun-19	1.07	304.33	19-Jun-19	1.54	304.66
26-Jul-19	2.03	304.87	26-Jul-19	1.32	304.08	26-Jul-19	1.66	304.54
20-Aug-19	2.15	304.75	20-Aug-19	1.21	304.19	20-Aug-19	1.72	304.48
25-Sep-19	2.29	304.61	25-Sep-19	1.35	304.05	25-Sep-19	1.83	304.37
29-Oct-19	2.23	304.67	29-Oct-19	1.32	304.08	29-Oct-19	1.71	304.49
13-Nov-19	2.22	304.68	13-Nov-19	1.26	304.14	13-Nov-19	1.70	304.50
16-Dec-19	2.17	304.73	16-Dec-19	1.27	304.13	16-Dec-19	1.65	304.55
09-Jan-20	2.15	304.75	09-Jan-20	1.26	304.14	09-Jan-20	1.68	304.52
10-Feb-20	1.99	304.91	10-Feb-20	1.14	304.26	10-Feb-20	1.57	304.63
09-Mar-20	1.96	304.94	09-Mar-20	1.09	304.31	09-Mar-20	1.52	304.68
14-Apr-20	1.96	304.94	14-Apr-20	1.10	304.30	14-Apr-20	1.55	304.65
13-May-20	2.05	304.85	13-May-20	1.15	304.25	13-May-20	1.60	304.60
11-Jun-20	2.07	304.83	11-Jun-20	1.04	304.36	11-Jun-20	1.64	304.56
08-Jul-20	2.22	304.68	08-Jul-20	1.37	304.03	08-Jul-20	1.83	304.37
19-Aug-20	2.36	304.54	19-Aug-20	1.42	303.98	19-Aug-20	1.91	304.29
17-Sep-20	2.43	304.47	17-Sep-20	1.53	303.87	17-Sep-20	1.94	304.26
23-Oct-20	2.41	304.49	23-Oct-20	1.35	304.05	23-Oct-20	1.86	304.34
19-Nov-20	2.43	304.47	19-Nov-20	1.34	304.06	19-Nov-20	1.84	304.36
03-Dec-20	2.37	304.53	03-Dec-20	1.24	304.16	03-Dec-20	1.77	304.43
08-Jan-21	2.28	304.62	08-Jan-21	1.08	304.32	08-Jan-21	1.73	304.47
10-Feb-21	2.31	304.59	10-Feb-21	1.19	304.21	10-Feb-21	1.80	304.40
10-Mar-21	2.27	304.63	10-Mar-21	1.31	304.09	10-Mar-21	1.74	304.46
21-Apr-21	2.19	304.71	21-Apr-21	1.37	304.03	21-Apr-21	1.70	304.50
19-May-21	2.29	304.61	19-May-21	1.28	304.12	19-May-21	1.81	304.39
25-Jun-21	2.41	304.49	25-Jun-21	1.36	304.04	25-Jun-21	1.91	304.29
27-Jul-21	2.40	304.50	27-Jul-21	1.32	304.08	27-Jul-21	1.90	304.31
12-Aug-21	2.42	304.48	12-Aug-21	1.39	304.01	12-Aug-21	1.90	304.30
23-Sep-21	2.41	304.49	23-Sep-21	1.08	304.32	23-Sep-21	1.64	304.56
27-Oct-21	2.33	304.57	27-Oct-21	1.21	304.19	27-Oct-21	1.72	304.48
10-Nov-21	2.36	304.54	10-Nov-21	1.30	304.10	10-Nov-21	1.78	304.42
16-Dec-21	2.21	304.69	16-Dec-21	1.18	304.22	16-Dec-21	1.67	304.53
14-Jan-22	2.37	304.53	14-Jan-22	1.26	304.14	14-Jan-22	1.76	304.44
24-Feb-22	2.13	304.77	24-Feb-22	1.08	304.32	24-Feb-22	1.59	304.61
17-Mar-22	2.11	304.79	17-Mar-22	1.08	304.32	17-Mar-22	1.60	304.60
21-Apr-22	2.08	304.82	21-Apr-22	1.02	304.38	21-Apr-22	1.60	304.60
24-May-22	2.06	304.84	24-May-22	1.09	304.31	24-May-22	1.63	304.57
15-Jun-22	2.03	304.87	15-Jun-22	1.08	304.32	15-Jun-22	1.64	304.56
14-Jul-22	2.23	304.67	14-Jul-22	1.31	304.09	14-Jul-22	1.85	304.35
25-Aug-22	2.32	304.58	25-Aug-22	1.33	304.07	25-Aug-22	1.86	304.34
08-Sep-22	2.38	304.52	08-Sep-22	1.42	303.98	08-Sep-22	1.93	304.27
13-Oct-22	2.43	304.47	13-Oct-22	1.37	304.03	13-Oct-22	1.91	304.29
24-Nov-22	2.50	304.40	24-Nov-22	1.41	303.99	24-Nov-22	1.92	304.28
16-Dec-22	2.43	304.47	16-Dec-22	1.28	304.12	16-Dec-22	1.86	304.35

NOTES:
- · BTOP — Below top of pipe
- · NA — Not available
- · m ASL — metres above sea level
- · (F) — Frozen

TABLE B-2
WATER LEVEL DATA - RESIDENTIAL WELLS
MILL CREEK AGGREGATES PIT

NORTH FARMHOUSE WELL (MOE WELL 4794)		SMITH WELL	
DATE	Water Level BTOC (m)	DATE	Water Level BTOC (m)
16-Jan-18	NA	16-Jan-18	6.38
26-Feb-18	NA	26-Feb-18	6.28
26-Mar-18	5.19	26-Mar-18	6.27
24-Apr-18	NA	24-Apr-18	6.13
18-May-18	NA	18-May-18	6.07
12-Jun-18	5.05	12-Jun-18	6.10
27-Jul-18	5.2	27-Jul-18	6.23
22-Aug-18	5.23	22-Aug-18	6.30
12-Sep-18	5.28	12-Sep-18	6.34
30-Oct-18	5.41	30-Oct-18	6.49
21-Nov-18	5.35	21-Nov-18	6.47
20-Dec-18	5.45	20-Dec-18	6.50
28-Jan-19	NA	28-Jan-19	NA
27-Feb-19	NA	27-Feb-19	NA
19-Mar-19	5.16	19-Mar-19	5.32
24-Apr-19	5	24-Apr-19	6.1
22-May-19	4.83	22-May-19	5.97
19-Jun-19	4.78	19-Jun-19	5.85
26-Jul-19	4.85	26-Jul-19	5.93
20-Aug-19	4.94	20-Aug-19	6.01
25-Sep-19	5.09	25-Sep-19	6.20
29-Oct-19	5.12	29-Oct-19	6.23
13-Nov-19	NA	13-Nov-19	6.27
16-Dec-19	5.1	16-Dec-19	6.26
09-Jan-20	5.09	09-Jan-20	6.26
10-Feb-20	4.91	10-Feb-20	6.06
09-Mar-20	4.82	09-Mar-20	5.95
14-Apr-20	NA	14-Apr-20	6.25
13-May-20	4.78	13-May-20	5.91
11-Jun-20	4.78	11-Jun-20	5.91
08-Jul-20	4.93	08-Jul-20	6.06
19-Aug-20	5.09	19-Aug-20	6.16
17-Sep-20	5.20	17-Sep-20	6.21
23-Oct-20	NA	23-Oct-20	6.44
19-Nov-20	5.39	19-Nov-20	6.47
18-Dec-20	5.38	18-Dec-20	6.50
08-Jan-21	NA	08-Jan-21	6.41
10-Feb-21	5.40	10-Feb-21	6.50
10-Mar-21	5.39	10-Mar-21	6.50
21-Apr-21	5.38	21-Apr-21	6.47
19-May-21	5.40	19-May-21	6.50
25-Jun-21	5.47	25-Jun-21	6.50
27-Jul-21	5.48	27-Jul-21	6.58
12-Aug-21	5.49	12-Aug-21	6.65
23-Sep-21	5.55	23-Sep-21	6.61
27-Oct-21	5.44	27-Oct-21	6.58
10-Nov-21	5.53	10-Nov-21	6.56
16-Dec-21	5.52	16-Dec-21	6.60
14-Jan-22	5.50	14-Jan-22	6.62
24-Feb-22	5.44	24-Feb-22	6.48
17-Mar-22	5.42	17-Mar-22	6.44
21-Apr-22	5.23	21-Apr-22	6.27
24-May-22	5.17	24-May-22	6.21
15-Jun-22	5.21	15-Jun-22	6.26
14-Jul-22	5.30	14-Jul-22	5.85
25-Aug-22	5.44	25-Aug-22	6.44
08-Sep-22	5.52	08-Sep-22	6.52
13-Oct-22	5.67	13-Oct-22	6.64
24-Nov-22	5.76	24-Nov-22	6.77
16-Dec-22	5.75	16-Dec-22	6.76

NOTES:
· BTOC — Below top of concrete crib
· NA — Not available

TABLE B-3
WATER LEVEL DATA - WETLAND DRIVE POINTS
MILL CREEK AGGREGATES PIT

DP6			DP7			DP8		
DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)
16-Jan-2018	0.95	305.87	16-Jan-2018	1.65	305.98	16-Jan-2018	1.44	305.76
26-Feb-2018	0.80	306.02	26-Feb-2018	1.50	306.13	26-Feb-2018	1.34	305.86
26-Mar-2018	1.00	305.82	26-Mar-2018	1.64	305.99	26-Mar-2018	1.41	305.79
24-Apr-2018	0.71	306.11	24-Apr-2018	1.40	306.23	24-Apr-2018	1.23	305.97
18-May-2018	0.80	305.72	18-May-2018	1.49	306.14	18-May-2018	1.30	305.90
12-Jun-2018	0.97	305.85	12-Jun-2018	1.55	306.08	12-Jun-2018	1.37	305.83
27-Jul-2018	1.02	305.80	27-Jul-2018	1.66	305.97	27-Jul-2018	1.53	305.67
22-Aug-2018	0.95	305.87	22-Aug-2018	1.63	306.00	22-Aug-2018	1.49	305.71
12-Sep-2018	1.06	305.76	12-Sep-2018	1.74	305.89	12-Sep-2018	1.54	305.66
30-Oct-2018	1.07	305.75	30-Oct-2018	1.73	305.90	30-Oct-2018	1.53	305.67
21-Nov-2018	1.05	305.77	21-Nov-2018	1.73	305.90	21-Nov-2018	1.45	305.75
20-Dec-2018	1.10	305.72	20-Dec-2018	1.80	305.83	20-Dec-2018	1.46	305.74
28-Jan-2019	1.09	305.73	28-Jan-2019	1.77	305.86	28-Jan-2019	1.51	305.69
27-Feb-2019	1.10	305.72	27-Feb-2019	1.68	305.95	27-Feb-2019	1.46	305.74
19-Mar-2019	0.88	305.94	19-Mar-2019	1.60	306.03	19-Mar-2019	1.39	305.81
24-Apr-2019	0.72	306.10	24-Apr-2019	1.44	306.19	24-Apr-2019	1.26	305.94
22-May-2019	0.76	306.06	22-May-2019	1.42	306.21	22-May-2019	1.39	305.81
19-Jun-2019	0.76	306.06	19-Jun-2019	1.38	306.25	19-Jun-2019	1.23	305.97
26-Jul-2019	0.81	306.01	26-Jul-2019	1.40	306.23	26-Jul-2019	1.28	305.92
20-Aug-2019	0.82	306.00	20-Aug-2019	1.39	306.24	20-Aug-2019	1.31	305.89
25-Sep-2019	0.90	305.92	25-Sep-2019	1.56	306.07	25-Sep-2019	1.41	305.79
29-Oct-2019	0.77	306.05	29-Oct-2019	1.42	306.21	29-Oct-2019	1.28	305.92
13-Nov-2019	(F)		13-Nov-2019	1.56	306.07	13-Nov-2019	1.33	305.87
16-Dec-2019	(F)		16-Dec-2019	1.58	306.05	16-Dec-2019	1.33	305.87
09-Jan-2020	0.89	305.93	09-Jan-2020	1.55	306.08	09-Jan-2020	1.34	305.86
10-Feb-2020	0.80	306.02	10-Feb-2020	1.43	306.20	10-Feb-2020	(F)	
09-Mar-2020	0.68	306.14	09-Mar-2020	1.38	306.25	09-Mar-2020	1.33	305.87
14-Apr-2020	0.68	306.14	14-Apr-2020	1.34	306.29	14-Apr-2020	1.21	305.99
13-May-2020	0.75	306.07	13-May-2020	1.37	306.26	13-May-2020	1.23	305.97
11-Jun-2020	0.67	306.15	11-Jun-2020	1.35	306.28	11-Jun-2020	1.33	305.87
08-Jul-2020	0.91	305.91	08-Jul-2020	1.52	306.11	08-Jul-2020	1.39	305.81
19-Aug-2020	0.97	305.85	19-Aug-2020	1.59	306.04	19-Aug-2020	1.57	305.63
17-Sep-2020	1.06	305.76	17-Sep-2020	1.65	305.98	17-Sep-2020	1.52	305.68
23-Oct-2020	0.95	305.87	23-Oct-2020	1.71	305.92	23-Oct-2020	1.58	305.62
19-Nov-2020	0.99	305.83	19-Nov-2020	1.75	305.88	19-Nov-2020	1.53	305.67
03-Dec-2020	1.10	305.72	03-Dec-2020	1.70	305.93	03-Dec-2020	1.47	305.73
08-Jan-2021	1.04	305.78	08-Jan-2021	1.70	305.93	08-Jan-2021	1.43	305.77
10-Feb-2021	1.13	305.69	10-Feb-2021	1.81	305.82	10-Feb-2021	1.52	305.68
10-Mar-2021	1.07	305.75	10-Mar-2021	1.78	305.85	10-Mar-2021	1.54	305.66
21-Apr-2021	1.01	305.81	21-Apr-2021	1.67	305.96	21-Apr-2021	1.50	305.70
19-May-2021	1.17	305.65	19-May-2021	1.81	305.82	19-May-2021	1.51	305.69
25-Jun-2021	0.90	305.92	25-Jun-2021	1.89	305.74	25-Jun-2021	1.72	305.48
27-Jul-2021	1.18	305.64	27-Jul-2021	1.87	305.76	27-Jul-2021	1.66	305.54
12-Aug-2021	1.21	305.61	12-Aug-2021	1.89	305.74	12-Aug-2021	1.69	305.51
23-Sep-2021	0.84	305.98	23-Sep-2021	1.65	305.98	23-Sep-2021	1.54	305.66
27-Oct-2021	1.03	305.79	27-Oct-2021	1.76	305.87	27-Oct-2021	1.51	305.69
10-Nov-2021	1.11	305.71	10-Nov-2021	1.82	305.81	10-Nov-2021	1.54	305.66
16-Dec-2021	1.10	305.72	16-Dec-2021	1.84	305.79	16-Dec-2021	1.52	305.68
14-Jan-2022	1.22	305.60	14-Jan-2022	1.91	305.72	14-Jan-2022	1.58	305.62
24-Feb-2022	0.95	305.87	24-Feb-2022	1.70	305.93	24-Feb-2022	1.49	305.71
17-Mar-2022	0.96	305.87	17-Mar-2022	1.67	305.96	17-Mar-2022	1.45	305.75
21-Apr-2022	0.89	305.93	21-Apr-2022	1.60	306.03	21-Apr-2022	1.38	305.82
24-May-2022	1.06	305.76	24-May-2022	1.73	305.90	24-May-2022	1.46	305.74
15-Jun-2022	1.07	305.75	15-Jun-2022	1.74	305.89	15-Jun-2022	1.54	305.66
14-Jul-2022	1.17	305.65	14-Jul-2022	1.84	305.79	14-Jul-2022	1.73	305.47
25-Aug-2022	1.24	305.58	25-Aug-2022	1.92	305.71	25-Aug-2022	1.85	305.35
08-Sep-2022	1.32	305.50	08-Sep-2022	1.99	305.64	08-Sep-2022	1.89	305.31
13-Oct-2022	1.28	305.54	13-Oct-2022	2.01	305.63	13-Oct-2022	1.98	305.22
24-Nov-2022	1.35	305.47	24-Nov-2022	2.08	305.55	24-Nov-2022	1.96	305.24
16-Dec-2022	1.26	305.56	16-Dec-2022	2.02	305.61	16-Dec-2022	1.85	305.35

NOTES:
- BTOP — Below top of pipe
- NA — Not available
- m ASL — metres above sea level
- (F) — Frozen

TABLE B-3
WATER LEVEL DATA - WETLAND DRIVE POINTS
MILL CREEK AGGREGATES PIT

DP9			DP10			DP11		
DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)
16-Jan-2018	(F)		16-Jan-2018	2.38	305.02	16-Jan-2018	1.77	305.03
26-Feb-2018	0.97	305.83	26-Feb-2018	2.20	305.20	26-Feb-2018	1.60	305.20
26-Mar-2018	1.27	305.53	26-Mar-2018	2.51	304.89	26-Mar-2018	1.95	304.85
24-Apr-2018	0.97	305.83	24-Apr-2018	2.09	305.31	24-Apr-2018	1.47	305.33
18-May-2018	1.08	305.72	18-May-2018	2.44	304.96	18-May-2018	1.27	305.53
12-Jun-2018	1.30	305.50	12-Jun-2018	2.44	304.96	12-Jun-2018	1.89	304.91
27-Jul-2018	1.57	305.23	27-Jul-2018	2.46	304.94	27-Jul-2018	1.99	304.81
22-Aug-2018	1.49	305.31	22-Aug-2018	2.34	305.06	22-Aug-2018	1.89	304.91
12-Sep-2018	1.54	305.26	12-Sep-2018	2.38	305.02	12-Sep-2018	1.95	304.85
30-Oct-2018	1.34	305.46	30-Oct-2018	2.32	305.08	30-Oct-2018	1.90	304.90
21-Nov-2018	1.21	305.59	21-Nov-2018	2.51	304.89	21-Nov-2018	1.94	304.86
20-Dec-2018	1.24	305.56	20-Dec-2018	2.45	304.95	20-Dec-2018	1.95	304.85
28-Jan-2019	1.37	305.43	28-Jan-2019	(F)		28-Jan-2019	(F)	
27-Feb-2019	1.27	305.53	27-Feb-2019	2.40	305.01	27-Feb-2019	1.88	304.92
19-Mar-2019	(F)		19-Mar-2019	2.24	305.16	19-Mar-2019	1.69	305.11
24-Apr-2019	1.00	305.80	24-Apr-2019	2.09	305.31	24-Apr-2019	1.54	305.26
22-May-2019	1.04	305.76	22-May-2019	2.29	305.11	22-May-2019	1.71	305.09
19-Jun-2019	1.07	305.73	19-Jun-2019	2.24	305.16	19-Jun-2019	1.73	305.07
26-Jul-2019	1.27	305.53	26-Jul-2019	2.42	304.98	26-Jul-2019	1.91	304.89
20-Aug-2019	1.32	305.48	20-Aug-2019	2.38	305.02	20-Aug-2019	1.92	304.88
25-Sep-2019	1.43	305.37	25-Sep-2019	2.50	304.90	25-Sep-2019	1.90	304.90
29-Oct-2019	1.05	305.75	29-Oct-2019	2.28	305.12	29-Oct-2019	1.84	304.96
13-Nov-2019	1.09	305.71	13-Nov-2019	2.37	305.03	13-Nov-2019	1.89	304.91
16-Dec-2019	1.13	305.67	16-Dec-2019	2.35	305.05	16-Dec-2019	1.85	304.95
09-Jan-2020	(F)		09-Jan-2020	2.40	305.00	09-Jan-2020	1.88	304.92
10-Feb-2020	(F)		10-Feb-2020	2.38	305.02	10-Feb-2020	1.86	304.94
09-Mar-2020	1.01	305.79	09-Mar-2020	2.22	305.18	09-Mar-2020	1.63	305.17
14-Apr-2020	1.02	305.78	14-Apr-2020	2.24	305.16	14-Apr-2020	1.61	305.19
13-May-2020	1.12	305.68	13-May-2020	2.40	305.00	13-May-2020	1.72	305.08
11-Jun-2020	1.10	305.70	11-Jun-2020	2.51	304.89	11-Jun-2020	1.85	304.95
08-Jul-2020	1.54	305.26	08-Jul-2020	2.36	305.04	08-Jul-2020	1.91	304.89
19-Aug-2020	1.61	305.19	19-Aug-2020	2.54	304.86	19-Aug-2020	2.08	304.72
17-Sep-2020	1.60	305.20	17-Sep-2020	2.50	304.90	17-Sep-2020	2.01	304.79
23-Oct-2020	1.38	305.42	23-Oct-2020	2.47	304.93	23-Oct-2020	1.98	304.82
19-Nov-2020	1.33	305.47	19-Nov-2020	2.48	304.92	19-Nov-2020	2.01	304.79
03-Dec-2020	1.22	305.58	03-Dec-2020	2.41	304.99	03-Dec-2020	1.92	304.88
08-Jan-2021	1.20	305.60	08-Jan-2021	2.40	305.00	08-Jan-2021	1.90	304.90
10-Feb-2021	1.42	305.38	10-Feb-2021	2.45	304.95	10-Feb-2021	1.95	304.85
10-Mar-2021	1.34	305.46	10-Mar-2021	2.49	304.91	10-Mar-2021	1.95	304.85
21-Apr-2021	1.14	305.66	21-Apr-2021	2.46	304.94	21-Apr-2021	1.94	304.86
19-May-2021	1.38	305.42	19-May-2021	2.50	304.90	19-May-2021	1.98	304.82
25-Jun-2021	1.69	305.11	25-Jun-2021	2.32	305.08	25-Jun-2021	1.87	304.93
27-Jul-2021	1.67	305.14	27-Jul-2021	2.57	304.83	27-Jul-2021	2.12	304.68
12-Aug-2021	1.71	305.09	12-Aug-2021	2.60	304.80	12-Aug-2021	2.14	304.66
23-Sep-2021	1.18	305.62	23-Sep-2021	2.02	305.38	23-Sep-2021	1.75	305.05
27-Oct-2021	1.23	305.57	27-Oct-2021	2.36	305.04	27-Oct-2021	1.88	304.92
10-Nov-2021	1.34	305.46	10-Nov-2021	2.46	304.94	10-Nov-2021	1.90	304.90
16-Dec-2021	1.20	305.60	16-Dec-2021	2.40	305.00	16-Dec-2021	1.87	304.93
14-Jan-2022	1.46	305.34	14-Jan-2022	2.55	304.85	14-Jan-2022	2.05	304.75
24-Feb-2022	1.18	305.62	24-Feb-2022	2.30	305.10	24-Feb-2022	1.76	305.04
17-Mar-2022	1.16	305.64	17-Mar-2022	2.33	305.07	17-Mar-2022	1.80	305.00
21-Apr-2022	1.10	305.70	21-Apr-2022	2.35	305.05	21-Apr-2022	1.81	304.99
24-May-2022	1.34	305.46	24-May-2022	2.51	304.89	24-May-2022	1.97	304.83
15-Jun-2022	1.36	305.44	15-Jun-2022	2.52	304.88	15-Jun-2022	1.95	304.85
14-Jul-2022	1.64	305.16	14-Jul-2022	2.60	304.80	14-Jul-2022	2.12	304.68
25-Aug-2022	1.75	305.05	25-Aug-2022	2.58	304.82	25-Aug-2022	2.10	304.70
08-Sep-2022	1.81	304.99	08-Sep-2022	2.63	304.77	08-Sep-2022	2.17	304.63
13-Oct-2022	1.71	305.10	13-Oct-2022	2.54	304.86	13-Oct-2022	2.01	304.79
24-Nov-2022	1.79	305.01	24-Nov-2022	2.62	304.78	24-Nov-2022	2.15	304.66
16-Dec-2022	1.58	305.22	16-Dec-2022	2.53	304.87	16-Dec-2022	1.97	304.84

NOTES:
- · BTOP — Below top of pipe
- · NA — Not available
- · m ASL — metres above sea level
- · (F) — Frozen

TABLE B-3
WATER LEVEL DATA - WETLAND DRIVE POINTS
MILL CREEK AGGREGATES PIT

DP12			DP16			DP113		
DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)	DATE	Water Level BTOP (m)	Groundwater Elevation (m ASL)
16-Jan-2018	1.78	304.92	16-Jan-2018	(F)		16-Jan-2018	(F)	
26-Feb-2018	1.62	305.08	26-Feb-2018	0.57	304.43	26-Feb-2018	1.16	306.71
26-Mar-2018	1.78	304.92	26-Mar-2018	0.74	304.26	26-Mar-2018	1.34	306.53
24-Apr-2018	1.49	305.21	24-Apr-2018	0.57	304.43	24-Apr-2018	1.10	306.77
18-May-2018	1.49	305.21	18-May-2018	0.68	304.32	18-May-2018	1.14	306.73
12-Jun-2018	1.79	304.91	12-Jun-2018	0.81	304.19	12-Jun-2018	1.23	306.64
27-Jul-2018	1.97	304.73	27-Jul-2018	0.92	304.08	27-Jul-2018	1.76	306.11
22-Aug-2018	1.92	304.78	22-Aug-2018	0.78	304.22	22-Aug-2018	1.35	306.52
12-Sep-2018	2.01	304.69	12-Sep-2018	0.89	304.11	12-Sep-2018	1.42	306.45
30-Oct-2018	2.04	304.66	30-Oct-2018	0.89	304.11	30-Oct-2018	1.55	306.32
21-Nov-2018	1.96	304.74	21-Nov-2018	0.82	304.18	21-Nov-2018	1.48	306.39
20-Dec-2018	1.94	304.76	20-Dec-2018	0.81	304.19	20-Dec-2018	1.45	306.42
28-Jan-2019	(F)		28-Jan-2019	(F)		28-Jan-2019	1.44	306.43
27-Feb-2019	1.88	304.82	27-Feb-2019	(F)		27-Feb-2019	(F)	
19-Mar-2019	1.72	304.98	19-Mar-2019	0.60	304.40	19-Mar-2019	1.31	306.56
24-Apr-2019	1.18	305.52	24-Apr-2019	0.55	304.45	24-Apr-2019	1.16	306.71
22-May-2019	1.29	305.41	22-May-2019	0.59	304.41	22-May-2019	1.07	306.80
19-Jun-2019	1.63	305.07	19-Jun-2019	0.61	304.39	19-Jun-2019	1.01	306.86
26-Jul-2019	1.81	304.89	26-Jul-2019	0.72	304.28	26-Jul-2019	1.05	306.82
20-Aug-2019	1.89	304.81	20-Aug-2019	0.78	304.22	20-Aug-2019	1.14	306.73
25-Sep-2019	2.01	304.69	25-Sep-2019	0.89	304.11	25-Sep-2019	1.24	306.63
29-Oct-2019	1.90	304.80	29-Oct-2019	0.71	304.29	29-Oct-2019	1.27	306.60
13-Nov-2019	1.88	304.82	13-Nov-2019	0.78	304.22	13-Nov-2019	1.24	306.63
16-Dec-2019	1.86	304.84	16-Dec-2019	0.70	304.30	16-Dec-2019	1.20	306.67
09-Jan-2020	1.90	304.80	09-Jan-2020	0.72	304.28	09-Jan-2020	1.29	306.58
10-Feb-2020	1.89	304.81	10-Feb-2020	0.69	304.31	10-Feb-2020	1.06	306.81
09-Mar-2020	1.45	305.25	09-Mar-2020	0.55	304.45	09-Mar-2020	1.05	306.82
14-Apr-2020	1.53	305.17	14-Apr-2020	0.65	304.35	14-Apr-2020	0.98	306.89
13-May-2020	1.58	305.12	13-May-2020	0.70	304.30	13-May-2020	0.97	306.90
11-Jun-2020	1.72	304.98	11-Jun-2020	0.63	304.37	11-Jun-2020	0.95	306.92
08-Jul-2020	1.90	304.80	08-Jul-2020	0.95	304.05	08-Jul-2020	1.22	306.65
19-Aug-2020	2.09	304.61	19-Aug-2020	0.97	304.03	19-Aug-2020	1.02	306.85
17-Sep-2020	2.03	304.67	17-Sep-2020	0.98	304.02	17-Sep-2020	1.16	306.71
23-Oct-2020	2.06	304.64	23-Oct-2020	0.83	304.17	23-Oct-2020	1.04	306.83
19-Nov-2020	2.14	304.56	19-Nov-2020	0.95	304.05	19-Nov-2020	1.23	306.64
03-Dec-2020	2.11	304.59	03-Dec-2020	0.78	304.22	03-Dec-2020	1.09	306.78
08-Jan-2021	2.08	304.62	08-Jan-2021	0.73	304.27	08-Jan-2021	1.16	306.71
10-Feb-2021	2.15	304.55	10-Feb-2021	0.86	304.14	10-Feb-2021	1.21	306.66
10-Mar-2021	1.97	304.73	10-Mar-2021	0.73	304.27	10-Mar-2021	1.26	306.61
21-Apr-2021	1.91	304.79	21-Apr-2021	0.72	304.28	21-Apr-2021	1.25	306.62
19-May-2021	1.95	304.75	19-May-2021	0.86	304.14	19-May-2021	1.34	306.53
25-Jun-2021	1.83	304.87	25-Jun-2021	0.94	304.06	25-Jun-2021	1.08	306.79
27-Jul-2021	2.15	304.56	27-Jul-2021	0.96	304.05	27-Jul-2021	1.34	306.53
12-Aug-2021	2.16	304.54	12-Aug-2021	0.96	304.04	12-Aug-2021	1.32	306.55
23-Sep-2021	1.87	304.83	30-Sep-2021	0.84	304.16	30-Sep-2021	1.22	306.65
27-Oct-2021	2.00	304.70	27-Oct-2021	0.73	304.27	27-Oct-2021	1.19	306.68
10-Nov-2021	2.08	304.62	10-Nov-2021	0.84	304.16	10-Nov-2021	1.22	306.65
16-Dec-2021	1.92	304.78	16-Dec-2021	0.71	304.29	16-Dec-2021	1.25	306.62
14-Jan-2022	1.99	304.71	14-Jan-2022	0.81	304.19	14-Jan-2022	1.32	306.55
24-Feb-2022	1.79	304.91	24-Feb-2022	0.54	304.46	24-Feb-2022	1.27	306.60
17-Mar-2022	1.78	304.92	17-Mar-2022	0.59	304.41	17-Mar-2022	1.28	306.59
21-Apr-2022	1.73	304.97	21-Apr-2022	0.55	304.45	21-Apr-2022	1.29	306.58
24-May-2022	1.85	304.85	24-May-2022	0.65	304.35	24-May-2022	1.31	306.56
15-Jun-2022	1.81	304.89	15-Jun-2022	0.64	304.36	15-Jun-2022	1.30	306.57
14-Jul-2022	2.01	304.69	14-Jul-2022	0.93	304.08	14-Jul-2022	1.36	306.51
25-Aug-2022	2.08	304.62	25-Aug-2022	0.89	304.11	25-Aug-2022	1.40	306.47
08-Sep-2022	2.13	304.57	08-Sep-2022	1.02	303.98	08-Sep-2022	1.43	306.44
13-Oct-2022	2.07	304.63	13-Oct-2022	0.94	304.07	13-Oct-2022	NA	
24-Nov-2022	2.21	304.49	24-Nov-2022	0.95	304.05	24-Nov-2022	1.56	306.31
16-Dec-2022	1.98	304.72	16-Dec-2022	0.83	304.17	16-Dec-2022	1.62	306.25

NOTES:
- BTOP — Below top of pipe
- NA — Not available
- m ASL — metres above sea level
- (F) — Frozen

TABLE B-4
WATER LEVEL DATA - SURFACE WATER STATIONS
MILL CREEK AGGREGATES PIT

SG4/SW1			SW2			Trench (West)		
DATE	Water Level On Gauge (m)	Surface Water Elevation (m ASL)	DATE	Water Level On Gauge (m)	Surface Water Elevation (m ASL)	DATE	Water Level FBOG (m)	Surface Water Elevation (m ASL)
16-Jan-2018	(F)		16-Jan-2018	(F)		16-Jan-2018	(F)	
26-Feb-2018	0.39	306.04	26-Feb-2018	0.59	303.12	26-Feb-2018	(F)	
26-Mar-2018	0.21	305.86	26-Mar-2018	0.80	302.91	26-Mar-2018	1.40	306.84
24-Apr-2018	0.43	306.08	24-Apr-2018	0.53	303.18	24-Apr-2018	1.56	307.00
18-May-2018	0.28	305.93	18-May-2018	0.67	303.04	18-May-2018	1.50	306.94
12-Jun-2018	0.19	305.84	12-Jun-2018	0.92	302.79	12-Jun-2018	1.49	306.93
27-Jul-2018	0.20	305.85	27-Jul-2018	0.84	302.87	27-Jul-2018	NA	
22-Aug-2018	0.26	305.91	22-Aug-2018	0.75	302.96	22-Aug-2018	NA	
12-Sep-2018	0.22	305.87	12-Sep-2018	0.81	302.90	12-Sep-2018	1.22	306.66
30-Oct-2018	0.29	305.94	30-Oct-2018	0.79	302.92	30-Oct-2018	NA	
21-Nov-2018	0.35	306.00	21-Nov-2018	0.76	302.95	21-Nov-2018	(F)	
20-Dec-2018	0.26	305.91	20-Dec-2018	0.76	302.95	20-Dec-2018	(F)	
28-Jan-2019	NA		28-Jan-2019	(F)		28-Jan-2019	(F)	
27-Feb-2019	(F)		27-Feb-2019	(F)		27-Feb-2019	(F)	
19-Mar-2019	0.43	306.08	19-Mar-2019	0.61	303.10	19-Mar-2019	(F)	
24-Apr-2019	0.47	306.12	24-Apr-2019	0.56	303.15	24-Apr-2019	1.50	306.94
22-May-2019	0.32	305.97	22-May-2019	0.69	303.02	22-May-2019	1.62	307.06
19-Jun-2019	0.28	305.93	19-Jun-2019	0.73	302.98	19-Jun-2019	1.70	307.14
26-Jul-2019	0.24	305.89	26-Jul-2019	0.80	302.91	26-Jul-2019	1.66	307.10
20-Aug-2019	0.25	305.90	20-Aug-2019	0.76	302.95	20-Aug-2019	1.52	306.96
25-Sep-2019	0.21	305.86	25-Sep-2019	0.58	303.13	25-Sep-2019	1.41	306.85
29-Oct-2019	0.39	306.04	29-Oct-2019	0.42	303.29	29-Oct-2019	1.39	306.83
13-Nov-2019	0.29	305.94	13-Nov-2019	0.47	303.24	13-Nov-2019	1.48	306.92
16-Dec-2019	0.30	305.95	16-Dec-2019	0.48	303.24	16-Dec-2019	(F)	
09-Jan-2020	0.31	305.96	09-Jan-2020	0.48	303.23	09-Jan-2020	(F)	
10-Feb-2020	0.29	305.94	10-Feb-2020	0.69	303.02	10-Feb-2020	(F)	
09-Mar-2020	0.37	306.02	09-Mar-2020	0.51	303.20	09-Mar-2020	1.69	307.13
14-Apr-2020	0.32	305.97	14-Apr-2020	0.62	303.09	14-Apr-2020	1.76	307.20
13-May-2020	0.26	305.91	13-May-2020	0.77	302.94	13-May-2020	1.70	307.14
11-Jun-2020	0.27	305.92	11-Jun-2020	0.55	303.16	11-Jun-2020	1.74	307.18
08-Jul-2020	0.21	305.86	08-Jul-2020	0.80	302.91	08-Jul-2020	1.59	307.03
19-Aug-2020	0.19	305.84	19-Aug-2020	0.81	302.90	19-Aug-2020	1.46	306.90
17-Sep-2020	0.17	305.82	17-Sep-2020	0.80	302.91	17-Sep-2020	1.31	306.75
23-Oct-2020	0.40	306.05	23-Oct-2020	0.67	303.04	23-Oct-2020	1.31	306.75
19-Nov-2020	0.24	305.89	19-Nov-2020	0.74	302.97	19-Nov-2020	1.25	306.69
18-Dec-2020	0.26	305.91	18-Dec-2020	0.79	302.92	18-Dec-2020	(F)	
08-Jan-2021	0.28	305.93	08-Jan-2021	0.70	303.01	08-Jan-2021	(F)	
10-Feb-2021	(F)		10-Feb-2021	0.86	302.85	10-Feb-2021	(F)	
10-Mar-2021	0.25	305.90	10-Mar-2021	0.62	303.09	10-Mar-2021	(F)	
21-Apr-2021	0.24	305.89	21-Apr-2021	0.81	302.90	21-Apr-2021	1.30	306.74
19-May-2021	0.36	306.01	19-May-2021	0.86	302.85	19-May-2021	1.20	306.64
25-Jun-2021	0.25	305.90	25-Jun-2021	0.39	303.32	25-Jun-2021	1.35	306.79
27-Jul-2021	0.19	305.84	27-Jul-2021	0.84	302.87	27-Jul-2021	1.49	306.93
12-Aug-2021	0.18	305.83	12-Aug-2021	0.84	302.87	12-Aug-2021	1.12	306.56
23-Sep-2021	0.24	305.89	23-Sep-2021	0.80	302.91	23-Sep-2021	1.25	306.69
27-Oct-2021	0.35	306.00	27-Oct-2021	0.71	303.00	27-Oct-2021	1.20	306.64
10-Nov-2021	0.28	305.93	10-Nov-2021	0.80	302.91	10-Nov-2021	1.15	306.59
16-Dec-2021	0.30	305.95	16-Dec-2021	0.78	302.93	16-Dec-2021	1.19	306.63
14-Jan-2022	0.22	305.87	14-Jan-2022	(F)		14-Jan-2022	(F)	
24-Feb-2022	0.48	306.13	24-Feb-2022	0.59	303.12	24-Feb-2022	(F)	
17-Mar-2022	0.34	305.99	17-Mar-2022	0.71	303.00	17-Mar-2022	(F)	
21-Apr-2022	0.32	305.97	21-Apr-2022	0.72	302.99	21-Apr-2022	1.40	306.84
24-May-2022	0.22	305.87	24-May-2022	0.82	302.89	24-May-2022	1.38	306.82
15-Jun-2022	0.22	305.87	15-Jun-2022	0.80	302.91	15-Jun-2022	1.38	306.82
14-Jul-2022	0.17	305.82	14-Jul-2022	0.85	302.86	14-Jul-2022	1.20	306.64
25-Aug-2022	0.18	305.83	25-Aug-2022	0.83	302.88	25-Aug-2022	1.14	306.58
08-Sep-2022	0.16	305.81	08-Sep-2022	0.84	302.87	08-Sep-2022	1.06	306.50
13-Oct-2022	0.23	305.88	13-Oct-2022	0.80	302.91	13-Oct-2022	1.00	306.44
24-Nov-2022	0.18	305.83	24-Nov-2022	0.85	302.87	24-Nov-2022	(F)	
16-Dec-2022	0.23	305.88	16-Dec-2022	0.81	302.90	16-Dec-2022	(F)	

NOTES:
- NA — Not available
- m ASL — metres above sea level
- (F) — Frozen
- FBOG — from bottom of gauge
- SW2 is measured from the top of DP5A, DP5B, DB5C, DP5D or DP5CR

TABLE B-4
WATER LEVEL DATA - SURFACE WATER STATIONS
MILL CREEK AGGREGATES PIT

PHASE 1 POND				PHASE 2 POND			
DATE	Water Level FBOG (m)	Surface Water Elevation (m ASL)	Water Temperature at Surface (°C)	DATE	Water Level FBOG (m)	Surface Water Elevation (m ASL)	Water Temperature at Surface (°C)
16-Jan-2018	(F)			16-Jan-2018	(F)		
26-Feb-2018	(F)			26-Feb-2018	(F)		
26-Mar-2018	0.32	306.16	7.0	26-Mar-2018	(F)		
24-Apr-2018	0.87	306.68	10.4	24-Apr-2018	0.85	306.14	8.4
18-May-2018	0.96	306.77	14.5	18-May-2018	0.89	306.18	15.3
12-Jun-2018	0.84	306.65	15.8	12-Jun-2018	0.87	306.16	22.2
27-Jul-2018	0.68	306.49	23.9	27-Jul-2018	0.75	306.04	24.3
22-Aug-2018	0.66	306.47	23.8	22-Aug-2018	0.71	306.00	24.2
12-Sep-2018	0.55	306.36	21.1	12-Sep-2018	0.65	305.94	21.0
30-Oct-2018	0.28	306.09	10.0	30-Oct-2018	0.48	305.77	9.4
21-Nov-2018	0.40	306.21	4.3	21-Nov-2018	0.53	305.82	4.3
20-Dec-2018	0.55	306.36	0.8	20-Dec-2018	0.50	305.79	1.4
28-Jan-2019	(F)			28-Jan-2019	(F)		
27-Feb-2019	(F)			27-Feb-2019	(F)		
19-Mar-2019	NA		2.8	19-Mar-2019	(F)		
24-Apr-2019	0.52	306.61	11.3	24-Apr-2019	0.56	306.19	9.2
22-May-2019	0.66	306.75	12.5	22-May-2019	0.72	306.35	12.4
19-Jun-2019	0.73	306.82	21.1	19-Jun-2019	0.78	306.41	22.5
26-Jul-2019	0.74	306.83	24.5	26-Jul-2019	0.72	306.35	24.9
20-Aug-2019	0.61	306.70	24.9	20-Aug-2019	0.63	306.26	23.1
25-Sep-2019	0.46	306.55	20.0	25-Sep-2019	0.49	306.12	19.5
29-Oct-2019	0.38	306.47	11.9	29-Oct-2019	0.44	306.07	12.3
13-Nov-2019	0.46	306.55	6.3	13-Nov-2019	0.44	306.07	6.2
16-Dec-2019	(F)			16-Dec-2019	(F)		
09-Jan-2020	(F)			09-Jan-2020	(F)		
10-Feb-2020	(F)			10-Feb-2020	(F)		
09-Mar-2020	(F)			09-Mar-2020	(F)		
14-Apr-2020	0.48	306.87	7.8	14-Apr-2020	0.70	306.43	7.7
13-May-2020	0.43	306.82	10.8	13-May-2020	0.66	306.39	10.9
11-Jun-2020	0.46	306.85	21.4	11-Jun-2020	0.66	306.39	20.0
08-Jul-2020	0.33	306.72	25.0	08-Jul-2020	0.53	306.26	25.8
19-Aug-2020	0.19	306.58	23.1	19-Aug-2020	0.38	306.11	24.2
17-Sep-2020	0.08	306.47	19.9	17-Sep-2020	0.24	305.97	20.7
23-Oct-2020	0.27	306.36	12.9	23-Oct-2020	0.15	305.88	13.0
19-Nov-2020	0.21	306.30	8.7	19-Nov-2020	0.06	305.79	10.8
18-Dec-2020	0.22	306.31	0.2	18-Dec-2020	0.07	305.80	1.1
08-Jan-2021	(F)			08-Jan-2021	(F)		
10-Feb-2021	(F)			10-Feb-2021	(F)		
10-Mar-2021	(F)		4.4	10-Mar-2021	(F)		
21-Apr-2021	0.82	306.40	10.8	21-Apr-2021	0.64	305.84	10.2
19-May-2021	0.73	306.31	16.1	19-May-2021	0.58	305.78	17.1
25-Jun-2021	0.72	306.30	24.5	25-Jun-2021	0.67	305.87	24.8
27-Jul-2021	0.67	306.25	22.8	27-Jul-2021	0.52	305.72	24.0
12-Aug-2021	0.64	306.22	24.2	12-Aug-2021	0.52	305.72	24.2
23-Sep-2021	0.65	306.23	19.7	23-Sep-2021	0.52	305.72	20.1
27-Oct-2021	0.67	306.25	14.7	27-Oct-2021	0.49	305.69	15.4
10-Nov-2021	0.64	306.22	11.2	10-Nov-2021	0.46	305.66	10.3
16-Dec-2021	0.64	306.22	5.4	16-Dec-2021	0.49	305.69	5.0
14-Jan-2022	(F)			14-Jan-2022	(F)		
24-Feb-2022	(F)			24-Feb-2022	(F)		
17-Mar-2022	(F)		4.8	17-Mar-2022	(F)		
21-Apr-2022	0.64	306.49	7.5	21-Apr-2022	0.80	306.06	8.1
24-May-2022	0.65	306.50	17.2	24-May-2022	0.80	306.06	18.9
15-Jun-2022	0.63	306.48	20.9	15-Jun-2022	0.77	306.03	22.3
14-Jul-2022	0.40	306.35	23.4	14-Jul-2022	0.60	305.89	23.5
25-Aug-2022	0.29	306.24	24.5	25-Aug-2022	0.46	305.75	24.8
08-Sep-2022	0.23	306.18	22.8	08-Sep-2022	0.39	305.68	22.8
13-Oct-2022	0.34	306.29	15.3	13-Oct-2022	0.51	305.80	14.8
24-Nov-2022	0.23	306.18	6.4	24-Nov-2022	0.39	305.68	6.6
16-Dec-2022	(F)		2.6	16-Dec-2022	(F)		2.9

Note: ·FBOG from bottom of gauge
·m ASL metres above sea level
· (F) Frozen
· NA Not available

TABLE B-4
WATER LEVEL DATA - SURFACE WATER STATIONS
MILL CREEK AGGREGATES PIT

PHASE 3 POND				PHASE 4 POND			
DATE	Water Level FBOG (m)	Surface Water Elevation (m ASL)	Water Temperature at Surface (°C)	DATE	Water Level FBOG (m)	Surface Water Elevation (m ASL)	Water Temperature at Surface (°C)
16-Jan-2018	(F)			16-Jan-2018	(F)		
26-Feb-2018	(F)			26-Feb-2018	(F)		
26-Mar-2018	0.40	304.98	7.6	26-Mar-2018	0.84	306.09	6.8
24-Apr-2018	0.80	305.04	8.6	24-Apr-2018	0.90	306.37	8.7
18-May-2018	0.80	305.04	18.6	18-May-2018	0.82	306.29	16.6
12-Jun-2018	0.71	304.95	20.2	12-Jun-2018	0.84	306.31	22.6
27-Jul-2018	0.54	304.78	25.2	27-Jul-2018	0.75	306.22	24.4
22-Aug-2018	0.49	304.73	23.6	22-Aug-2018	0.68	306.15	23.2
12-Sep-2018	0.43	304.67	20.2	12-Sep-2018	0.56	306.03	19.9
30-Oct-2018	0.38	304.62	10.1	30-Oct-2018	0.61	306.08	10.2
21-Nov-2018	0.46	304.70	2.7	21-Nov-2018	0.59	306.06	3.6
20-Dec-2018	(F)			20-Dec-2018	(F)		1.3
28-Jan-2019	(F)			28-Jan-2019	(F)		
27-Feb-2019	(F)			27-Feb-2019	(F)		
19-Mar-2019	(F)			19-Mar-2019	(F)		
24-Apr-2019	0.22	305.02	10.6	24-Apr-2019	0.04	306.25	9.8
22-May-2019	0.25	305.05	13.8	22-May-2019	0.16	306.37	12.8
19-Jun-2019	0.26	305.06	19.8	19-Jun-2019	0.23	306.44	20.1
26-Jul-2019	0.15	304.95	27.7	26-Jul-2019	0.29	306.50	28.3
20-Aug-2019	0.05	304.85	26.7	20-Aug-2019	0.27	306.48	26.4
25-Sep-2019	0.31	304.74	19.8	25-Sep-2019	0.03	306.24	19.3
29-Oct-2019	0.33	304.76	11.2	29-Oct-2019	0.19	306.40	11.2
13-Nov-2019	0.38	304.81	4.2	13-Nov-2019	0.01	306.22	6.3
16-Dec-2019	(F)			16-Dec-2019	(F)		
09-Jan-2020	(F)			09-Jan-2020	(F)		
10-Feb-2020	(F)			10-Feb-2020	(F)		
09-Mar-2020	(F)			09-Mar-2020	(F)		
14-Apr-2020	0.74	305.03	7.0	14-Apr-2020	0.24	306.58	7.2
13-May-2020	0.64	304.93	10.0	13-May-2020	0.20	306.54	13.0
11-Jun-2020	0.61	304.90	21.3	11-Jun-2020	0.20	306.54	21.6
08-Jul-2020	0.47	304.76	27.3	08-Jul-2020	0.10	306.44	26.3
19-Aug-2020	0.34	304.63	22.8	19-Aug-2020	0.21	306.33	22.8
17-Sep-2020	0.24	304.53	20.7	17-Sep-2020	0.07	306.19	19.6
23-Oct-2020	0.24	304.53	12.7	23-Oct-2020	0.42	306.13	12.7
19-Nov-2020	0.22	304.51	6.7	19-Nov-2020	0.34	306.05	9.9
18-Dec-2020	0.29	304.58	0.3	18-Dec-2020	0.34	306.05	0.9
08-Jan-2021	(F)			08-Jan-2021	(F)		
10-Feb-2021	(F)			10-Feb-2021	(F)		
10-Mar-2021	(F)			10-Mar-2021	(F)		
21-Apr-2021	0.42	304.73	9.1	21-Apr-2021	0.64	306.14	8.7
19-May-2021	0.35	304.66	14.9	19-May-2021	0.54	306.04	16.9
25-Jun-2021	0.31	304.62	27.6	25-Jun-2021	0.55	306.05	27.5
27-Jul-2021	0.25	304.56	25.3	27-Jul-2021	0.49	305.99	24.9
12-Aug-2021	0.23	304.54	24.6	12-Aug-2021	0.40	305.90	24.1
23-Sep-2021	0.25	304.56	19.5	23-Sep-2021	0.51	306.01	20.0
27-Oct-2021	0.29	304.60	12.0	27-Oct-2021	0.51	306.01	13.0
10-Nov-2021	0.28	304.59	8.5	10-Nov-2021	0.47	305.97	12.4
16-Dec-2021	0.41	304.72	4.5	16-Dec-2021	0.37	305.87	4.6
14-Jan-2022	(F)			14-Jan-2022	(F)		
24-Feb-2022	(F)			24-Feb-2022	(F)		
17-Mar-2022	(F)			17-Mar-2022	(F)		
21-Apr-2022	0.62	304.85	8.2	21-Apr-2022	0.58	306.19	8.3
24-May-2022	0.66	304.89	17.2	24-May-2022	0.46	306.07	17.5
15-Jun-2022	0.70	304.93	21.7	15-Jun-2022	0.44	306.05	21.1
14-Jul-2022	0.50	304.73	23.6	14-Jul-2022	0.36	305.97	23.6
25-Aug-2022	0.41	304.64	24.7	25-Aug-2022	0.23	305.84	23
08-Sep-2022	0.37	304.60	22.3	08-Sep-2022	0.16	305.77	22.1
13-Oct-2022	0.29	304.52	14.7	13-Oct-2022	0.10	305.71	15.4
24-Nov-2022	0.23	304.46	4.9	24-Nov-2022	0.03	305.64	6.8
16-Dec-2022	(F)			16-Dec-2022	(F)		

Note:
- ·FBOG — from bottom of gauge
- ·m ASL — metres above sea level
- · (F) — Frozen
- · NA — Not available

TABLE B-5
SUMMARY OF CREEK BASED DRIVE POINT DATA
MILL CREEK AGGREGATES PIT

MONITOR LOCATION	DATE	G.W. LEVEL BTOP (m)	S.W. LEVEL BTOP (m)	GROUND-WATER ELEVATION (m ASL)	SURFACE WATER ELEVATION (m ASL)	HYDRAULIC HEAD IN GROUND-WATER (m)	VERTICAL HYDRAULIC GRADIENT	CALCULATED GROUNDWATER FLUX TO CREEK (L/s/m2)	TEMPERATURE	
									GROUND-WATER (°C)	SURFACE WATER (°C)
DP1	16-Jan-18	(F)	(F)						(F)	(F)
	26-Feb-18	0.53	0.87	304.33	303.99	0.34	0.24	9.36E-03	7.7	2.1
	26-Mar-18	0.65	1.07	304.21	303.79	0.42	0.30	1.16E-02	(F)	2.7
	24-Apr-18	0.50	0.85	304.36	304.01	0.35	0.25	9.64E-03	8.7	8.3
	18-May-18	0.60	1.03	304.26	303.83	0.43	0.31	1.18E-02	10.9	14.6
	12-Jun-18	0.69	1.09	304.17	303.77	0.40	0.29	1.10E-02	11.6	14.3
	27-Jul-18	0.75	1.09	304.11	303.77	0.34	0.24	9.36E-03	13.4	18.4
	22-Aug-18	0.68	1.04	304.18	303.82	0.36	0.26	9.91E-03	13.0	17.9
	12-Sep-18	0.74	1.08	304.12	303.78	0.34	0.24	9.36E-03	12.1	14.6
	30-Oct-18	0.73	1.07	304.13	303.79	0.34	0.24	9.36E-03	10.0	6.5
	21-Nov-18	(F)	1.05		303.82				(F)	2.1
	20-Dec-18	(F)	1.06		303.80				(F)	3.1
	28-Jan-19	(F)	(F)						(F)	(F)
	27-Feb-19	(F)	1.03		303.83				(F)	-0.1
	19-Mar-19	(F)	0.92		303.94				(F)	1.8
	24-Apr-19	0.49	0.88	304.37	303.98	0.39	0.28	1.07E-02	8.4	7.5
	22-May-19	0.68	0.99	304.18	303.87	0.31	0.22	8.54E-03	11.2	11.7
	19-Jun-19	0.55	1.00	304.31	303.86	0.45	0.32	1.24E-02	12.1	15.5
	26-Jul-19	0.64	1.05	304.22	303.81	0.41	0.29	1.12E-02	16.2	17.8
	20-Aug-19	0.66	1.04	304.20	303.82	0.38	0.27	1.05E-02	15.9	19.3
	25-Sep-19	0.73	1.05	304.13	303.81	0.32	0.23	8.81E-03	12.7	13.6
	29-Oct-19	0.54	0.74	304.32	304.12	0.20	0.14	5.51E-03	8.0	8.2
	13-Nov-19	(F)	0.99		303.87				(F)	1.0
	16-Dec-19	(F)	0.98		303.88				(F)	0.8
	09-Jan-20	(F)	1.03		303.83				(F)	0.5
	10-Feb-20	(F)	1.01		303.85				(F)	0.9
	09-Mar-20	0.51	0.89	304.35	303.97	0.38	0.27	1.05E-02	8.3	3.3
	14-Apr-20	0.58	1.01	304.28	303.85	0.43	0.31	1.18E-02	9.0	8.4
	13-May-20	0.60	1.03	304.26	303.83	0.43	0.31	1.18E-02	8.8	6.9
	11-Jun-20	0.55	0.89	304.31	303.97	0.34	0.24	9.36E-03	15.0	18.6
	08-Jul-20	0.73	1.09	304.13	303.77	0.36	0.26	9.91E-03	16.2	17.8
	19-Aug-20	0.78	1.00	304.08	303.86	0.22	0.16	6.06E-03	14.2	14.8
	17-Sep-20	0.80	1.07	304.06	303.79	0.27	0.19	7.43E-03	12.3	13.2
	23-Oct-20	0.59	0.70	304.27	304.16	0.11	0.08	3.03E-03	11.0	10.5
	19-Nov-20	0.63	0.59	304.23	304.27	-0.04	-0.03	-1.10E-03	6.7	4.5
	18-Dec-20	(F)	0.86		304.00				(F)	0.4
	08-Jan-21	(F)	0.90		303.96				(F)	0.1
	10-Feb-21	(F)	(F)						(F)	(F)
	10-Mar-21	0.62	0.93	304.24	303.93	0.31	0.22	8.54E-03	6.7	3.1
	21-Apr-21	0.60	0.94	304.26	303.92	0.34	0.24	9.36E-03	8.2	5.2
	19-May-21	0.69	1.09	304.17	303.77	0.40	0.29	1.10E-02	12.1	11.8
	25-Jun-21	0.43	0.53	304.43	304.33	0.10	0.07	2.75E-03	17.8	21.4
	27-Jul-21	0.74	1.06	304.13	303.80	0.32	0.23	8.95E-03	14.6	17.5
	12-Aug-21	0.74	1.07	304.12	303.79	0.33	0.24	9.09E-03	14.9	18.6
	30-Sep-21	0.69	1.05	304.17	303.81	0.36	0.26	9.91E-03	11.3	11.8
	27-Oct-21	0.60	0.92	304.26	303.94	0.32	0.23	8.81E-03	10.4	8.8
	10-Nov-21	0.66	1.01	304.20	303.85	0.35	0.25	9.64E-03	9.3	7.4
	16-Dec-21	0.60	0.98	304.26	303.88	0.38	0.27	1.05E-02	8.7	6.4
	14-Jan-22	(F)	1.07		303.79				(F)	0.8
	24-Feb-22	0.45	0.75	304.41	304.11	0.30	0.22	8.26E-03	7.5	2.4
	17-Mar-22	0.53	0.96	304.33	303.90	0.43	0.31	1.18E-02	7.5	2.4
	21-Apr-22	0.53	1.00	304.33	303.86	0.47	0.34	1.29E-02	8.1	6.7
	24-May-22	0.57	1.08	304.29	303.78	0.51	0.37	1.40E-02	12.9	12.1
	15-Jun-22	0.55	1.09	304.31	303.77	0.54	0.39	1.49E-02	14.5	16.0
	14-Jul-22	0.70	1.12	304.16	303.74	0.42	0.30	1.16E-02	15.4	14.1
	25-Aug-22	0.71	0.99	304.15	303.87	0.28	0.20	7.71E-03	19.8	17.1
	08-Sep-22	0.77	1.13	304.09	303.73	0.36	0.26	9.91E-03	13.4	14.9
	13-Oct-22	0.73	1.06	304.13	303.81	0.32	0.23	8.95E-03	11.8	12.5
	24-Nov-22	0.75	1.10	304.11	303.76	0.35	0.25	9.64E-03	6.8	4.1
	16-Dec-22	0.69	1.05	304.17	303.81	0.36	0.26	9.91E-03	4.1	2.7
2022 AVERAGE VALUES						0.40	0.28	1.09E-02	11.1	8.8
OVERALL AVERAGE VALUES						0.34	0.24	9.30E-03	9.9	10.0

NOTES:
- m ASL — metres above sea level
- (F) — Frozen
- L/s/m² — Litres per second per square metre
- Depth of screen midpoint below the creek bed is 1.39 m
- Assumed vertical permeability is 3.80E-05 m/s

TABLE B-5
SUMMARY OF CREEK BASED DRIVE POINT DATA
MILL CREEK AGGREGATES PIT

MONITOR LOCATION	DATE	G.W. LEVEL BTOP (m)	S.W. LEVEL BTOP (m)	GROUND-WATER ELEVATION (m ASL)	SURFACE WATER ELEVATION (m ASL)	HYDRAULIC HEAD IN GROUND-WATER (m)	VERTICAL HYDRAULIC GRADIENT	CALCULATED GROUND WATER FLUX TO CREEK (L/s/m2)	TEMPERATURE	
									GROUND-WATER (°C)	SURFACE WATER (°C)
DP2	16-Jan-18	(F)	(F)						(F)	(F)
	26-Feb-18	0.28	0.73	304.24	303.79	0.45	0.24	2.07E-03	5.7	2.2
	26-Mar-18	(F)	0.99		303.53				5.3	2.7
	24-Apr-18	0.26	0.70	304.26	303.82	0.44	0.24	2.02E-03	7.0	8.3
	18-May-18	0.35	0.92	304.17	303.60	0.57	0.31	2.62E-03	9.9	14.6
	12-Jun-18	0.44	1.03	304.08	303.49	0.59	0.32	2.71E-03	12.5	14.6
	27-Jul-18	0.53	1.01	303.99	303.51	0.48	0.26	2.21E-03	15.5	18.6
	22-Aug-18	0.42	0.90	304.10	303.62	0.48	0.26	2.21E-03	13.2	18.0
	12-Sep-18	0.50	0.96	304.02	303.56	0.46	0.25	2.11E-03	13.3	14.1
	30-Oct-18	0.50	0.95	304.02	303.57	0.45	0.24	2.07E-03	10.3	6.3
	21-Nov-18	(F)	0.92		303.61				(F)	2.2
	20-Dec-18	(F)	0.93		303.59				(F)	2.8
	28-Jan-19	(F)	(F)						(F)	(F)
	27-Feb-19	(F)	0.91		303.61				(F)	-0.1
	19-Mar-19	(F)	0.76		303.76				(F)	1.8
	24-Apr-19	0.25	0.70	304.27	303.82	0.45	0.24	2.07E-03	6.4	7.4
	22-May-19	0.29	0.86	304.23	303.66	0.57	0.31	2.62E-03	11.3	11.7
	19-Jun-19	0.42	0.87	304.10	303.65	0.45	0.24	2.07E-03	12.2	15.5
	26-Jul-19	0.39	0.92	304.13	303.60	0.526	0.28	2.42E-03	17.4	17.6
	20-Aug-19	0.41	0.90	304.11	303.62	0.49	0.26	2.25E-03	17.9	19.4
	25-Sep-19	0.50	0.94	304.02	303.58	0.44	0.24	2.02E-03	13.1	13.6
	29-Oct-19	0.61	0.89	303.91	303.63	0.28	0.15	1.29E-03	9.0	8.1
	13-Nov-19	(F)	0.84		303.68				(F)	0.9
	16-Dec-19	(F)	0.84		303.68				(F)	0.8
	09-Jan-20	(F)	0.91		303.61				(F)	0.5
	10-Feb-20	(F)	0.87		303.65				(F)	0.9
	09-Mar-20	0.26	0.74	304.26	303.78	0.48	0.26	2.21E-03	7.5	3.5
	14-Apr-20	0.32	0.88	304.20	303.64	0.56	0.30	2.57E-03	8.9	8.3
	13-May-20	0.35	0.92	304.17	303.60	0.57	0.31	2.62E-03	8.7	7.0
	11-Jun-20	0.30	0.74	304.22	303.78	0.44	0.24	2.02E-03	14.8	18.5
	08-Jul-20	0.46	0.84	304.06	303.68	0.38	0.21	1.75E-03	16.8	16.4
	19-Aug-20	0.69	0.99	303.83	303.53	0.3	0.16	1.38E-03	14.6	15.4
	17-Sep-20	0.59	0.95	303.93	303.57	0.36	0.19	1.65E-03	12.5	13.2
	23-Oct-20	**	**						**	**
	19-Nov-20	**	**						**	**
	18-Dec-20	**	**						**	**
	08-Jan-21	**	**						**	**
	10-Feb-21	**	**						**	**
	10-Mar-21	**	**						**	**
	21-Apr-21	**	**						**	**
	19-May-21	0.66	1.07	303.86	303.45	0.41	0.22	1.88E-03	11.6	11.8
	25-Jun-21	**	**						**	**
	27-Jul-21	0.55	1.01	303.97	303.51	0.46	0.25	2.11E-03	15.1	17.6
	12-Aug-21	**	**						**	**
	30-Sep-21	0.19*	0.95	304.33*	303.57	0.76*	0.41*	3.49E-03*	12.5	11.8
	27-Oct-21	0.37	0.78	304.15	303.74	0.41	0.22	1.88E-03	10.4	8.8
	10-Nov-21	0.39	0.88	304.13	303.64	0.49	0.26	2.25E-03	9.4	7.4
	16-Dec-21	0.39	0.86	304.13	303.66	0.47	0.25	2.16E-03	8.8	6.3
	14-Jan-22	(F)	0.98		303.54				(F)	0.7
	24-Feb-22	(F)	(F)						(F)	(F)
	17-Mar-22	0.29	0.81	304.23	303.71	0.52	0.28	2.39E-03	4.5	2.6
	21-Apr-22	0.29	0.84	304.23	303.68	0.55	0.30	2.53E-03	8.3	6.8
	24-May-22	0.31	0.96	304.21	303.56	0.65	0.35	2.99E-03	12.9	12.2
	15-Jun-22	0.31	0.96	304.21	303.56	0.65	0.35	2.99E-03	15.1	16.0
	14-Jul-22	0.67	1.02	303.85	303.50	0.35	0.19	1.61E-03	16.3	14.1
	25-Aug-22	0.63	1.12	303.89	303.40	0.49	0.26	2.25E-03	19.2	17.2
	08-Sep-22	0.73	1.15	303.79	303.37	0.42	0.23	1.93E-03	13.6	14.7
	13-Oct-22	0.58	0.92	303.94	303.60	0.34	0.18	1.56E-03	11.8	12.2
	24-Nov-22	0.67	0.92	303.86	303.60	0.25	0.14	1.17E-03	5.1	4.2
	16-Dec-22	0.57	0.76	303.95	303.76	0.19	0.10	8.73E-04	4.0	2.8
2022 AVERAGE VALUES						0.44	0.24	2.03E-03	11.1	9.4
OVERALL AVERAGE VALUES						0.35	0.22	1.84E-03	10.0	10.1

NOTES:
- · m ASL — metres above sea level
- · (F) — Frozen
- · * — Sept. 30, 2021 water level at DP2 is interpreted to be anomalous. On Oct. 6, the water level elevation at DP2 was 304.09 m ASL.
- · ** — Unavailable due to unsafe conditions
- · L/s/m² — Litres per second per square metre
- · Depth of screen midpoint below the creek bed is 1.85 m
- · Assumed vertical permeability is 8.50E-06 m/s

TABLE B-5
SUMMARY OF CREEK BASED DRIVE POINT DATA
MILL CREEK AGGREGATES PIT

MONITOR LOCATION	DATE	G.W. LEVEL BTOP (m)	S.W. LEVEL BTOP (m)	GROUND-WATER ELEVATION (m ASL)	SURFACE WATER ELEVATION (m ASL)	HYDRAULIC HEAD IN GROUND-WATER (m)	VERTICAL HYDRAULIC GRADIENT	CALCULATED GROUNDWATER FLUX TO CREEK (L/s/m2)	TEMPERATURE	
									GROUND-WATER (°C)	SURFACE WATER (°C)
DP3	16-Jan-18	(F)	(F)						(F)	(F)
	26-Feb-18	0.66	0.77	305.02	304.91	0.11	0.07	3.26E-03	6.8	2.3
	26-Mar-18	0.95	1.06	304.73	304.62	0.11	0.07	3.26E-03	8.1	5.2
	24-Apr-18	0.55	0.65	305.13	305.03	0.10	0.07	2.96E-03	9.0	8.6
	18-May-18	0.78	0.89	304.90	304.79	0.11	0.07	3.26E-03	10.8	14.0
	12-Jun-18	0.83	0.96	304.85	304.72	0.13	0.09	3.85E-03	12.2	16.1
	27-Jul-18	0.84	0.94	304.84	304.74	0.10	0.07	2.96E-03	11.6	19.3
	22-Aug-18	0.71	0.83	304.97	304.85	0.12	0.08	3.55E-03	13.2	19.4
	12-Sep-18	0.73	0.88	304.95	304.80	0.15	0.10	4.44E-03	14.6	15.4
	30-Oct-18	0.67	0.79	305.01	304.89	0.12	0.08	3.55E-03	8.7	5.0
	21-Nov-18	0.80	0.96	304.88	304.72	0.16	0.11	4.74E-03	6.5	1.5
	20-Dec-18	0.84	0.79	304.84	304.89	-0.05	-0.03	-1.48E-03	7.7	2.6
	28-Jan-19	(F)	(F)						(F)	(F)
	27-Feb-19	(F)	(F)						(F)	(F)
	19-Mar-19	0.62	1.19	305.06	304.49	0.57	0.37	1.69E-02	5.2	2.1
	24-Apr-19	0.57	0.72	305.11	304.96	0.15	0.10	4.44E-03	8.6	8.2
	22-May-19	0.74	0.61	304.94	305.07	-0.13	-0.09	-3.85E-03	9.4	13.0
	19-Jun-19	0.79	0.74	304.89	304.94	-0.05	-0.03	-1.48E-03	13.7	16.9
	26-Jul-19	0.85	0.86	304.83	304.82	0.01	0.01	2.96E-04	15.1	19.5
	20-Aug-19	0.86	0.81	304.82	304.87	-0.05	-0.03	-1.48E-03	17.1	20.5
	25-Sep-19	0.90	0.85	304.78	304.83	-0.05	-0.03	-1.48E-03	14.3	14.9
	29-Oct-19	0.70	0.73	304.98	304.95	0.03	0.02	8.88E-04	11.3	10.3
	13-Nov-19	0.80	0.82	304.88	304.86	0.02	0.01	5.92E-04	7.1	1.6
	16-Dec-19	(F)	0.78		304.90				(F)	1.0
	09-Jan-20	(F)	0.78		304.90				(F)	0.3
	10-Feb-20	(F)	0.80		304.88				(F)	0.9
	09-Mar-20	0.68	0.74	305.00	304.94	0.06	0.04	1.78E-03	8.5	5.2
	14-Apr-20	0.70	0.79	304.98	304.89	0.09	0.06	2.66E-03	6.4	5.8
	13-May-20	0.80	0.85	304.88	304.83	0.05	0.03	1.48E-03	8.1	8.0
	11-Jun-20	0.70	0.73	304.98	304.95	0.03	0.02	8.88E-04	14.7	18.9
	08-Jul-20	0.81	0.83	304.87	304.85	0.02	0.01	5.92E-04	14.4	15.2
	19-Aug-20	0.94	1.06	304.74	304.62	0.12	0.08	3.55E-03	13.2	16.2
	17-Sep-20	0.94	1.05	304.74	304.63	0.11	0.07	3.26E-03	12.8	14.6
	23-Oct-20	0.80	0.91	304.88	304.77	0.11	0.07	3.26E-03	11.4	10.7
	19-Nov-20	0.87	0.95	304.81	304.73	0.08	0.05	2.37E-03	10.3	6.3
	18-Dec-20	(F)	1.03		304.65				(F)	0.7
	08-Jan-21	(F)	0.97		304.71				(F)	0.3
	10-Feb-21	(F)	0.95		304.73				(F)	0.1
	10-Mar-21	0.75	0.93	304.93	304.75	0.18	0.12	5.33E-03	4.1	3.0
	21-Apr-21	0.88	0.92	304.80	304.76	0.04	0.03	1.18E-03	9.0	7.3
	19-May-21	1.00	1.11	304.68	304.57	0.11	0.07	3.26E-03	11.8	13.2
	25-Jun-21	0.81	0.85	304.87	304.83	0.04	0.03	1.18E-03	21.4	21.2
	27-Jul-21	0.96	1.01	304.72	304.67	0.05	0.03	1.48E-03	14.6	18.8
	12-Aug-21	0.98	1.10	304.70	304.58	0.12	0.08	3.55E-03	15.5	20.8
	30-Sep-21	0.91	0.97	304.77	304.71	0.06	0.04	1.78E-03	13.2	13.7
	27-Oct-21	0.65	0.81	305.03	304.87	0.16	0.11	4.74E-03	11.7	9.8
	10-Nov-21	0.85	0.92	304.83	304.76	0.07	0.05	2.07E-03	10.4	8.2
	16-Dec-21	0.87	0.89	304.81	304.79	0.02	0.01	5.92E-04	9.3	7.0
	14-Jan-22	(F)	1.01		304.67				(F)	0.0
	24-Feb-22	0.59	0.78	305.09	304.90	0.19	0.12	5.62E-03	(F)	0.5
	17-Mar-22	0.75	0.87	304.93	304.82	0.12	0.08	3.40E-03	7.1	3.4
	21-Apr-22	0.77	0.85	304.91	304.83	0.08	0.05	2.37E-03	8.3	7.9
	24-May-22	0.93	1.03	304.75	304.65	0.10	0.07	2.96E-03	13.1	12.6
	15-Jun-22	0.94	1.03	304.74	304.65	0.09	0.06	2.66E-03	15.0	17.6
	14-Jul-22	1.00	1.09	304.68	304.59	0.09	0.06	2.66E-03	14.3	15.5
	25-Aug-22	0.98	1.07	304.70	304.61	0.09	0.06	2.66E-03	16.0	18.8
	08-Sep-22	1.01	1.07	304.67	304.61	0.06	0.04	1.78E-03	13.9	16.2
	13-Oct-22	0.90	0.99	304.78	304.69	0.09	0.06	2.66E-03	12.1	12.7
	24-Nov-22	0.99	1.08	304.69	304.60	0.09	0.06	2.66E-03	5.2	2.8
	16-Dec-22	0.92	1.01	304.76	304.67	0.09	0.06	2.66E-03	8.1	1.7
2022 AVERAGE VALUES						0.10	0.06	2.92E-03	11.3	9.1
OVERALL AVERAGE VALUES						0.07	0.05	2.18E-03	9.8	10.5

NOTES:
- m ASL — metres above sea level
- (F) — Frozen
- L/s/m² — Litres per second per square metre
- Depth of screen midpoint below the creek bed is 1.52 m
- Assumed vertical permeability is 5.00E-05 m/s

TABLE B-5
SUMMARY OF CREEK BASED DRIVE POINT DATA
MILL CREEK AGGREGATES PIT

MONITOR LOCATION	DATE	G.W. LEVEL BTOP (m)	S.W. LEVEL BTOP (m)	GROUND-WATER ELEVATION (m ASL)	SURFACE WATER ELEVATION (m ASL)	HYDRAULIC HEAD IN GROUND-WATER (m)	VERTICAL HYDRAULIC GRADIENT	CALCULATED GROUNDWATER FLUX TO CREEK (L/s/m2)	TEMPERATURE	
									GROUND-WATER (°C)	SURFACE WATER (°C)
DP4	16-Jan-18	(F)	(F)						(F)	(F)
	26-Feb-18	1.27	1.24	305.53	305.56	-0.03	-0.03	-9.03E-04	4.8	2.4
	26-Mar-18	1.22	1.36	305.58	305.44	0.14	0.12	4.21E-03	8.5	4.8
	24-Apr-18	1.00	1.20	305.80	305.60	0.20	0.18	6.02E-03	10.2	9.2
	18-May-18	1.11	1.29	305.69	305.51	0.18	0.16	5.42E-03	12.5	14.6
	12-Jun-18	1.20	1.40	305.60	305.40	0.20	0.18	6.02E-03	17.0	17.0
	27-Jul-18	1.25	1.40	305.55	305.40	0.15	0.13	4.51E-03	20.0	20.2
	22-Aug-18	1.18	1.36	305.62	305.44	0.18	0.16	5.42E-03	17.5	19.8
	12-Sep-18	1.23	1.38	305.57	305.42	0.15	0.13	4.51E-03	16.9	15.6
	30-Oct-18	1.23	1.38	305.57	305.42	0.15	0.13	4.51E-03	8.3	4.8
	21-Nov-18	1.23	1.37	305.57	305.43	0.14	0.12	4.21E-03	1.5	1.3
	20-Dec-18	(F)	1.38		305.42				3.1	2.3
	28-Jan-19	(F)	1.37		305.43				(F)	0
	27-Feb-19	(F)	1.31		305.49				(F)	0
	19-Mar-19	1.08	1.22	305.72	305.58	0.14	0.12	4.21E-03	3.3	1.9
	24-Apr-19	1.12	1.22	305.68	305.58	0.10	0.09	3.01E-03	9.5	8.0
	22-May-19	1.11	1.30	305.69	305.50	0.19	0.17	5.72E-03	13.0	13.1
	19-Jun-19	1.16	1.31	305.64	305.49	0.15	0.13	4.51E-03	14.7	17.4
	26-Jul-19	1.16	1.33	305.64	305.47	0.17	0.15	5.12E-03	18.5	19.7
	20-Aug-19	1.21	1.33	305.59	305.47	0.12	0.11	3.61E-03	20.3	22.9
	25-Sep-19	1.23	1.34	305.57	305.46	0.11	0.10	3.31E-03	14.9	15.0
	29-Oct-19	1.11	1.28	305.69	305.52	0.17	0.15	5.12E-03	12.0	9.9
	13-Nov-19	(F)	1.32		305.48				(F)	0.7
	16-Dec-19	1.11	1.27	305.69	305.53				(F)	0.7
	09-Jan-20	(F)	1.30		305.50				(F)	0.3
	10-Feb-20	(F)	1.20		305.60				(F)	1.0
	09-Mar-20	1.16	1.22	305.64	305.58	0.06	0.05	1.81E-03	7.6	4.8
	14-Apr-20	**	1.25		305.55				**	5.9
				DRIVE POINT WAS REPLACED DUE TO CORROSION						
DP4R	13-May-20	0.85	0.94	305.61	305.52	0.09	0.08	2.71E-03		
	11-Jun-20	0.78	0.85	305.68	305.61	0.07	0.06	2.11E-03	13.3	19.2
	08-Jul-20	1.20	1.34	305.26	305.12	0.14	0.12	4.21E-03	17.6	20.5
	19-Aug-20	0.94	0.98	305.52	305.48	0.04	0.04	1.20E-03	14.1	16.6
	17-Sep-20	0.92	0.97	305.54	305.49	0.05	0.04	1.50E-03	13.9	15.0
	23-Oct-20	0.84	0.90	305.62	305.56	0.06	0.05	1.81E-03	12.1	10.5
	19-Nov-20	0.88	0.95	305.58	305.51	0.07	0.06	2.11E-03	10.3	6.3
	18-Dec-20	(F)	0.95		305.51				(F)	0.5
	08-Jan-21	(F)	0.93		305.53				(F)	0.1
	10-Feb-21	0.92	0.85	305.54	305.61	-0.07	-0.06	-2.11E-03	(F)	-0.2
	10-Mar-21	0.89	0.92	305.57	305.54	0.03	0.03	9.03E-04	5.1	3.0
	21-Apr-21	0.92	0.95	305.54	305.51	0.03	0.03	9.03E-04	8.0	6.8
	19-May-21	0.94	0.99	305.52	305.47	0.05	0.04	1.50E-03	14.0	14.1
	25-Jun-21	0.61	0.61	305.85	305.85	0.00	0.00	0.00E+00	20.3	21.3
	27-Jul-21	0.94	0.98	305.52	305.48	0.04	0.04	1.20E-03	16.4	19.4
	12-Aug-21	0.96	0.99	305.50	305.47	0.03	0.03	9.03E-04	17.7	21.5
	30-Sep-21	0.92	0.98	305.54	305.48	0.06	0.05	1.81E-03	13.9	13.7
	27-Oct-21	0.83	0.88	305.63	305.58	0.05	0.04	1.50E-03	12.4	9.8
	10-Nov-21	0.90	0.94	305.56	305.52	0.04	0.04	1.20E-03	11.5	8.3
	16-Dec-21	0.87	0.90	305.59	305.56	0.03	0.03	9.03E-04	9.3	6.7
	14-Jan-22	(F)	0.98		305.48				(F)	0.0
	24-Feb-22	0.72	0.83	305.74	305.63	0.11	0.10	3.31E-03	(F)	0.6
	17-Mar-22	0.84	0.87	305.62	305.59	0.03	0.03	9.03E-04	5.4	3.2
	21-Apr-22	0.85	0.90	305.61	305.56	0.05	0.04	1.50E-03	8.4	7.8
	24-May-22	0.93	0.95	305.53	305.51	0.02	0.02	6.02E-04	12.0	12.8
	15-Jun-22	0.93	0.97	305.53	305.49	0.04	0.04	1.20E-03	15.0	18.1
	14-Jul-22	0.97	1.01	305.49	305.45	0.04	0.04	1.20E-03	14.4	16.3
	25-Aug-22	0.96	0.99	305.50	305.47	0.03	0.03	9.03E-04	17.7	19.4
	08-Sep-22	0.99	1.01	305.47	305.45	0.02	0.02	6.02E-04	16.5	16.8
	13-Oct-22	0.93	0.94	305.53	305.52	0.01	0.01	3.01E-04	12.1	12.8
	24-Nov-22	0.98	0.98	305.48	305.48	0.00	0.00	0.00E+00	5.2	2.4
	16-Dec-22	0.93	0.95	305.53	305.51	0.02	0.02	6.02E-04	3.5	1.2
2022 AVERAGE VALUES						0.03	0.03	1.01E-03	11.0	9.3
OVERALL AVERAGE VALUES						0.08	0.07	2.43E-03	10.6	10.7

NOTES:
- m ASL — metres above sea level
- (F) — Frozen
- ** — Unavailable due to damaged drive point
- L/s/m² — Litres per second per square metre
- Depth of screen midpoint below the creek bed was 1.13 m for DP4, 0.61 for DP4R
- Assumed vertical permeability is 3.30E-05 m/s

TABLE B-5
SUMMARY OF CREEK BASED DRIVE POINT DATA
MILL CREEK AGGREGATES PIT

MONITOR LOCATION	DATE	G.W. LEVEL BTOP (m)	S.W. LEVEL BTOP (m)	GROUND-WATER ELEVATION (m ASL)	SURFACE WATER ELEVATION (m ASL)	HYDRAULIC HEAD IN GROUND-WATER (m)	VERTICAL HYDRAULIC GRADIENT	CALCULATED GROUNDWATER FLUX TO CREEK (L/s/m2)	TEMPERATURE	
									GROUND-WATER (°C)	SURFACE WATER (°C)
DP5CR	16-Jan-18	(F)	(F)						(F)	0.7
	26-Feb-18	0.30	0.59	303.41	303.12	0.29	0.51	1.68E-03	5.8	3.9
	26-Mar-18	0.50	0.80	303.21	302.91	0.30	0.53	1.74E-03	7.2	3.4
	24-Apr-18	0.33	0.53	303.38	303.18	0.20	0.35	1.16E-03	8.4	8.9
	18-May-18	0.35	0.67	303.36	303.04	0.32	0.56	1.85E-03	10.4	14.3
	12-Jun-18	0.49	0.92	303.22	302.79	0.43	0.75	2.49E-03	12.9	16.0
	27-Jul-18	0.60	0.84	303.11	302.87	0.24	0.42	1.39E-03	14.3	17.5
	22-Aug-18	0.46	0.75	303.25	302.96	0.29	0.51	1.68E-03	13.6	17.9
	12-Sep-18	0.49	0.81	303.22	302.90	0.32	0.56	1.85E-03	14.1	15.8
	30-Oct-18	0.43	0.79	303.28	302.92	0.36	0.63	2.08E-03	10.6	4.9
	21-Nov-18	(F)	0.76		302.95				(F)	1.8
	20-Dec-18	(F)	0.76		302.95				(F)	4.5
	28-Jan-19	(F)	(F)						(F)	(F)
	27-Feb-19	(F)	(F)						(F)	(F)
	19-Mar-19	(F)	0.61		303.10				(F)	2.5
	24-Apr-19	0.27	0.56	303.44	303.15	0.29	0.51	1.68E-03	8.9	9.4
	22-May-19	0.33	0.69	303.38	303.02	0.36	0.63	2.08E-03	10.3	12.4
	19-Jun-19	0.34	0.73	303.37	302.98	0.39	0.68	2.26E-03	14.3	17.6
	26-Jul-19	0.46	0.80	303.26	302.91	0.34	0.60	1.99E-03	23.1	21.2
	20-Aug-19	0.44	0.76	303.27	302.95	0.32	0.56	1.85E-03	17.3	17.6
	25-Sep-19	0.43	0.58	303.28	303.13	0.15	0.26	8.68E-04	12.1	12.6
	29-Oct-19	0.20	0.42	303.51	303.29	0.22	0.39	1.27E-03	10.2	8.1
	13-Nov-19	(F)	0.47		303.24				(F)	1.4
	16-Dec-19	(F)	0.48		303.24				(F)	1.1
	09-Jan-20	(F)	0.48		303.23				(F)	0.4
	10-Feb-20	0.30	0.69	303.42	303.02	0.39	0.69	2.29E-03	(F)	0.8
	09-Mar-20	0.16	0.51	303.55	303.20	0.35	0.61	2.03E-03	6.2	3.3
	14-Apr-20	0.25	0.62	303.46	303.09	0.37	0.65	2.14E-03	7.1	6.3
	13-May-20	0.33	0.77	303.38	302.94	0.44	0.77	2.55E-03	8.8	9.2
	11-Jun-20	0.25	0.55	303.46	303.16	0.30	0.53	1.74E-03	12.5	18.4
	08-Jul-20	0.53	0.80	303.18	302.91	0.27	0.47	1.56E-03	16.0	18.2
	19-Aug-20	0.52	0.81	303.19	302.90	0.29	0.51	1.68E-03	13.9	14.2
	17-Sep-20	0.52	0.80	303.19	302.91	0.28	0.49	1.62E-03	13.2	13.4
	23-Oct-20	0.32	0.67	303.39	303.04	0.35	0.61	2.03E-03	11.4	10.2
	19-Nov-20	0.66	0.74	303.05	302.97	0.08	0.14	4.63E-04	10.7	6.7
	18-Dec-20	(F)	0.79		302.92				(F)	0.6
	08-Jan-21	(F)	0.70		303.01				(F)	0.2
	10-Feb-21	(F)	0.86		302.85				(F)	0.1
	10-Mar-21	0.16	0.62	303.55	303.09	0.46	0.81	2.66E-03	7.7	4.9
	21-Apr-21	0.36	0.81	303.35	302.90	0.45	0.79	2.61E-03	8.9	8.0
	19-May-21	0.51	0.86	303.20	302.85	0.35	0.61	2.03E-03	11.6	12.0
	25-Jun-21	0.27	0.39	303.44	303.32	0.12	0.21	6.95E-04	17.2	21.1
	27-Jul-21	0.50	0.84	303.21	302.87	0.34	0.60	1.97E-03	15.9	18.1
	12-Aug-21	0.47	0.84	303.24	302.87	0.37	0.65	2.14E-03	16.9	20.3
	30-Sep-21	0.39	0.71	303.32	303.00	0.32	0.56	1.85E-03	13.4	13.1
	27-Oct-21	0.34	0.80	303.37	302.91	0.46	0.81	2.66E-03	12.8	10.1
	10-Nov-21	0.37	0.78	303.34	302.93	0.41	0.72	2.37E-03	10.9	8.5
	16-Dec-21	0.31	0.78	303.40	302.93	0.47	0.82	2.72E-03	9.3	7.7
	14-Jan-22	(F)	(F)						(F)	0.7
	24-Feb-22	(F)	0.59		303.12				(F)	0.4
	17-Mar-22	0.24	0.71	303.47	303.00	0.47	0.82	2.72E-03	7.5	5.1
	21-Apr-22	0.25	0.72	303.46	302.99	0.47	0.82	2.72E-03	9.2	8.2
	24-May-22	0.36	0.82	303.35	302.89	0.46	0.81	2.66E-03	13.4	14.5
	15-Jun-22	0.37	0.80	303.34	302.91	0.43	0.75	2.49E-03	15.0	17.3
	14-Jul-22	0.53	0.85	303.18	302.86	0.32	0.56	1.85E-03	15.6	16.6
	25-Aug-22	0.49	0.83	303.22	302.88	0.34	0.60	1.97E-03	17.3	18.4
	08-Sep-22	0.56	0.84	303.15	302.87	0.28	0.49	1.62E-03	16.0	15.7
	13-Oct-22	0.45	0.80	303.26	302.91	0.35	0.61	2.03E-03	12.0	12.4
	24-Nov-22	0.45	0.85	303.27	302.87	0.40	0.70	2.32E-03	6.9	4.4
	16-Dec-22	0.44	0.81	303.27	302.90	0.37	0.65	2.14E-03	7.8	2.5
2022 AVERAGE VALUES						0.39	0.68	2.25E-03	12.1	9.7
OVERALL AVERAGE VALUES						0.13	0.20	2.48E-03	10.9	10.0

NOTES:
- m ASL — metres above sea level
- (F) — Frozen
- L/s/m² — Litres per second per square metre
- Depth of screen midpoint below the creek bed is 0.72 m for DP5B, 0.57 m for DP5C, 0.62 m for DP5D and 0.76 m for DP5CR.
- Horizontal hydraulic conductivity (Kh) value for DP5B/5C data in 2011/2012 estimated as the geometric mean of slug test values for DP5A and DP5C. Vertical hydraulic conductivity value (Kv) calculated as 1.0E-06 m/s based on assumed Kv:Kh of 1:10.
- Vertical hydraulic conductivity value (Kv) for DP5D calculated as 4.7E-06 m/s based on assumed Kv:Kh of 1:10.
- Vertical hydraulic conductivity value (Kv) for DP5CR calculated as 3.3E-06 m/s based on geometric mean of slug test values for DP5A, DP5C, and DP5CR, and assumed Kv:Kh of 1:10.
- Underlining indicates data are interpreted with caution due to beaver dam downstream of DP5CR

TABLE B-5
SUMMARY OF CREEK BASED DRIVE POINT DATA
MILL CREEK AGGREGATES PIT

MONITOR LOCATION	DATE	G.W. LEVEL BTOP (m)	S.W. LEVEL BTOP (m)	GROUND-WATER ELEVATION (m ASL)	SURFACE WATER ELEVATION (m ASL)	HYDRAULIC HEAD IN GROUND-WATER (m)	VERTICAL HYDRAULIC GRADIENT	CALCULATED GROUNDWATER FLUX TO CREEK (L/s/m2)	TEMPERATURE	
									GROUND-WATER (°C)	SURFACE WATER (°C)
DP17	16-Jan-18	(F)	(F)						(F)	(F)
	26-Feb-18	0.87	0.95	305.39	305.31	0.08	0.09	1.57E-03	7.4	2.5
	26-Mar-18	1.00	1.05	305.26	305.21	0.05	0.06	9.83E-04	9.4	5.0
	24-Apr-18	0.83	0.93	305.43	305.33	0.10	0.11	1.97E-03	9.7	8.9
	18-May-18	0.95	1.02	305.31	305.24	0.07	0.08	1.38E-03	10.5	14.1
	12-Jun-18	1.01	1.10	305.25	305.16	0.09	0.10	1.77E-03	12.0	16.4
	27-Jul-18	1.02	1.07	305.24	305.19	0.05	0.06	9.83E-04	11.8	20.1
	22-Aug-18	0.97	1.03	305.29	305.23	0.06	0.07	1.18E-03	11.7	19.7
	12-Sep-18	1.00	1.05	305.26	305.21	0.05	0.06	9.83E-04	12.7	15.7
	30-Oct-18	0.99	1.06	305.27	305.20	0.07	0.08	1.38E-03	10.7	4.9
	21-Nov-18	0.99	1.04	305.27	305.22	0.05	0.06	9.83E-04	9.4	1.3
	20-Dec-18	0.99	1.04	305.27	305.22	0.05	0.06	9.83E-04	9.0	2.6
	28-Jan-19	(F)	(F)						(F)	(F)
	27-Feb-19	(F)	1.03		305.23				(F)	0
	19-Mar-19	0.91	0.96	305.35	305.30	0.05	0.06	9.83E-04	8.9	1.9
	24-Apr-19	0.87	0.92	305.39	305.34	0.05	0.06	9.83E-04		8.8
		DRIVE POINT WAS REPLACED DUE TO CORROSION								
DP17R	22-May-19	0.91	0.96	305.47	305.42	0.05	0.06	9.83E-04	10.3	13.1
	19-Jun-19	0.92	0.95	305.46	305.43	0.03	0.03	5.90E-04	15.6	17.2
	26-Jul-19	1.06	1.11	305.32	305.27	0.05	0.06	9.83E-04	14.7	19.7
	20-Aug-19	1.06	1.08	305.32	305.30	0.02	0.02	3.93E-04	14.9	20.4
	25-Sep-19	1.11	1.13	305.27	305.25	0.02	0.02	3.93E-04	14.3	14.3
	29-Oct-19	0.99	1.05	305.39	305.33	0.06	0.07	1.18E-03	12.1	10.1
	13-Nov-19	(F)	1.10		305.28				(F)	0.2
	16-Dec-19	(F)	1.08		305.30				(F)	0.7
	09-Jan-20	(F)	1.08		305.30				(F)	0.3
	10-Feb-20	1.01	1.07	305.37	305.31	0.06	0.07	1.18E-03	(F)	1.0
	09-Mar-20	0.95	1.10	305.43	305.28	0.15	0.17	2.95E-03	8.1	4.8
	14-Apr-20	0.98	1.05	305.40	305.33	0.07	0.08	1.38E-03	6.4	5.9
	13-May-20	1.02	1.07	305.36	305.31	0.05	0.06	9.83E-04	8.4	7.8
	11-Jun-20	0.96	1.01	305.42	305.37	0.05	0.06	9.83E-04	16.2	18.9
	08-Jul-20	1.09	1.13	305.29	305.25	0.04	0.04	7.87E-04	14.2	20.3
	19-Aug-20	1.09	1.13	305.29	305.25	0.04	0.04	7.87E-04	14.2	16.7
	17-Sep-20	1.09	1.11	305.29	305.27	0.02	0.02	3.93E-04	15.1	15.0
	23-Oct-20	1.00	1.05	305.38	305.33	0.05	0.06	9.83E-04	12.1	10.6
	19-Nov-20	1.05	1.09	305.33	305.29	0.04	0.04	7.87E-04	11.0	5.8
	18-Dec-20	(F)	1.11		305.27				(F)	0.5
	08-Jan-21	(F)	1.09		305.29				(F)	0.1
	10-Feb-21	(F)	1.00		305.38				(F)	-0.1
	10-Mar-21	0.99	1.07	305.39	305.31	0.08	0.09	1.57E-03	3.5	2.4
	21-Apr-21	1.05	1.09	305.33	305.29	0.04	0.04	7.87E-04	8.1	6.7
	19-May-21	1.12	1.14	305.26	305.24	0.02	0.02	3.93E-04	13.5	13.9
	25-Jun-21	0.80	0.84	305.58	305.54	0.04	0.04	7.87E-04	21.6	21.4
	27-Jul-21	1.09	1.12	305.29	305.26	0.03	0.03	5.90E-04	15.6	19.1
	12-Aug-21	1.11	1.13	305.27	305.25	0.02	0.02	3.93E-04	17.4	21.4
	30-Sep-21	1.06	1.11	305.32	305.27	0.05	0.06	9.83E-04	12.9	13.8
	27-Oct-21	0.99	1.02	305.39	305.36	0.03	0.03	5.90E-04	12.3	9.8
	10-Nov-21	1.04	1.07	305.34	305.31	0.03	0.03	5.90E-04	10.4	8.2
	16-Dec-21	1.01	1.06	305.37	305.32	0.05	0.06	9.83E-04	9.1	6.8
	14-Jan-22	(F)	1.08		305.30				(F)	0.0
	24-Feb-22	0.94	1.03	305.44	305.35	0.09	0.10	1.77E-03	(F)	0.4
	17-Mar-22	1.01	1.06	305.37	305.32	0.05	0.06	9.83E-04	8.2	3.1
	21-Apr-22	1.01	1.06	305.37	305.32	0.05	0.06	9.83E-04	8.5	7.8
	24-May-22	1.06	1.11	305.32	305.27	0.05	0.06	9.83E-04	12.2	12.6
	15-Jun-22	1.09	1.12	305.29	305.26	0.03	0.03	5.90E-04	14.7	17.9
	14-Jul-22	1.14	1.16	305.24	305.22	0.02	0.02	3.93E-04	14.1	15.6
	25-Aug-22	1.12	1.14	305.26	305.24	0.02	0.02	3.93E-04	16.1	19.3
	08-Sep-22	1.15	1.15	305.23	305.23	0.00	0.00	0.00E+00	15.3	16.7
	13-Oct-22	1.08	1.10	305.30	305.28	0.02	0.02	3.93E-04	12.1	12.8
	24-Nov-22	1.13	1.15	305.25	305.23	0.02	0.02	3.93E-04	6.0	2.0
	16-Dec-22	1.09	1.11	305.29	305.27	0.02	0.02	3.93E-04	2.5	1.2
2022 AVERAGE VALUES						0.03	0.04	6.62E-04	11.0	9.1
OVERALL AVERAGE VALUES						0.03	0.03	5.39E-04	10.6	10.5

NOTES:
- m ASL
- (F)
- L/s/m²
- Depth of screen midpoint below the creek bed is 0.90 m for DP17 and 0.45m for DP17R
- Assumed vertical permeability is 2.00E-05 m/s

TABLE B-5
SUMMARY OF CREEK BASED DRIVE POINT DATA
MILL CREEK AGGREGATES PIT

MONITOR LOCATION	DATE	G.W. LEVEL BTOP (m)	S.W. LEVEL BTOP (m)	GROUND-WATER ELEVATION (m ASL)	SURFACE WATER ELEVATION (m ASL)	HYDRAULIC HEAD IN GROUND-WATER (m)	VERTICAL HYDRAULIC GRADIENT	CALCULATED GROUNDWATER FLUX TO CREEK (L/s/m2)	TEMPERATURE	
									GROUND-WATER (°C)	SURFACE WATER (°C)
DP18	16-Jan-18	(F)	(F)						(F)	0.2
	26-Feb-18	0.18	0.20	307.56	307.54	0.02	0.03	5.56E-04	2.7	2.5
	26-Mar-18	0.42	0.47	307.32	307.27	0.05	0.07	1.39E-03	5.6	2.7
	24-Apr-18	0.13	0.16	307.61	307.58	0.03	0.04	8.34E-04	7.5	8.3
	18-May-18	0.32	0.38	307.42	307.36	0.06	0.08	1.67E-03	13.6	14.7
	12-Jun-18	0.41	0.49	307.33	307.25	0.08	0.11	2.22E-03	15.3	15.3
	27-Jul-18	0.44	0.49	307.30	307.25	0.05	0.07	1.39E-03	19.2	19.6
	22-Aug-18	0.38	0.41	307.36	307.33	0.03	0.04	8.34E-04	18.7	19.7
	12-Sep-18	0.42	0.47	307.32	307.27	0.05	0.07	1.39E-03	16.3	15.1
	30-Oct-18	0.41	0.43	307.33	307.31	0.02	0.03	5.56E-04	7.0	4.3
	21-Nov-18	0.36	0.41	307.38	307.33	0.05	0.07	1.39E-03	3.4	1.5
	20-Dec-18	0.37	0.41	307.37	307.33	0.04	0.05	1.11E-03	2.0	5.3
	28-Jan-19	(F)	(F)						(F)	(F)
	27-Feb-19	(F)	0.44		307.30				(F)	-0.4
	19-Mar-19	0.22	0.25	307.52	307.49	0.03	0.04	8.34E-04	3.2	0.8
	24-Apr-19	0.19	0.22	307.55	307.52	0.03	0.04	8.34E-04	7.0	7.3
	22-May-19	0.30	0.37	307.44	307.37	0.07	0.10	1.95E-03	12.0	12.4
	19-Jun-19	0.30	0.39	307.44	307.35	0.09	0.12	2.50E-03	17.3	18.3
	26-Jul-19	0.34	0.46	307.40	307.28	0.12	0.16	3.34E-03	19.1	19.7
	20-Aug-19	0.37	0.48	307.37	307.26	0.11	0.15	3.06E-03	21.0	22.0
	25-Sep-19	0.43	0.48	307.31	307.26	0.05	0.07	1.39E-03	16.6	16.8
	29-Oct-19	0.23	0.31	307.51	307.43	0.08	0.11	2.22E-03	9.8	8.4
	13-Nov-19	(F)	0.38		307.36				(F)	0.9
	16-Dec-19	(F)	0.36		307.38				(F)	0.8
	09-Jan-20	(F)	0.38		307.36				(F)	0.3
	10-Feb-20	0.31	0.39	307.43	307.35	0.08	0.11	2.22E-03	(F)	1.0
	09-Mar-20	0.25	0.27	307.49	307.47	0.02	0.03	5.56E-04	3.9	2.9
	14-Apr-20	0.28	0.33	307.46	307.41	0.05	0.07	1.39E-03	6.8	6.4
	13-May-20	0.28	0.41	307.46	307.33	0.13	0.18	3.62E-03	8.4	10.8
	11-Jun-20	0.16	0.24	307.58	307.50	0.08	0.11	2.22E-03	16.6	18.4
	08-Jul-20	0.45	0.50	307.29	307.24	0.05	0.07	1.39E-03	17.3	19.1
	19-Aug-20	0.41	0.52	307.33	307.22	0.11	0.15	3.06E-03	16.6	16.8
	17-Sep-20	0.45	0.51	307.29	307.23	0.06	0.08	1.67E-03	14.6	14.8
	23-Oct-20	0.27	0.36	307.47	307.38	0.09	0.12	2.50E-03	11.1	10.4
	19-Nov-20	0.34	0.42	307.40	307.32	0.08	0.11	2.22E-03	9.2	6.5
	18-Dec-20	(F)	0.39		307.35				(F)	0.8
	08-Jan-21	(F)	0.37		307.37				(F)	0.2
	10-Feb-21	(F)	0.49		307.25				(F)	-0.2
	10-Mar-21	0.34	0.43	307.40	307.31	0.09	0.12	2.50E-03	3.8	2.7
	21-Apr-21	0.34	0.43	307.40	307.31	0.09	0.12	2.50E-03	9.2	7.4
	19-May-21	0.49	0.57	307.25	307.17	0.08	0.11	2.22E-03	13.2	13.6
	25-Jun-21	0.25	0.40	307.49	307.34	0.15	0.21	4.17E-03	20.6	21.5
	27-Jul-21	0.39	0.49	307.35	307.25	0.10	0.14	2.78E-03	18.6	19.8
	12-Aug-21	0.43	0.51	307.31	307.23	0.08	0.11	2.22E-03	20.7	22.0
	30-Sep-21	0.21	0.45	307.53	307.29	0.24	0.33	6.67E-03	14.2	13.3
	27-Oct-21	0.21	0.29	307.53	307.45	0.08	0.11	2.22E-03	11.7	9.2
	10-Nov-21	0.29	0.38	307.45	307.36	0.09	0.12	2.50E-03	9.5	8.1
	16-Dec-21	0.26	0.34	307.48	307.40	0.08	0.11	2.22E-03	8.5	6.7
	14-Jan-22	(F)	0.45		307.29				(F)	0.1
	24-Feb-22	(F)	0.13		307.61				(F)	0.8
	17-Mar-22	0.23	0.32	307.51	307.42	0.09	0.12	2.50E-03	6.7	5.0
	21-Apr-22	0.24	0.30	307.50	307.44	0.06	0.08	1.67E-03	8.6	8.1
	24-May-22	0.33	0.44	307.41	307.30	0.11	0.15	3.06E-03	14.2	14.9
	15-Jun-22	0.35	0.45	307.39	307.29	0.10	0.14	2.78E-03	16.8	19.3
	14-Jul-22	0.58	0.51	307.16	307.23	-0.07	-0.10	-1.95E-03	19.3	18.8
	25-Aug-22	0.71	0.48	307.03	307.26	-0.23	-0.32	-6.40E-03	21.4	20.6
	08-Sep-22	0.57	0.52	307.17	307.22	-0.05	-0.07	-1.39E-03	18.0	17.6
	13-Oct-22	0.70	0.44	307.04	307.30	-0.26	-0.36	-7.23E-03	13.4	12.8
	24-Nov-22	0.74	0.47	307.00	307.27	-0.27	-0.37	-7.51E-03	5.3	3.7
	16-Dec-22	0.54	0.43	307.20	307.31	-0.11	-0.15	-3.06E-03	3.9	3.0
2022 AVERAGE VALUES						-0.06	-0.09	-1.75E-03	12.8	10.4
OVERALL AVERAGE VALUES						0.04	0.05	1.01E-03	11.4	10.4

NOTES:
- m ASL — metres above sea level
- (F) — Frozen
- L/s/m² — Litres per second per square metre
- n/a not available
- Depth of screen midpoint below the creek bed is 0.73 m
- Assumed vertical permeability is 2.00E-05 m/s

TABLE B-5
SUMMARY OF CREEK BASED DRIVE POINT DATA
MILL CREEK AGGREGATES PIT

MONITOR LOCATION	DATE	G.W. LEVEL BTOP (m)	S.W. LEVEL BTOP (m)	GROUND-WATER ELEVATION (m ASL)	SURFACE WATER ELEVATION (m ASL)	HYDRAULIC HEAD IN GROUND-WATER (m)	VERTICAL HYDRAULIC GRADIENT	CALCULATED GROUNDWATER FLUX TO CREEK (L/s/m2)	TEMPERATURE	
									GROUND-WATER (°C)	SURFACE WATER (°C)
DP19	16-Jan-18	(F)	(F)						(F)	(F)
	26-Feb-18	0.75	0.74	306.78	306.79	-0.01	0.00	-6.70E-05	3.5	2.5
	26-Mar-18	0.93	0.99	306.60	306.54	0.06	0.03	4.02E-04	5.3	2.5
	24-Apr-18	0.53	0.76	307.00	306.77	0.23	0.11	1.54E-03	7.2	8.4
	18-May-18	0.75	0.92	306.78	306.61	0.17	0.08	1.14E-03	13.5	15.0
	12-Jun-18	0.70	0.96	306.83	306.57	0.26	0.12	1.74E-03	13.7	15.6
	27-Jul-18	0.97	1.01	306.56	306.52	0.04	0.02	2.68E-04	18.0	19.8
	22-Aug-18	0.93	0.95	306.60	306.58	0.02	0.01	1.34E-04	18.3	19.7
	12-Sep-18	1.00	0.98	306.53	306.55	-0.02	-0.01	-1.34E-04	16.4	15.2
	30-Oct-18	1.11	0.97	306.42	306.56	-0.14	-0.07	-9.38E-04	8.4	4.2
	21-Nov-18	1.05	0.95	306.48	306.58	-0.1	-0.05	-6.70E-04	6.7	1.5
	20-Dec-18	1.00	0.96	306.53	306.57	-0.04	-0.02	-2.68E-04	5.2	2.0
	28-Jan-19	(F)	(F)						(F)	(F)
	27-Feb-19	(F)	0.84		306.69				(F)	-0.4
	19-Mar-19	(F)	0.80		306.73				4.3	0.8
	24-Apr-19	0.71	0.73	306.82	306.80	0.02	0.01	1.34E-04	7.0	7.5
	22-May-19	0.73	0.92	306.80	306.61	0.19	0.09	1.27E-03	11.3	12.4
	19-Jun-19	0.74	0.92	306.79	306.61	0.18	0.08	1.21E-03	16.8	20.1
	26-Jul-19	0.88	0.98	306.65	306.55	0.10	0.05	6.70E-04	19.4	19.7
	20-Aug-19	0.87	0.99	306.66	306.54	0.12	0.06	8.04E-04	19.2	19.6
	25-Sep-19	0.95	1.00	306.58	306.53	0.05	0.02	3.35E-04	16.3	16.6
	29-Oct-19	0.76	0.85	306.77	306.68	0.09	0.04	6.03E-04	9.7	8.3
	13-Nov-19	(F)	0.92		306.61				(F)	0.6
	16-Dec-19	(F)	0.90		306.63				(F)	0.8
	09-Jan-20	(F)	0.86		306.67				(F)	0.1
	10-Feb-20	0.73	0.93	306.80	306.60	0.20	0.09	1.34E-03	(F)	1.0
	09-Mar-20	0.67	0.83	306.86	306.70	0.16	0.07	1.07E-03	4.8	3.2
	14-Apr-20	0.67	0.87	306.86	306.66	0.20	0.09	1.34E-03	7.5	6.3
	13-May-20	0.70	0.93	306.83	306.60	0.23	0.11	1.54E-03	8.0	10.1
	11-Jun-20	0.68	0.75	306.85	306.78	0.07	0.03	4.69E-04	14.0	19.8
	08-Jul-20	0.98	1.00	306.55	306.53	0.02	0.01	1.34E-04	17.2	19.3
	19-Aug-20	0.92	1.02	306.61	306.51	0.10	0.05	6.70E-04	16.3	16.8
	17-Sep-20	0.96	1.05	306.57	306.48	0.09	0.04	6.03E-04	14.4	14.9
	23-Oct-20	0.80	0.91	306.73	306.62	0.11	0.05	7.37E-04	10.0	10.4
	19-Nov-20	0.94	0.95	306.59	306.58	0.01	0.00	6.70E-05	8.1	5.4
	18-Dec-20	(F)	0.92		306.61				(F)	0.6
	08-Jan-21	(F)	0.85		306.68				(F)	0.2
	10-Feb-21	(F)	0.88		306.65				(F)	-0.1
	10-Mar-21	0.91	0.95	306.62	306.58	0.04	0.02	2.68E-04	4.6	3.0
	21-Apr-21	0.80	0.97	306.73	306.56	0.17	0.08	1.14E-03	9.1	7.3
	19-May-21	0.93	1.03	306.60	306.50	0.10	0.05	6.70E-04	12.5	13.7
	25-Jun-21	0.81	0.90	306.72	306.63	0.09	0.04	6.03E-04	19.8	20.2
	27-Jul-21	1.02	1.03	306.51	306.50	0.01	0.00	6.70E-05	18.9	19.7
	12-Aug-21	1.07	1.03	306.46	306.50	-0.04	-0.02	-2.68E-04	20.9	22.0
	30-Sep-21	0.90	0.98	306.63	306.55	0.08	0.04	5.36E-04	14.8	13.3
	27-Oct-21	0.78	0.81	306.75	306.72	0.03	0.01	2.01E-04	12.4	9.3
	10-Nov-21	0.77	0.88	306.76	306.65	0.11	0.05	7.37E-04	9.7	8.1
	16-Dec-21	0.89	0.87	306.64	306.66	0.11	0.05	7.37E-04	7.9	6.6
	14-Jan-22	(F)	0.92		306.61				(F)	0.2
	24-Feb-22	(F)	0.49		307.04				(F)	(F)
	17-Mar-22	0.78	0.81	306.75	306.72	0.03	0.01	2.01E-04	7.7	5.2
	21-Apr-22	0.79	0.84	306.74	306.69	0.05	0.02	3.35E-04	7.8	7.9
	24-May-22	0.88	0.94	306.65	306.59	0.06	0.03	4.02E-04	14.6	14.8
	15-Jun-22	0.90	0.92	306.63	306.61	0.02	0.01	1.34E-04	16.3	18.7
	14-Jul-22	1.58	0.98	305.95	306.55	-0.60	-0.28	-4.02E-03	19.1	19
	25-Aug-22	1.63	0.94	305.90	306.59	-0.69	-0.32	-4.62E-03	20.6	20.6
	08-Sep-22	1.91	0.98	305.62	306.55	-0.93	-0.43	-6.23E-03	18.0	17.7
	13-Oct-22	1.80	0.99	305.73	306.54	-0.81	-0.38	-5.43E-03	12.1	12.9
	24-Nov-22	1.63	0.95	305.90	306.58	-0.68	-0.32	-4.55E-03	6.8	4.1
	16-Dec-22	1.58	0.91	305.96	306.63	-0.67	-0.31	-4.49E-03	5.1	2.8
2022 AVERAGE VALUES						-0.42	-0.20	-2.83E-03	12.8	11.3
OVERALL AVERAGE VALUES						-0.04	-0.02	-2.99E-04	11.3	10.6

NOTES:
- m ASL — metres above sea level
- (F) — Frozen
- L/s/m² — Litres per second per square metre
- Depth of screen midpoint below the creek bed is 2.15 m
- Assumed vertical permeability is 1.50E-05 m/s

TABLE B-5
SUMMARY OF CREEK BASED DRIVE POINT DATA
MILL CREEK AGGREGATES PIT

MONITOR LOCATION	DATE	G.W. LEVEL BTOP (m)	S.W. LEVEL BTOP (m)	GROUND-WATER ELEVATION (m ASL)	SURFACE WATER ELEVATION (m ASL)	HYDRAULIC HEAD IN GROUND-WATER (m)	VERTICAL HYDRAULIC GRADIENT	CALCULATED GROUNDWATER FLUX TO CREEK (L/s/m2)	TEMPERATURE	
									GROUND-WATER (°C)	SURFACE WATER (°C)
DP20	16-Jan-18	(F)	(F)						(F)	(F)
	26-Feb-18	0.55	0.75	306.59	306.39	0.20	0.09	1.13E-03	2.9	1.5
	26-Mar-18	0.72	0.95	306.42	306.19	0.23	0.11	1.30E-03	5.4	2.6
	24-Apr-18	0.68	0.69	306.46	306.45	0.01	0.00	5.64E-05	10.7	10.6
	18-May-18	0.58	0.90	306.56	306.24	0.32	0.15	1.81E-03	12	15
	12-Jun-18	0.89	1.02	306.25	306.12	0.13	0.06	7.33E-04	15.2	15.2
	27-Jul-18	0.76	0.96	306.38	306.18	0.20	0.09	1.13E-03	17	19.8
	22-Aug-18	0.70	0.92	306.44	306.22	0.22	0.10	1.24E-03	17.2	19.7
	12-Sep-18	0.78	0.93	306.36	306.21	0.15	0.07	8.46E-04	16.6	15.2
	30-Oct-18	0.85	0.97	306.29	306.17	0.12	0.06	6.77E-04	8.5	4.2
	21-Nov-18	(F)	0.93		306.21				(F)	1.4
	20-Dec-18	(F)	0.94		306.20				(F)	1.6
	28-Jan-19	(F)	(F)						(F)	(F)
	27-Feb-19	(F)	0.79		306.35				(F)	-0.4
	19-Mar-19	(F)	0.82		306.32				(F)	0.8
	24-Apr-19	0.53	0.79	306.61	306.35	0.26	0.12	1.47E-03	6.6	7.3
	22-May-19	0.57	0.90	306.57	306.24	0.33	0.15	1.86E-03	11.3	12.3
	19-Jun-19	0.59	0.91	306.55	306.23	0.32	0.15	1.81E-03	17.0	19.9
	26-Jul-19	0.62	0.95	306.52	306.19	0.33	0.15	1.86E-03	18.8	19.5
	20-Aug-19	0.65	0.96	306.49	306.18	0.31	0.14	1.75E-03	18.6	19.9
	25-Sep-19	0.76	0.96	306.38	306.18	0.20	0.09	1.13E-03	16.7	16.9
	29-Oct-19	0.59	0.86	306.55	306.28	0.27	0.12	1.52E-03	9.9	8.3
	13-Nov-19	(F)	0.91		306.23				(F)	0.6
	16-Dec-19	(F)	0.91		306.23				(F)	0.8
	09-Jan-20	(F)	0.76		306.38				(F)	0.1
	10-Feb-20	0.56	0.67	306.58	306.47	0.11	0.05	6.21E-04	(F)	1.0
	09-Mar-20	0.69	0.84	306.45	306.30	0.15	0.07	8.46E-04	4.2	2.9
	14-Apr-20	0.49	0.88	306.65	306.26	0.39	0.18	2.20E-03	6.8	6.4
	13-May-20	0.52	0.94	306.62	306.20	0.42	0.19	2.37E-03	7.8	10.0
	11-Jun-20	0.49	0.76	306.65	306.38	0.27	0.12	1.52E-03	13.7	19.4
	08-Jul-20	0.82	0.96	306.32	306.18	0.14	0.06	7.90E-04	17.1	19.5
	19-Aug-20	0.72	0.96	306.42	306.18	0.24	0.11	1.35E-03	16.6	16.8
	17-Sep-20	0.75	1.00	306.39	306.14	0.25	0.11	1.41E-03	14.6	14.7
	23-Oct-20	0.63	0.82	306.51	306.32	0.19	0.09	1.07E-03	11.5	10.5
	19-Nov-20	0.76	0.91	306.38	306.23	0.15	0.07	8.46E-04	7.7	5.1
	18-Dec-20	(F)	0.90		306.24				(F)	0.7
	08-Jan-21	(F)	0.82		306.32				(F)	0.1
	10-Feb-21	(F)	(F)						(F)	(F)
	10-Mar-21	0.63	0.91	306.51	306.23	0.28	0.13	1.58E-03	4.3	2.8
	21-Apr-21	0.68	0.93	306.46	306.21	0.25	0.11	1.41E-03	9.4	7.5
	19-May-21	0.76	1.02	306.38	306.12	0.26	0.12	1.47E-03	12.4	13.8
	25-Jun-21	0.65	0.86	306.49	306.28	0.21	0.10	1.18E-03	18.5	19.3
	27-Jul-21	0.82	0.96	306.32	306.18	0.14	0.06	7.90E-04	18.3	20.1
	12-Aug-21	0.84	0.97	306.30	306.17	0.13	0.06	7.33E-04	20.9	22.3
	30-Sep-21	0.77	0.92	306.37	306.22	0.15	0.07	8.46E-04	14.5	13.6
	27-Oct-21	0.70	0.80	306.44	306.34	0.10	0.05	5.64E-04	11.8	9.3
	10-Nov-21	0.90	1.00	306.24	306.14	0.10	0.05	5.64E-04	10.4	8.3
	16-Dec-21	0.72	0.86	306.42	306.28	0.14	0.06	7.90E-04	7.5	6.6
	14-Jan-22	(F)	0.92		306.22				(F)	0.2
	24-Feb-22	0.42	(F)	306.72					(F)	(F)
	17-Mar-22	0.55	0.81	306.59	306.33	0.26	0.12	1.47E-03	7.6	5.1
	21-Apr-22	0.56	0.83	306.58	306.31	0.27	0.12	1.52E-03	8.0	7.9
	24-May-22	0.69	0.89	306.45	306.25	0.20	0.09	1.13E-03	13.1	15.2
	15-Jun-22	0.70	0.89	306.44	306.25	0.19	0.09	1.07E-03	15.4	18.8
	14-Jul-22	1.44	0.94	305.70	306.20	-0.50	-0.23	-2.82E-03	18.8	19.9
	25-Aug-22	1.38	0.91	305.76	306.23	-0.47	-0.22	-2.65E-03	21.5	21.3
	08-Sep-22	1.21	0.95	305.93	306.19	-0.26	-0.12	-1.47E-03	19.1	19.2
	13-Oct-22	1.34	0.90	305.80	306.24	-0.44	-0.20	-2.48E-03	13.6	13.1
	24-Nov-22	1.30	0.94	305.85	306.20	-0.35	-0.16	-1.99E-03	7.2	3.5
	16-Dec-22	1.24	0.92	305.90	306.22	-0.32	-0.15	-1.81E-03	5.1	2.6
2022 AVERAGE VALUES						-0.14	-0.07	-8.02E-04	12.9	11.5
OVERALL AVERAGE VALUES						0.11	0.05	6.46E-04	11.3	10.8

NOTES:
- m ASL — metres above sea level
- (F) — Frozen
- L/s/m² — Litres per second per square metre
- NA — Not available
- Depth of screen midpoint below the creek bed is 2.18 m
- Assumed vertical permeability is 1.20E-05 m/s

TABLE B-5
SUMMARY OF CREEK BASED DRIVE POINT DATA
MILL CREEK AGGREGATES PIT

MONITOR LOCATION	DATE	G.W. LEVEL BTOP (m)	S.W. LEVEL BTOP (m)	GROUND-WATER ELEVATION (m ASL)	SURFACE WATER ELEVATION (m ASL)	HYDRAULIC HEAD IN GROUND-WATER (m)	VERTICAL HYDRAULIC GRADIENT	CALCULATED GROUNDWATER FLUX TO CREEK (L/s/m2)	TEMPERATURE	
									GROUND-WATER (°C)	SURFACE WATER (°C)
DP21	16-Jan-18	(F)	(F)						(F)	(F)
	26-Feb-18	0.79	0.92	305.98	305.85	0.13	0.10	2.31E-03	3.5	2.5
	26-Mar-18	0.95	1.05	305.82	305.72	0.10	0.08	1.77E-03	7.4	4.8
	24-Apr-18	0.71	0.86	306.06	305.91	0.15	0.12	2.66E-03	7.0	9.2
	18-May-18	0.84	0.99	305.93	305.78	0.15	0.12	2.66E-03	10.8	14.4
	12-Jun-18	0.95	1.03	305.82	305.74	0.08	0.06	1.42E-03	12.4	14.9
	27-Jul-18	0.98	1.09	305.79	305.68	0.11	0.09	1.95E-03	16.8	20.4
	22-Aug-18	0.88	1.03	305.89	305.74	0.15	0.12	2.66E-03	17.1	19.8
	12-Sep-18	0.95	1.05	305.82	305.72	0.10	0.08	1.77E-03	16.6	15.8
	30-Oct-18	0.91	0.86	305.86	305.91	-0.05	-0.04	-8.87E-04	9.5	4.8
	21-Nov-18	0.95	0.80	305.82	305.97	-0.15	-0.12	-2.66E-03	6.2	1.4
	20-Dec-18	0.91	0.91	305.86	305.86	0.00	0.00	0.00E+00	4.8	2.4
	28-Jan-19	(F)	(F)						(F)	(F)
	27-Feb-19	(F)	(F)						(F)	(F)
	19-Mar-19	0.81	0.76	305.96	306.01	-0.05	-0.04	-8.87E-04	3.0	1.9
	24-Apr-19	0.68	0.74	306.09	306.03	0.06	0.05	1.06E-03	8.4	8.3
	22-May-19	0.79	0.86	305.98	305.91	0.07	0.06	1.24E-03	10.2	13.2
	19-Jun-19	0.81	0.87	305.96	305.90	0.06	0.05	1.06E-03	14.9	17.3
	26-Jul-19	0.87	1.04	305.90	305.73	0.17	0.14	3.02E-03	18.0	19.8
	20-Aug-19	0.86	1.02	305.91	305.75	0.16	0.13	2.84E-03	18.2	20.3
	25-Sep-19	0.94	1.02	305.83	305.75	0.08	0.06	1.42E-03	15.5	15.0
	29-Oct-19	0.79	0.84	305.98	305.93	0.05	0.04	8.87E-04	10.8	9.8
	13-Nov-19	0.74	0.94	306.03	305.83	0.20	0.16	3.55E-03	(F)	0.5
	16-Dec-19	0.73	0.93	306.04	305.84	0.20	0.16	3.55E-03	(F)	1.0
	09-Jan-20	(F)	0.95		305.82				(F)	0.1
	10-Feb-20	0.84	1.00	305.93	305.77	0.16	0.13	2.84E-03	(F)	1.0
	09-Mar-20	0.76	0.92	306.01	305.85	0.16	0.13	2.84E-03	7.0	5.0
	14-Apr-20	0.78	0.97	305.99	305.80	0.19	0.15	3.37E-03	6.6	5.9
	13-May-20	0.84	1.04	305.93	305.73	0.20	0.16	3.55E-03	8.0	7.5
	11-Jun-20	0.75	0.92	306.02	305.85	0.17	0.14	3.02E-03	14.5	19.1
	08-Jul-20	0.95	1.05	305.82	305.72	0.10	0.08	1.77E-03	17.4	20.6
	19-Aug-20	0.96	1.10	305.81	305.67	0.14	0.11	2.48E-03	16.4	16.7
	17-Sep-20	0.97	1.09	305.80	305.68	0.12	0.10	2.13E-03	14.6	14.8
	23-Oct-20	0.86	0.96	305.91	305.81	0.10	0.08	1.77E-03	12.2	10.6
	19-Nov-20	0.92	1.03	305.85	305.74	0.11	0.09	1.95E-03	7.7	7.6
	18-Dec-20	(F)	1.07		305.70				(F)	0.4
	08-Jan-21	(F)	1.04		305.73				(F)	0.1
	10-Feb-21	(F)	0.99		305.78				(F)	0.0
	10-Mar-21	0.91	1.03	305.86	305.74	0.12	0.10	2.13E-03	3.5	2.5
	21-Apr-21	0.93	1.05	305.84	305.72	0.12	0.10	2.13E-03	8.1	6.7
	19-May-21	1.00	1.12	305.77	305.65	0.12	0.10	2.13E-03	12.7	14.3
	25-Jun-21	0.67	0.69	306.10	306.08	0.02	0.02	3.55E-04	16.6	21.3
	27-Jul-21	1.01	1.09	305.76	305.68	0.08	0.06	1.42E-03	18.0	19.7
	12-Aug-21	1.03	1.10	305.74	305.67	0.07	0.06	1.24E-03	18.9	21.6
	30-Sep-21	0.96	1.07	305.81	305.70	0.11	0.09	1.95E-03	14.7	13.8
	27-Oct-21	0.84	0.85	305.93	305.92	0.01	0.01	1.77E-04	13.0	9.8
	10-Nov-21	0.92	1.01	305.85	305.76	0.09	0.07	1.60E-03	11.3	8.6
	16-Dec-21	0.91	1.00	305.86	305.77	0.09	0.07	1.60E-03	7.6	6.7
	14-Jan-22	(F)	1.08		305.69				(F)	0
	24-Feb-22	0.71	0.93	306.06	305.84	0.22	0.18	3.90E-03	(F)	0.7
	17-Mar-22	0.84	0.98	305.93	305.79	0.14	0.11	2.48E-03	5.3	3.2
	21-Apr-22	0.84	0.99	305.93	305.78	0.15	0.12	2.66E-03	7.9	7.8
	24-May-22	0.94	1.08	305.83	305.69	0.14	0.11	2.48E-03	14.8	16.3
	15-Jun-22	0.94	1.04	305.83	305.73	0.10	0.08	1.77E-03	16.8	18.4
	14-Jul-22	1.04	1.12	305.73	305.65	0.08	0.06	1.42E-03	14.6	16.5
	25-Aug-22	1.01	1.10	305.76	305.67	0.09	0.07	1.60E-03	18.3	19.6
	08-Sep-22	1.09	1.13	305.68	305.64	0.04	0.03	7.10E-04	17.2	17.1
	13-Oct-22	1.00	1.03	305.77	305.74	0.03	0.02	5.32E-04	12.6	13.1
	24-Nov-22	1.10	1.15	305.68	305.62	0.05	0.04	9.76E-04	6.8	2.5
	16-Dec-22	1.00	1.07	305.77	305.71	0.06	0.05	1.15E-03	5.3	1.2
2022 AVERAGE VALUES						0.10	0.08	1.79E-03	12.0	9.7
OVERALL AVERAGE VALUES						0.09	0.07	1.54E-03	11.0	11.0

NOTES:
- m ASL metres above sea level
- (F) Frozen
- L/s/m² Litres per second per square metre
- Depth of screen midpoint below the creek bed is 1.24 m
- Assumed vertical permeability is 2.20E-05 m/s

TABLE B-5
SUMMARY OF CREEK BASED DRIVE POINT DATA
MILL CREEK AGGREGATES PIT

MONITOR LOCATION	DATE	G.W. LEVEL BTOP (m)	S.W. LEVEL BTOP (m)	GROUND-WATER ELEVATION (m ASL)	SURFACE WATER ELEVATION (m ASL)	HYDRAULIC HEAD IN GROUND-WATER (m)	VERTICAL HYDRAULIC GRADIENT	CALCULATED GROUNDWATER FLUX TO CREEK (L/s/m2)	TEMPERATURE	
									GROUND-WATER (°C)	SURFACE WATER (°C)
DP22	16-Jan-18	(F)	(F)						(F)	(F)
	26-Feb-18	0.37	0.50	305.64	305.51	0.13	0.06	4.78E-03	3.8	2.9
	26-Mar-18	0.53	0.65	305.48	305.36	0.12	0.05	4.41E-03	6.4	5.1
	24-Apr-18	0.39	0.48	305.62	305.53	0.09	0.04	3.31E-03	7.7	8.8
	18-May-18	0.42	0.61	305.59	305.40	0.19	0.09	6.99E-03	11.1	14.4
	12-Jun-18	0.52	0.75	305.49	305.26	0.23	0.10	8.46E-03	13.6	16.8
	27-Jul-18	0.57	0.71	305.44	305.30	0.14	0.06	5.15E-03	17.3	20.8
	22-Aug-18	0.47	0.65	305.54	305.36	0.18	0.08	6.62E-03	16.6	19.7
	12-Sep-18	0.52	0.70	305.49	305.31	0.18	0.08	6.62E-03	16.0	15.6
	30-Oct-18	0.54	0.69	305.47	305.32	0.15	0.07	5.52E-03	8.7	4.9
	21-Nov-18	0.50	0.67	305.51	305.34	0.17	0.08	6.25E-03	6.1	1.3
	20-Dec-18	0.53	0.68	305.48	305.33	0.15	0.07	5.52E-03	6.0	2.3
	28-Jan-19	(F)	(F)						(F)	(F)
	27-Feb-19	(F)	(F)						(F)	(F)
	19-Mar-19	0.42	0.55	305.59	305.46	0.13	0.06	4.78E-03	3.4	1.9
	24-Apr-19	0.33	0.51	305.68	305.50	0.18	0.08	6.62E-03	7.6	8.0
	22-May-19	0.43	0.61	305.58	305.40	0.18	0.08	6.62E-03	9.9	13.0
	19-Jun-19	0.49	0.63	305.52	305.38	0.14	0.06	5.15E-03	14.8	17.3
	26-Jul-19	0.46	0.67	305.55	305.34	0.21	0.09	7.72E-03	16.6	19.7
	20-Aug-19	0.56	0.69	305.45	305.32	0.13	0.06	4.78E-03	18.4	20.4
	25-Sep-19	0.56	0.72	305.45	305.29	0.16	0.07	5.88E-03	14.6	14.7
	29-Oct-19	0.41	0.59	305.60	305.42	0.18	0.08	6.62E-03	11.6	10.2
	13-Nov-19	(F)	0.64		305.37				(F)	0.2
	16-Dec-19	(F)	0.63		305.38				(F)	0.7
	09-Jan-20	(F)	0.63		305.38				(F)	0.3
	10-Feb-20	(F)	0.63		305.38				(F)	1.0
	09-Mar-20	0.65	0.56	305.36	305.45	-0.09	-0.04	-3.31E-03	7.7	5.0
	14-Apr-20	0.36	0.58	305.65	305.43	0.22	0.10	8.09E-03	6.3	5.8
	13-May-20	0.43	0.54	305.58	305.47	0.11	0.05	4.04E-03	8.1	7.5
	11-Jun-20	0.35	0.52	305.66	305.49	0.17	0.08	6.25E-03	14.5	19.1
	8-Jul-20	0.57	0.71	305.44	305.30	0.14	0.06	5.15E-03	16.7	20.6
	19-Aug-20	0.54	0.72	305.47	305.29	0.18	0.08	6.62E-03	15.6	16.7
	17-Sep-20	0.55	0.71	305.46	305.30	0.16	0.07	5.88E-03	15.2	15.0
	23-Oct-20	0.47	0.61	305.54	305.40	0.14	0.06	5.15E-03	11.9	10.6
	19-Nov-20	0.51	0.66	305.50	305.35	0.15	0.07	5.52E-03	10.1	5.7
	18-Dec-20	(F)	0.69		305.32				(F)	0.5
	08-Jan-21	(F)	0.66		305.35				(F)	0.2
	10-Feb-21	(F)	(F)						(F)	(F)
	10-Mar-21	0.77	0.64	305.24	305.37	-0.13	-0.06	-4.78E-03	3.0	2.5
	21-Apr-21	0.51	0.66	305.50	305.35	0.15	0.07	5.52E-03	8.4	6.6
	19-May-21	0.58	0.74	305.43	305.27	0.16	0.07	5.88E-03	13.8	14.0
	25-Jun-21	0.30	0.33	305.71	305.68	0.03	0.01	1.10E-03	21.5	21.3
	27-Jul-21	0.59	0.71	305.42	305.30	0.12	0.05	4.41E-03	16.2	19.2
	12-Aug-21	0.61	0.73	305.40	305.28	0.12	0.05	4.41E-03	17.9	21.5
	30-Sep-21	0.56	0.69	305.45	305.32	0.13	0.06	4.78E-03	14.1	13.7
	27-Oct-21	0.46	0.58	305.55	305.43	0.12	0.05	4.41E-03	13.1	9.7
	10-Nov-21	0.51	0.64	305.50	305.37	0.13	0.06	4.78E-03	11.2	8.2
	16-Dec-21	0.49	0.52	305.52	305.49	0.03	0.01	1.10E-03	9.0	6.8
	14-Jan-22	(F)	0.69		305.32				(F)	0.0
	24-Feb-22	0.31	0.54	305.70	305.47	0.23	0.10	8.46E-03	(F)	0.5
	17-Mar-22	0.45	0.57	305.56	305.45	0.12	0.05	4.23E-03	4.9	3.1
	21-Apr-22	0.43	0.58	305.58	305.43	0.15	0.07	5.52E-03	8.5	9.2
	24-May-22	0.76	0.68	305.25	305.33	-0.08	-0.04	-2.94E-03	12.7	12.6
	15-Jun-22	0.55	0.68	305.46	305.33	0.13	0.06	4.78E-03	15.4	18.0
	14-Jul-22	0.61	0.75	305.40	305.26	0.14	0.06	5.15E-03	14.3	16.0
	25-Aug-22	0.67	0.72	305.34	305.29	0.05	0.02	1.84E-03	17.8	19.4
	08-Sep-22	0.68	0.74	305.33	305.27	0.06	0.03	2.21E-03	16.0	16.7
	13-Oct-22	0.62	0.67	305.39	305.34	0.05	0.02	1.84E-03	12.5	12.8
	24-Nov-22	0.65	0.72	305.36	305.29	0.07	0.03	2.57E-03	6.6	2.4
	16-Dec-22	0.62	0.68	305.39	305.33	0.06	0.03	2.21E-03	6.8	1.0
2022 AVERAGE VALUES						0.09	0.04	3.26E-03	11.6	9.3
OVERALL AVERAGE VALUES						0.10	0.04	3.62E-03	10.7	10.7

NOTES:
- m ASL — metres above sea level
- (F) — Frozen
- L/s/m² — Litres per second per square metre
- Depth of screen midpoint below the creek bed is 2.23 m
- Assumed vertical permeability is 8.00E-05 m/s

TABLE B-6
WATER LEVEL SUMMARY - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

YEAR		BH1-I/BH1-R		BH2-I/2B/BH2-R		BH3-I/3B		BH4-I		BH5-I		BH6-I		BH7-II	
		Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)
2018	MAXIMUM	306.85	2.6			306.38	8.2	306.24	2.3	306.55	1.9	306.30	1.3		
	MINIMUM	306.26	2.0			305.73	7.6	305.83	1.9	306.02	1.3	305.85	0.8		
	AVERAGE	306.56	2.2			305.98	7.9	306.00	2.2	306.31	1.6	306.06	1.0		
	FLUCTUATION	0.59	0.6			0.65	0.6	0.41	0.4	0.53	0.5	0.45	0.4		
	NUMBER	12		0		11		12		12		11		0	
2019	MAXIMUM	306.80	2.3			306.34	8.1	306.38	2.3	306.62	1.7	306.30	1.2		
	MINIMUM	306.53	2.0			305.85	7.6	305.88	1.8	306.20	1.3	305.88	0.8		
	AVERAGE	306.67	2.1			306.11	7.8	306.18	2.0	306.44	1.5	306.12	1.0		
	FLUCTUATION	0.27	0.3			0.49	0.5	0.50	0.5	0.42	0.4	0.42	0.4		
	NUMBER	3		0		10		12		12		12		0	
2020	MAXIMUM	306.97	4.9	306	9	306.36	8.3	306.44	2.4	306.73	1.6	306.37	1.2		
	MINIMUM	306.13	4.1	306	8	305.67	7.6	305.81	1.7	306.24	1.2	305.89	0.7		
	AVERAGE	306.48	4.6	306	8	306.04	7.9	306.19	2.0	306.49	1.4	306.15	1.0		
	FLUCTUATION	0.84	0.8	1	1	0.69	0.7	0.63	0.6	0.49	0.5	0.48	0.5		
	NUMBER	7		7		10		12		12		12		0	
2021	MAXIMUM	306.39	4.9	305.88	8.7	305.79	8.3	305.89	2.5	306.32	1.9	305.99	1.3		
	MINIMUM	306.11	4.7	305.64	8.4	305.62	8.1	305.68	2.3	306.03	1.6	305.77	1.1		
	AVERAGE	306.25	4.8	305.76	8.6	305.69	8.2	305.78	2.4	306.19	1.7	305.87	1.2		
	FLUCTUATION	0.28	0.3	0.24	0.2	0.17	0.2	0.21	0.2	0.29	0.3	0.22	0.2		
	NUMBER	12		12		11		12		12		12		0	
2022	MAXIMUM	306.51	5.1	306.10	8.9	306.04	8.5	306.05	2.7	306.60	2.0	306.01	1.5		
	MINIMUM	305.93	4.6	305.42	8.2	305.45	7.9	305.48	2.1	305.90	1.3	305.60	1.1		
	AVERAGE	306.27	4.8	305.80	8.5	305.76	8.2	305.79	2.4	306.21	1.7	305.83	1.3		
	FLUCTUATION	0.58	0.6	0.68	0.7	0.59	0.6	0.57	0.6	0.70	0.7	0.42	0.4		
	NUMBER	12		12		12		12		12		12		0	
1986 to 2021	MAXIMUM	307.69	5.7	307.41	9.4	306.83	9.3	306.96	2.9	306.99	2.3	306.70	1.8	307.00	2.2
	MINIMUM	305.41	3.4	304.92	6.9	304.66	7.1	305.28	1.2	305.56	0.9	305.30	0.4	305.20	0.4
	AVERAGE	306.48	4.6	306.15	8.2	305.81	8.1	305.99	2.2	306.35	1.5	305.97	1.1	306.06	1.3
	FLUCTUATION	2.28	2.3	2.49	2.5	2.17	2.2	1.68	1.7	1.43	1.4	1.40	1.4	1.80	1.8
	NUMBER	448		320		362		380		494		480		303	

Notes: mASL - Groundwater elevation in metres above sea level
mBGL - Groundwater levels in metres below ground level
Number - Indicates number of readings taken during the indicated time period
Fluctuations - Difference between the maximum and minimum groundwater reading
Negative groundwater levels indicate groundwater level above ground surface

TABLE B-6
WATER LEVEL SUMMARY - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

YEAR		BH11		BH12		BH13		BH14	
		Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)
2018	MAXIMUM	306.28	4.0			306.37	0.9	305.75	1.9
	MINIMUM	305.34	3.0			306.03	0.6	305.50	1.7
	AVERAGE	306.03	3.3			306.22	0.7	305.57	1.8
	FLUCTUATION	0.94	0.9			0.34	0.3	0.25	0.3
	NUMBER	12		0		12		12	
2019	MAXIMUM	306.47	3.9			306.43	0.8	305.73	1.9
	MINIMUM	305.44	2.8			306.14	0.5	305.49	1.7
	AVERAGE	306.20	3.1			306.32	0.6	305.60	1.8
	FLUCTUATION	1.03	1.0			0.29	0.3	0.24	0.2
	NUMBER	11		0		12		12	
2020	MAXIMUM	306.49	3.4			306.57	0.8	305.72	2.0
	MINIMUM	305.87	2.8			306.14	0.4	305.45	1.7
	AVERAGE	306.20	3.1			306.36	0.6	305.58	1.8
	FLUCTUATION	0.62	0.6			0.43	0.4	0.27	0.3
	NUMBER	12		0		12		12	
2021	MAXIMUM	305.94	3.6			306.36	1.1	305.80	2.0
	MINIMUM	305.72	3.4			305.89	0.6	305.42	1.6
	AVERAGE	305.82	3.5			306.16	0.8	305.53	1.9
	FLUCTUATION	0.22	0.2			0.47	0.5	0.38	0.4
	NUMBER	12		0		12		12	
2022	MAXIMUM	306.15	3.8			306.34	1.0	305.65	2.0
	MINIMUM	305.52	3.2			305.92	0.6	305.39	1.8
	AVERAGE	305.85	3.5			306.14	0.8	305.50	1.9
	FLUCTUATION	0.63	0.6			0.42	0.4	0.26	0.3
	NUMBER	12		0		12		12	
1986 to 2021	MAXIMUM	307.11	4.1	306.53	6.2	306.8	1.2	305.80	2.0
	MINIMUM	305.25	2.2	304.88	4.5	305.72	0.2	305.40	1.6
	AVERAGE	306.10	3.2	305.74	5.3	306.17	0.8	305.57	1.8
	FLUCTUATION	1.86	1.9	1.65	1.6	1.05	1.0	0.40	0.4
	NUMBER	247		180		431		80	

Notes: mASL - Groundwater elevation in metres above sea level
mBGL - Groundwater levels in metres below ground level
Number - Indicates number of readings taken during the indicated time period
Fluctuations - Difference between the maximum and minimum groundwater reading
Negative groundwater levels indicate groundwater level above ground surface

TABLE B-6
WATER LEVEL SUMMARY - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

YEAR		TW16-79		OW1-84		OW2-84		OW4-84		OW5-84		OW16A-78	
		Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)
2018	MAXIMUM	303.77	0.1	303.76	0.3	303.72	0.4	303.79	0.1	303.71	0.1	303.79	-0.1
	MINIMUM	303.56	-0.1	303.54	0.0	303.51	0.1	303.57	-0.1	303.50	-0.1	303.58	-0.3
	AVERAGE	303.67	0.0	303.65	0.1	303.62	0.2	303.68	0.0	303.61	0.0	303.67	-0.2
	FLUCTUATION	0.21	0.2	0.22	0.2	0.21	0.2	0.22	0.2	0.21	0.2	0.21	0.2
	NUMBER	12		12		12		12		12		9	
2019	MAXIMUM	303.81	0.2	303.81	0.3	303.77	0.4	303.83	0.2	303.76	0.2	303.83	0.0
	MINIMUM	303.47	-0.1	303.46	0.0	303.43	0.1	303.48	-0.1	303.41	-0.2	303.48	-0.4
	AVERAGE	303.64	0.0	303.63	0.2	303.61	0.3	303.64	0.1	303.58	0.0	303.63	-0.2
	FLUCTUATION	0.34	0.3	0.35	0.4	0.34	0.3	0.35	0.4	0.35	0.4	0.35	0.3
	NUMBER	12		12		12		10		11		9	
2020	MAXIMUM	303.82	0.2	303.81	0.3	303.75	0.4	303.81	0.2	303.73	0.1	303.82	-0.1
	MINIMUM	303.51	-0.1	303.49	0.0	303.46	0.1	303.53	-0.1	303.46	-0.1	303.57	-0.4
	AVERAGE	303.69	0.0	303.66	0.1	303.63	0.2	303.69	0.0	303.62	0.0	303.70	-0.2
	FLUCTUATION	0.31	0.3	0.32	0.3	0.29	0.3	0.28	0.3	0.27	0.3	0.25	0.3
	NUMBER	12		12		11		9		10		9	
2021	MAXIMUM	303.83	0.3	303.84	0.4	303.80	0.5	303.87	0.3	303.80	0.3	303.87	0.0
	MINIMUM	303.39	-0.2	303.39	0.0	303.39	0.1	303.42	-0.2	303.34	-0.2	303.42	-0.4
	AVERAGE	303.62	0.1	303.61	0.2	303.59	0.3	303.64	0.1	303.57	0.0	303.63	-0.2
	FLUCTUATION	0.44	0.4	0.45	0.4	0.41	0.4	0.45	0.4	0.46	0.5	0.45	0.4
	NUMBER	12		10		12		12		12		10	
2022	MAXIMUM	303.85	0.3	303.81	0.4	303.87	0.5	303.90	0.3	303.76	0.3	303.82	0.1
	MINIMUM	303.37	-0.2	303.37	0.0	303.34	0.0	303.40	-0.2	303.32	-0.2	303.39	-0.4
	AVERAGE	303.62	0.1	303.59	0.2	303.58	0.3	303.63	0.1	303.52	0.1	303.58	-0.1
	FLUCTUATION	0.48	0.5	0.44	0.4	0.53	0.5	0.50	0.5	0.44	0.4	0.43	0.4
	NUMBER	12		12		12		12		12		12	
1986 to 2021	MAXIMUM	304.01	0.4	303.99	0.6	303.95	0.7	304.01	0.5	303.93	0.4	303.99	0.2
	MINIMUM	303.27	-0.3	303.19	-0.2	303.17	-0.1	303.21	-0.3	303.20	-0.3	303.26	-0.5
	AVERAGE	303.61	0.1	303.60	0.2	303.58	0.3	303.62	0.1	303.48	0.1	303.61	-0.2
	FLUCTUATION	0.74	0.7	0.80	0.8	0.78	0.8	0.80	0.8	0.73	0.7	0.73	0.7
	NUMBER	380		380		384		379		587		348	

Notes: mASL - Groundwater elevation in metres above sea level
mBGL - Groundwater levels in metres below ground level
Number - Indicates number of readings taken during the indicated time period
Fluctuations - Difference between the maximum and minimum groundwater reading
Negative groundwater levels indicate groundwater level above ground surface

TABLE B-6
WATER LEVEL SUMMARY - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

YEAR		BH92-I/BH92-1R		BH92-5		BH92-8		BH92-12A		BH92-13		BH92-14	
		Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)
2018	MAXIMUM	306.80	6.0	307.03	1.8	306.51	2.0	305.90	1.7	306.83	3.6		
	MINIMUM	306.15	5.4	306.49	1.3	306.10	1.6	305.68	1.4	305.89	2.6		
	AVERAGE	306.48	5.7	306.76	1.6	306.35	1.8	305.79	1.5	306.21	3.3		
	FLUCTUATION	0.65	0.7	0.54	0.5	0.41	0.4	0.22	0.2	0.94	0.9		
	NUMBER	12		12		12		12		12		0	
2019	MAXIMUM	306.55	6.0	306.77	2.1	306.58	2.0	306.01	1.7	306.41	3.5		
	MINIMUM	306.17	5.6	306.19	1.6	306.17	1.6	305.66	1.3	305.99	3.1		
	AVERAGE	306.34	5.8	306.52	1.8	306.36	1.8	305.77	1.6	306.19	3.3		
	FLUCTUATION	0.38	0.4	0.58	0.6	0.41	0.4	0.35	0.4	0.42	0.4		
	NUMBER	9		11		11		12		12		0	
2020	MAXIMUM			306.84	2.0	306.72	1.9	305.97	1.7	306.58	3.5		
	MINIMUM			306.37	1.5	306.20	1.4	305.67	1.4	306.02	2.9		
	AVERAGE			306.63	1.7	306.51	1.6	305.83	1.5	306.36	3.1		
	FLUCTUATION			0.47	0.5	0.52	0.5	0.30	0.3	0.56	0.6		
	NUMBER	0		11		12		12		12		0	
2021	MAXIMUM	306.70	7.6	306.91	1.9	306.78	1.9	305.98	1.7	306.65	3.4		
	MINIMUM	306.12	7.0	306.38	1.4	306.24	1.4	305.66	1.4	306.09	2.8		
	AVERAGE	306.35	7.3	306.70	1.6	306.53	1.6	305.82	1.5	306.40	3.1		
	FLUCTUATION	0.58	0.6	0.53	0.5	0.54	0.5	0.32	0.3	0.56	0.6		
	NUMBER	7		10		11		12		12		0	
2022	MAXIMUM	306.37	8.0	306.55	2.3	306.41	2.2	305.84	1.9	306.27	3.8		
	MINIMUM	305.71	7.3	306.01	1.8	305.88	1.7	305.45	1.5	305.68	3.2		
	AVERAGE	306.08	7.6	306.32	2.0	306.15	2.0	305.64	1.7	305.98	3.5		
	FLUCTUATION	0.66	0.7	0.54	0.5	0.52	0.5	0.39	0.4	0.59	0.6		
	NUMBER	12		12		12		12		12		0	
1986 to 2021	MAXIMUM	307.46	10.3	307.43	5.0	307.13	4.7	306.37	1.9	307.27	4.0	307.54	2.9
	MINIMUM	303.42	6.2	303.34	0.9	303.42	1.0	305.46	1.0	305.46	2.2	305.95	1.3
	AVERAGE	306.40	7.3	306.48	1.8	306.17	2.0	305.82	1.5	306.28	3.2	306.67	2.2
	FLUCTUATION	4.04	4.0	4.09	4.1	3.71	3.7	0.91	0.9	1.81	1.8	1.59	1.6
	NUMBER	316		424		324		535		327		222	

Notes: mASL - Groundwater elevation in metres above sea level
mBGL - Groundwater levels in metres below ground level
Number - Indicates number of readings taken during the indicated time period
Fluctuations - Difference between the maximum and minimum groundwater reading
Negative groundwater levels indicate groundwater level above ground surface

TABLE B-6
WATER LEVEL SUMMARY - GROUNDWATER MONITORS
MILL CREEK AGGREGATES PIT

YEAR		BH92-15		BH92-26		BH92-27		BH92-28		BH92-29		BH92-32		BH92-33	
		Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)	Groundwater Elevation (m ASL)	Groundwater Level (m BGL)
2018	MAXIMUM					304.91	0.6	304.78	1.3	305.17	1.4	304.40	0.8	304.75	1.1
	MINIMUM					304.55	0.2	304.48	1.0	304.66	0.9	304.11	0.6	304.44	0.8
	AVERAGE					304.73	0.4	304.61	1.2	304.94	1.1	304.23	0.7	304.60	0.9
	FLUCTUATION					0.36	0.4	0.30	0.3	0.51	0.5	0.29	0.3	0.31	0.3
	NUMBER	0		0		12		12		12		12		12	
2019	MAXIMUM					304.83	0.6	304.75	1.4	304.98	1.5	304.37	0.9	304.70	1.2
	MINIMUM					304.48	0.3	304.41	1.1	304.52	1.1	304.03	0.6	304.36	0.8
	AVERAGE					304.63	0.5	304.54	1.3	304.75	1.3	304.20	0.7	304.50	1.0
	FLUCTUATION					0.35	0.4	0.34	0.3	0.46	0.5	0.34	0.3	0.34	0.3
	NUMBER	0		0		12		12		12		12		12	
2020	MAXIMUM					304.83	0.6	304.67	1.4	304.99	1.5	304.48	0.9	304.70	1.1
	MINIMUM					304.50	0.3	304.42	1.1	304.61	1.1	304.05	0.5	304.37	0.8
	AVERAGE					304.68	0.4	304.57	1.2	304.79	1.3	304.22	0.7	304.54	1.0
	FLUCTUATION					0.33	0.3	0.25	0.3	0.38	0.4	0.43	0.4	0.33	0.3
	NUMBER	0		0		12		12		12		12		12	
2021	MAXIMUM					304.82	0.8	304.66	1.5	304.94	1.6	304.36	1.1	304.68	1.3
	MINIMUM					304.37	0.3	304.30	1.1	304.47	1.1	303.87	0.6	304.26	0.8
	AVERAGE					304.61	0.5	304.50	1.3	304.70	1.4	304.15	0.8	304.47	1.0
	FLUCTUATION					0.45	0.4	0.36	0.4	0.47	0.5	0.49	0.5	0.42	0.4
	NUMBER	0		0		12		12		12		12		12	
2022	MAXIMUM					304.74	0.7	304.71	1.5	304.87	1.7	304.38	1.0	304.61	1.3
	MINIMUM					304.39	0.4	304.34	1.1	304.40	1.2	303.98	0.6	304.27	0.9
	AVERAGE					304.57	0.6	304.49	1.3	304.64	1.4	304.17	0.8	304.44	1.1
	FLUCTUATION					0.35	0.3	0.37	0.4	0.47	0.5	0.40	0.4	0.34	0.3
	NUMBER	0		0		12		12		12		12		12	
1986 to 2021	MAXIMUM	307.21	2.9	305.29	1.7	305.18	1.1	305.06	1.7	305.58	1.9	304.93	1.2	305.04	1.5
	MINIMUM	305.53	1.2	303.74	0.1	304.01	-0.1	304.09	0.8	304.16	0.5	303.75	0.0	304.00	0.5
	AVERAGE	306.24	2.2	304.19	1.3	304.61	0.5	304.46	1.3	304.69	1.4	304.29	0.7	304.50	1.0
	FLUCTUATION	1.68	1.7	1.55	1.6	1.17	1.2	0.97	1.0	1.42	1.4	1.18	1.2	1.04	1.0
	NUMBER	239		436		328		603		339		346		335	

Notes: mASL - Groundwater elevation in metres above sea level
mBGL - Groundwater levels in metres below ground level
Number - Indicates number of readings taken during the indicated time period
Fluctuations - Difference between the maximum and minimum groundwater reading
Negative groundwater levels indicate groundwater level above ground surface

TABLE B-7
WATER LEVEL SUMMARY - WETLAND DRIVE-POINTS
MILL CREEK AGGREGATES PIT

YEAR		DP6		DP7		DP8		DP9		DP10		DP11	
		GROUNDWATER ELEVATION (m ASL)	GROUNDWATER LEVEL (m BGL)	GROUNDWATER ELEVATION (m ASL)	GROUNDWATER LEVEL (m BGL)	GROUNDWATER ELEVATION (m ASL)	GROUNDWATER LEVEL (m BGL)	GROUNDWATER ELEVATION (m ASL)	GROUNDWATER LEVEL (m BGL)	GROUNDWATER ELEVATION (m ASL)	GROUNDWATER LEVEL (m BGL)	GROUNDWATER ELEVATION (m ASL)	GROUNDWATER LEVEL (m BGL)
2018	MAXIMUM	306.11	0.5	306.23	0.5	305.97	0.5	305.83	0.7	305.31	1.1	305.53	0.8
	MINIMUM	305.72	0.1	305.83	0.1	305.66	0.2	305.23	0.1	304.89	0.6	304.81	0.1
	AVERAGE	305.84	0.3	306.00	0.3	305.78	0.3	305.53	0.4	305.02	0.9	305.00	0.4
	FLUCTUATION	0.39	0.4	0.40	0.4	0.31	0.3	0.60	0.6	0.42	0.4	0.72	0.7
	NUMBER	12		12		12		11		12		12	
2019	MAXIMUM	306.10	0.5	306.25	0.4	305.97	0.5	305.80	0.6	305.31	1.1	305.26	0.7
	MINIMUM	305.72	0.2	305.86	0.1	305.69	0.2	305.37	0.1	304.90	0.6	304.88	0.4
	AVERAGE	305.96	0.3	306.11	0.3	305.85	0.3	305.61	0.3	305.08	0.9	304.99	0.5
	FLUCTUATION	0.38	0.4	0.39	0.4	0.28	0.3	0.43	0.4	0.41	0.4	0.38	0.4
	NUMBER	10		12		12		11		11		11	
2020	MAXIMUM	306.15	0.5	306.29	0.4	305.99	0.5	305.79	0.7	305.18	1.1	305.19	0.9
	MINIMUM	305.72	0.1	305.88	0.0	305.62	0.2	305.19	0.1	304.86	0.8	304.72	0.4
	AVERAGE	305.95	0.3	306.10	0.2	305.79	0.3	305.51	0.4	304.99	0.9	304.93	0.7
	FLUCTUATION	0.43	0.4	0.41	0.4	0.37	0.4	0.60	0.6	0.32	0.3	0.47	0.5
	NUMBER	12		12		11		10		12		12	
2021	MAXIMUM	305.98	0.6	305.98	0.6	305.77	0.7	305.66	0.8	305.38	1.2	305.05	0.9
	MINIMUM	305.61	0.3	305.74	0.3	305.48	0.4	305.09	0.3	304.80	0.6	304.66	0.6
	AVERAGE	305.75	0.5	305.84	0.4	305.64	0.5	305.43	0.6	304.98	0.9	304.86	0.8
	FLUCTUATION	0.37	0.4	0.24	0.2	0.29	0.3	0.57	0.6	0.58	0.6	0.39	0.4
	NUMBER	12		12		12		12		12		12	
2022	MAXIMUM	305.93	0.8	306.03	0.8	305.82	0.9	305.70	0.9	305.10	1.2	305.04	1.0
	MINIMUM	305.47	0.3	305.55	0.3	305.22	0.3	304.99	0.2	304.77	0.9	304.63	0.6
	AVERAGE	305.67	0.6	305.78	0.5	305.52	0.6	305.31	0.6	304.90	1.0	304.81	0.8
	FLUCTUATION	0.46	0.5	0.48	0.5	0.60	0.6	0.71	0.7	0.33	0.3	0.41	0.4
	NUMBER	12		12		12		12		12		12	
1989 to 2021	MAXIMUM	306.39	1.1	306.58	1.0	306.45	1.1	306.03	1.0	305.58	1.6	305.61	1.2
	MINIMUM	305.15	-0.1	305.31	-0.3	305.05	-0.3	304.93	-0.1	304.36	0.4	304.41	0.0
	AVERAGE	305.71	0.5	305.89	0.4	305.76	0.4	305.49	0.5	304.91	1.0	304.96	0.6
	FLUCTUATION	1.24	1.2	1.27	1.3	1.40	1.4	1.10	1.1	1.22	1.2	1.20	1.2
	NUMBER	641		363		358		355		370		363	

Notes: mASL - Groundwater elevation in metres above sea level
mBGL - Groundwater level in metres below ground level
Number - indicates number of readings taken during the indicated period
Fluctuation - difference between the maximum and minimum groundwater elevations
Negative groundwater levels indicate groundwater level above ground surface

TABLE B-7
WATER LEVEL SUMMARY - WETLAND DRIVE-POINTS
MILL CREEK AGGREGATES PIT

YEAR		DP12 GROUNDWATER ELEVATION (m ASL)	DP12 GROUNDWATER LEVEL (m BGL)	DP16 GROUNDWATER ELEVATION (m ASL)	DP16 GROUNDWATER LEVEL (m BGL)	DP113 GROUNDWATER ELEVATION (m ASL)	DP113 GROUNDWATER LEVEL (m BGL)
2018	MAXIMUM	305.21	1.0	304.43	0.0	306.77	1.0
	MINIMUM	304.66	0.4	304.08	-0.3	306.11	0.3
	AVERAGE	304.88	0.7	304.23	-0.2	306.51	0.6
	FLUCTUATION	0.55	0.6	0.35	0.4	0.66	0.7
	NUMBER	12		11		11	
2019	MAXIMUM	305.52	1.0	304.45	0.0	306.86	0.6
	MINIMUM	304.69	0.1	304.11	-0.4	306.43	0.2
	AVERAGE	304.97	0.5	304.31	-0.2	306.68	0.4
	FLUCTUATION	0.83	0.8	0.34	0.3	0.43	0.4
	NUMBER	11		10		11	
2020	MAXIMUM	305.25	1.1	304.45	0.1	306.92	0.5
	MINIMUM	304.56	0.4	304.02	-0.4	306.58	0.1
	AVERAGE	304.83	0.7	304.22	-0.1	306.78	0.3
	FLUCTUATION	0.69	0.7	0.43	0.4	0.34	0.3
	NUMBER	12		12		12	
2021	MAXIMUM	304.87	1.1	304.29	0.0	306.79	0.5
	MINIMUM	304.54	0.8	304.04	-0.2	306.53	0.3
	AVERAGE	304.69	0.9	304.18	-0.1	306.63	0.4
	FLUCTUATION	0.33	0.3	0.25	0.3	0.26	0.3
	NUMBER	12		12		12	
2022	MAXIMUM	304.97	1.2	304.46	0.1	306.60	0.8
	MINIMUM	304.49	0.7	303.98	-0.4	306.25	0.5
	AVERAGE	304.75	0.9	304.22	-0.1	306.49	0.6
	FLUCTUATION	0.48	0.5	0.48	0.5	0.35	0.4
	NUMBER	12		12		11	
1989 to 2021	MAXIMUM	305.78	1.2	304.80	0.4	307.17	1.4
	MINIMUM	304.45	-0.1	303.69	-0.7	305.68	-0.1
	AVERAGE	305.15	0.5	304.25	-0.2	306.45	0.6
	FLUCTUATION	1.33	1.3	1.11	1.1	1.49	1.5
	NUMBER	388		356		367	

Notes: mASL - Groundwater elevation in metres above sea level
mBGL - Groundwater level in metres below ground level
Number - indicates number of readings taken during the indicated period
Fluctuation - difference between the maximum and minimum groundwater elevations
Negative groundwater levels indicate groundwater level above ground surface

TABLE B-8

COMPARISON OF GROUNDWATER INFLUX, 2018 CONDITIONS

MILL CREEK AGGREGATES PIT

FROM	TO	LENGTH	AVERAGE WIDTH	AVERAGE INFLUX (L/s/m²)								TOTAL GROUNDWATER INFLUX (L/s)							
		(m)	(m)	26-Feb-18	24-Apr-18	18-May-18	12-Jun-18	27-Jul-18	22-Aug-18	12-Sep-18	30-Oct-18	26-Feb-18	24-Apr-18	18-May-18	12-Jun-18	27-Jul-18	22-Aug-18	12-Sep-18	30-Oct-18
DP18	DP19	670	6.5	2.4E-04	1.2E-03	1.4E-03	2.0E-03	8.3E-04	4.8E-04	6.3E-04	-1.9E-04	1.1	5.2	6.1	8.6	3.6	2.1	2.7	-0.8
DP19	DP20	310	6.5	5.3E-04	8.0E-04	1.5E-03	1.2E-03	7.0E-04	6.9E-04	3.6E-04	-1.3E-04	1.1	1.6	3.0	2.5	1.4	1.4	0.7	-0.3
DP20	Hwy 401	270	6.5	1.1E-03	5.6E-05	1.8E-03	7.3E-04	1.1E-03	1.2E-03	8.5E-04	6.8E-04	2.0	0.1	3.2	1.3	2.0	2.2	1.5	1.2
Hwy 401	DP21	60	7.1	2.3E-03	2.7E-03	2.7E-03	1.4E-03	2.0E-03	2.7E-03	1.8E-03	-8.9E-04	1.0	1.1	1.1	0.6	0.8	1.1	0.8	-0.4
DP21	DP4	100	7.3	7.0E-04	4.3E-03	4.0E-03	3.7E-03	3.2E-03	4.0E-03	3.1E-03	1.8E-03	0.5	3.2	2.9	2.7	2.4	2.9	2.3	1.3
DP4	DP22	50	7.1	1.9E-03	4.7E-03	6.2E-03	7.2E-03	4.8E-03	6.0E-03	5.6E-03	5.0E-03	0.7	1.7	2.2	2.6	1.7	2.1	2.0	1.8
DP22	DP17	100	6.6	3.2E-03	2.6E-03	4.2E-03	5.1E-03	3.1E-03	3.9E-03	3.8E-03	3.4E-03	2.1	1.7	2.8	3.4	2.0	2.6	2.5	2.3
DP17	DP3	165	7.1	2.4E-03	2.5E-03	2.3E-03	2.8E-03	2.0E-03	2.4E-03	2.7E-03	2.5E-03	2.8	2.9	2.7	3.3	2.3	2.8	3.2	2.9
DP3	Galt Creek	420	6.0	2.3E-03	2.1E-03	2.3E-03	2.6E-03	2.1E-03	2.4E-03	2.9E-03	2.4E-03	5.7	5.4	5.7	6.5	5.4	6.1	7.2	6.1
Galt Creek	Pond Creek	255	8.1	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Pond Creek	DP1	250	8.0	7.0E-03	7.2E-03	8.3E-03	7.9E-03	7.0E-03	7.3E-03	7.0E-03	7.0E-03	14.1	14.3	16.5	15.7	14.1	14.6	14.1	14.1
DP1	DP2	100	6.7	5.7E-03	5.8E-03	7.2E-03	6.9E-03	5.8E-03	6.1E-03	5.7E-03	5.7E-03	3.8	3.9	4.9	4.6	3.9	4.1	3.9	3.8
DP2	DP5CR	800	7.6	1.9E-03	1.6E-03	2.2E-03	2.6E-03	1.8E-03	1.9E-03	2.0E-03	2.1E-03	11.3	9.6	13.5	15.7	10.9	11.8	12.0	12.6
TOTALS												**52.4**	**56.9**	**70.8**	**73.7**	**56.6**	**60.0**	**59.0**	**50.7**

Notes - Groundwater influx at Galt Creek and Pond Creek based on seepage data from May/June 1992

TABLE B-8

COMPARISON OF GROUNDWATER INFLUX, 2018 CONDITIONS

MILL CREEK AGGREGATES PIT

FROM	TO	LENGTH	AVERAGE WIDTH	ESTIMATED GROUNDWATER FLUX FROM NORTH SIDE OF CREEK (L/s)								ESTIMATED GROUNDWATER FLUX FROM SOUTH SIDE OF CREEK (L/s)							
		(m)	(m)	26-Feb-18	24-Apr-18	18-May-18	12-Jun-18	27-Jul-18	22-Aug-18	12-Sep-18	30-Oct-18	26-Feb-18	24-Apr-18	18-May-18	12-Jun-18	27-Jul-18	22-Aug-18	12-Sep-18	30-Oct-18
DP18	DP19	670	6.5	0.5	2.6	3.1	4.3	1.8	1.1	1.4	-0.4	0.5	2.6	3.1	4.3	1.8	1.1	1.4	-0.4
DP19	DP20	310	6.5	0.4	0.6	1.2	1.0	0.6	0.6	0.3	-0.1	0.6	1.0	1.8	1.5	0.8	0.8	0.4	-0.2
DP20	Hwy 401	270	6.5	0.8	0.0	1.3	0.5	0.8	0.9	0.6	0.5	1.2	0.1	1.9	0.8	1.2	1.3	0.9	0.7
Hwy 401	DP21	60	7.1	0.4	0.5	0.5	0.2	0.3	0.5	0.3	-0.2	0.6	0.7	0.7	0.4	0.5	0.7	0.5	-0.2
DP21	DP4	100	7.3	0.2	1.3	1.2	1.1	0.9	1.2	0.9	0.5	0.3	1.9	1.8	1.6	1.4	1.8	1.4	0.8
DP4	DP22	50	7.1	0.3	0.7	0.88	1.0	0.7	0.9	0.8	0.7	0.4	1.0	1.3	1.5	1.0	1.3	1.2	1.1
DP22	DP17	100	6.6	0.8	0.7	1.1	1.4	0.8	1.0	1.0	0.9	1.3	1.0	1.7	2.0	1.2	1.6	1.5	1.4
DP17	DP3	165	7.1	1.1	1.1	1.1	1.3	0.9	1.1	1.3	1.1	1.7	1.7	1.6	2.0	1.4	1.7	1.9	1.7
DP3	Galt Creek	420	6.0	2.3	2.1	2.3	2.6	2.1	2.4	2.9	2.4	3.4	3.2	3.4	3.9	3.2	3.7	4.3	3.7
Galt Creek	Pond Creek	255	8.1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Pond Creek	DP1	250	8.0	7.0	7.2	8.3	7.9	7.0	7.3	7.0	7.0	7.0	7.2	8.3	7.9	7.0	7.3	7.0	7.0
DP1	DP2	100	6.7	1.9	2.0	2.4	2.3	1.9	2.0	1.9	1.9	1.9	2.0	2.4	2.3	1.9	2.0	1.9	1.9
DP2	DP5CR	800	7.6	5.7	4.8	6.8	7.9	5.4	5.9	6.0	6.3	5.7	4.8	6.8	7.9	5.4	5.9	6.0	6.3
TOTALS				**24.0**	**26.1**	**32.4**	**34.0**	**25.9**	**27.2**	**26.9**	**23.3**	**28.4**	**30.8**	**38.4**	**39.7**	**30.7**	**32.7**	**32.1**	**27.5**

Notes - Groundwater influx at Galt Creek and Pond Creek based on seepage data from May/June 1992

TABLE B-8

COMPARISON OF GROUNDWATER INFLUX, 2019 CONDITIONS

MILL CREEK AGGREGATES PIT

FROM	TO	LENGTH	AVERAGE WIDTH	AVERAGE INFLUX (L/s/m²)							TOTAL GROUNDWATER INFLUX (L/s)						
		(m)	(m)	24-Apr-19	22-May-19	19-Jun-19	26-Jul-19	20-Aug-19	25-Sep-19	29-Oct-19	24-Apr-19	22-May-19	19-Jun-19	26-Jul-19	20-Aug-19	25-Sep-19	29-Oct-19
DP18	DP19	670	6.5	4.8E-04	1.6E-03	1.9E-03	2.0E-03	1.9E-03	8.6E-04	1.4E-03	2.1	7.0	8.1	8.7	8.4	3.8	6.2
DP19	DP20	310	6.5	8.0E-04	1.6E-03	1.5E-03	1.3E-03	1.3E-03	7.3E-04	1.1E-03	1.6	3.2	3.0	2.6	2.6	1.5	2.1
DP20	Hwy 401	270	6.5	1.5E-03	1.9E-03	1.8E-03	1.9E-03	1.7E-03	1.1E-03	1.5E-03	2.6	3.3	3.2	3.3	3.1	2.0	2.7
Hwy 401	DP21	60	7.1	1.1E-03	1.2E-03	1.1E-03	3.0E-03	2.8E-03	1.4E-03	8.9E-04	0.5	0.5	0.5	1.3	1.2	0.6	0.4
DP21	DP4	100	7.3	2.0E-03	3.5E-03	2.8E-03	4.1E-03	3.2E-03	2.4E-03	3.0E-03	1.5	2.5	2.0	3.0	2.4	1.7	2.2
DP4	DP22	50	7.1	4.8E-03	6.2E-03	4.8E-03	6.4E-03	4.2E-03	4.6E-03	5.9E-03	1.7	2.2	1.7	2.3	1.5	1.6	2.1
DP22	DP17/R	100	6.6	3.8E-03	3.8E-03	2.9E-03	4.4E-03	2.6E-03	3.1E-03	3.9E-03	2.5	2.5	1.9	2.9	1.7	2.1	2.6
DP17/R	DP3	165	7.1	2.7E-03	-1.4E-03	-4.5E-04	6.4E-04	-5.4E-04	-5.4E-04	1.0E-03	3.2	-1.7	-0.5	0.7	-0.6	-0.6	1.2
DP3	Galt Creek	420	6.0	2.9E-03	-1.3E-03	-1.1E-04	7.8E-04	-1.1E-04	-1.1E-04	1.1E-03	7.2	-3.3	-0.3	2.0	-0.3	-0.3	2.7
Galt Creek	Pond Creek	255	8.1	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Pond Creek	DP1	250	8.0	7.7E-03	6.6E-03	8.5E-03	8.0E-03	7.6E-03	6.8E-03	5.1E-03	15.4	13.2	17.1	15.9	15.2	13.5	10.2
DP1	DP2	100	6.7	6.4E-03	5.6E-03	7.2E-03	6.8E-03	6.4E-03	5.4E-03	3.4E-03	4.3	3.8	4.9	4.6	4.3	3.6	2.3
DP2	DP5CR	800	7.6	1.9E-03	2.4E-03	2.2E-03	2.2E-03	2.1E-03	1.4E-03	1.3E-03	11.3	14.2	13.1	13.3	12.4	8.6	7.6
TOTALS											**60.1**	**53.7**	**60.8**	**66.7**	**57.9**	**44.4**	**48.6**

Notes - Groundwater influx at Galt Creek and Pond Creek based on seepage data from May/June 1992

- Underlining indicates reduced flux value may be attributed to beaver dam downstream of DP5CR

TABLE B-8

COMPARISON OF GROUNDWATER INFLUX, 2019 CONDITIONS

MILL CREEK AGGREGATES PIT

FROM	TO	LENGTH (m)	AVERAGE WIDTH (m)	ESTIMATED GROUNDWATER FLUX FROM NORTH SIDE OF CREEK (L/s)							ESTIMATED GROUNDWATER FLUX FROM SOUTH SIDE OF CREEK (L/s)						
				24-Apr-19	22-May-19	19-Jun-19	26-Jul-19	20-Aug-19	25-Sep-19	29-Oct-19	24-Apr-19	22-May-19	19-Jun-19	26-Jul-19	20-Aug-19	25-Sep-19	29-Oct-19
DP18	DP19	670	6.5	1.1	3.5	4.0	4.4	4.2	1.9	3.1	1.1	3.5	4.0	4.4	4.2	1.9	3.1
DP19	DP20	310	6.5	0.6	1.3	1.2	1.0	1.0	0.6	0.9	1.0	1.9	1.8	1.5	1.5	0.9	1.3
DP20	Hwy 401	270	6.5	1.0	1.3	1.3	1.3	1.2	0.8	1.1	1.5	2.0	1.9	2.0	1.8	1.2	1.6
Hwy 401	DP21	60	7.1	0.2	0.2	0.2	0.5	0.5	0.2	0.2	0.3	0.3	0.3	0.8	0.7	0.4	0.2
DP21	DP4	100	7.3	0.6	1.0	0.8	1.2	0.9	0.7	0.9	0.9	1.5	1.2	1.8	1.4	1.0	1.3
DP4	DP22	50	7.1	0.7	0.9	0.69	0.9	0.6	0.7	0.8	1.0	1.3	1.0	1.4	0.9	1.0	1.2
DP22	DP17/R	100	6.6	1.0	1.0	0.8	1.2	0.7	0.8	1.0	1.5	1.5	1.1	1.7	1.0	1.2	1.6
DP17/R	DP3	165	7.1	1.3	-0.7	-0.2	0.3	-0.3	-0.3	0.5	1.9	-1.0	-0.3	0.4	-0.4	-0.4	0.7
DP3	Galt Creek	420	6.0	2.9	-1.3	-0.1	0.8	-0.1	-0.1	1.1	4.3	-2.0	-0.2	1.2	-0.2	-0.2	1.6
Galt Creek	Pond Creek	255	8.1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Pond Creek	DP1	250	8.0	7.7	6.6	8.5	8.0	7.6	6.8	5.1	7.7	6.6	8.5	8.0	7.6	6.8	5.1
DP1	DP2	100	6.7	2.2	1.9	2.4	2.3	2.1	1.8	1.1	2.2	1.9	2.4	2.3	2.1	1.8	1.1
DP2	DP5CR	800	7.6	5.7	7.1	6.5	6.7	6.2	4.4	3.9	5.7	7.1	6.5	6.7	6.2	4.4	3.9
TOTALS				**27.4**	**25.3**	**28.6**	**30.9**	**27.2**	**20.7**	**22.1**	**32.8**	**28.4**	**32.2**	**35.8**	**30.7**	**23.7**	**26.5**

Notes - Groundwater influx at Galt Creek and Pond Creek based on seepage data from May/June 1992

- Underlining indicates reduced flux value may be attributed to beaver dam downstream of DP5CR

TABLE B-8

COMPARISON OF GROUNDWATER INFLUX, 2020 CONDITIONS

MILL CREEK AGGREGATES PIT

FROM	TO	LENGTH (m)	AVERAGE WIDTH (m)	AVERAGE INFLUX (L/s/m²)						TOTAL GROUNDWATER INFLUX (L/s)					
				09-Mar-20	13-May-20	11-Jun-20	08-Jul-20	19-Aug-20	17-Sep-20	09-Mar-20	13-May-20	11-Jun-20	08-Jul-20	19-Aug-20	17-Sep-20
DP18	DP19	670	6.5	8.1E-04	2.6E-03	1.3E-03	7.6E-04	1.9E-03	1.1E-03	3.5	11.2	5.9	3.3	8.1	4.9
DP19	DP20	310	6.5	9.6E-04	2.0E-03	1.0E-03	4.6E-04	1.0E-03	1.0E-03	1.9	3.9	2.0	0.9	2.0	2.0
DP20	Hwy 401	270	6.5	8.5E-04	2.4E-03	1.5E-03	7.9E-04	1.4E-03	1.4E-03	1.5	4.2	2.7	1.4	2.4	2.5
Hwy 401	DP21	60	7.1	2.8E-03	3.5E-03	3.0E-03	1.8E-03	2.5E-03	2.1E-03	1.2	1.5	1.3	0.8	1.1	0.9
DP21	DP4/R	100	7.3	2.3E-03	3.1E-03	2.6E-03	3.0E-03	1.8E-03	1.8E-03	1.7	2.3	1.9	2.2	1.3	1.3
DP4/R	DP22	50	7.1	-7.5E-04	3.4E-03	4.2E-03	4.7E-03	3.9E-03	3.7E-03	-0.3	1.2	1.5	1.7	1.4	1.3
DP22	DP17/R	100	6.6	-1.8E-04	2.5E-03	3.6E-03	3.0E-03	3.7E-03	3.1E-03	-0.1	1.7	2.4	2.0	2.5	2.1
DP17/R	DP3	165	7.1	2.4E-03	1.2E-03	9.4E-04	6.9E-04	2.2E-03	1.8E-03	2.8	1.4	1.1	0.8	2.5	2.1
DP3	Galt Creek	420	6.0	1.5E-03	1.4E-03	1.1E-03	9.3E-04	2.4E-03	2.3E-03	3.9	3.5	2.7	2.3	6.1	5.7
Galt Creek	Pond Creek	255	8.1	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	6.2	6.2	6.2	6.2	6.2	6.2
Pond Creek	DP1	250	8.0	7.6E-03	8.3E-03	7.0E-03	7.3E-03	5.4E-03	6.1E-03	15.2	16.5	14.1	14.6	10.8	12.1
DP1	DP2	100	6.7	6.3E-03	7.2E-03	5.7E-03	5.8E-03	3.7E-03	4.5E-03	4.3	4.9	3.8	3.9	2.5	3.1
DP2	DP5CR	800	7.6	2.1E-03	2.6E-03	1.9E-03	1.7E-03	1.5E-03	1.6E-03	12.8	15.6	11.4	10.0	9.3	9.9
TOTALS										**54.5**	**74.1**	**56.8**	**50.1**	**56.1**	**54.2**

Notes - Groundwater influx at Galt Creek and Pond Creek based on seepage data from May/June 1992

TABLE B-8

COMPARISON OF GROUNDWATER INFLUX, 2020 CONDITIONS

MILL CREEK AGGREGATES PIT

FROM	TO	LENGTH	AVERAGE WIDTH	ESTIMATED GROUNDWATER FLUX FROM NORTH SIDE OF CREEK (L/s)						ESTIMATED GROUNDWATER FLUX FROM SOUTH SIDE OF CREEK (L/s)					
		(m)	(m)	09-Mar-20	13-May-20	11-Jun-20	08-Jul-20	19-Aug-20	17-Sep-20	09-Mar-20	13-May-20	11-Jun-20	08-Jul-20	19-Aug-20	17-Sep-20
DP18	DP19	670	6.5	1.8	5.6	2.9	1.7	4.1	2.5	1.8	5.6	2.9	1.7	4.1	2.5
DP19	DP20	310	6.5	0.8	1.6	0.8	0.4	0.8	0.8	1.2	2.4	1.2	0.6	1.2	1.2
DP20	Hwy 401	270	6.5	0.6	1.7	1.1	0.6	1.0	1.0	0.9	2.5	1.6	0.8	1.4	1.5
Hwy 401	DP21	60	7.1	0.5	0.6	0.5	0.3	0.4	0.4	0.7	0.9	0.8	0.5	0.6	0.5
DP21	DP4/R	100	7.3	0.7	0.9	0.7	0.9	0.5	0.5	1.0	1.4	1.1	1.3	0.8	0.8
DP4/R	DP22	50	7.1	-0.1	0.5	0.59	0.7	0.6	0.5	-0.2	0.7	0.9	1.0	0.8	0.8
DP22	DP17/R	100	6.6	0.0	0.7	1.0	0.8	1.0	0.8	-0.1	1.0	1.4	1.2	1.5	1.2
DP17/R	DP3	165	7.1	1.1	0.6	0.4	0.3	1.0	0.9	1.7	0.9	0.7	0.5	1.5	1.3
DP3	Galt Creek	420	6.0	1.5	1.4	1.1	0.9	2.4	2.3	2.3	2.1	1.6	1.4	3.7	3.4
Galt Creek	Pond Creek	255	8.1	2.5	2.5	2.5	2.5	2.5	2.5	3.7	3.7	3.7	3.7	3.7	3.7
Pond Creek	DP1	250	8.0	7.6	8.3	7.0	7.3	5.4	6.1	7.6	8.3	7.0	7.3	5.4	6.1
DP1	DP2	100	6.7	2.1	2.4	1.9	2.0	1.3	1.5	2.1	2.4	1.9	2.0	1.3	1.5
DP2	DP5CR	800	7.6	6.4	7.8	5.7	5.0	4.6	5.0	6.4	7.8	5.7	5.0	4.6	5.0
TOTALS				**25.4**	**34.5**	**26.2**	**23.2**	**25.5**	**24.7**	**29.1**	**39.6**	**30.6**	**26.9**	**30.6**	**29.5**

Notes - Groundwater influx at Galt Creek and Pond Creek based on seepage data from May/June 1992

TABLE B-8

COMPARISON OF GROUNDWATER INFLUX, 2021 CONDITIONS

MILL CREEK AGGREGATES PIT

FROM	TO	LENGTH (m)	AVERAGE WIDTH (m)	AVERAGE INFLUX (L/s/m²)						TOTAL GROUNDWATER INFLUX (L/s)					
				19-May-21	27-Jul-21	30-Sep-21	27-Oct-21	10-Nov-21	16-Dec-21	19-May-21	27-Jul-21	30-Sep-21	27-Oct-21	10-Nov-21	16-Dec-21
DP18	DP19	670	6.5	1.4E-03	1.4E-03	3.6E-03	1.2E-03	1.6E-03	1.5E-03	6.3	6.2	15.7	5.3	7.1	6.4
DP19	DP20	310	6.5	1.1E-03	4.3E-04	6.9E-04	3.8E-04	6.5E-04	7.6E-04	2.2	0.9	1.4	0.8	1.3	1.5
DP20	Hwy 401	270	6.5	1.5E-03	7.9E-04	8.5E-04	5.6E-04	5.6E-04	7.9E-04	2.6	1.4	1.5	1.0	1.0	1.4
Hwy 401	DP21	60	7.1	2.1E-03	1.4E-03	2.0E-03	1.8E-04	1.6E-03	1.6E-03	0.9	0.6	0.8	0.1	0.7	0.7
DP21	DP4/R	100	7.3	1.8E-03	1.3E-03	1.9E-03	8.4E-04	1.4E-03	1.2E-03	1.3	1.0	1.4	0.6	1.0	0.9
DP4/R	DP22	50	7.1	3.7E-03	2.8E-03	3.3E-03	3.0E-03	3.0E-03	1.0E-03	1.3	1.0	1.2	1.1	1.1	0.4
DP22	DP17/R	100	6.6	3.1E-03	2.5E-03	2.9E-03	2.5E-03	2.7E-03	1.0E-03	2.1	1.7	1.9	1.7	1.8	0.7
DP17/R	DP3	165	7.1	1.8E-03	1.0E-03	1.4E-03	2.7E-03	1.3E-03	7.9E-04	2.1	1.2	1.6	3.1	1.6	0.9
DP3	Galt Creek	420	6.0	2.3E-03	1.4E-03	1.5E-03	3.0E-03	1.7E-03	9.3E-04	5.7	3.5	3.9	7.6	4.2	2.3
Galt Creek	Pond Creek	255	8.1	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	6.2	6.2	6.2	6.2	6.2	6.2
Pond Creek	DP1	250	8.0	7.9E-03	6.8E-03	7.3E-03	6.8E-03	7.2E-03	7.6E-03	15.7	13.7	14.6	13.5	14.3	15.2
DP1	DP2	100	6.7	6.4E-03	5.5E-03	6.2E-03	5.3E-03	5.9E-03	6.3E-03	4.3	3.7	4.1	3.6	4.0	4.2
DP2	DP5CR	800	7.6	2.0E-03	2.0E-03	2.1E-03	2.3E-03	2.3E-03	2.4E-03	11.8	12.4	12.8	13.8	14.0	14.8
TOTALS										**62.6**	**53.3**	**67.1**	**58.2**	**58.2**	**55.6**

Notes - Groundwater influx at Galt Creek and Pond Creek based on seepage data from May/June 1992

- September 2021 DP2 flux value is calculated using groundwater elevation measured on Oct. 6 and surface water elevation measured on Sept. 30, due to anomalous groundwater level on Sept. 30

TABLE B-8

COMPARISON OF GROUNDWATER INFLUX, 2021 CONDITIONS

MILL CREEK AGGREGATES PIT

FROM	TO	LENGTH (m)	AVERAGE WIDTH (m)	ESTIMATED GROUNDWATER FLUX FROM NORTH SIDE OF CREEK (L/s)						ESTIMATED GROUNDWATER FLUX FROM SOUTH SIDE OF CREEK (L/s)					
				19-May-21	27-Jul-21	30-Sep-21	27-Oct-21	10-Nov-21	16-Dec-21	19-May-21	27-Jul-21	30-Sep-21	27-Oct-21	10-Nov-21	16-Dec-21
DP18	DP19	670	6.5	3.2	3.1	7.8	2.6	3.5	3.2	3.2	3.1	7.8	2.6	3.5	3.2
DP19	DP20	310	6.5	0.9	0.3	0.6	0.3	0.5	0.6	1.3	0.5	0.8	0.5	0.8	0.9
DP20	Hwy 401	270	6.5	1.0	0.6	0.6	0.4	0.4	0.6	1.5	0.8	0.9	0.6	0.6	0.8
Hwy 401	DP21	60	7.1	0.4	0.2	0.3	0.0	0.3	0.3	0.5	0.4	0.5	0.0	0.4	0.4
DP21	DP4/R	100	7.3	0.5	0.4	0.5	0.2	0.4	0.4	0.8	0.6	0.8	0.4	0.6	0.5
DP4/R	DP22	50	7.1	0.5	0.4	0.47	0.4	0.4	0.1	0.8	0.6	0.7	0.6	0.6	0.2
DP22	DP17/R	100	6.6	0.8	0.7	0.8	0.7	0.7	0.3	1.2	1.0	1.1	1.0	1.1	0.4
DP17/R	DP3	165	7.1	0.9	0.5	0.6	1.2	0.6	0.4	1.3	0.7	1.0	1.9	0.9	0.6
DP3	Galt Creek	420	6.0	2.3	1.4	1.5	3.0	1.7	0.9	3.4	2.1	2.3	4.6	2.5	1.4
Galt Creek	Pond Creek	255	8.1	2.5	2.5	2.5	2.5	2.5	2.5	3.7	3.7	3.7	3.7	3.7	3.7
Pond Creek	DP1	250	8.0	7.9	6.8	7.3	6.8	7.2	7.6	7.9	6.8	7.3	6.8	7.2	7.6
DP1	DP2	100	6.7	2.2	1.9	2.1	1.8	2.0	2.1	2.2	1.9	2.1	1.8	2.0	2.1
DP2	DP5CR	800	7.6	5.9	6.2	6.4	6.9	7.0	7.4	5.9	6.2	6.4	6.9	7.0	7.4
TOTALS				**28.8**	**24.9**	**31.6**	**26.9**	**27.2**	**26.3**	**33.7**	**28.4**	**35.5**	**31.3**	**31.0**	**29.3**

Notes - Groundwater influx at Galt Creek and Pond Creek based on seepage data from May/June 1992

- September 2021 DP2 flux value is calculated using groundwater elevation measured on Oct. 6 and surface water elevation measured on Sept. 30, due to anomalous groundwater level on Sept. 30

TABLE B-8

COMPARISON OF GROUNDWATER INFLUX, 2022 CONDITIONS

MILL CREEK AGGREGATES PIT

FROM	TO	LENGTH	AVERAGE WIDTH	AVERAGE INFLUX (L/s/m²)										TOTAL GROUNDWATER INFLUX (L/s)									
		(m)	(m)	17-Mar-22	21-Apr-22	24-May-22	15-Jun-22	14-Jul-22	25-Aug-22	08-Sep-22	13-Oct-22	24-Nov-22	16-Dec-22	17-Mar-22	21-Apr-22	24-May-22	15-Jun-22	14-Jul-22	25-Aug-22	08-Sep-22	13-Oct-22	24-Nov-22	16-Dec-22
DP18	DP19	670	6.5	1.4E-03	1.0E-03	1.7E-03	1.5E-03	-3.0E-03	-5.5E-03	-3.8E-03	-6.3E-03	-6.0E-03	-3.8E-03	5.9	4.4	7.5	6.3	-13.0	-24.0	-16.6	-27.6	-26.3	-16.4
DP19	DP20	310	6.5	8.3E-04	9.3E-04	7.7E-04	6.0E-04	-3.4E-03	-3.6E-03	-3.8E-03	-4.0E-03	-3.3E-03	-3.1E-03	1.7	1.9	1.5	1.2	-6.9	-7.3	-7.8	-8.0	-6.6	-6.3
DP20	Hwy 401	270	6.5	1.5E-03	1.5E-03	1.1E-03	1.1E-03	-2.8E-03	-2.7E-03	-1.5E-03	-2.5E-03	-2.0E-03	-1.8E-03	2.6	2.7	2.0	1.9	-5.0	-4.7	-2.6	-4.4	-3.5	-3.2
Hwy 401	DP21	60	7.1	2.5E-03	2.7E-03	2.5E-03	1.8E-03	1.4E-03	1.6E-03	7.1E-04	5.3E-04	9.8E-04	1.2E-03	1.1	1.1	1.1	0.8	0.6	0.7	0.3	0.2	0.4	0.5
DP21	DP4	100	7.3	1.7E-03	2.1E-03	1.5E-03	1.5E-03	1.3E-03	1.2E-03	6.6E-04	4.2E-04	4.9E-04	8.8E-04	1.2	1.5	1.1	1.1	1.0	0.9	0.5	0.3	0.4	0.6
DP4	DP22	50	7.1	2.6E-03	3.5E-03	-1.2E-03	3.0E-03	3.2E-03	1.4E-03	1.4E-03	1.1E-03	1.3E-03	1.4E-03	0.9	1.2	-0.4	1.1	1.1	0.5	0.5	0.4	0.5	0.5
DP22	DP17	100	6.6	2.6E-03	3.2E-03	-9.8E-04	2.7E-03	2.6E-03	1.1E-03	1.1E-03	1.1E-03	1.5E-03	1.3E-03	1.7	2.2	-0.6	1.8	1.8	0.7	0.7	0.7	1.0	0.9
DP17	DP3	165	7.1	2.2E-03	1.7E-03	2.0E-03	1.6E-03	1.5E-03	1.5E-03	8.9E-04	1.5E-03	1.5E-03	1.5E-03	2.6	2.0	2.3	1.9	1.8	1.8	1.0	1.8	1.8	1.8
DP3	Galt Creek	420	6.0	2.3E-03	1.8E-03	2.1E-03	2.0E-03	2.0E-03	2.0E-03	1.5E-03	2.0E-03	2.0E-03	2.0E-03	5.9	4.6	5.4	5.0	5.0	5.0	3.9	5.0	5.0	5.0
Galt Creek	Pond Creek	255	8.1	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Pond Creek	DP1	250	8.0	8.3E-03	8.8E-03	9.4E-03	9.8E-03	8.1E-03	6.2E-03	7.3E-03	6.8E-03	7.2E-03	7.3E-03	16.5	17.7	18.8	19.6	16.3	12.4	14.6	13.7	14.3	14.6
DP1	DP2	100	6.7	7.1E-03	7.7E-03	8.5E-03	8.9E-03	6.6E-03	5.0E-03	5.9E-03	5.3E-03	5.4E-03	5.4E-03	4.8	5.2	5.7	6.0	4.4	3.4	4.0	3.5	3.6	3.6
DP2	DP5CR	800	7.6	2.6E-03	2.6E-03	2.8E-03	2.7E-03	1.7E-03	2.1E-03	1.8E-03	1.8E-03	1.7E-03	1.5E-03	15.5	15.9	17.1	16.6	10.5	12.8	10.8	10.9	10.6	9.1
TOTALS														**66.5**	**66.4**	**67.6**	**69.3**	**23.8**	**8.3**	**15.5**	**2.8**	**7.3**	**16.9**

Notes - Groundwater influx at Galt Creek and Pond Creek based on seepage data from May/June 1992

TABLE B-8

COMPARISON OF GROUNDWATER INFLUX, 2022 CONDITIONS

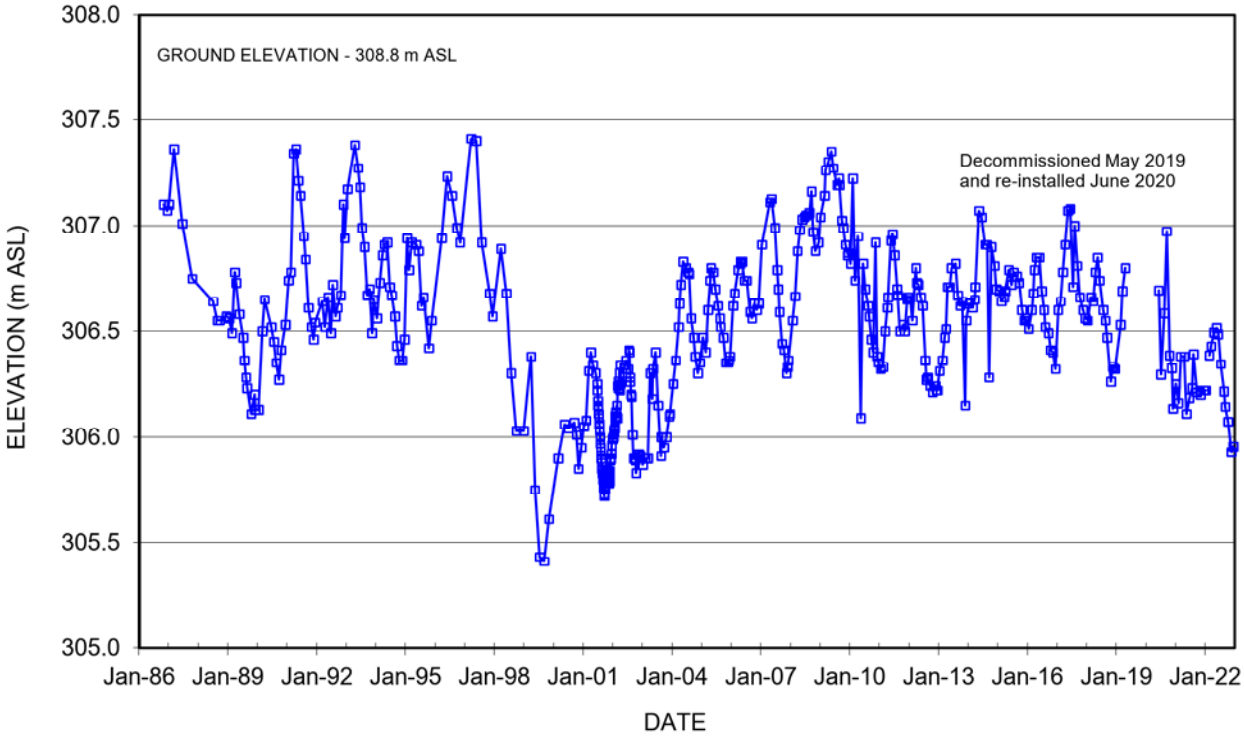
MILL CREEK AGGREGATES PIT

FROM	TO	LENGTH	AVERAGE WIDTH	ESTIMATED GROUNDWATER FLUX FROM NORTH SIDE OF CREEK (L/s)										ESTIMATED GROUNDWATER FLUX FROM SOUTH SIDE OF CREEK (L/s)									
		(m)	(m)	17-Mar-22	21-Apr-22	24-May-22	15-Jun-22	14-Jul-22	25-Aug-22	08-Sep-22	13-Oct-22	24-Nov-22	16-Dec-22	17-Mar-22	21-Apr-22	24-May-22	15-Jun-22	14-Jul-22	25-Aug-22	08-Sep-22	13-Oct-22	24-Nov-22	16-Dec-22
DP18	DP19	670	6.5	2.9	2.2	3.8	3.2	-6.5	-12.0	-8.3	-13.8	-13.1	-8.2	2.9	2.2	3.8	3.2	-6.5	-12.0	-8.3	-13.8	-13.1	-8.2
DP19	DP20	310	6.5	0.7	0.7	0.6	0.5	-2.8	-2.9	-3.1	-3.2	-2.6	-2.5	1.0	1.1	0.9	0.7	-4.1	-4.4	-4.7	-4.8	-4.0	-3.8
DP20	Hwy 401	270	6.5	1.0	1.1	0.8	0.8	-2.0	-1.9	-1.0	-1.7	-1.4	-1.3	1.5	1.6	1.2	1.1	-3.0	-2.8	-1.5	-2.6	-2.1	-1.9
Hwy 401	DP21	60	7.1	0.4	0.5	0.4	0.3	0.2	0.3	0.1	0.1	0.2	0.2	0.6	0.7	0.6	0.5	0.4	0.4	0.2	0.1	0.2	0.3
DP21	DP4	100	7.3	0.5	0.6	0.5	0.4	0.4	0.4	0.2	0.1	0.1	0.3	0.7	0.9	0.7	0.7	0.6	0.5	0.3	0.2	0.2	0.4
DP4	DP22	50	7.1	0.4	0.5	-0.17	0.4	0.5	0.2	0.2	0.2	0.2	0.2	0.5	0.7	-0.2	0.6	0.7	0.3	0.3	0.2	0.3	0.3
DP22	DP17	100	6.6	0.7	0.9	-0.3	0.7	0.7	0.3	0.3	0.3	0.4	0.3	1.0	1.3	-0.4	1.1	1.1	0.4	0.4	0.4	0.6	0.5
DP17	DP3	165	7.1	1.0	0.8	0.9	0.8	0.7	0.7	0.4	0.7	0.7	0.7	1.5	1.2	1.4	1.1	1.1	1.1	0.6	1.1	1.1	1.1
DP3	Galt Creek	420	6.0	2.4	1.8	2.1	2.0	2.0	2.0	1.5	2.0	2.0	2.0	3.5	2.8	3.2	3.0	3.0	3.0	2.3	3.0	3.0	3.0
Galt Creek	Pond Creek	255	8.1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Pond Creek	DP1	250	8.0	8.3	8.8	9.4	9.8	8.1	6.2	7.3	6.8	7.2	7.3	8.3	8.8	9.4	9.8	8.1	6.2	7.3	6.8	7.2	7.3
DP1	DP2	100	6.7	2.4	2.6	2.9	3.0	2.2	1.7	2.0	1.8	1.8	1.8	2.4	2.6	2.9	3.0	2.2	1.7	2.0	1.8	1.8	1.8
DP2	DP5CR	800	7.6	7.7	7.9	8.6	8.3	5.2	6.4	5.4	5.4	5.3	4.6	7.7	7.9	8.6	8.3	5.2	6.4	5.4	5.4	5.3	4.6
TOTALS				**30.9**	**30.9**	**31.9**	**32.6**	**11.3**	**3.8**	**7.5**	**1.2**	**3.2**	**7.8**	**35.6**	**35.5**	**35.6**	**36.7**	**12.5**	**4.5**	**8.0**	**1.6**	**4.2**	**9.0**

Notes - **Groundwater influx at Galt Creek and Pond Creek based on seepage data from May/June 1992**

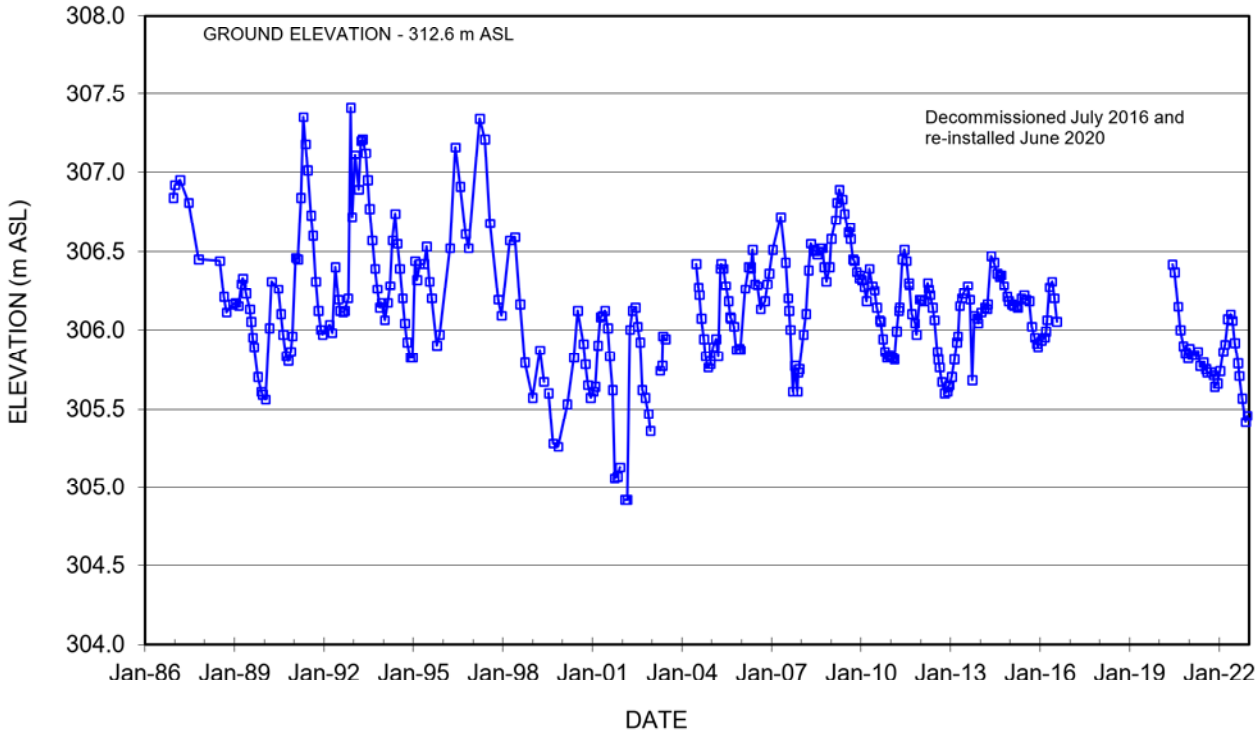
GROUNDWATER HYDROGRAPH
BOREHOLE 1-I/1-R

FIGURE B-1



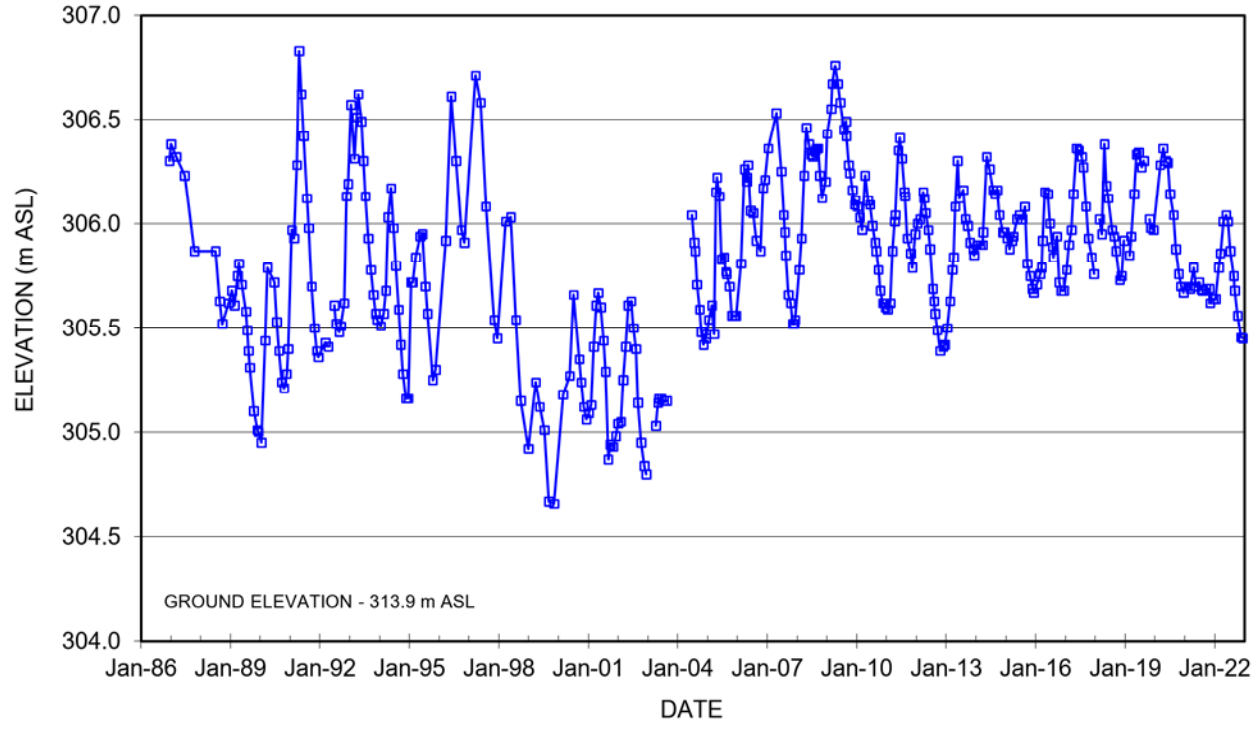
GROUNDWATER HYDROGRAPH
BOREHOLE 2/2B/2-R

FIGURE B-2



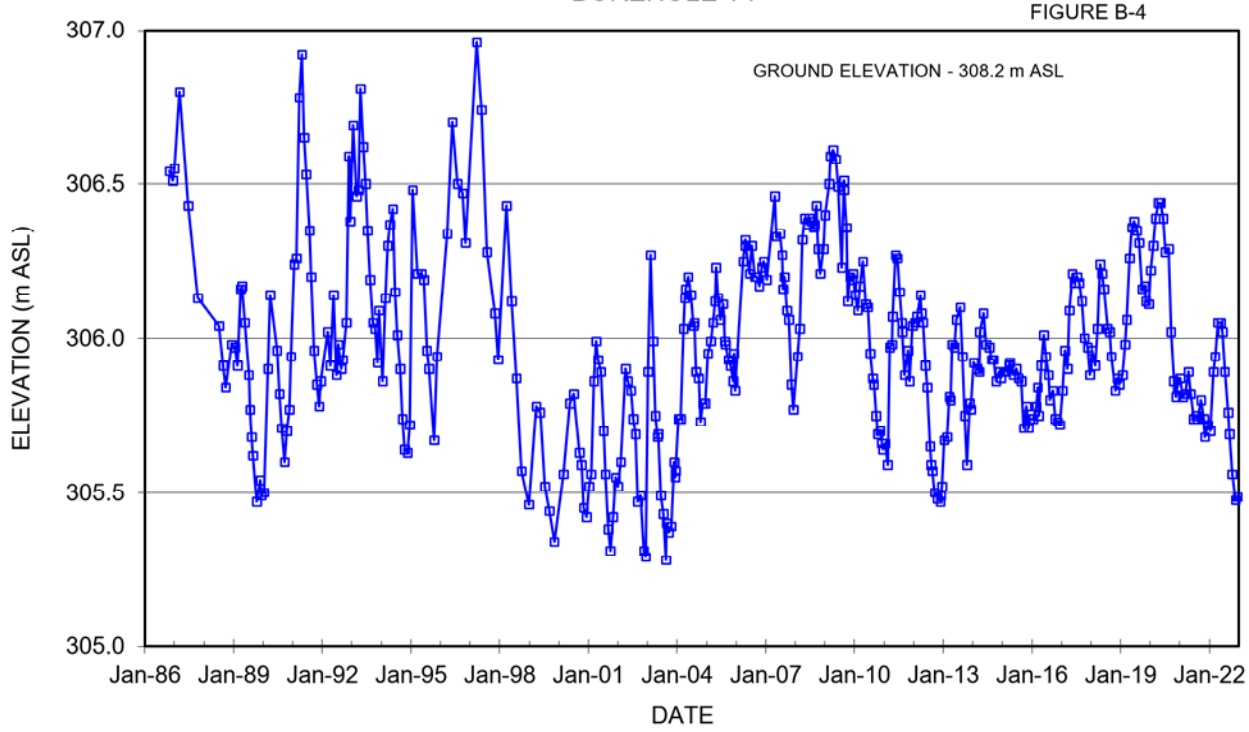
GROUNDWATER HYDROGRAPH
BOREHOLE 3

FIGURE B-3



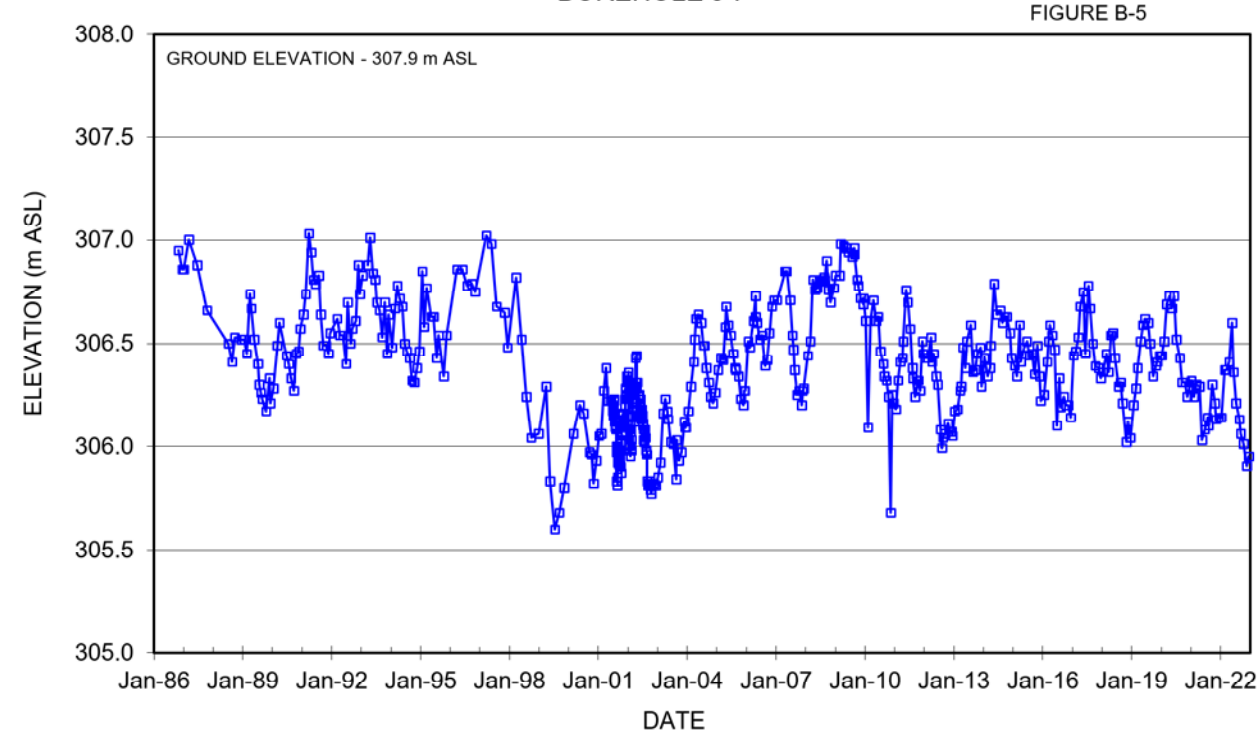
GROUNDWATER HYDROGRAPH
BOREHOLE 4-I

FIGURE B-4



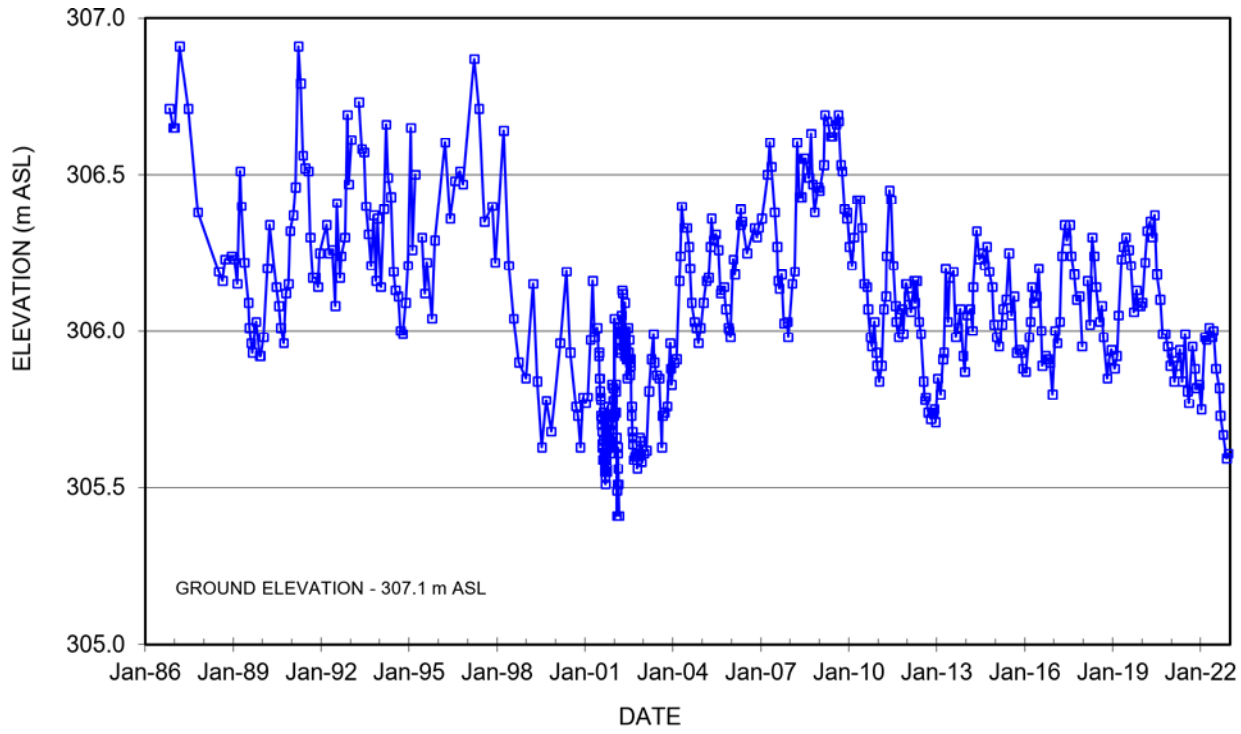
GROUNDWATER HYDROGRAPH
BOREHOLE 5-I

FIGURE B-5



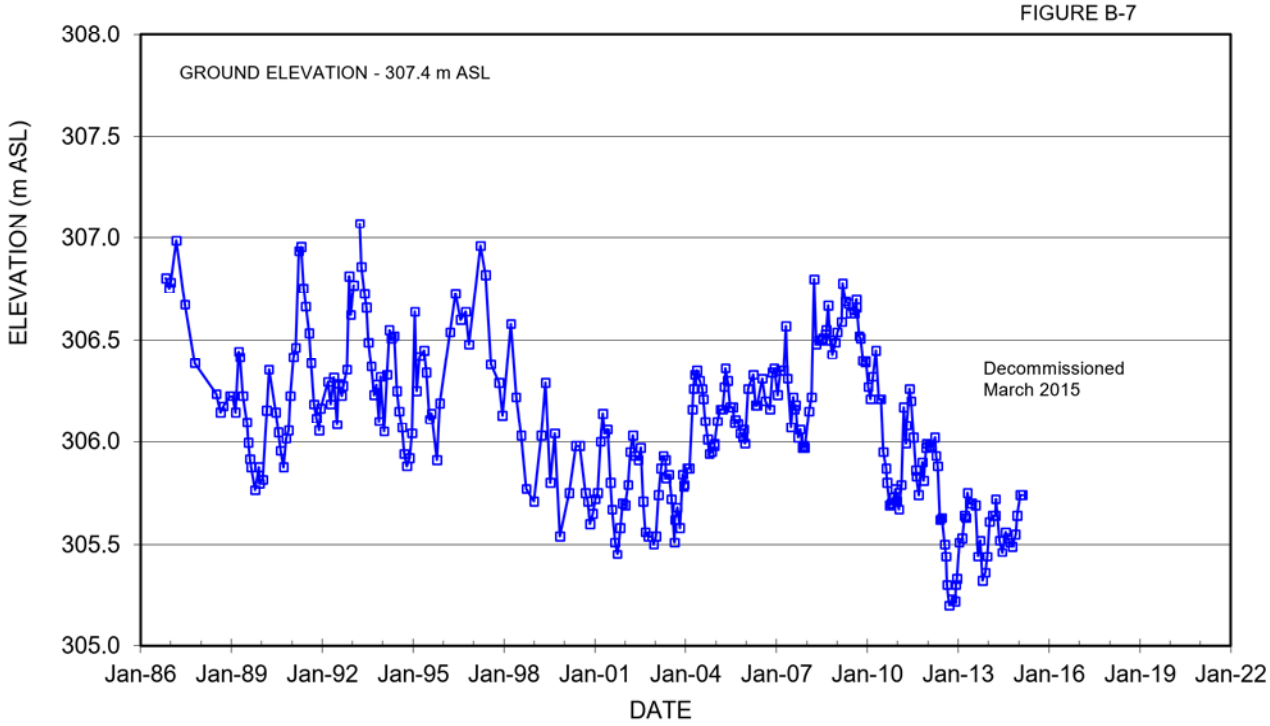
GROUNDWATER HYDROGRAPH
BOREHOLE 6-I

FIGURE B-6



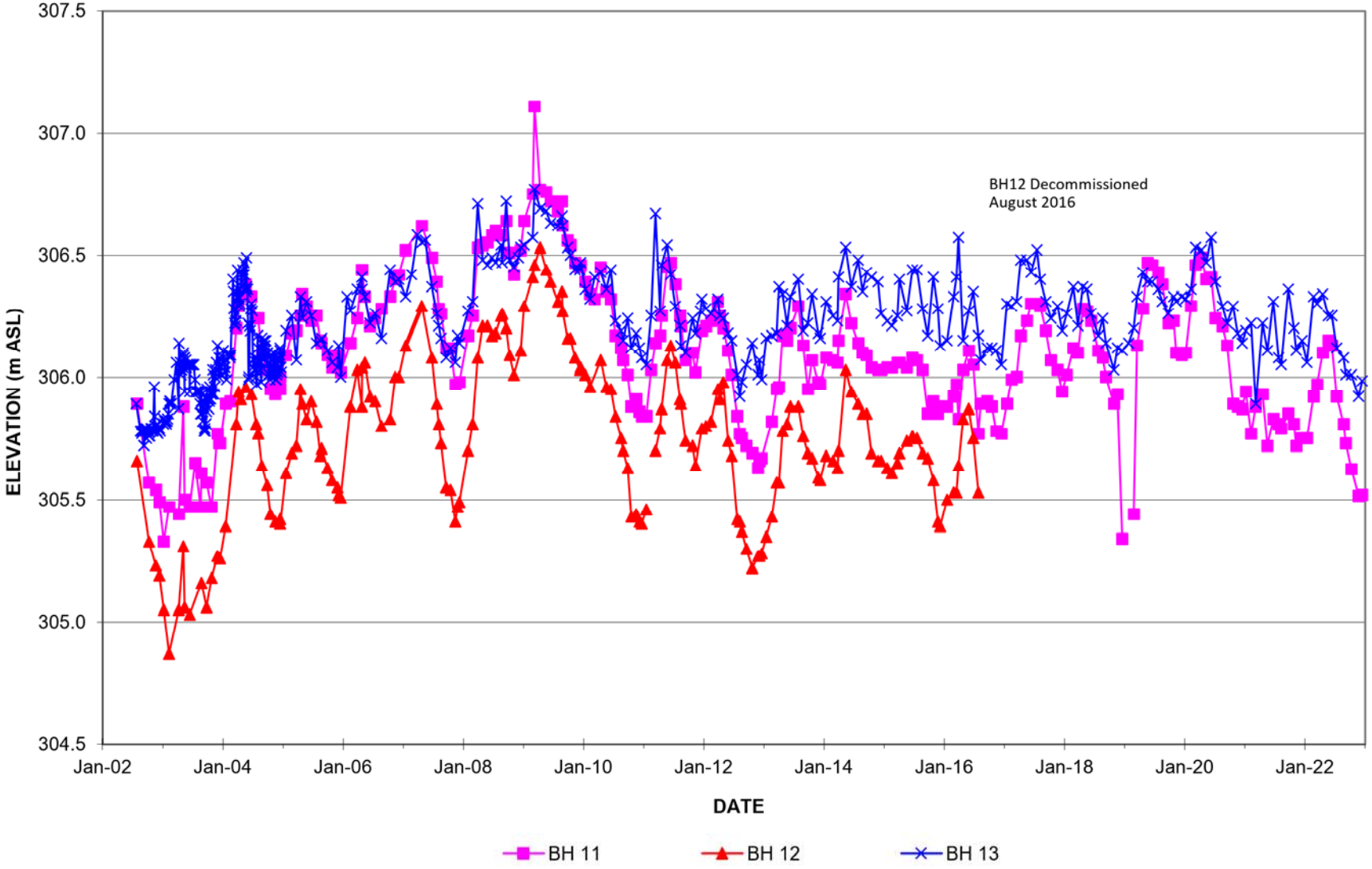
GROUNDWATER HYDROGRAPH
BOREHOLE 7

FIGURE B-7



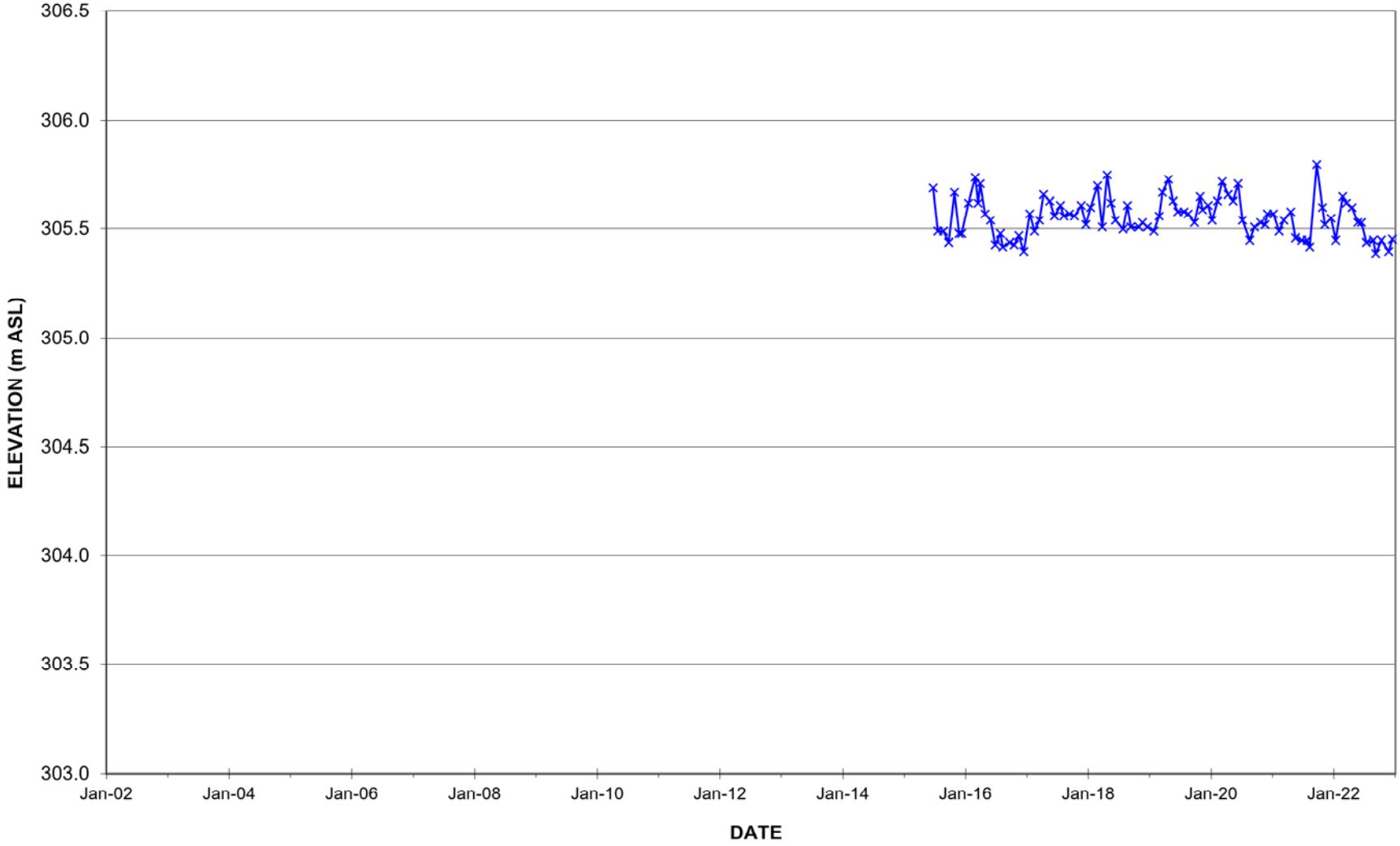
GROUNDWATER HYDROGRAPH
2002 MONITORS

FIGURE B-8



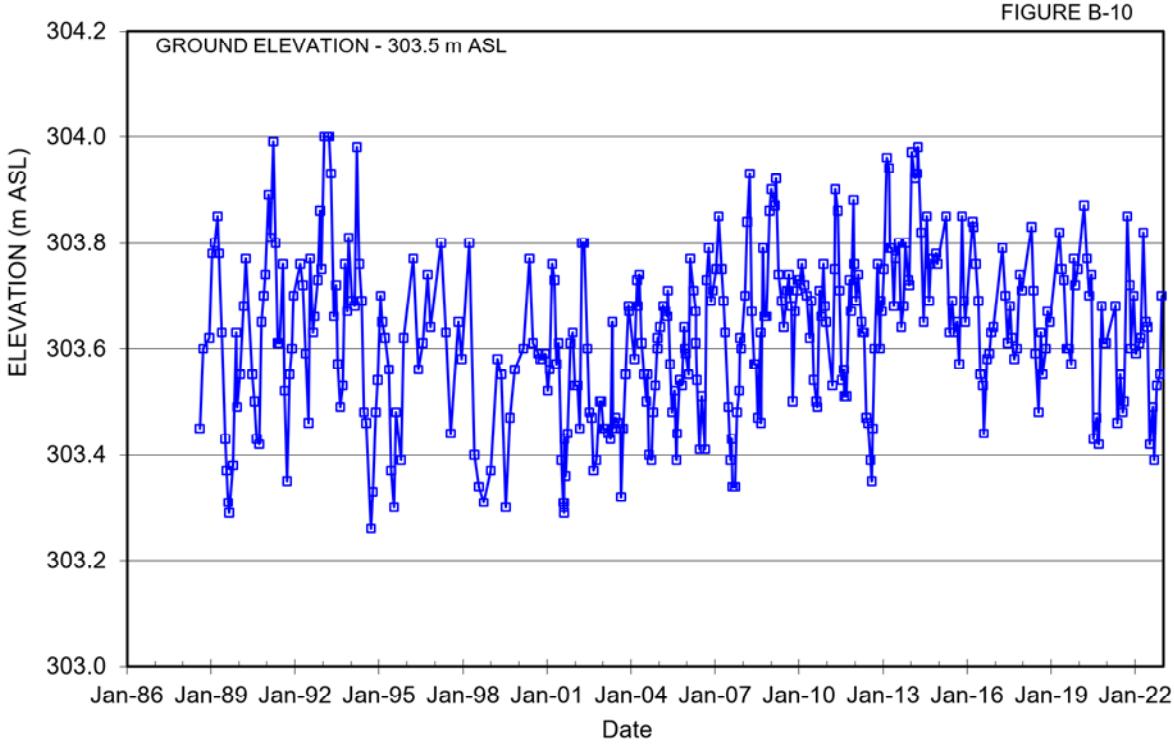
GROUNDWATER HYDROGRAPH
BOREHOLE 14

FIGURE B-9



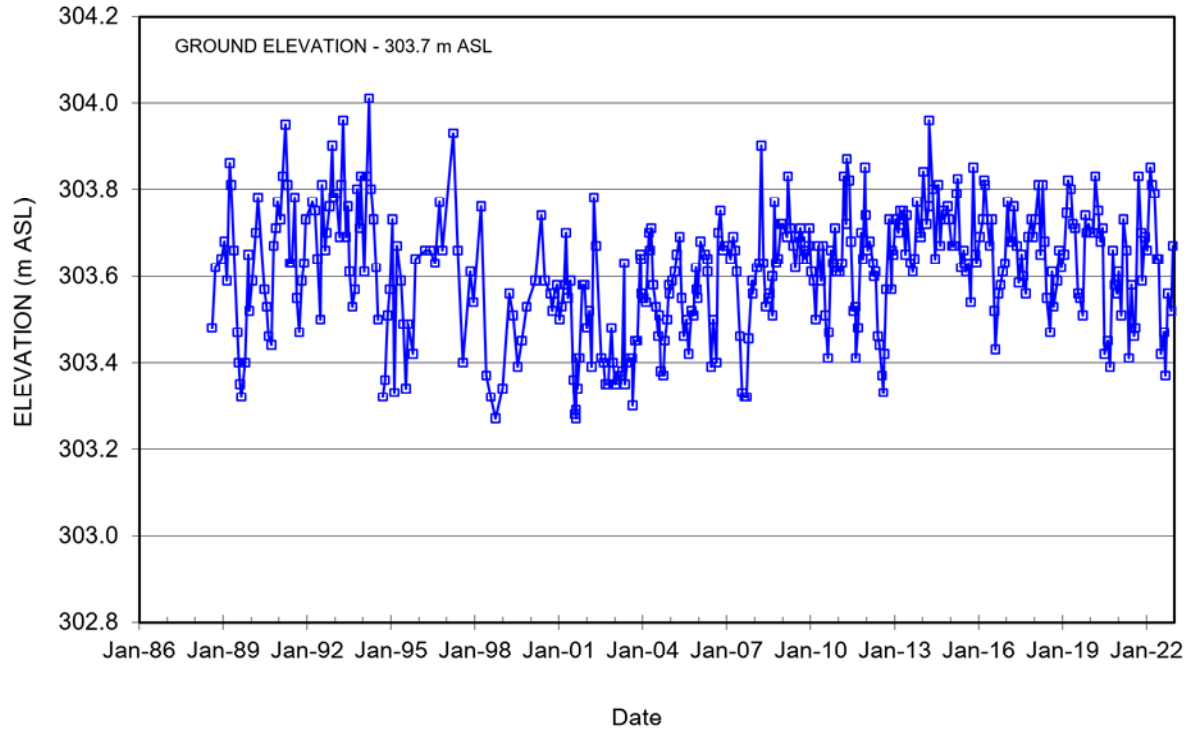
GROUNDWATER HYDROGRAPH
OW16A-78

FIGURE B-10



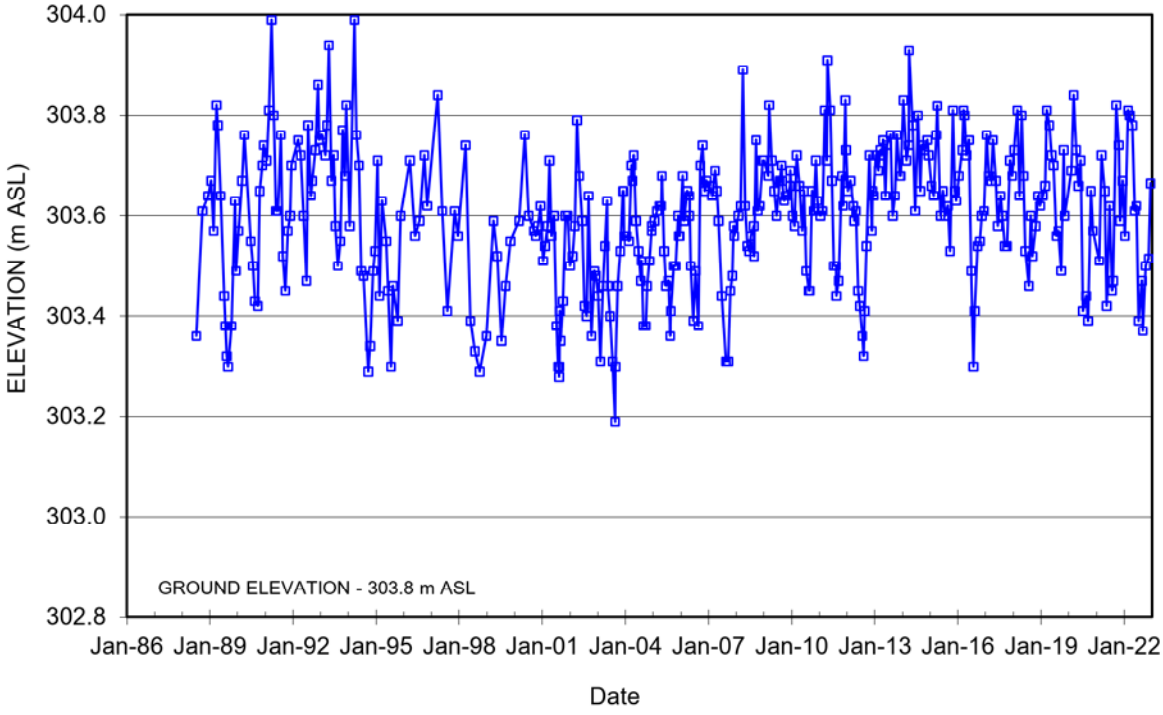
GROUNDWATER HYDROGRAPH
TW16-79

FIGURE B-11



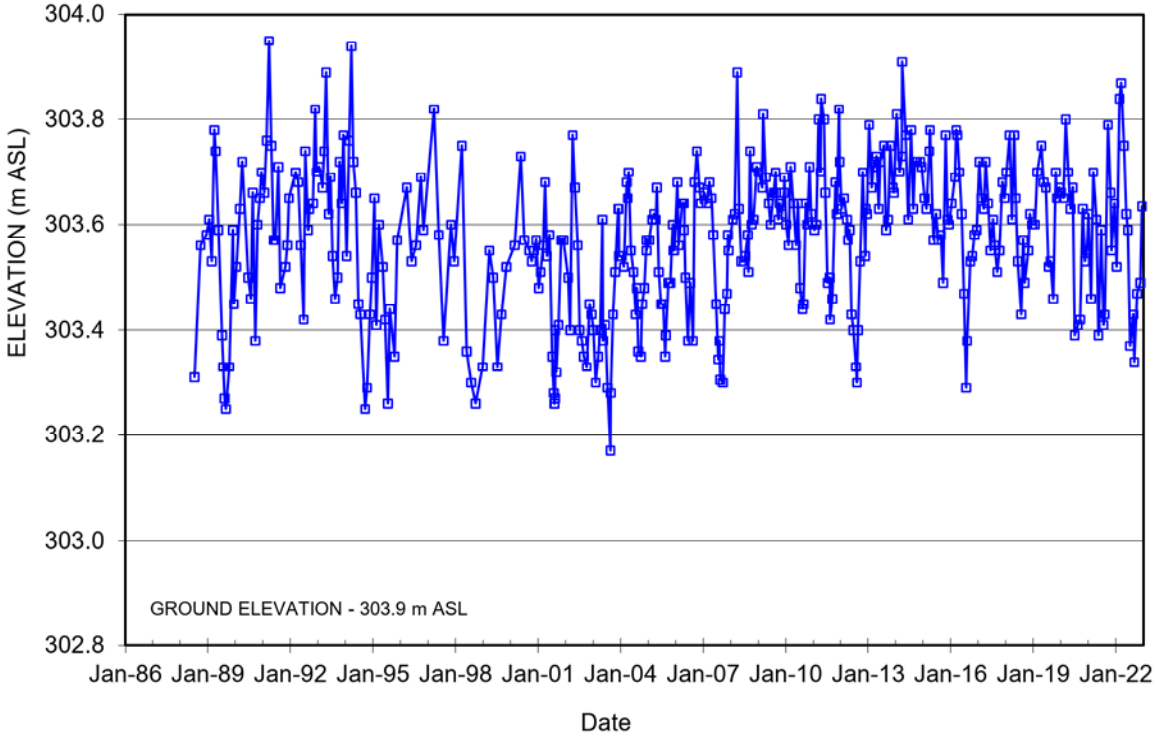
GROUNDWATER HYDROGRAPH
OW1-84

FIGURE B-12



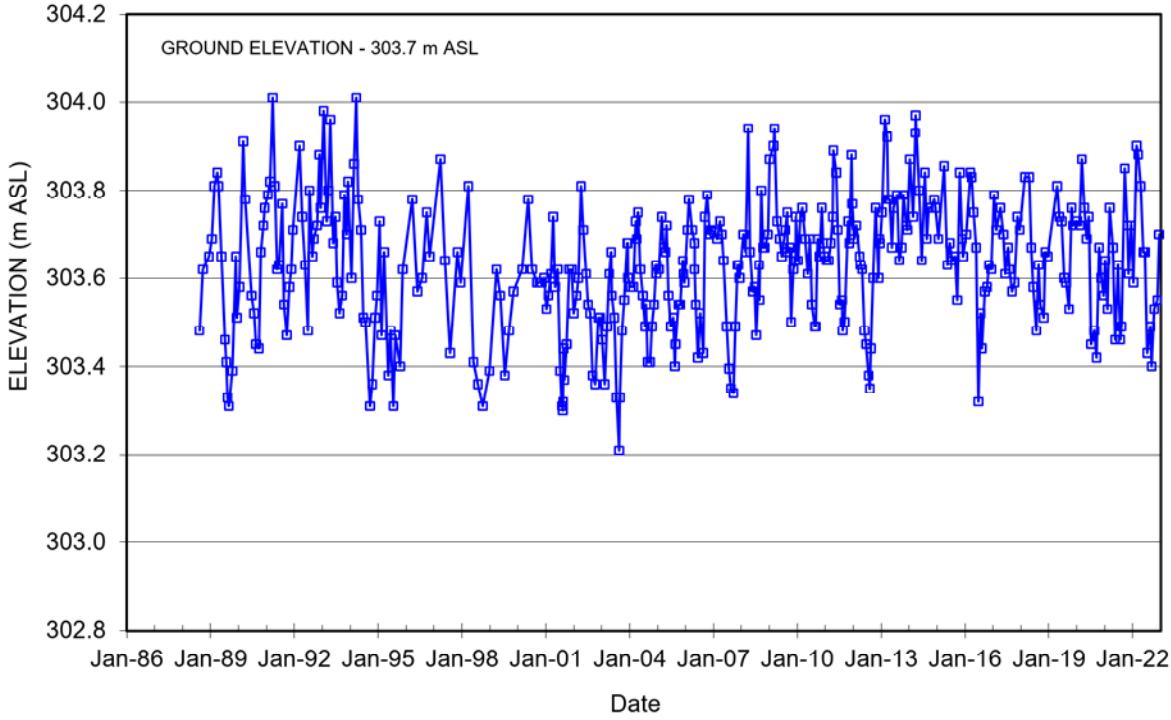
GROUNDWATER HYDROGRAPH
OW2-84

FIGURE B-13



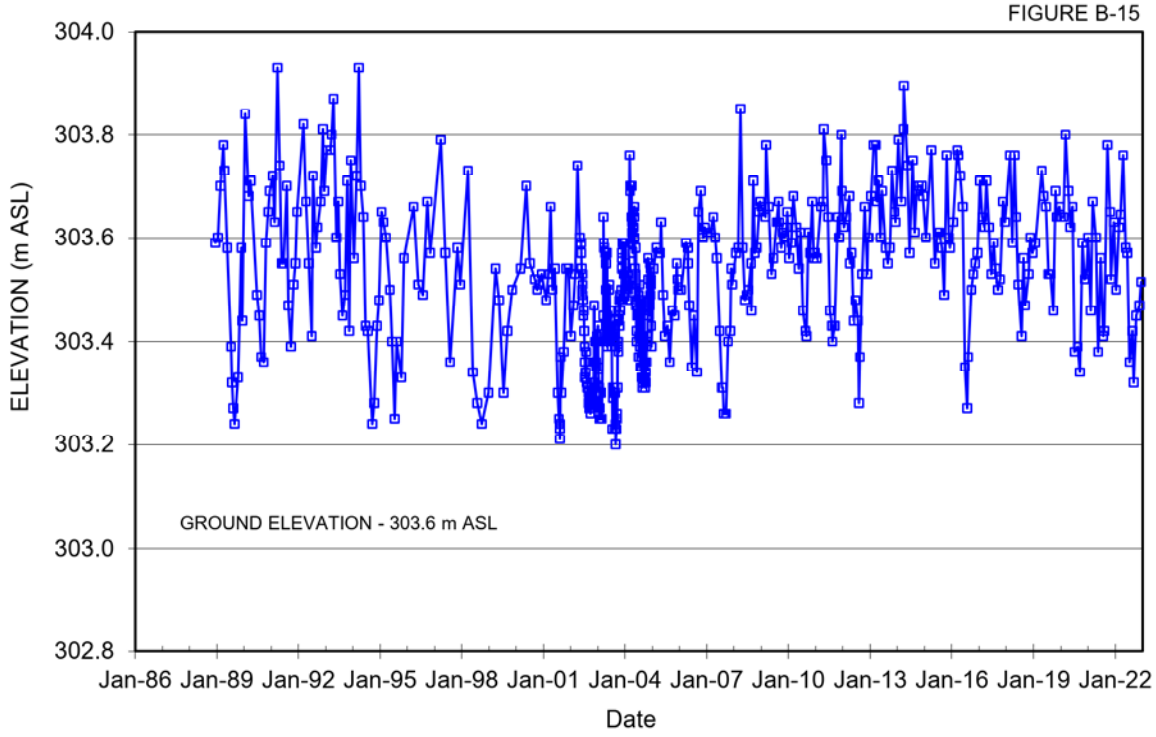
GROUNDWATER HYDROGRAPH
OW4-84

FIGURE B-14



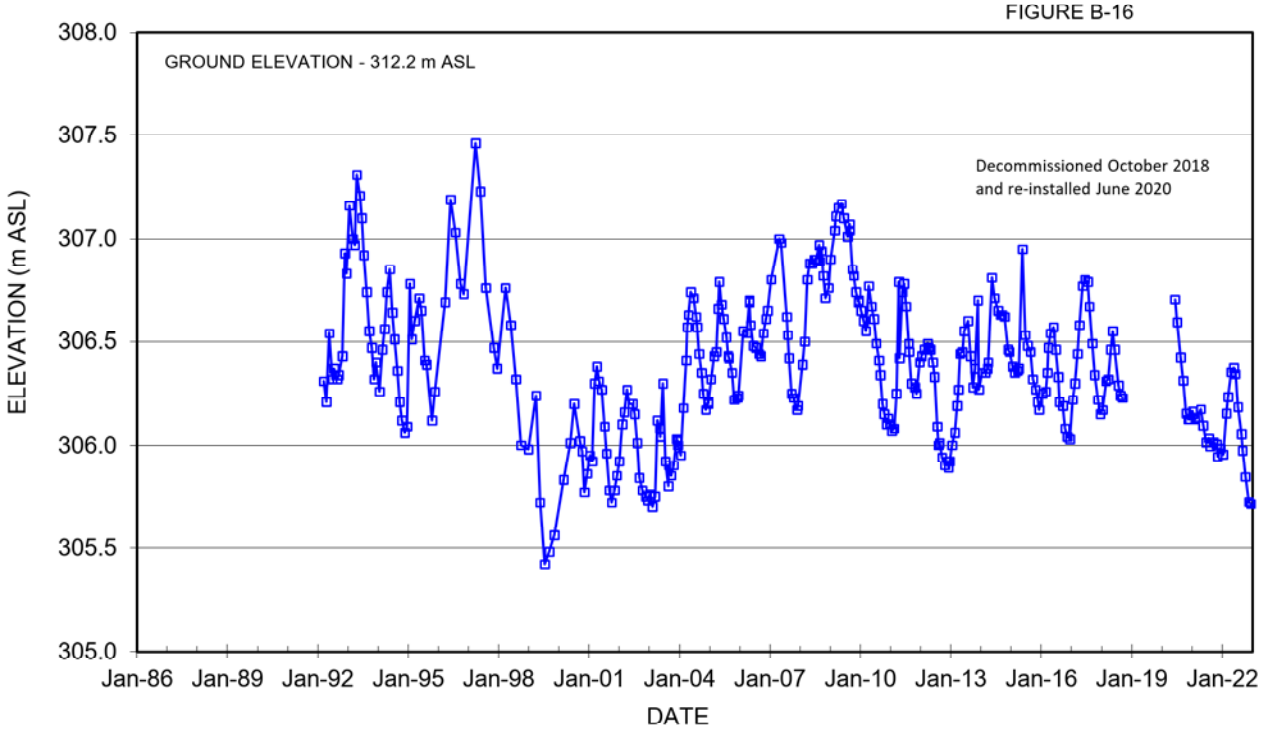
GROUNDWATER HYDROGRAPH
OW5-84

FIGURE B-15



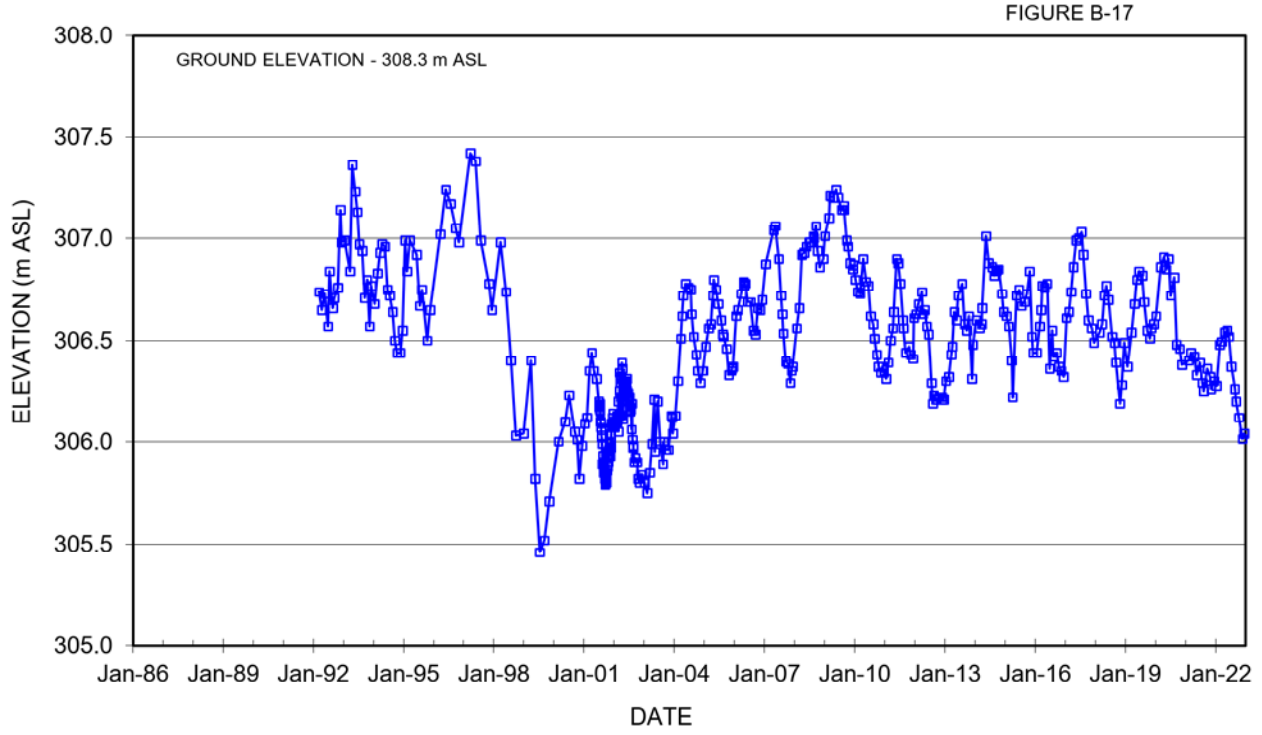
GROUNDWATER HYDROGRAPH
BOREHOLE 92-1/92-1R

FIGURE B-16



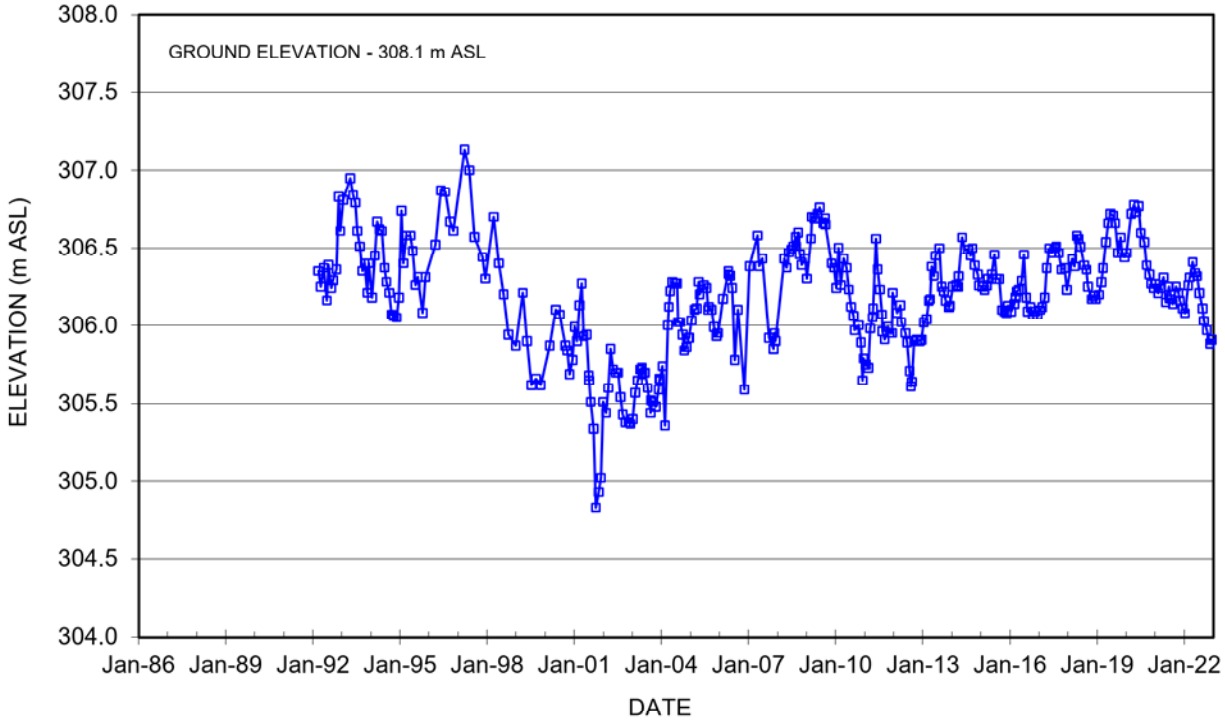
GROUNDWATER HYDROGRAPH
BOREHOLE 92-5

FIGURE B-17



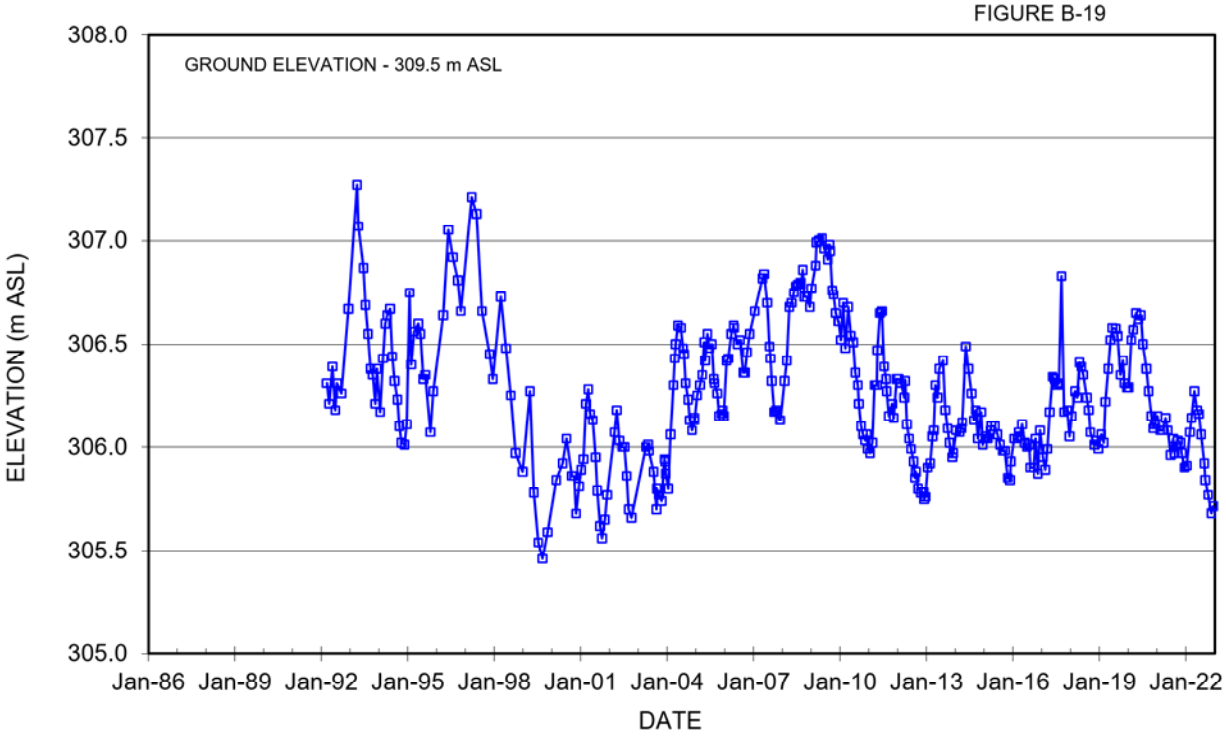
GROUNDWATER HYDROGRAPH
BOREHOLE 92-8

FIGURE B-18



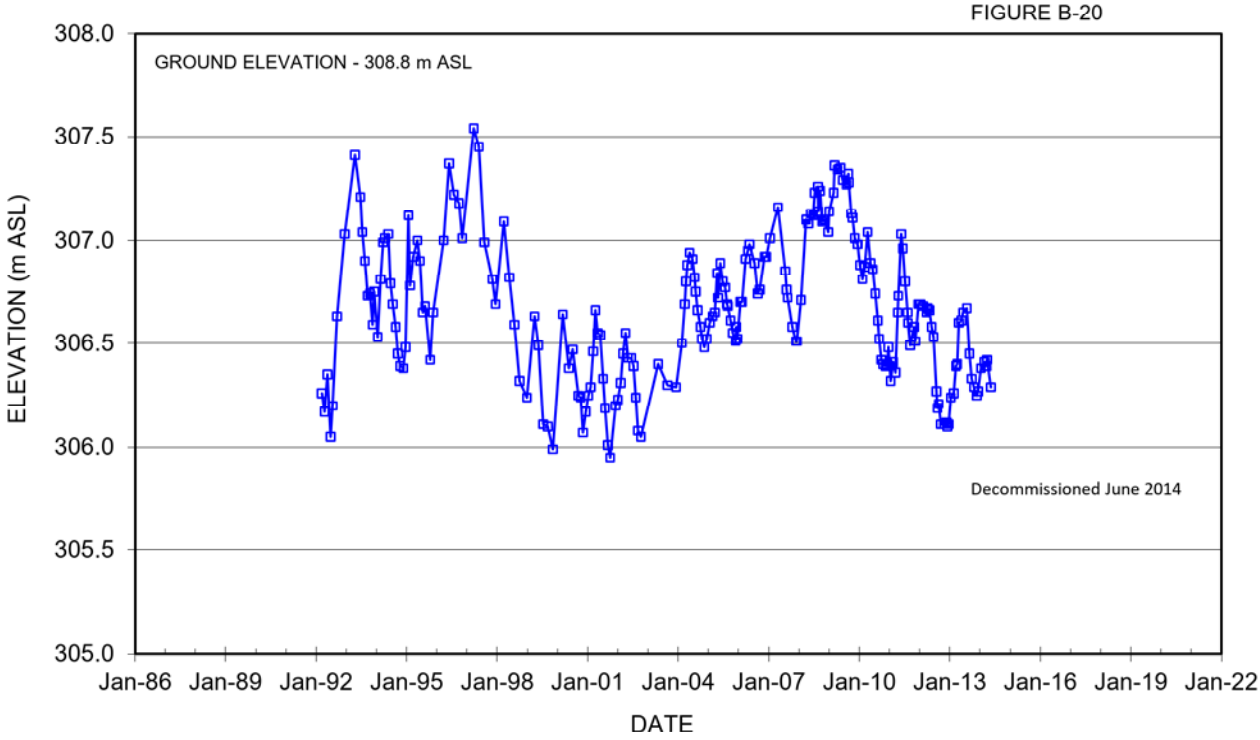
GROUNDWATER HYDROGRAPH
BOREHOLE 92-13

FIGURE B-19



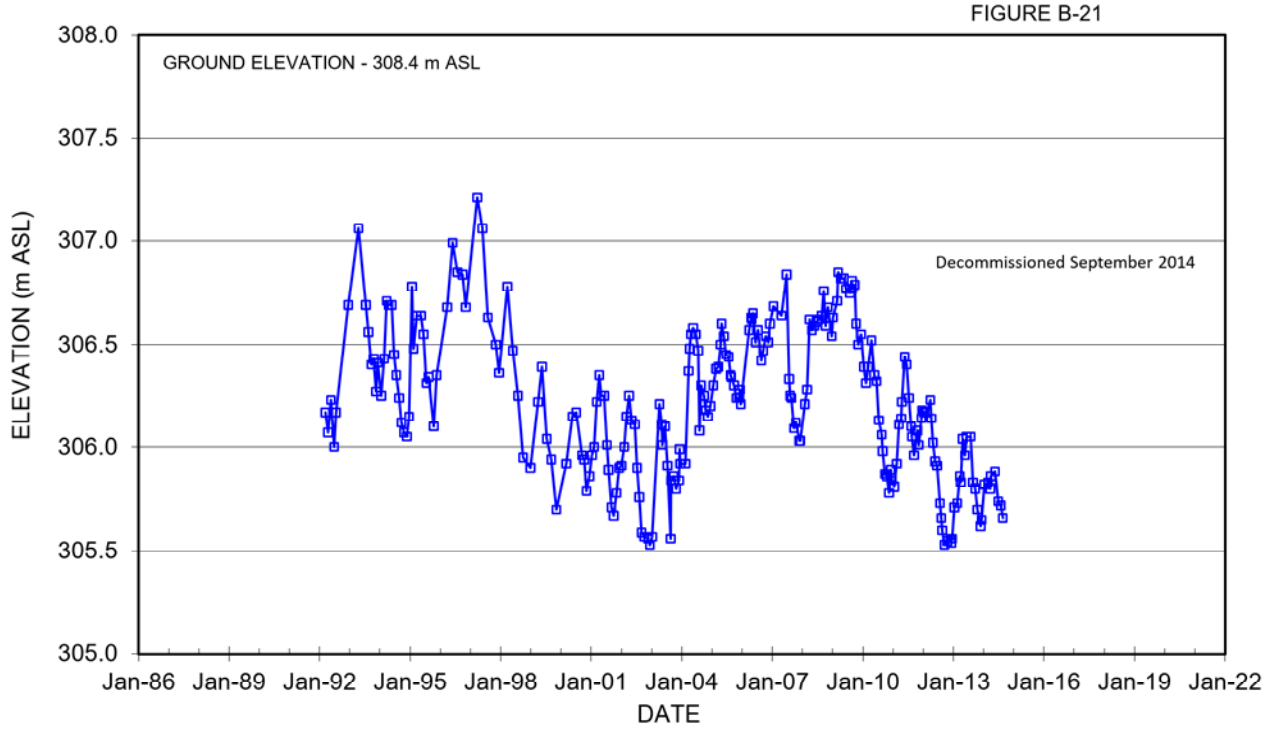
GROUNDWATER HYDROGRAPH
BOREHOLE 92-14

FIGURE B-20



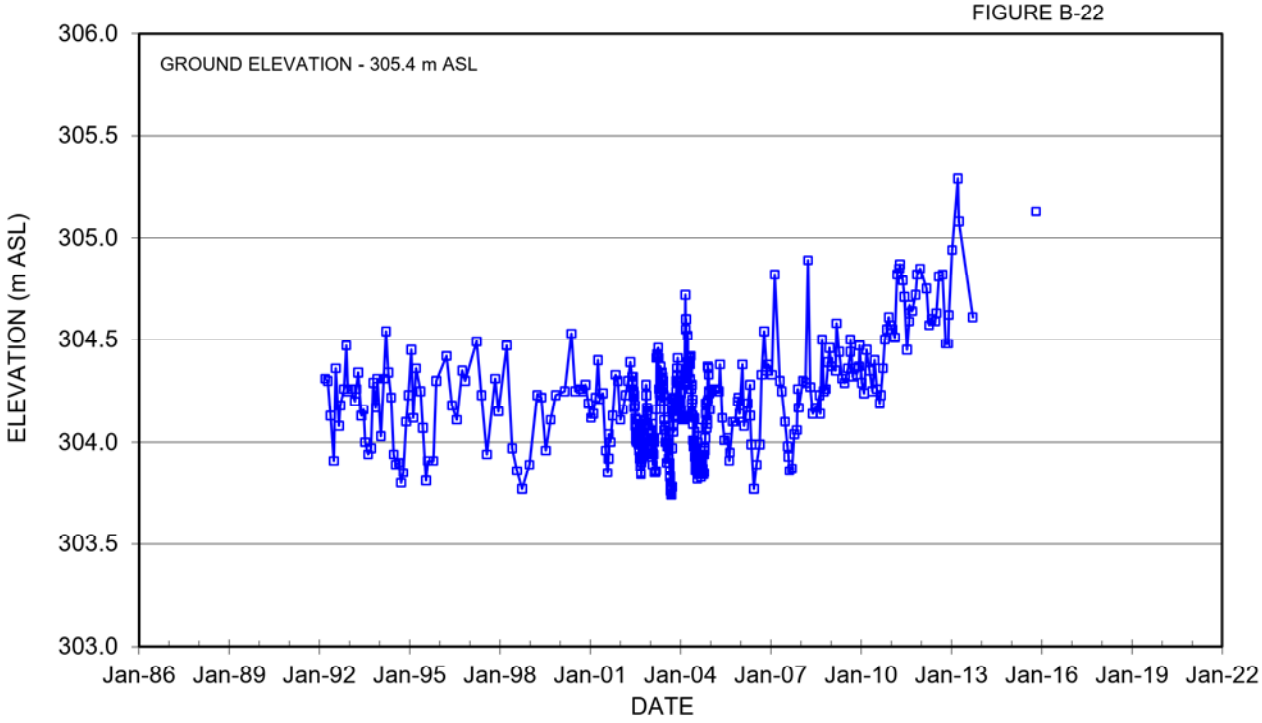
GROUNDWATER HYDROGRAPH
BOREHOLE 92-15

FIGURE B-21



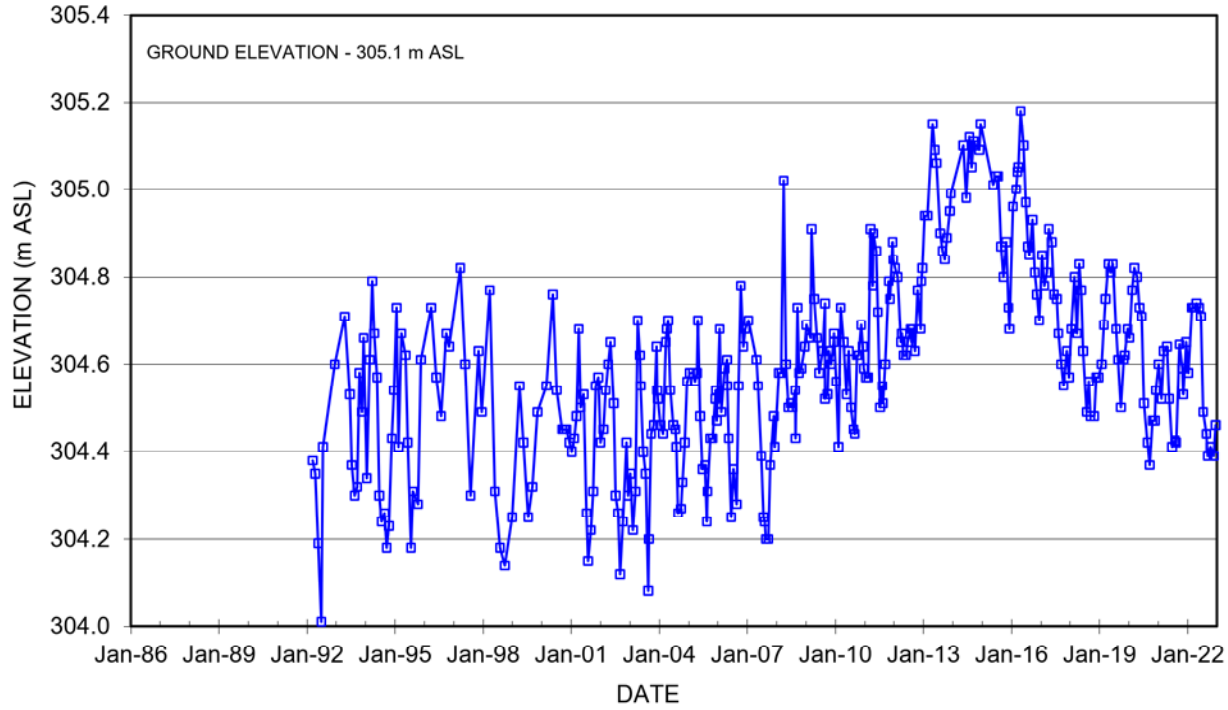
GROUNDWATER HYDROGRAPH
BOREHOLE 92-26

FIGURE B-22



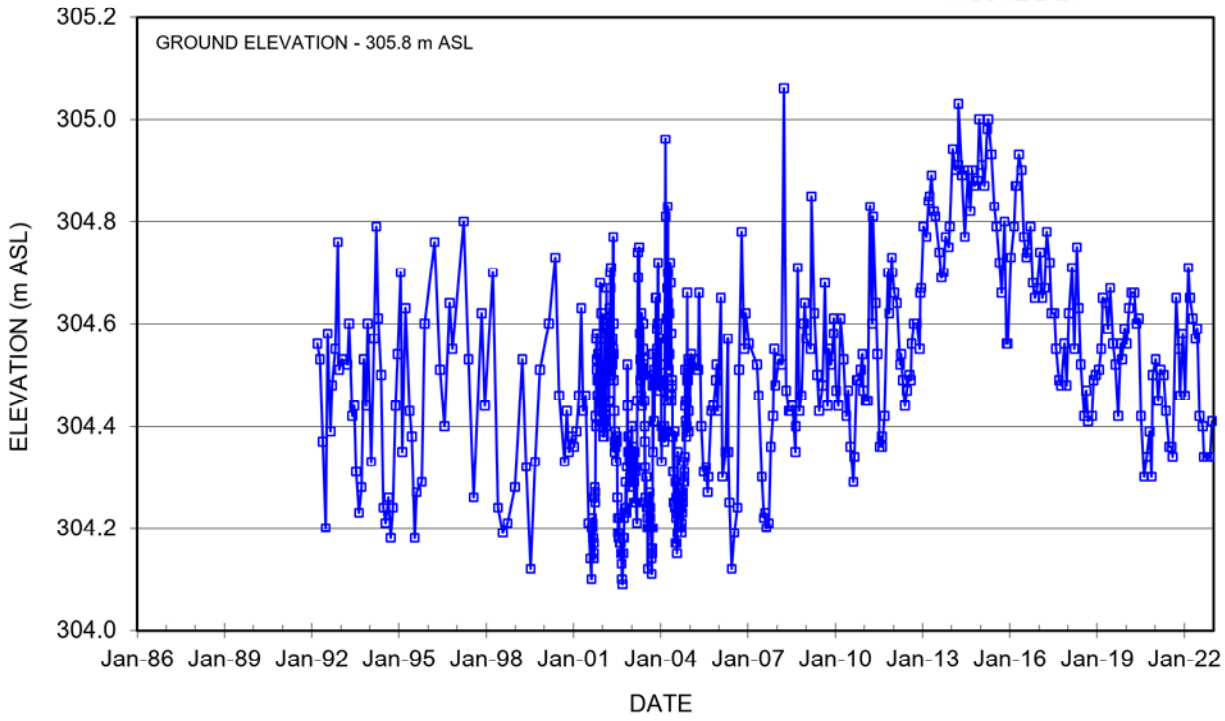
GROUNDWATER HYDROGRAPH
BOREHOLE 92-27

FIGURE B-23



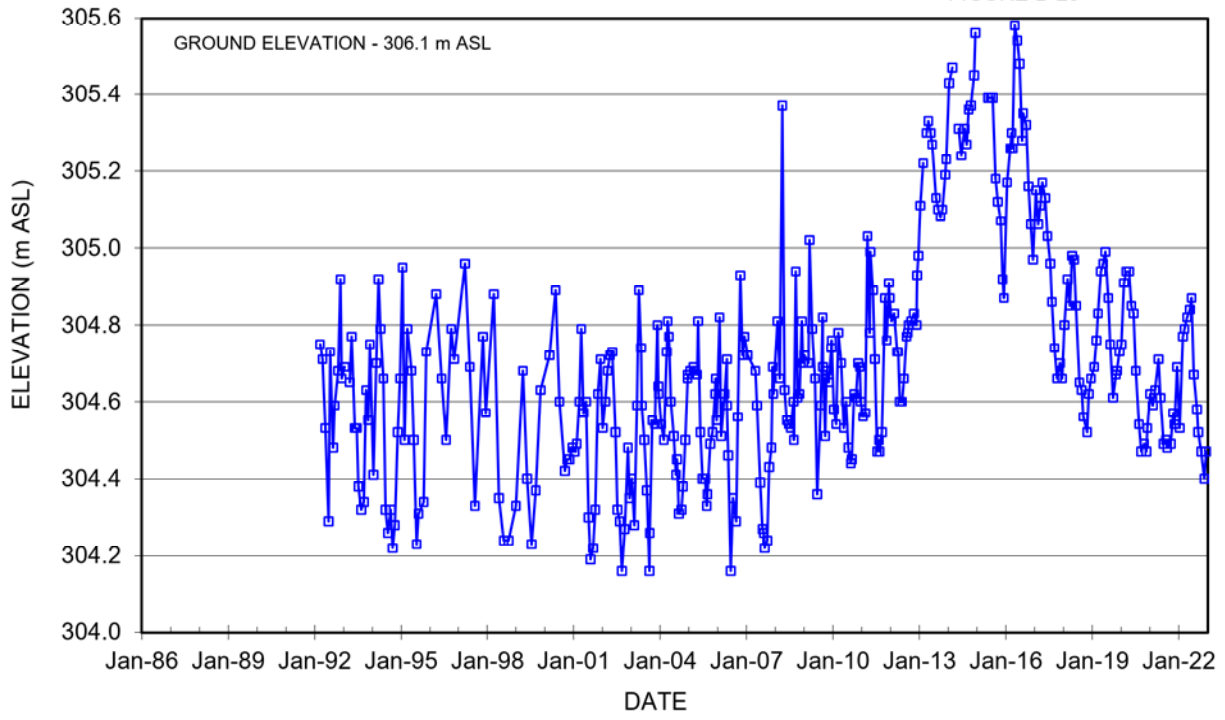
GROUNDWATER HYDROGRAPH
BOREHOLE 92-28

FIGURE B-24



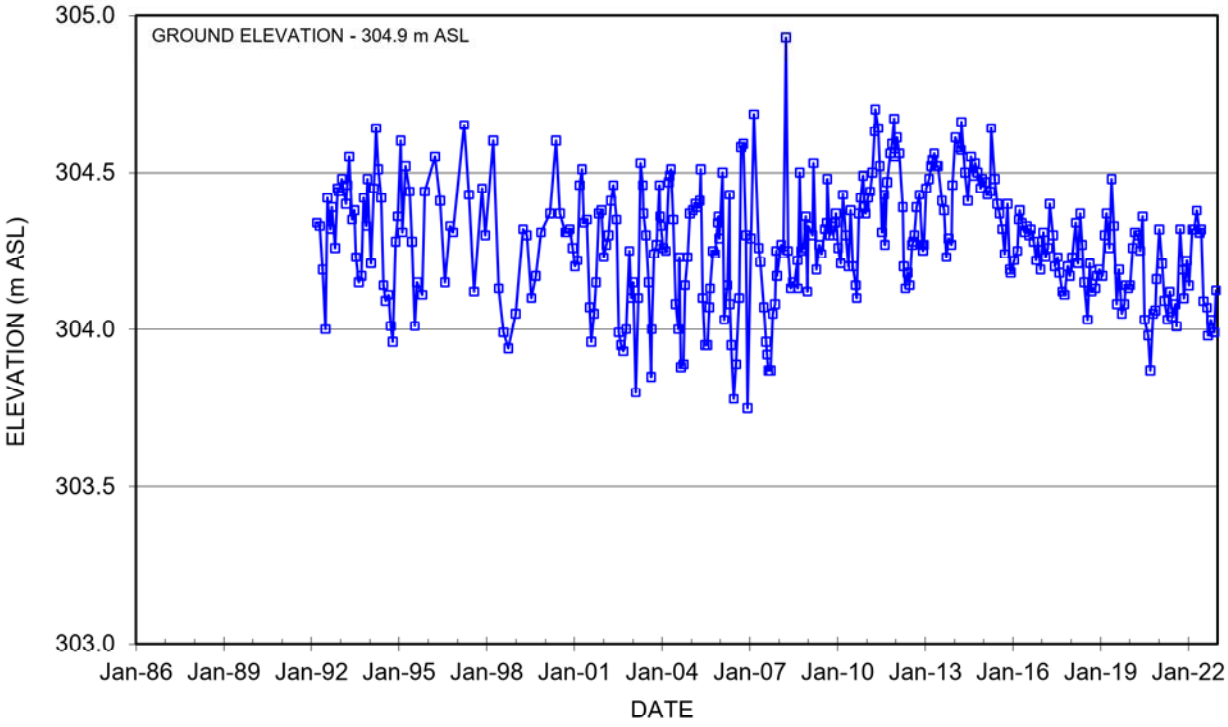
GROUNDWATER HYDROGRAPH
BOREHOLE 92-29

FIGURE B-25



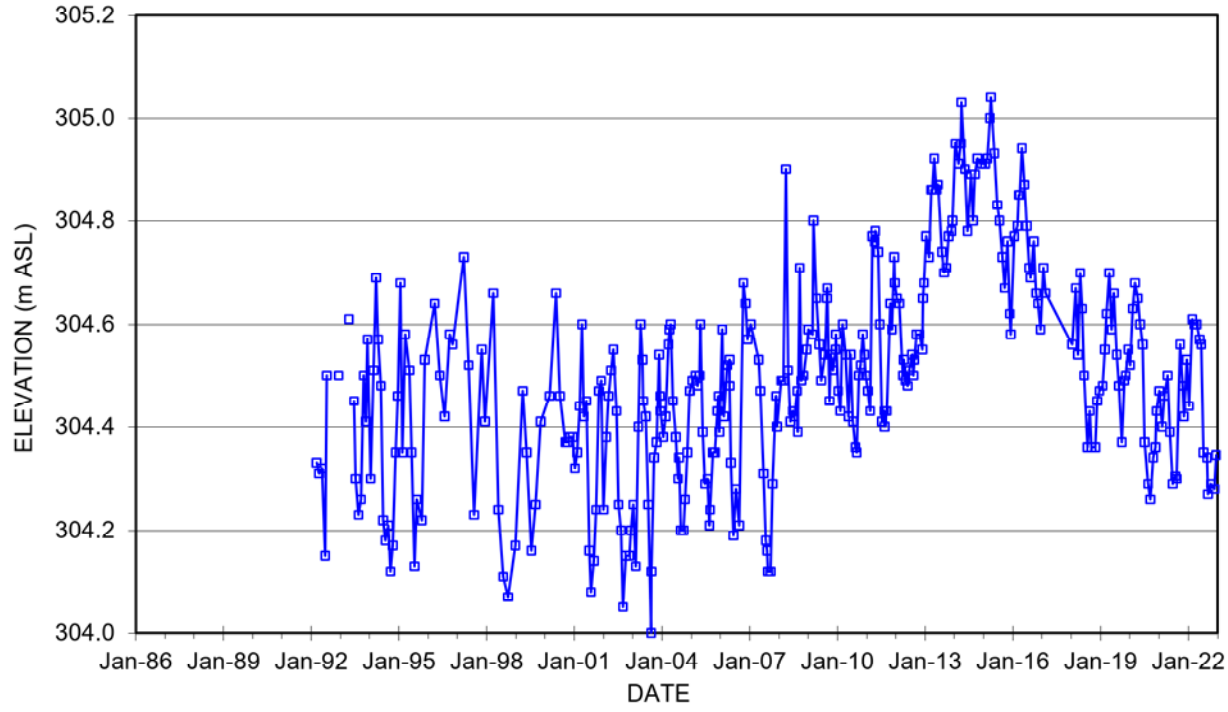
GROUNDWATER HYDROGRAPH
BOREHOLE 92-32

FIGURE B-26



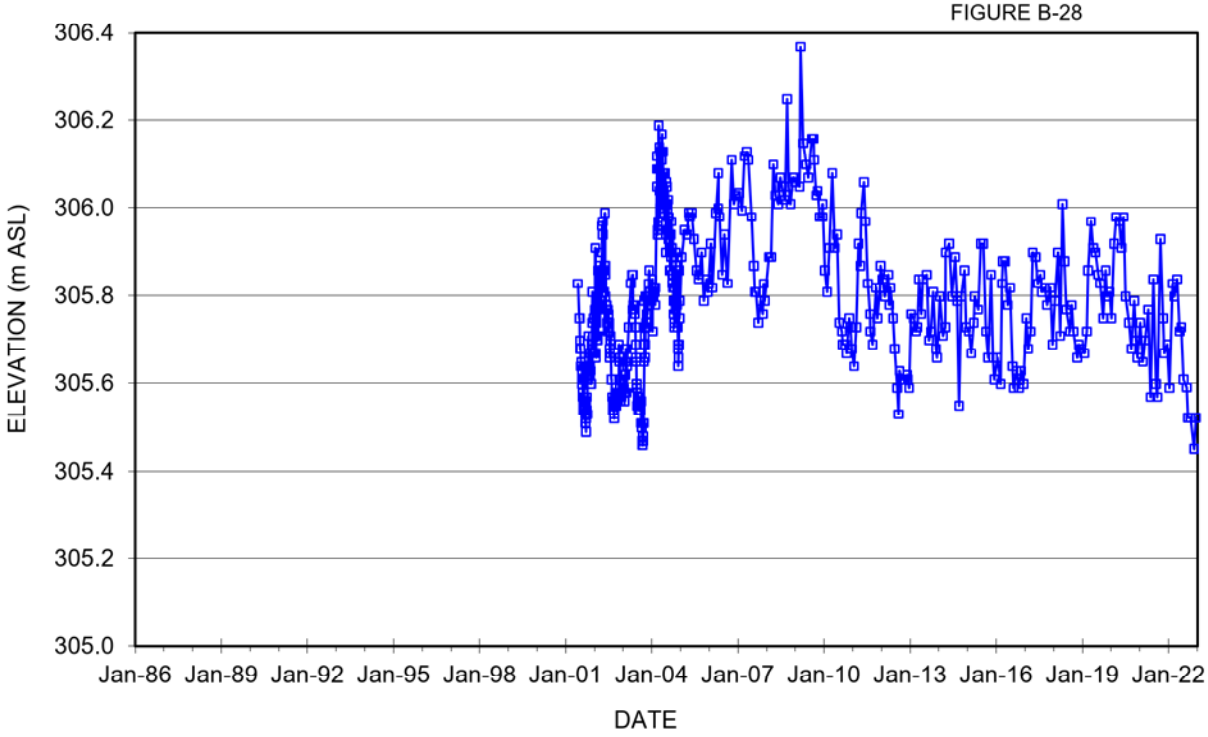
GROUNDWATER HYDROGRAPH
BOREHOLE 92-33

FIGURE B-27



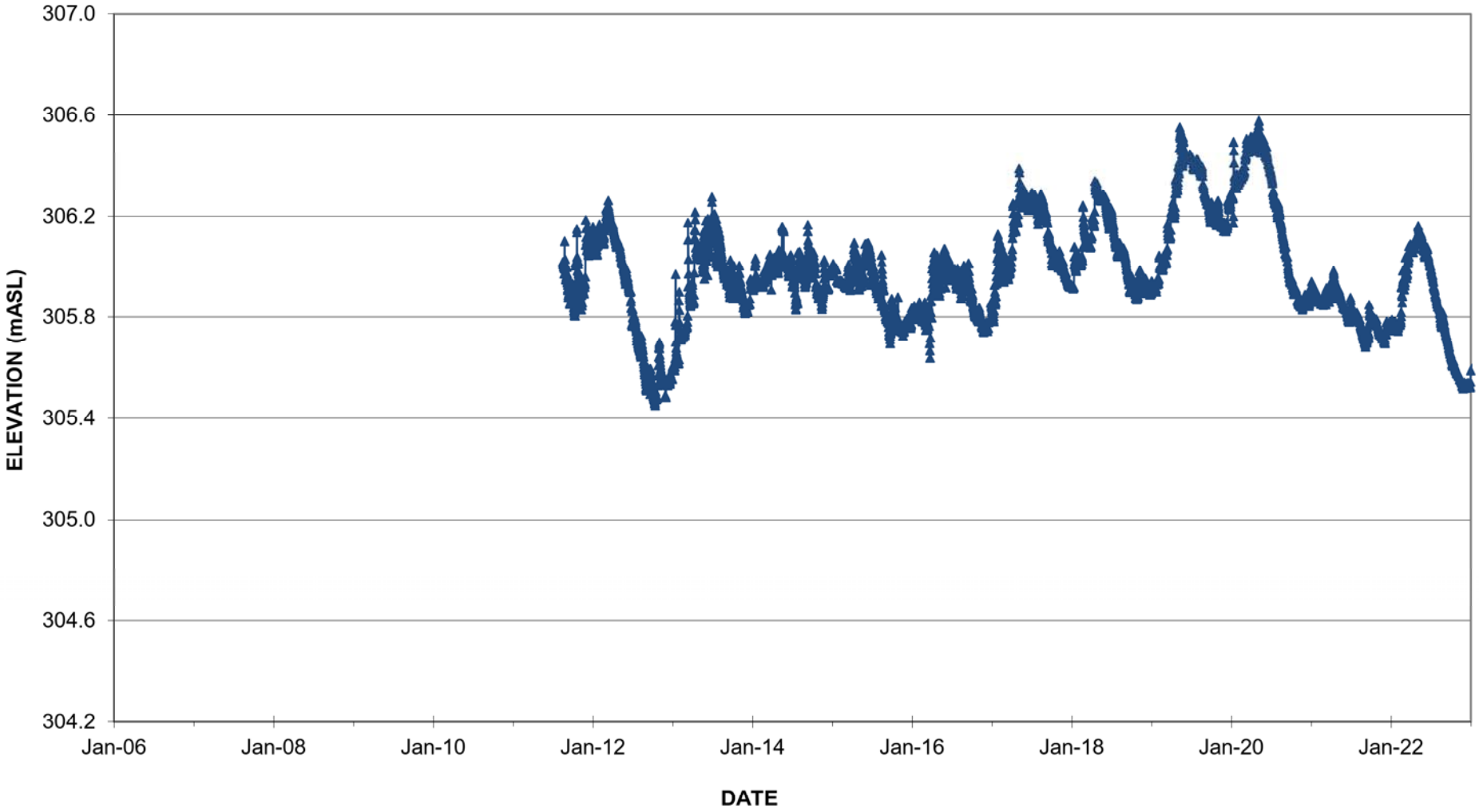
GROUNDWATER HYDROGRAPH
BOREHOLE 92-12

FIGURE B-28



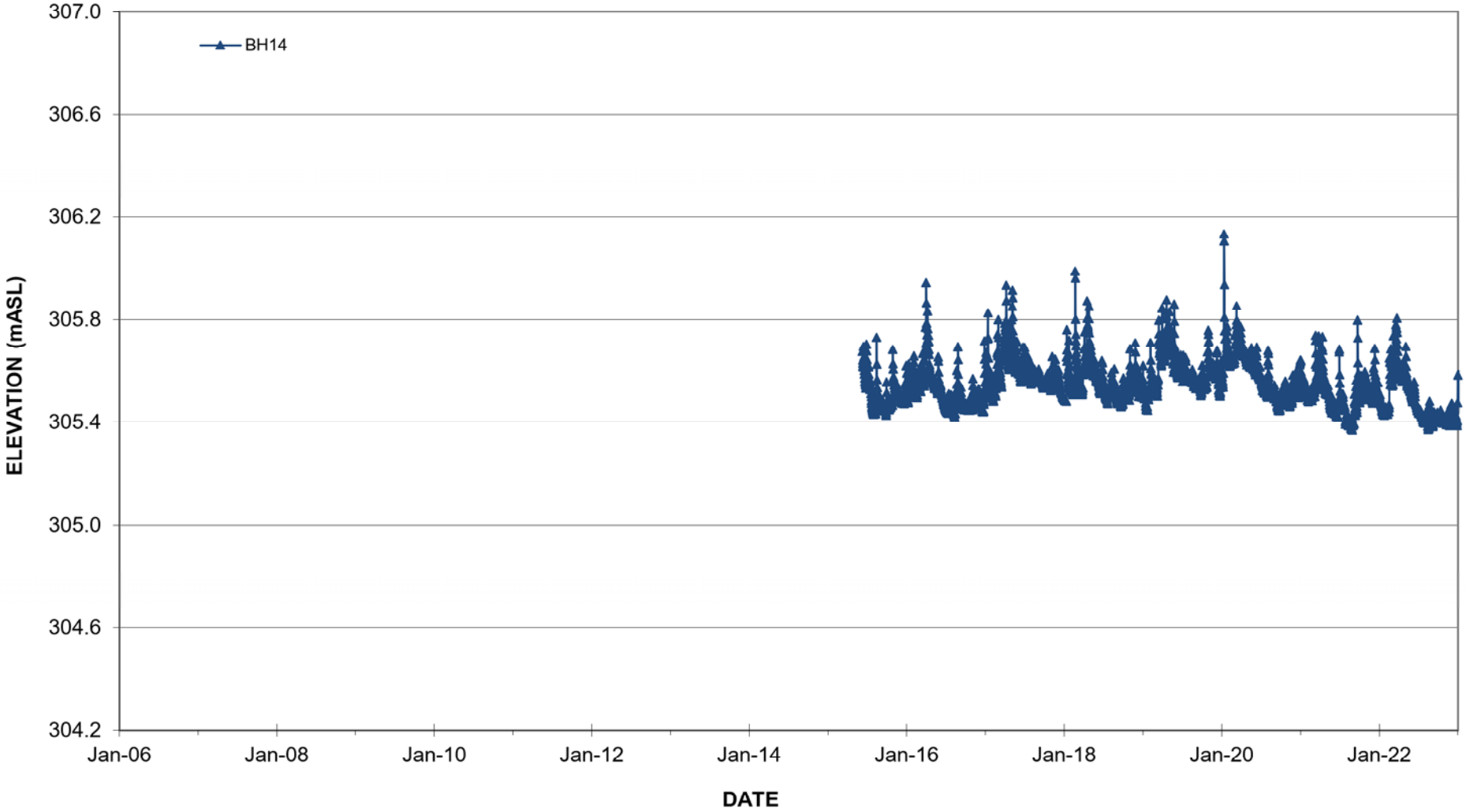
GROUNDWATER HYDROGRAPH
MONITOR BH4

FIGURE B-29



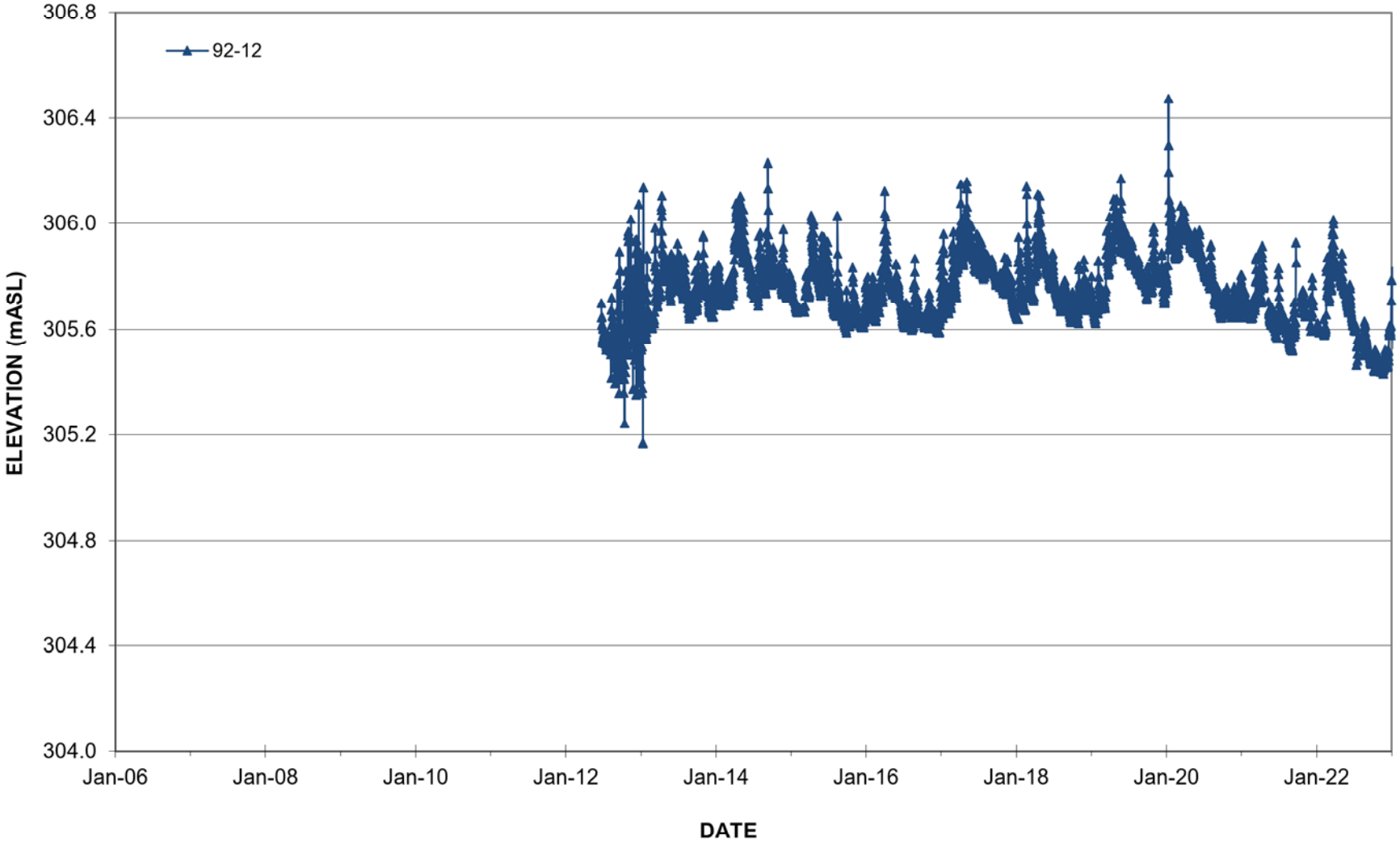
GROUNDWATER HYDROGRAPH
MONITOR BH14

FIGURE B-30



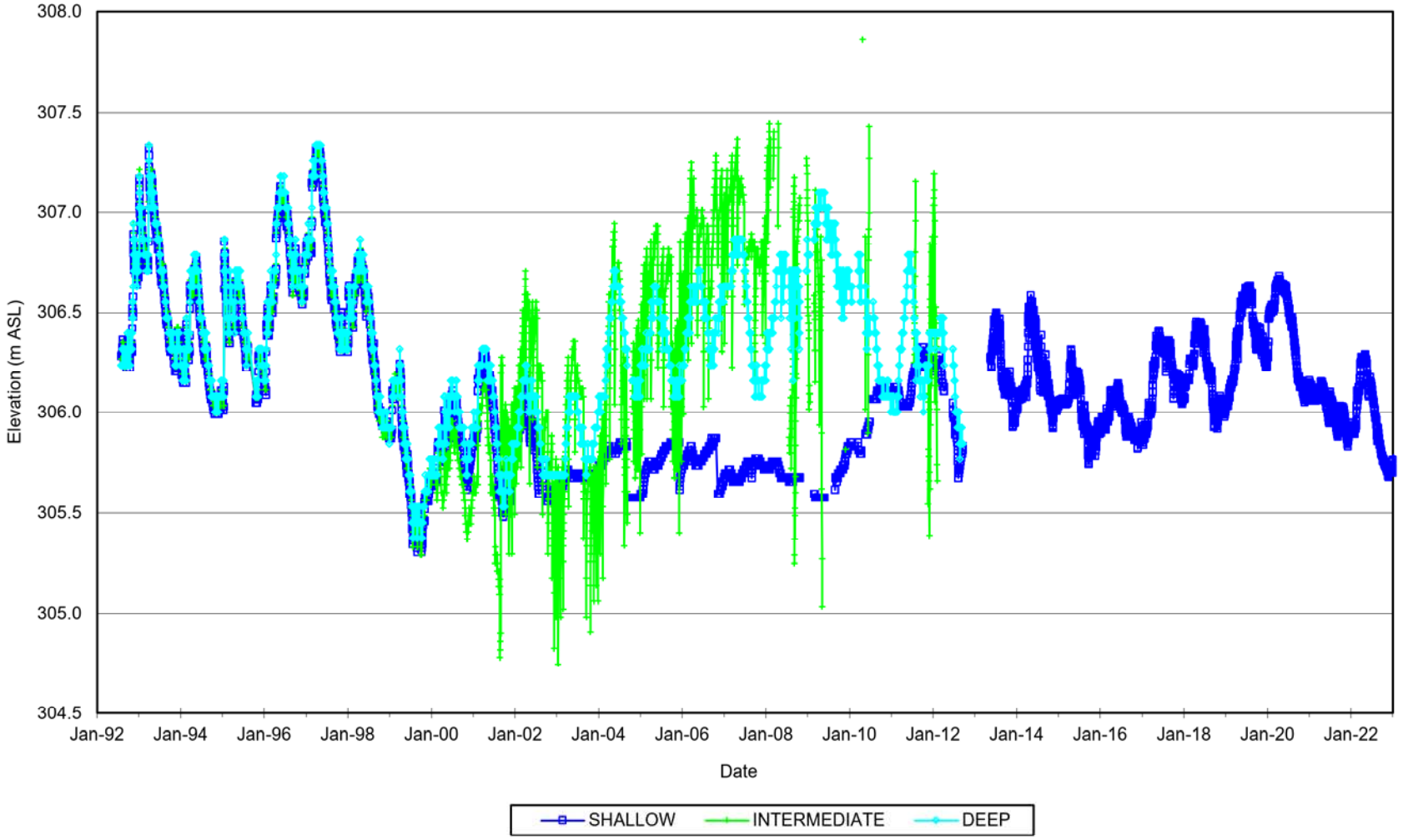
GROUNDWATER HYDROGRAPH
MONITOR 92-12

FIGURE B-31



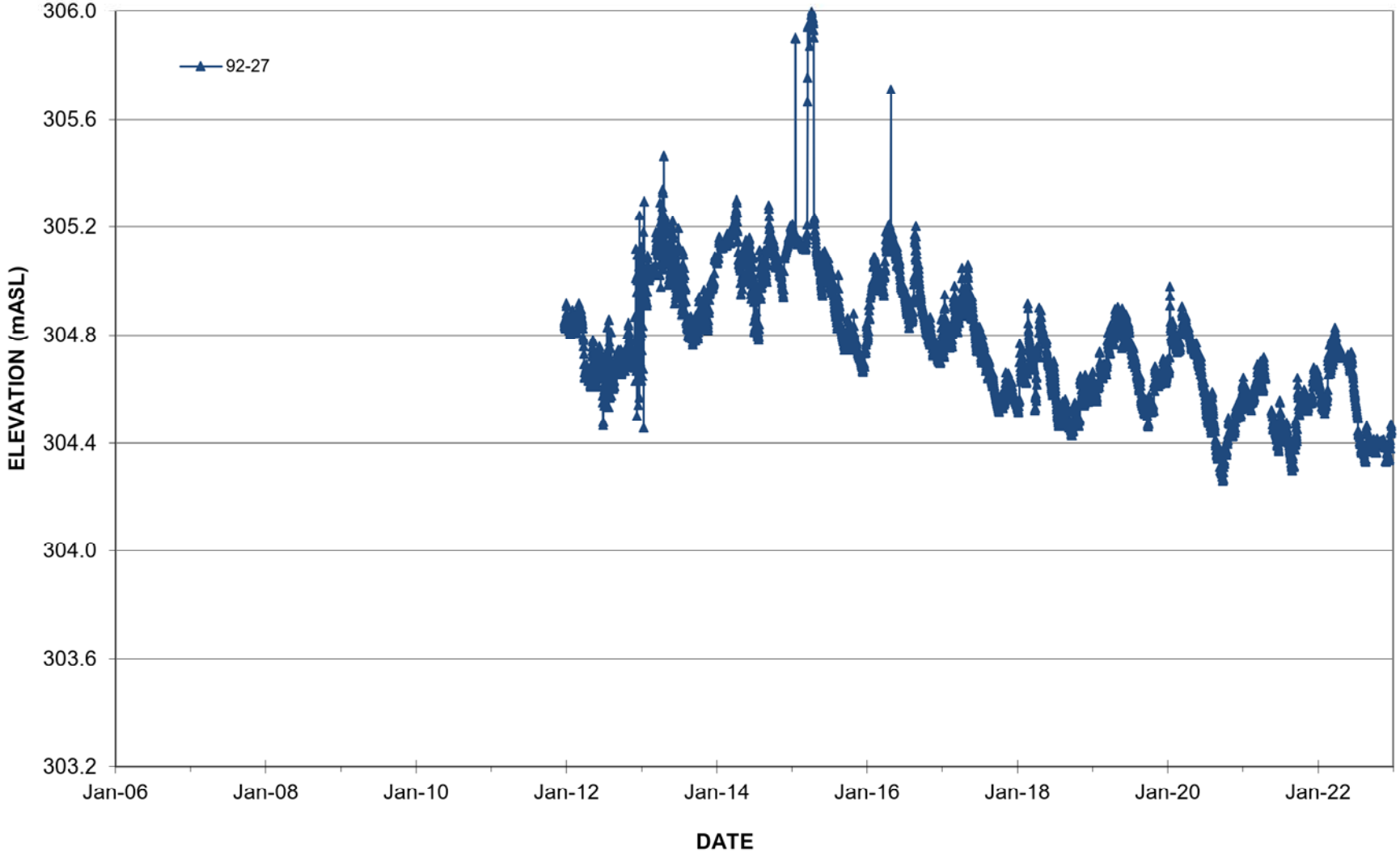
GROUNDWATER HYDROGRAPH
MULTI-LEVEL MONITOR 92-13

FIGURE B-32



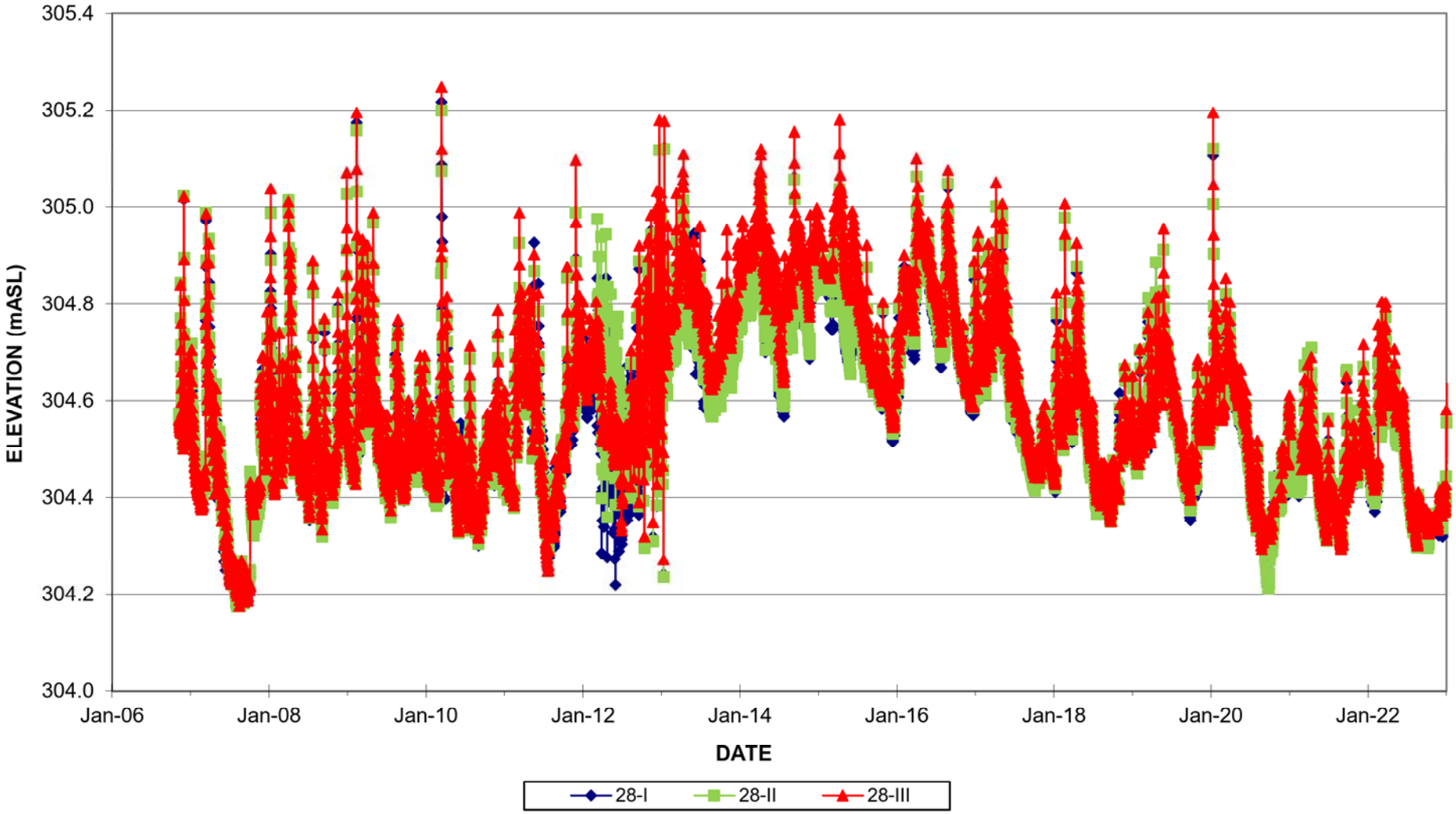
GROUNDWATER HYDROGRAPH
MONITOR 92-27

FIGURE B-33



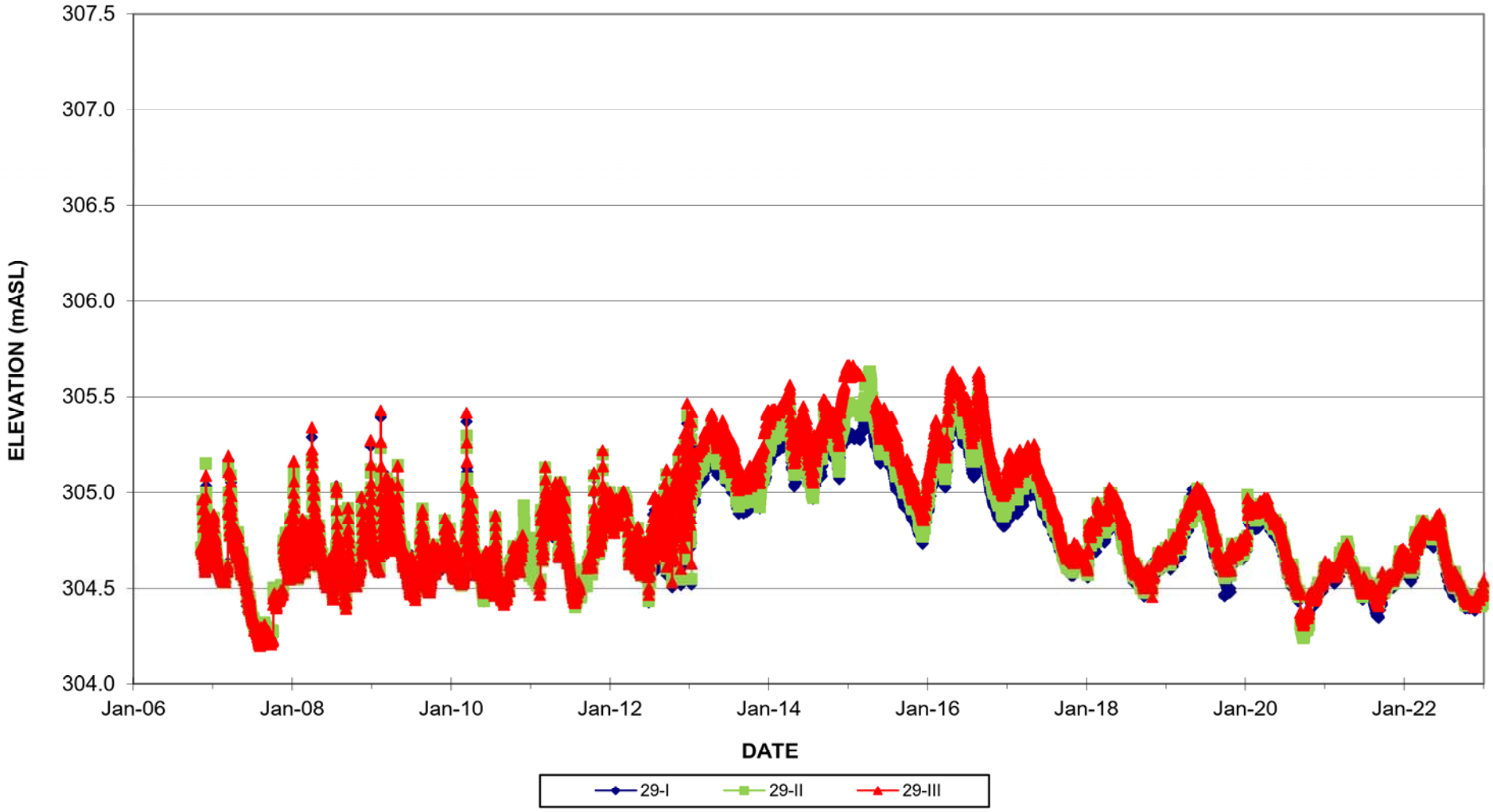
GROUNDWATER HYDROGRAPH
MULTI-LEVEL MONITOR 92-28

FIGURE B-34



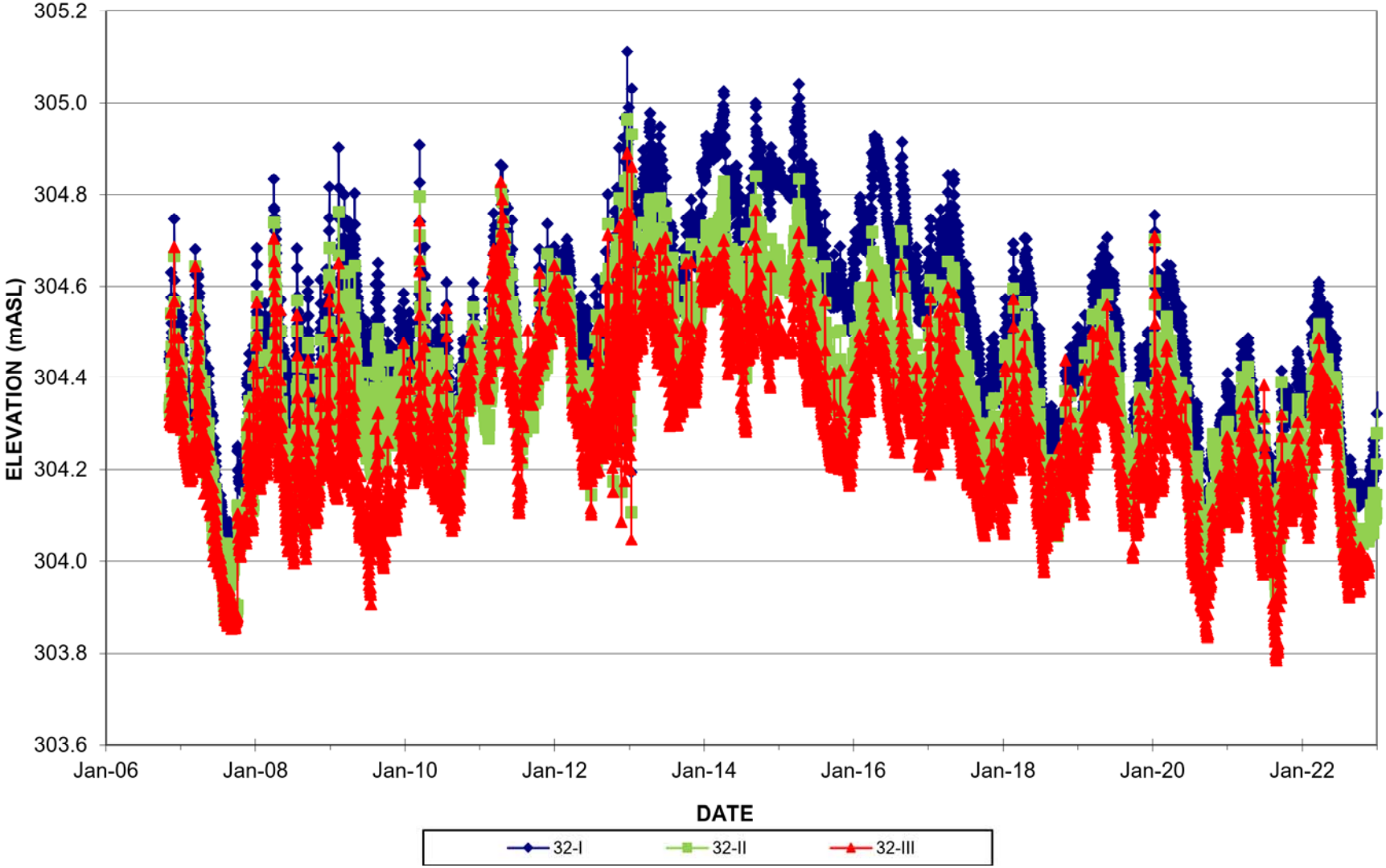
GROUNDWATER HYDROGRAPH
MULTI-LEVEL MONITOR 92-29

FIGURE B-35



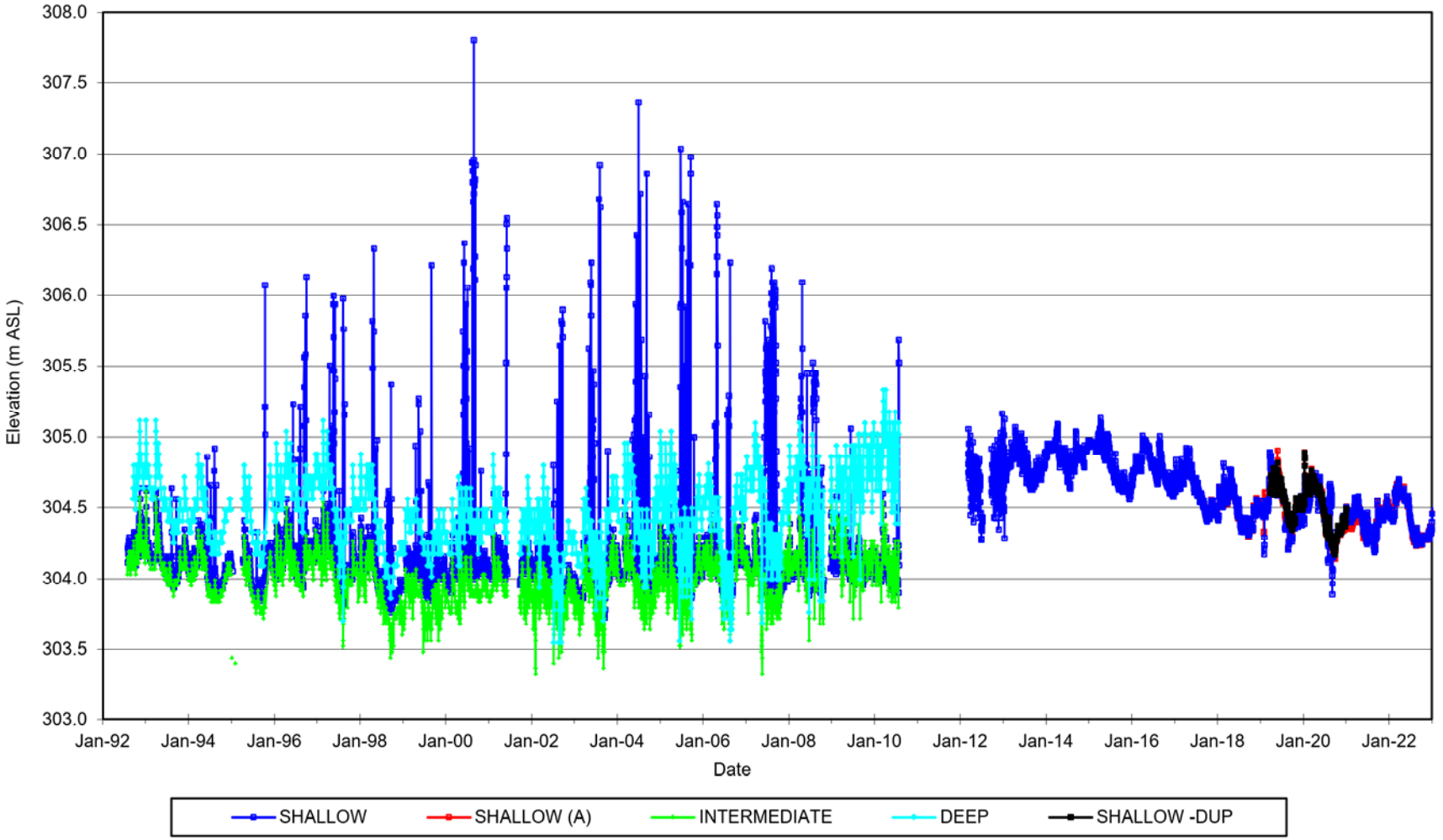
GROUNDWATER HYDROGRAPH
MULTI-LEVEL MONITOR 92-32

FIGURE B-36



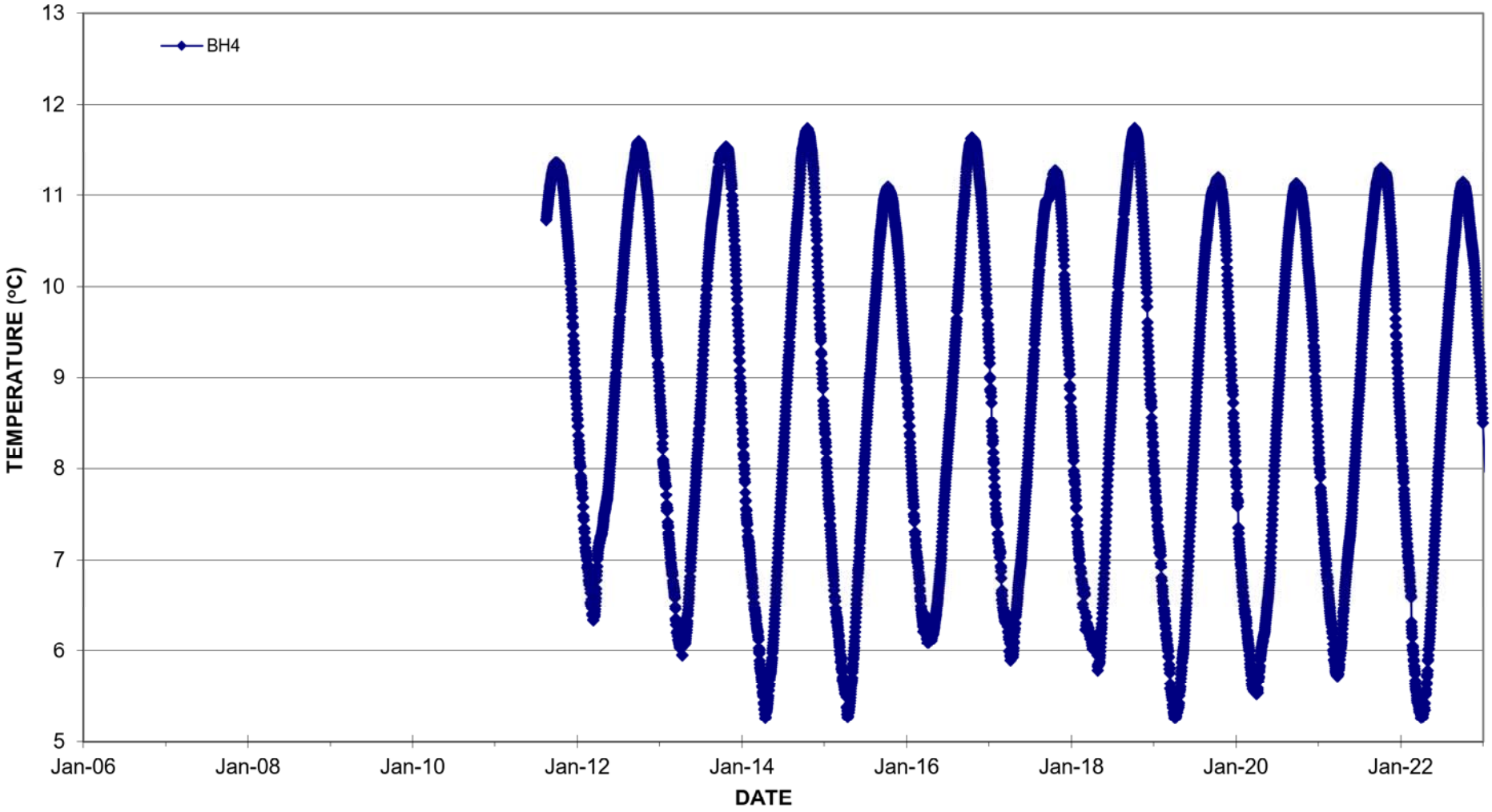
GROUNDWATER HYDROGRAPH
MULTI-LEVEL MONITOR 92-33

FIGURE B-37



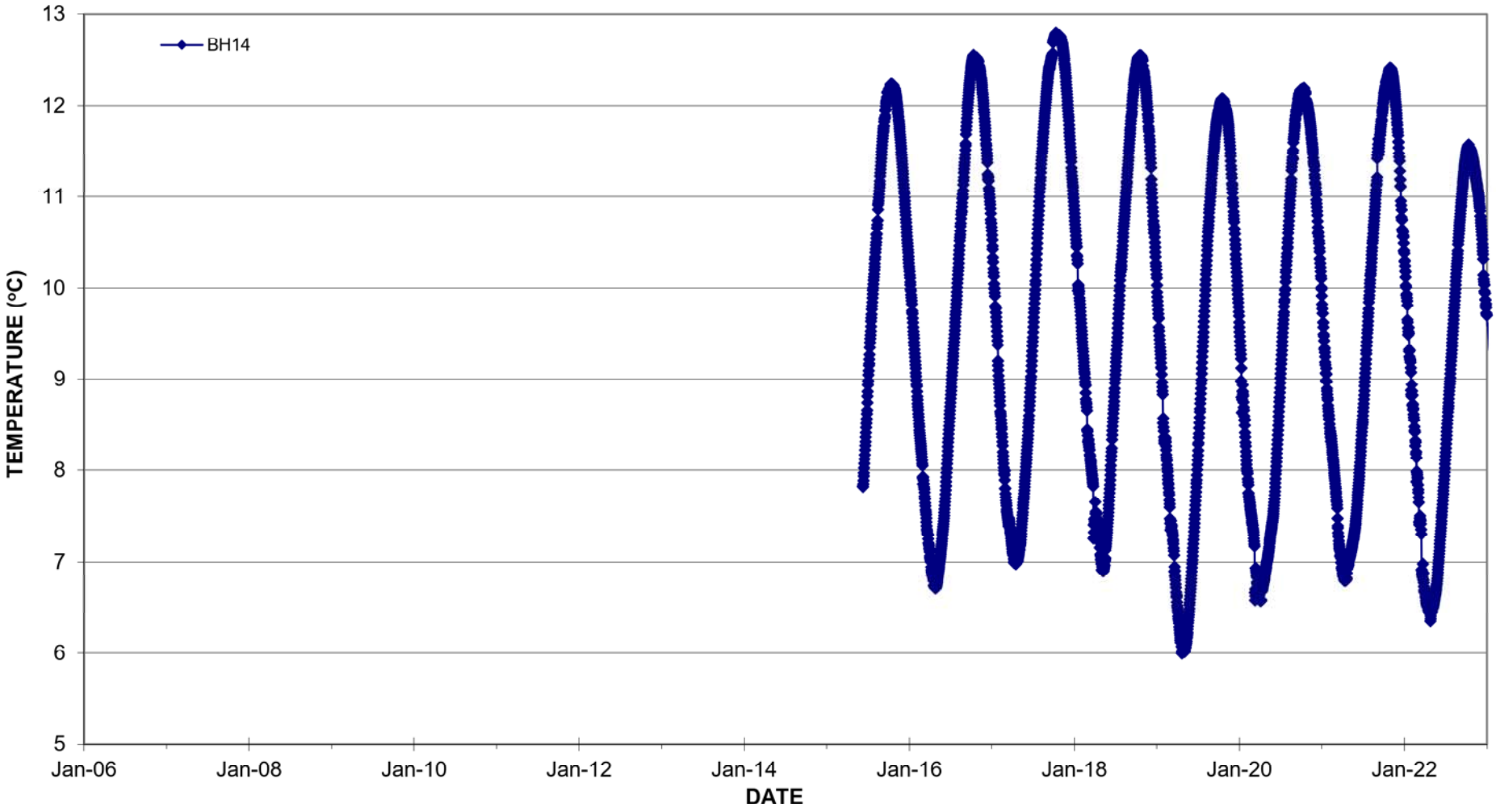
GROUNDWATER THERMOGRAPH
MONITOR BH4

FIGURE B-38



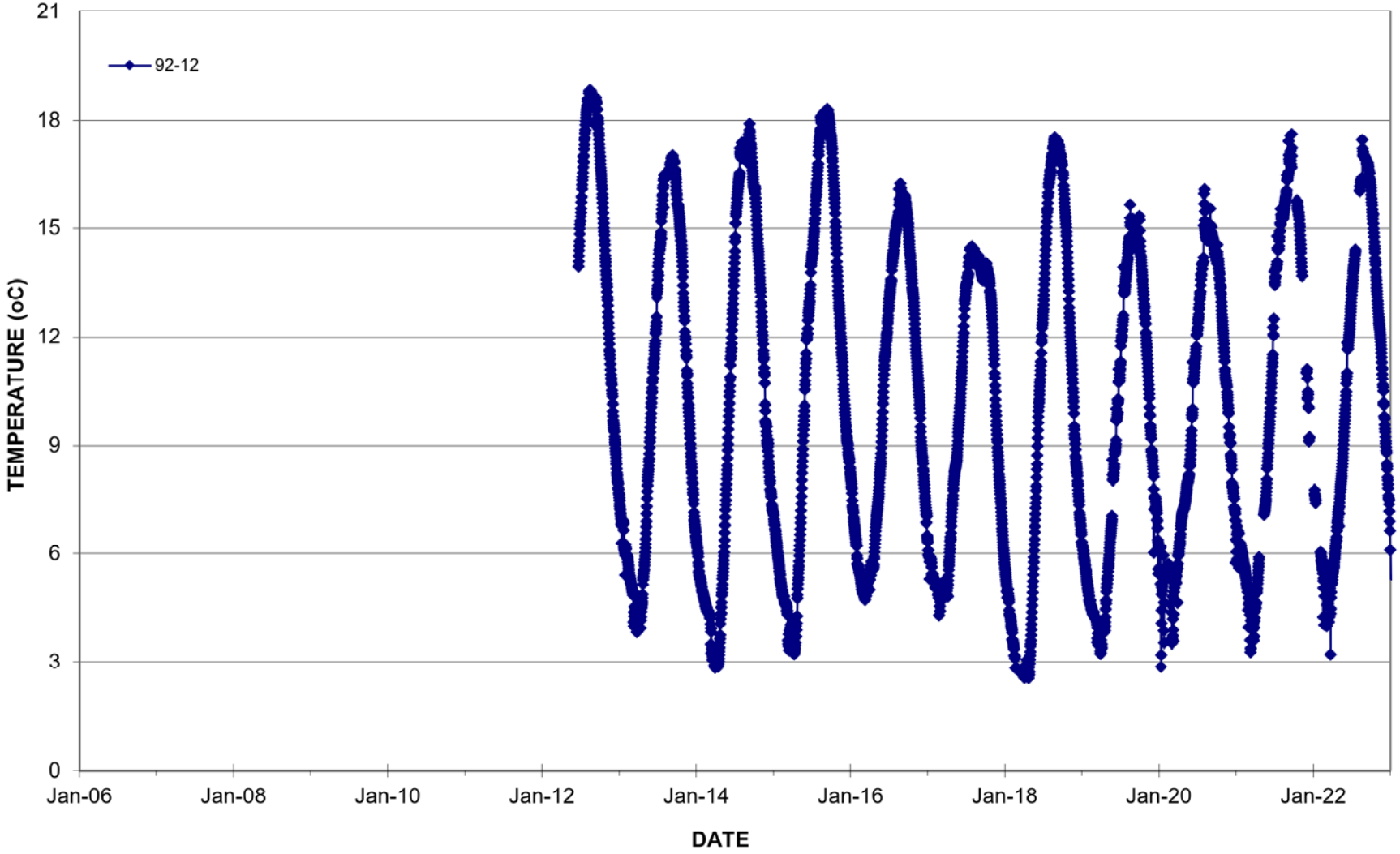
GROUNDWATER THERMOGRAPH
MONITOR BH14

FIGURE B-39



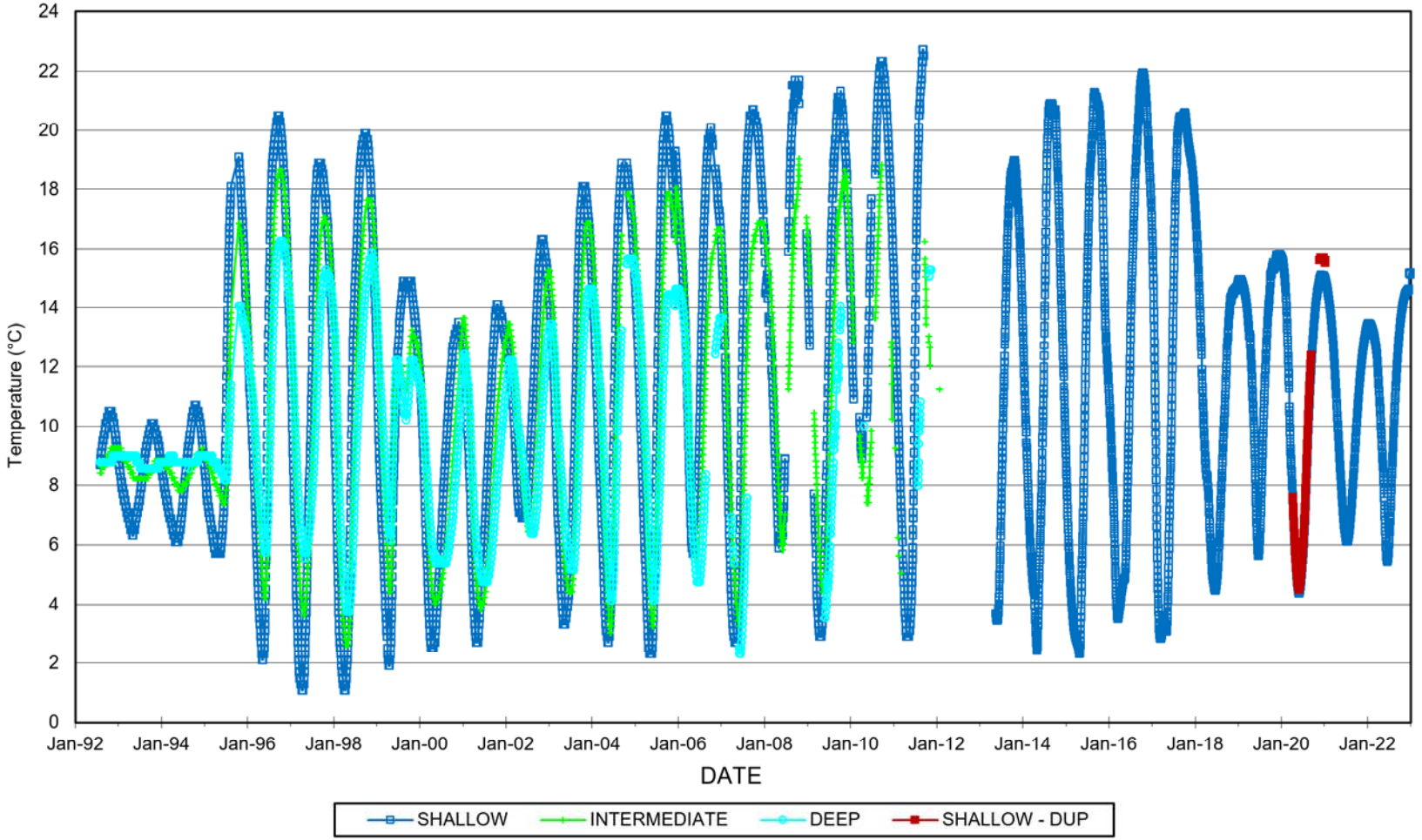
GROUNDWATER THERMOGRAPH
MONITOR 92-12

FIGURE B-40



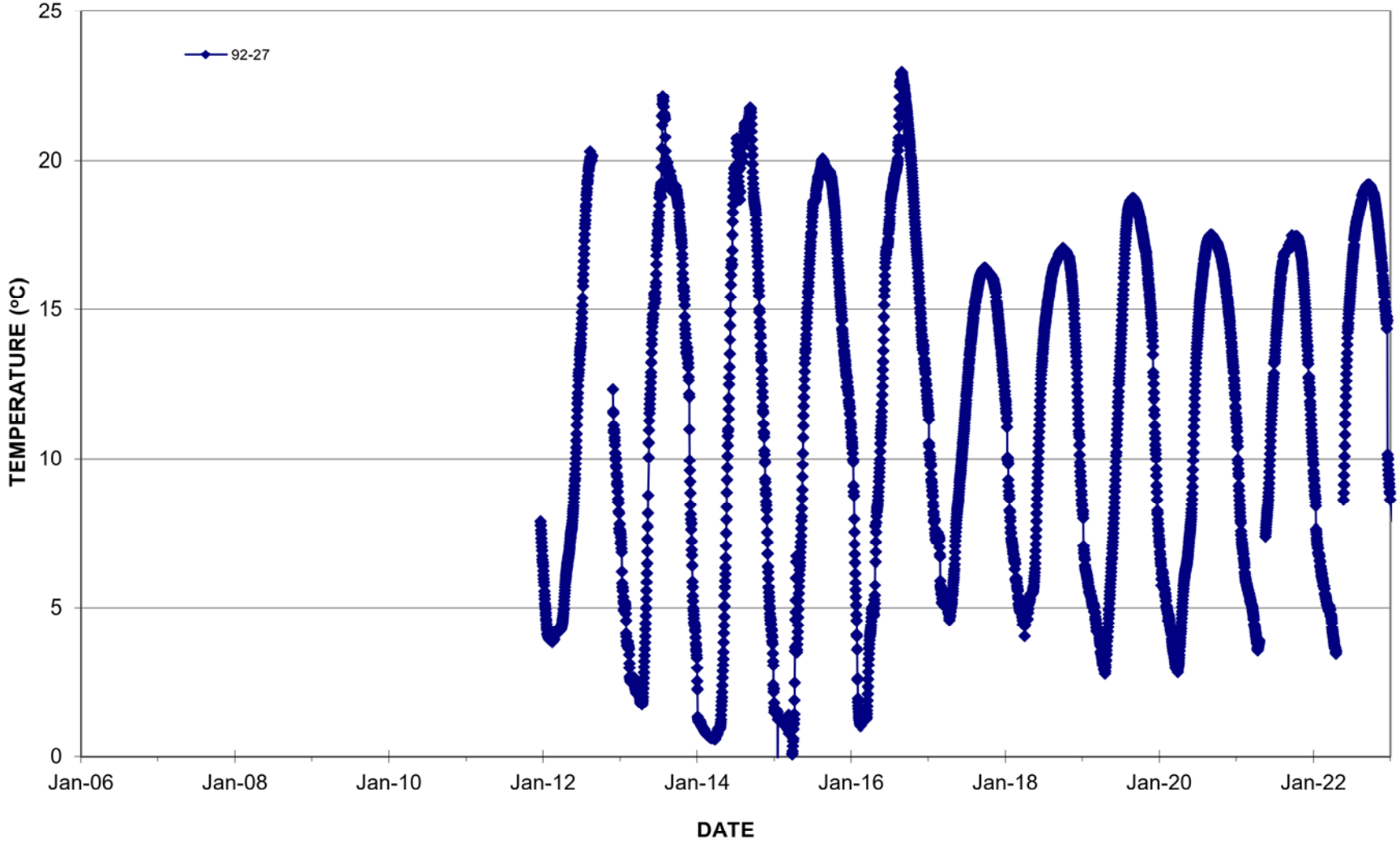
GROUNDWATER THERMOGRAPH
MULTI-LEVEL MONITOR 92-13

FIGURE B-41



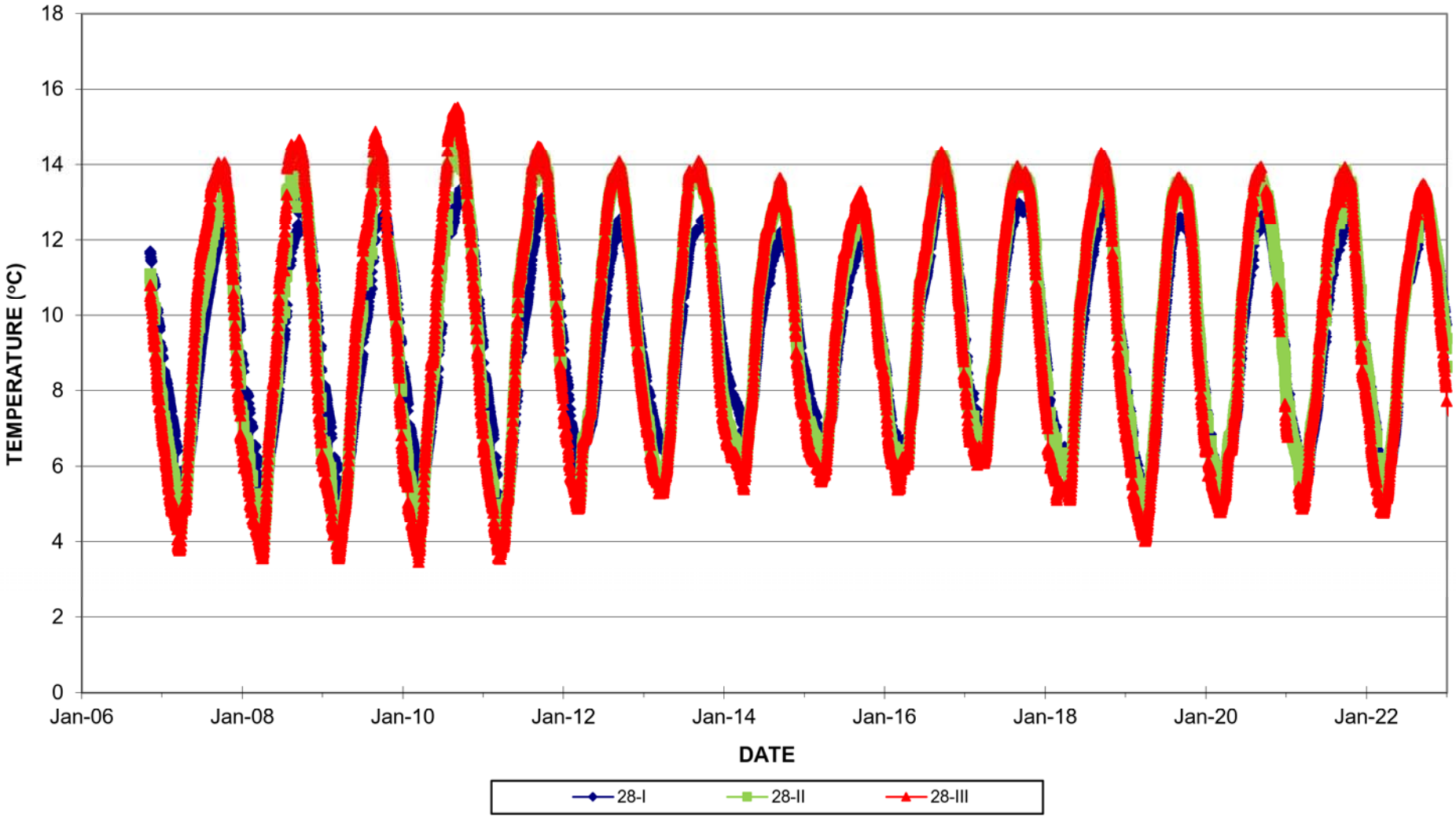
GROUNDWATER THERMOGRAPH
MONITOR 92-27

FIGURE B-42



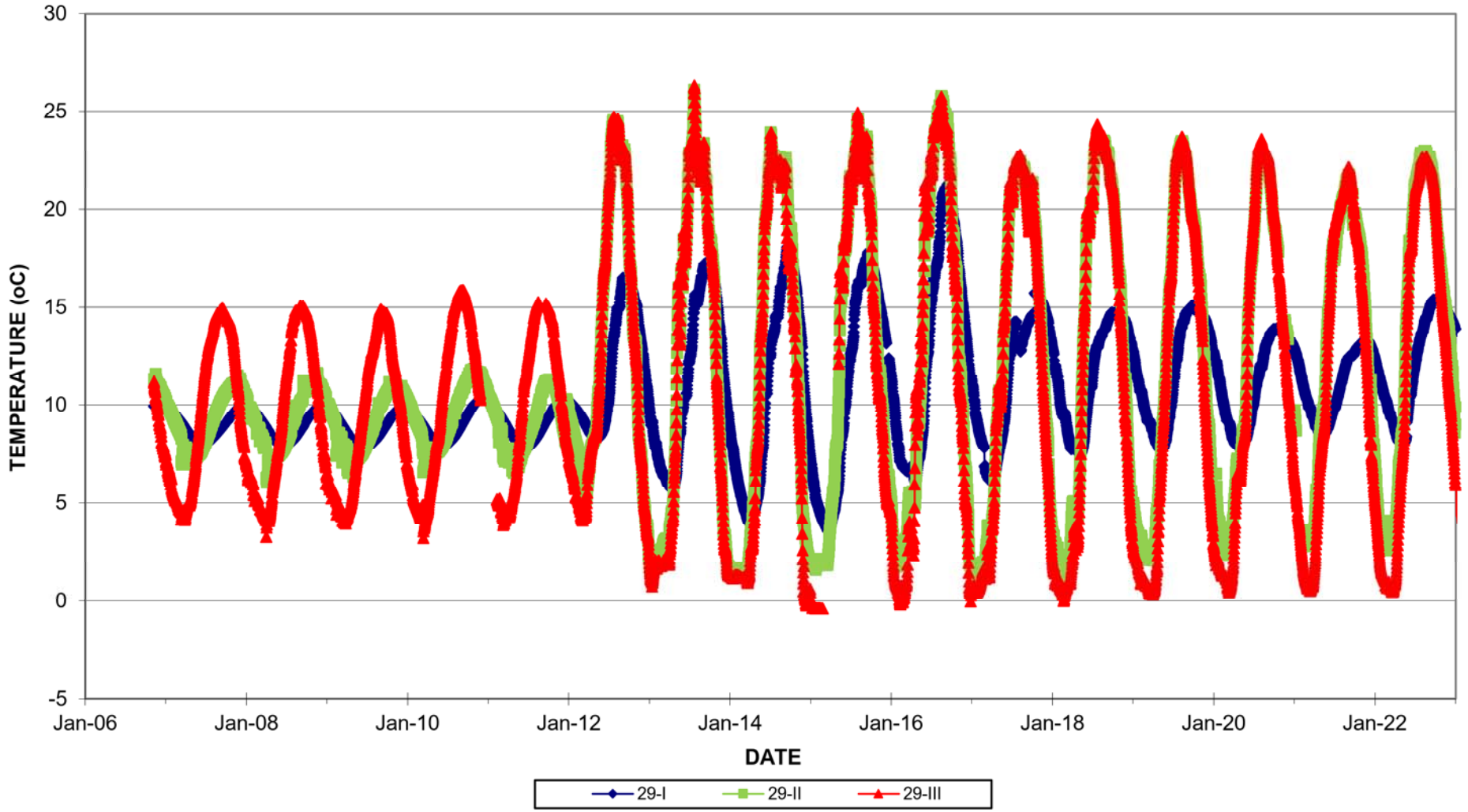
GROUNDWATER THERMOGRAPH
MULTI-LEVEL MONITOR 92-28

FIGURE B-43



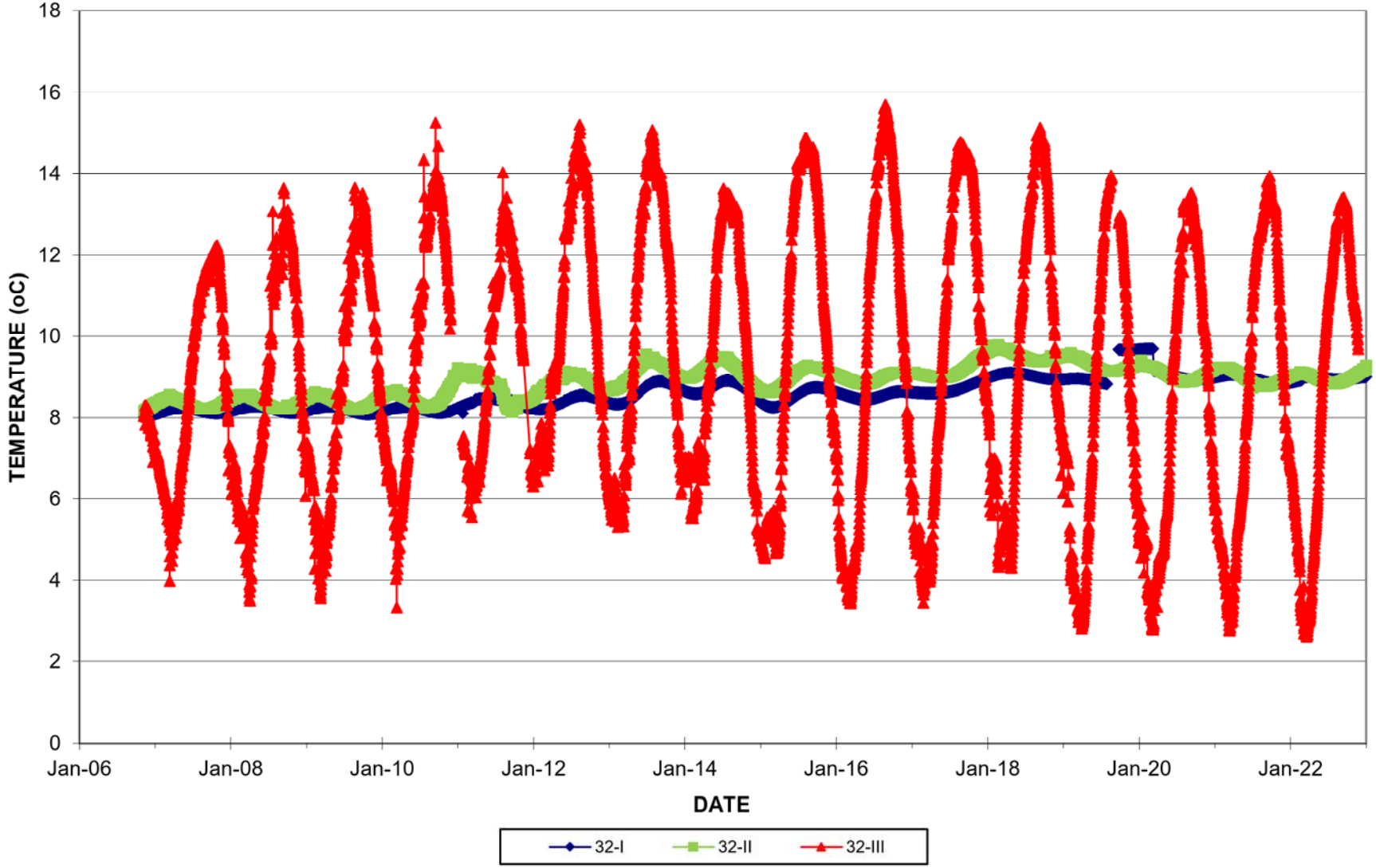
GROUNDWATER THERMOGRAPH
MULTI-LEVEL MONITOR 92-29

FIGURE B-44



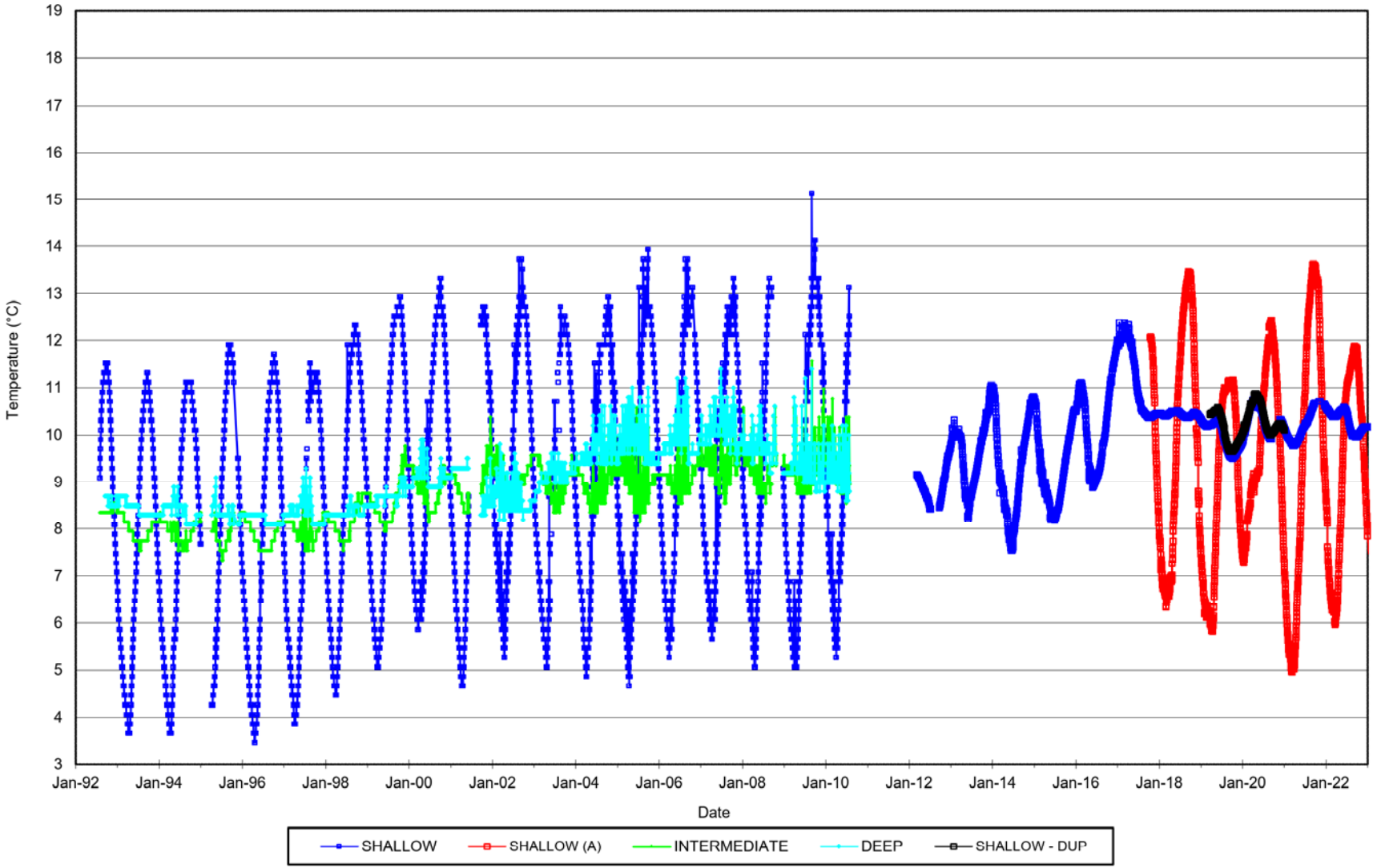
GROUNDWATER THERMOGRAPH
MULTI-LEVEL MONITOR 92-32

FIGURE B-45



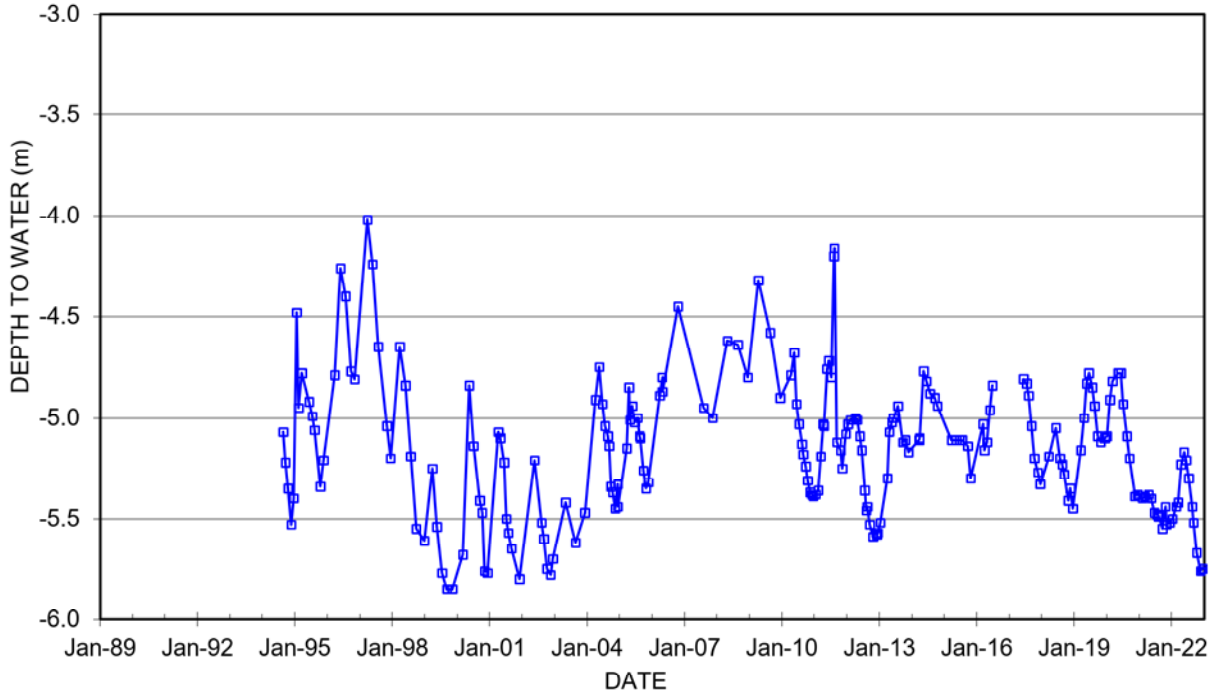
GROUNDWATER THERMOGRAPH
MULTI-LEVEL MONITOR 92-33

FIGURE B-46



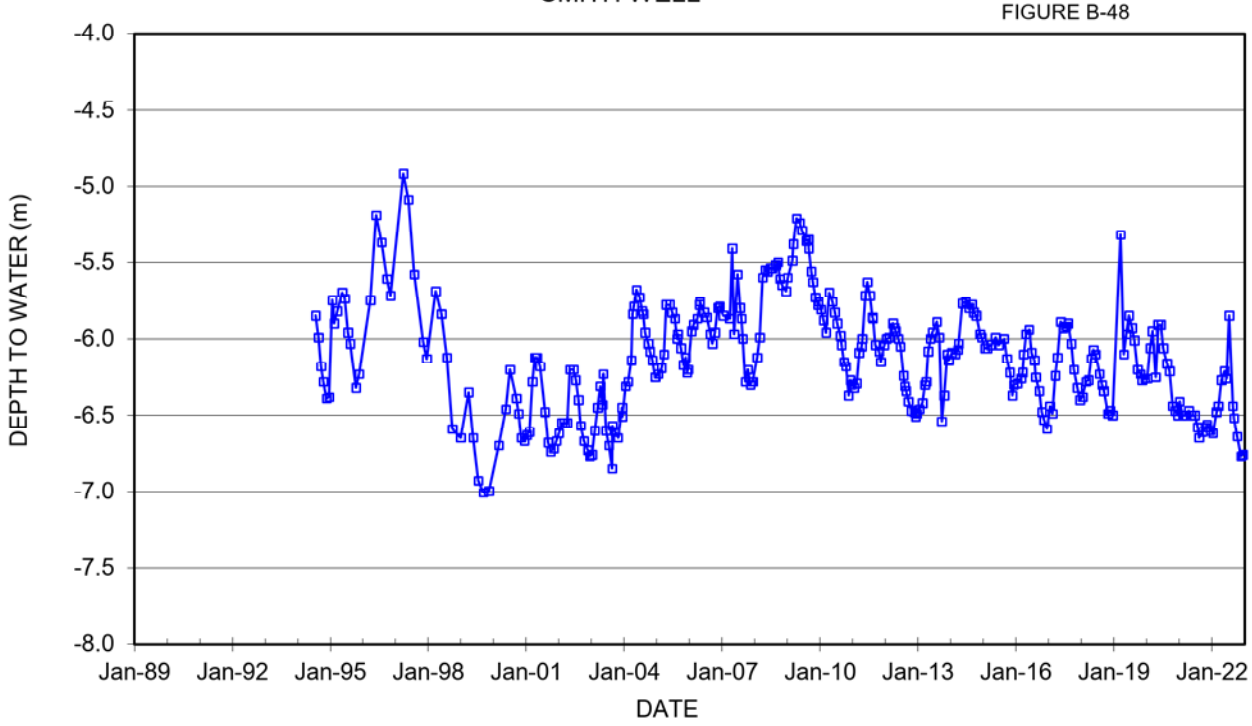
GROUNDWATER HYDROGRAPH
NORTH FARMHOUSE WELL (MOE WELL 4794)

FIGURE B-47



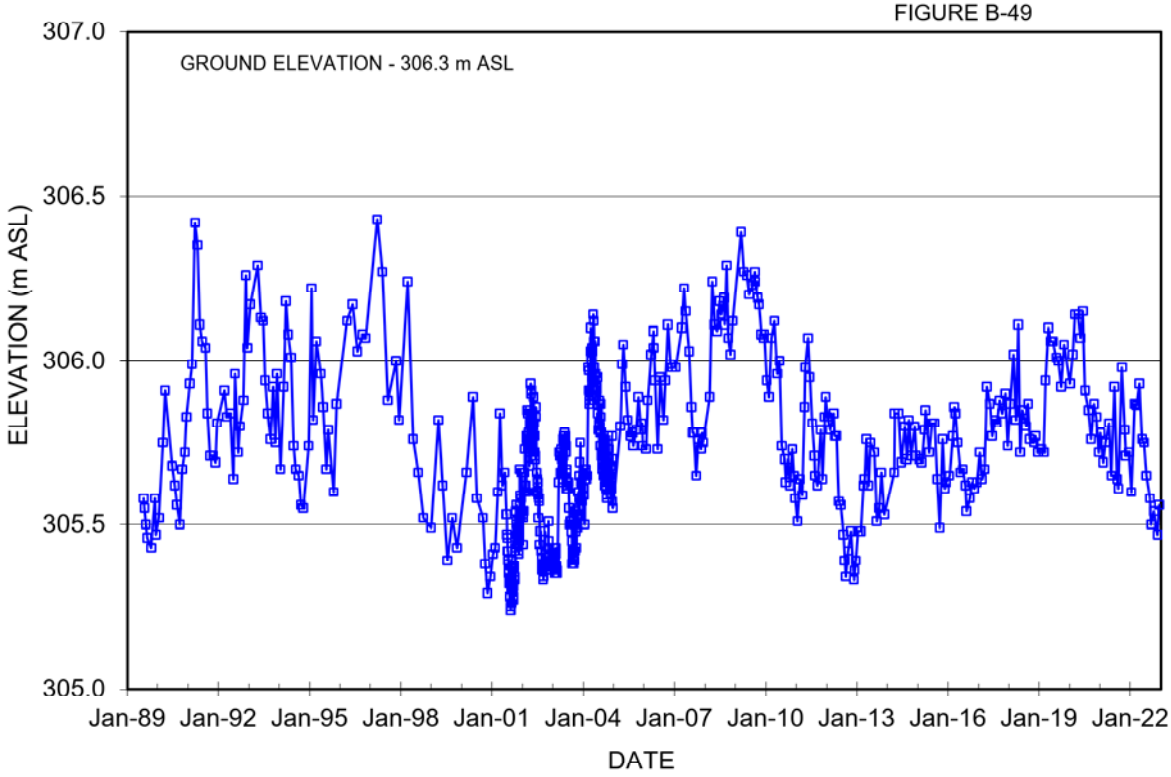
GROUNDWATER HYDROGRAPH
SMITH WELL

FIGURE B-48



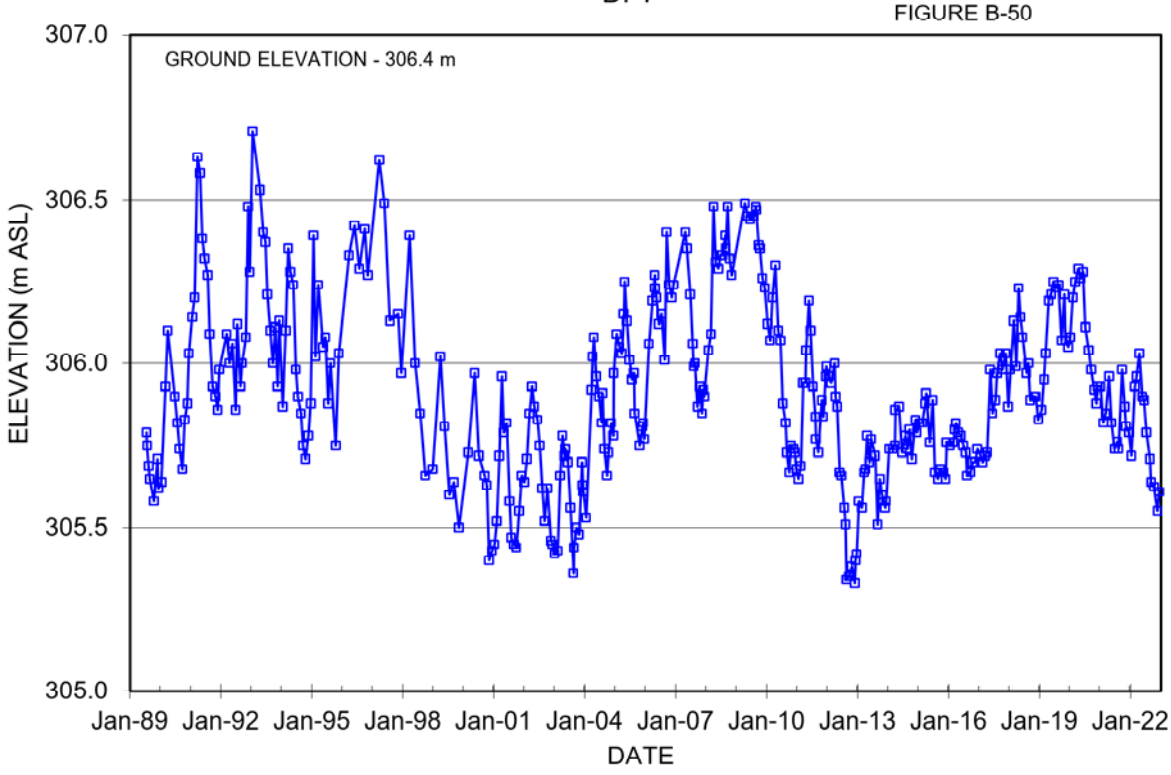
GROUNDWATER HYDROGRAPH
DP6

FIGURE B-49



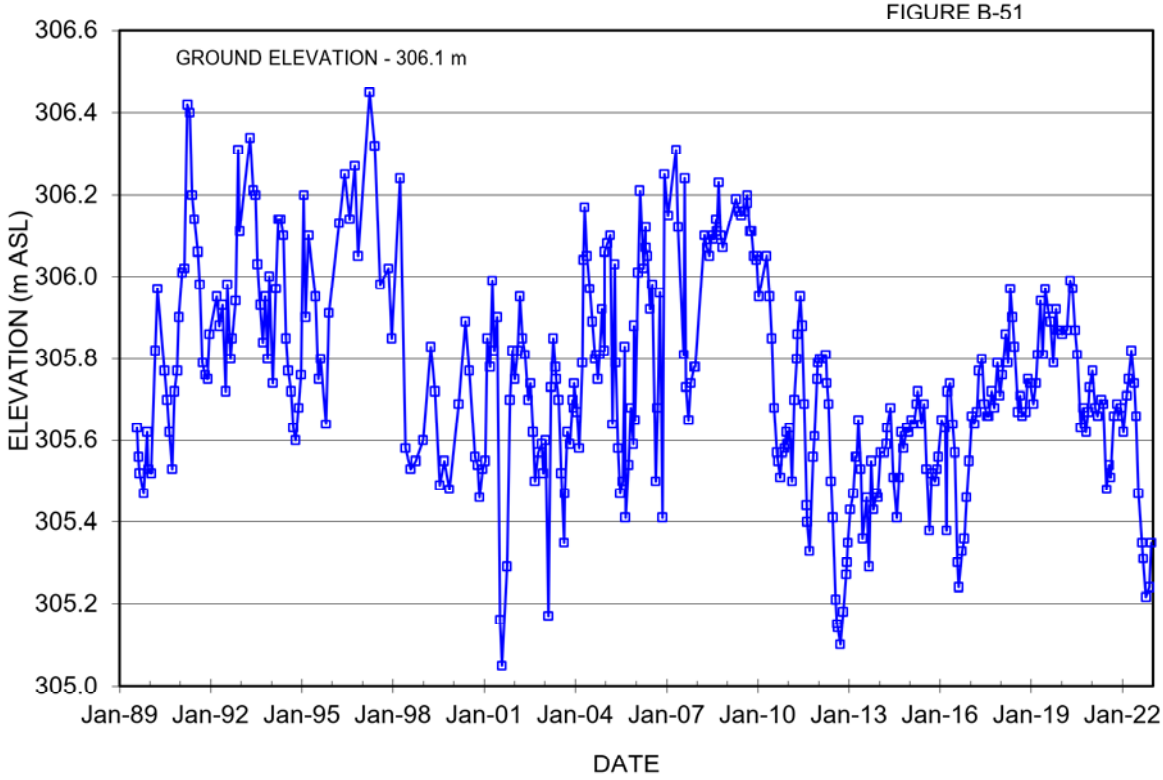
GROUNDWATER HYDROGRAPH
DP7

FIGURE B-50



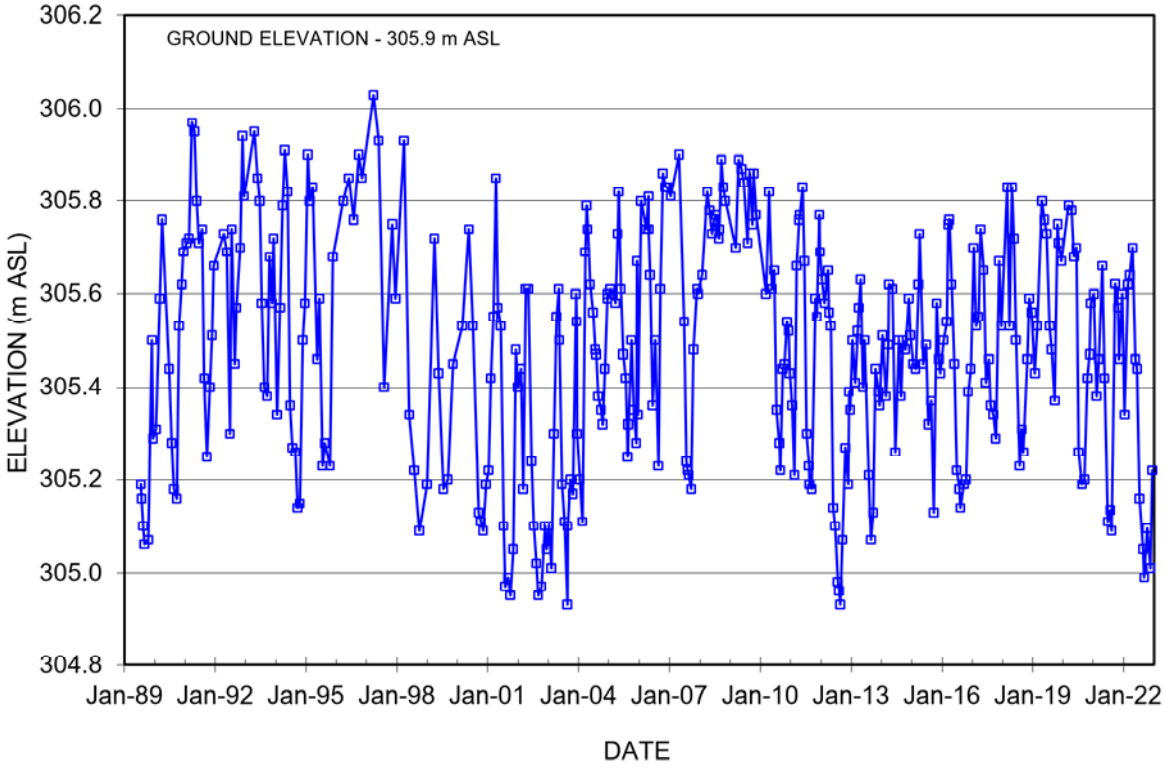
GROUNDWATER HYDROGRAPH
DP8

FIGURE B-51



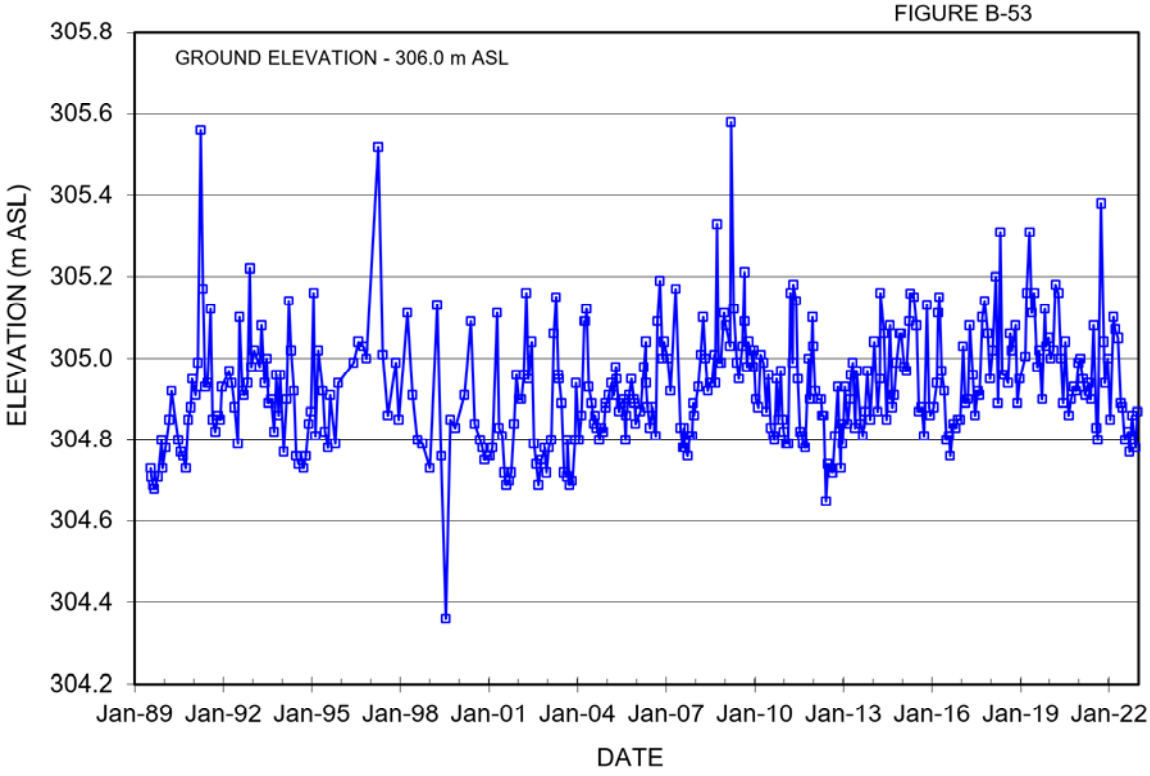
GROUNDWATER HYDROGRAPH
DP9

FIGURE B-52



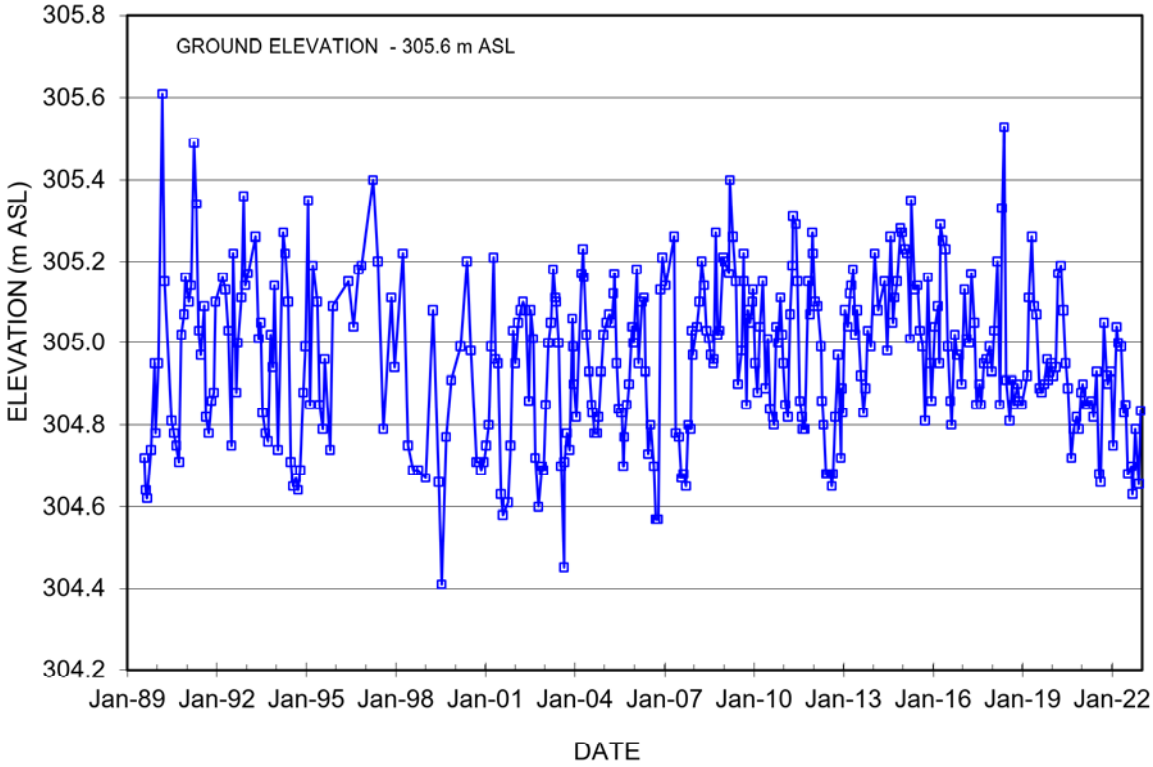
GROUNDWATER HYDROGRAPH
DP10

FIGURE B-53



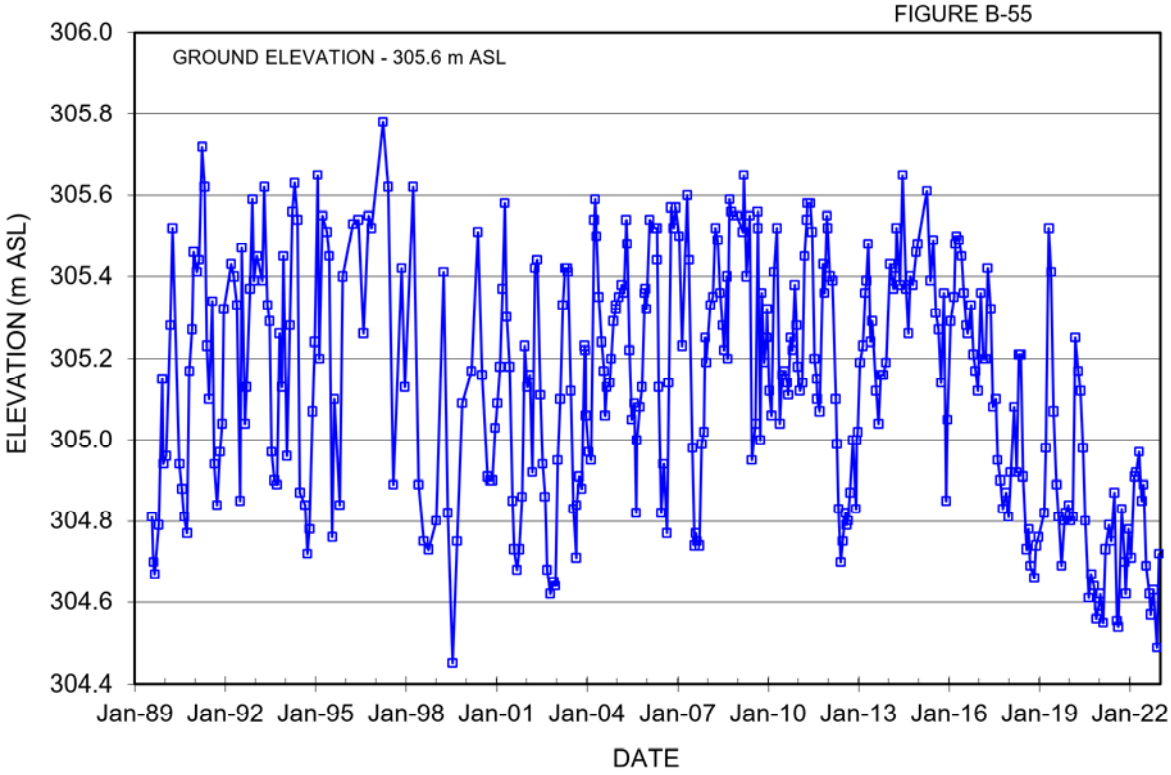
GROUNDWATER HYDROGRAPH
DP11

FIGURE B-54



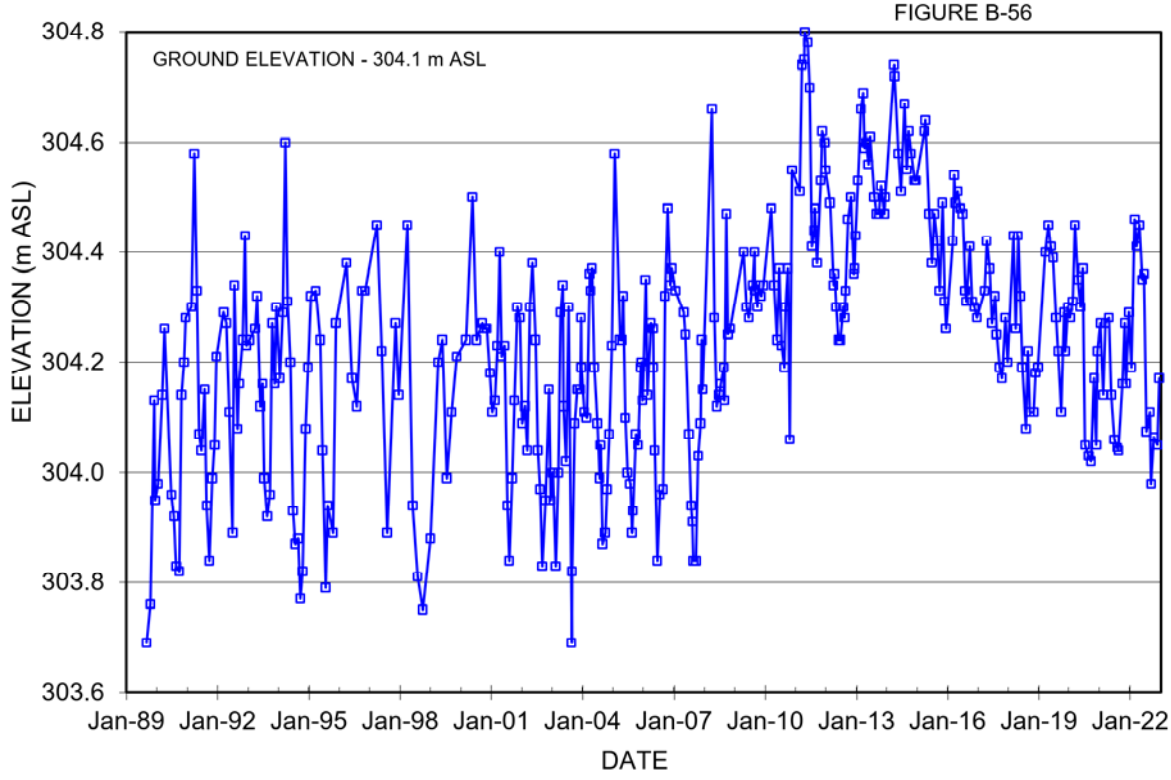
GROUNDWATER HYDROGRAPH
DP12

FIGURE B-55



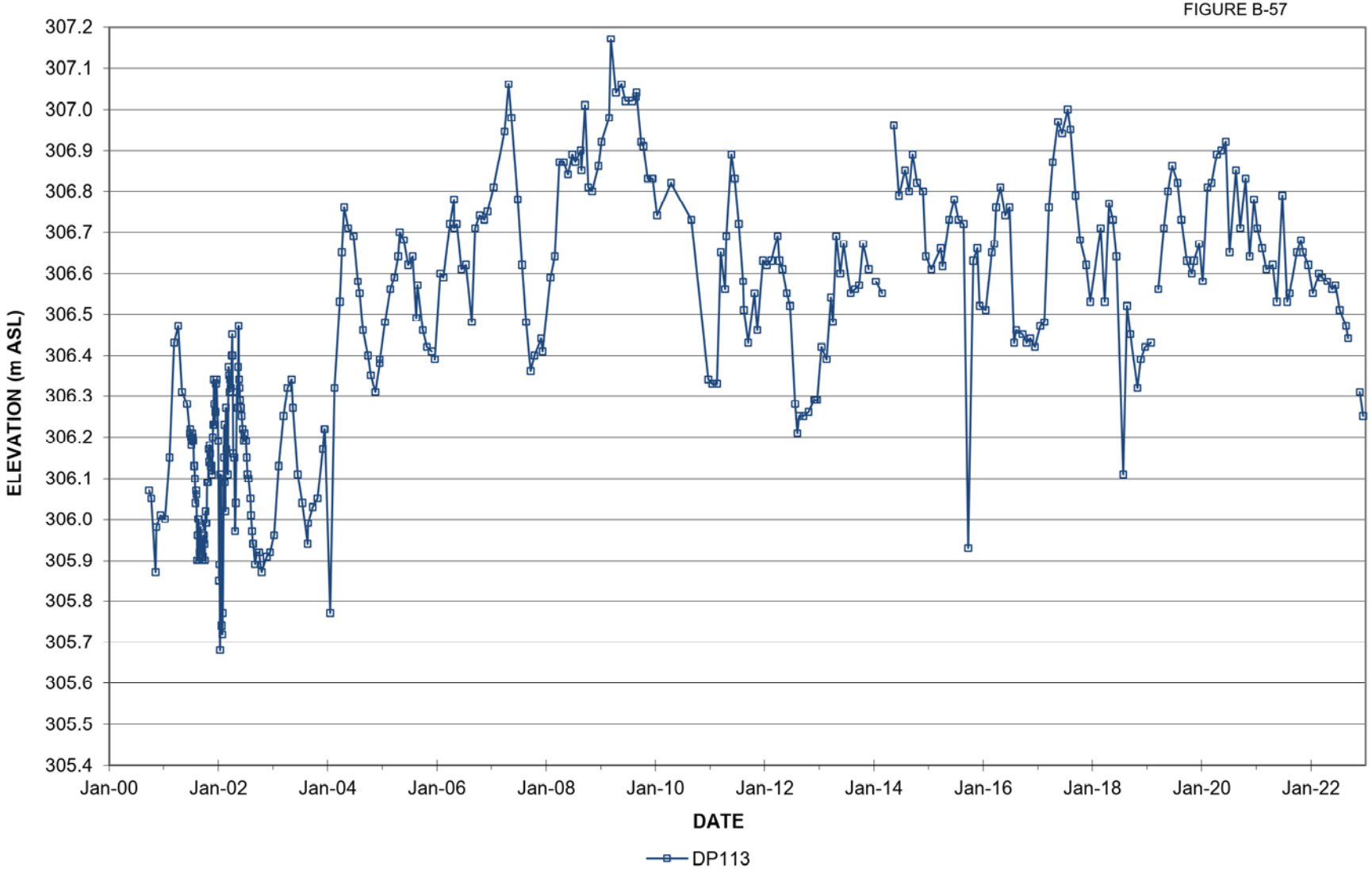
GROUNDWATER HYDROGRAPH
DP16

FIGURE B-56



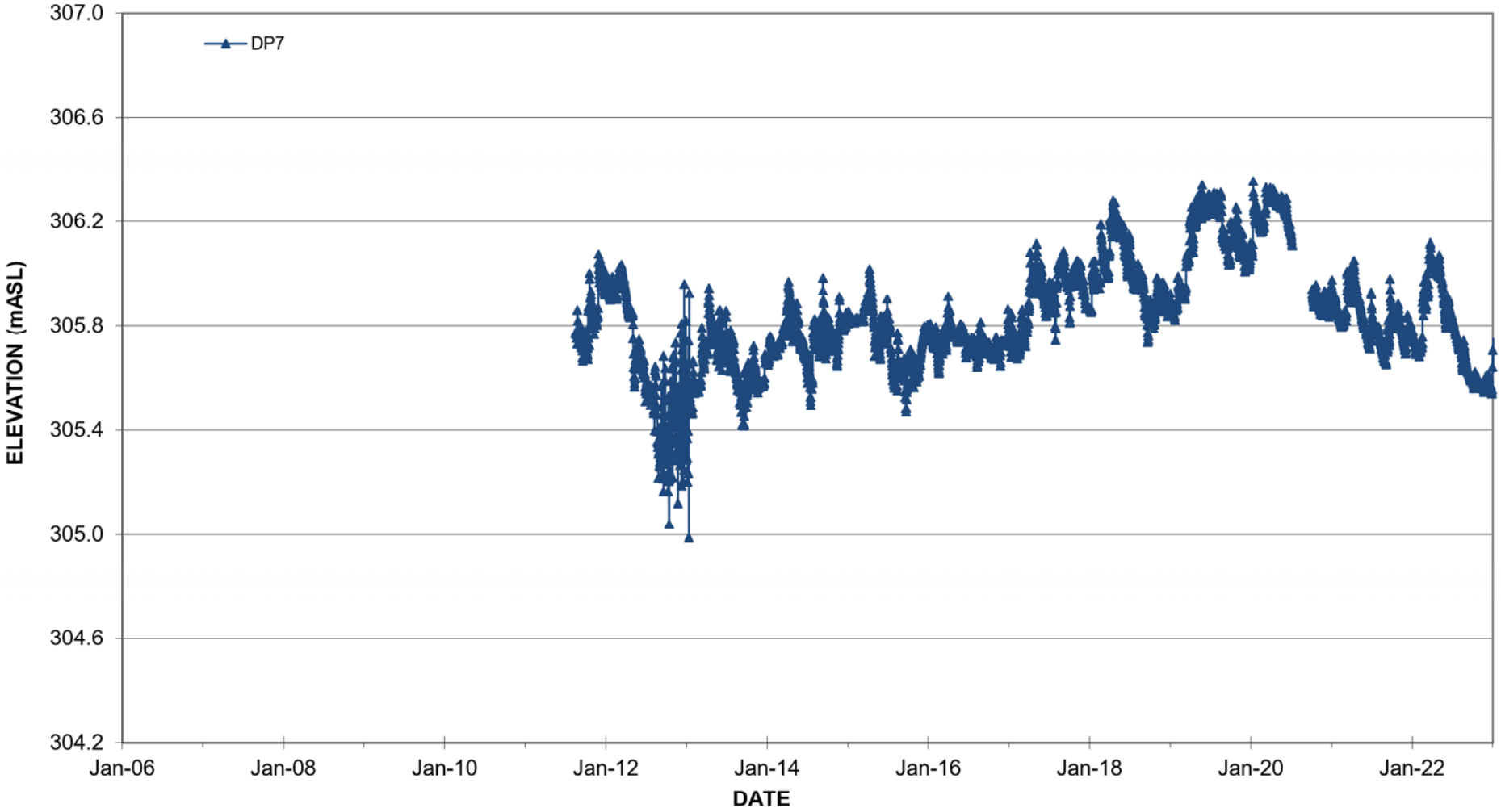
GROUNDWATER HYDROGRAPH
REID MONITOR

FIGURE B-57



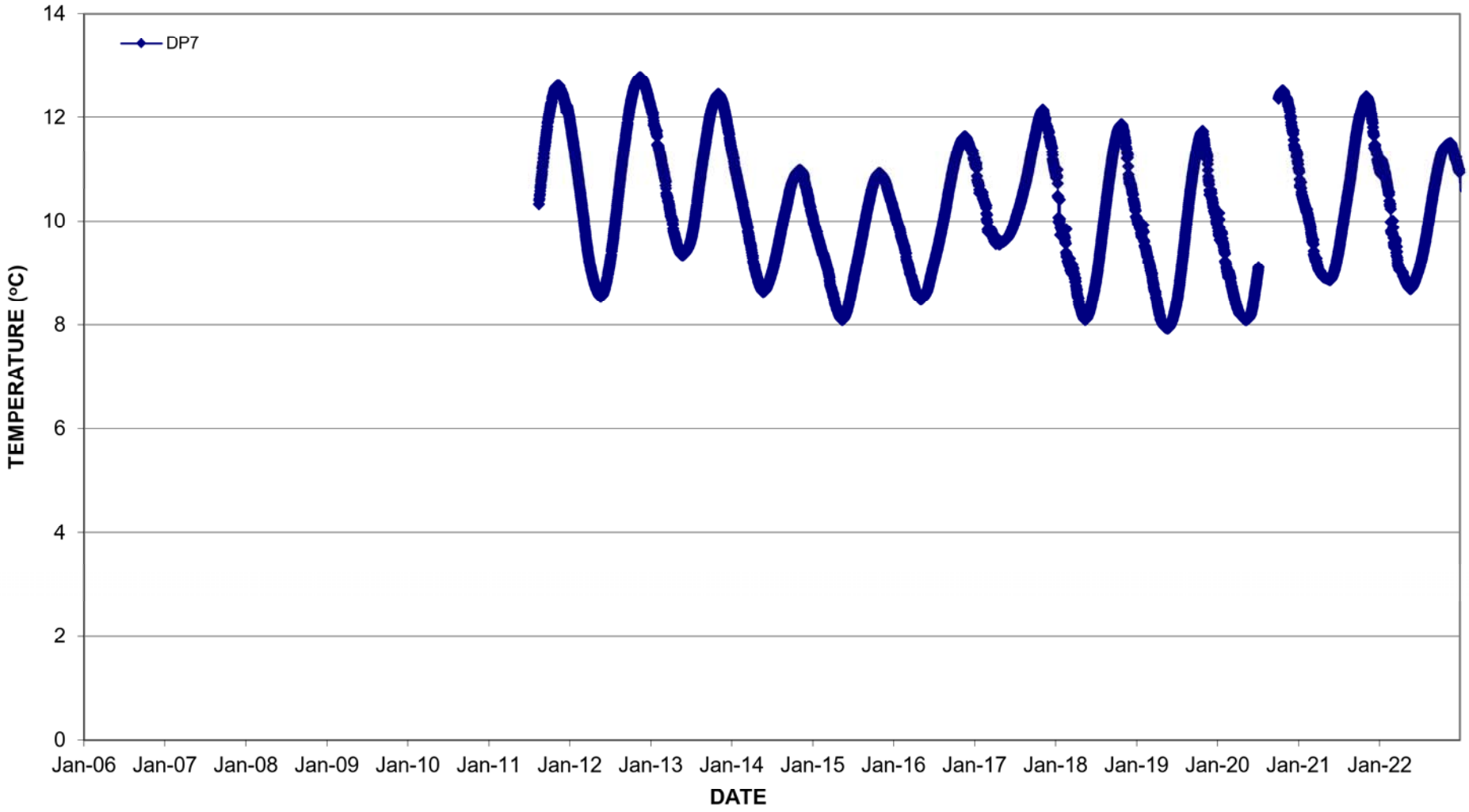
GROUNDWATER HYDROGRAPH
DP7

FIGURE B-58



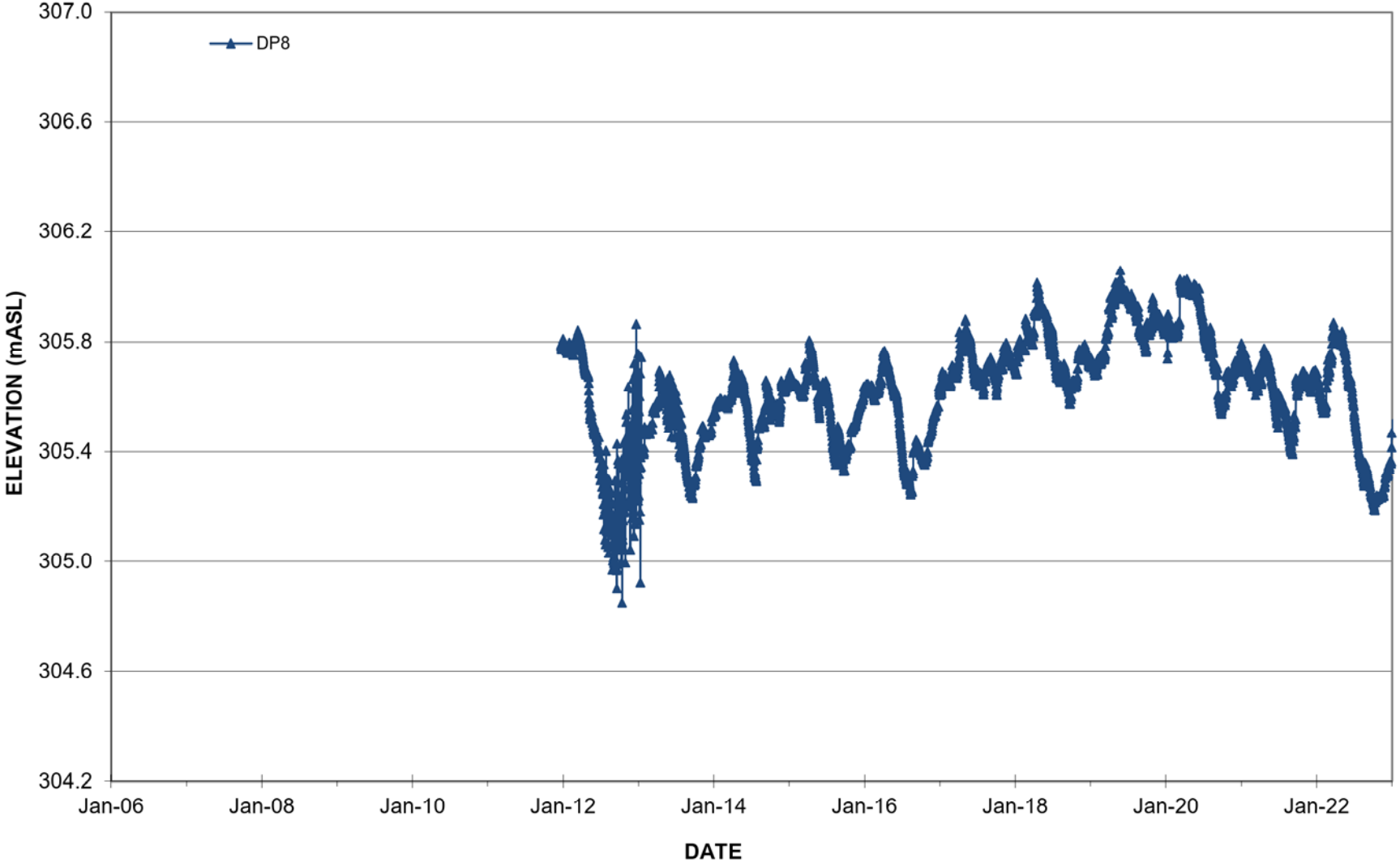
GROUNDWATER THERMOGRAPH
DP7

FIGURE B-59



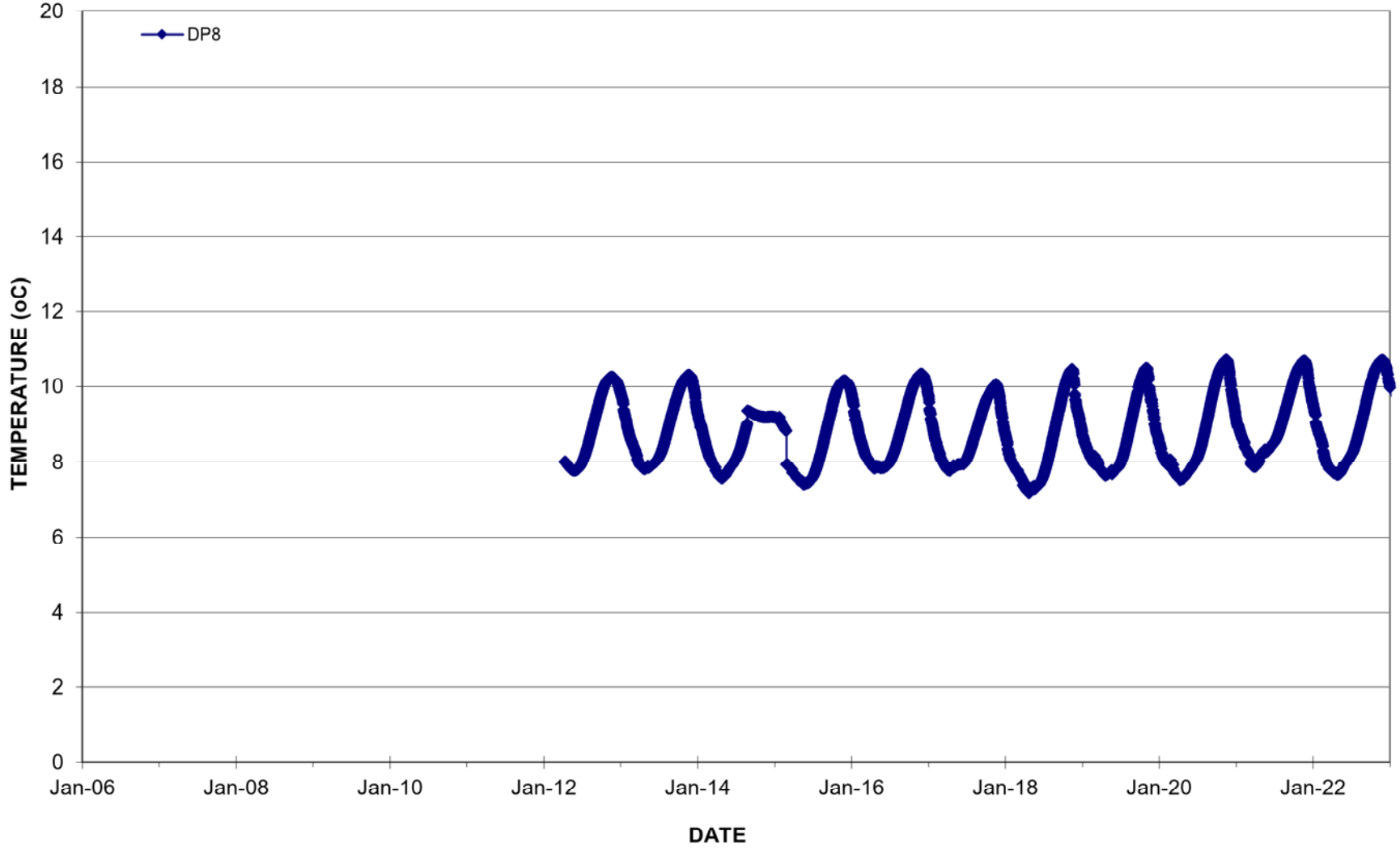
GROUNDWATER HYDROGRAPH
DP8

FIGURE B-60



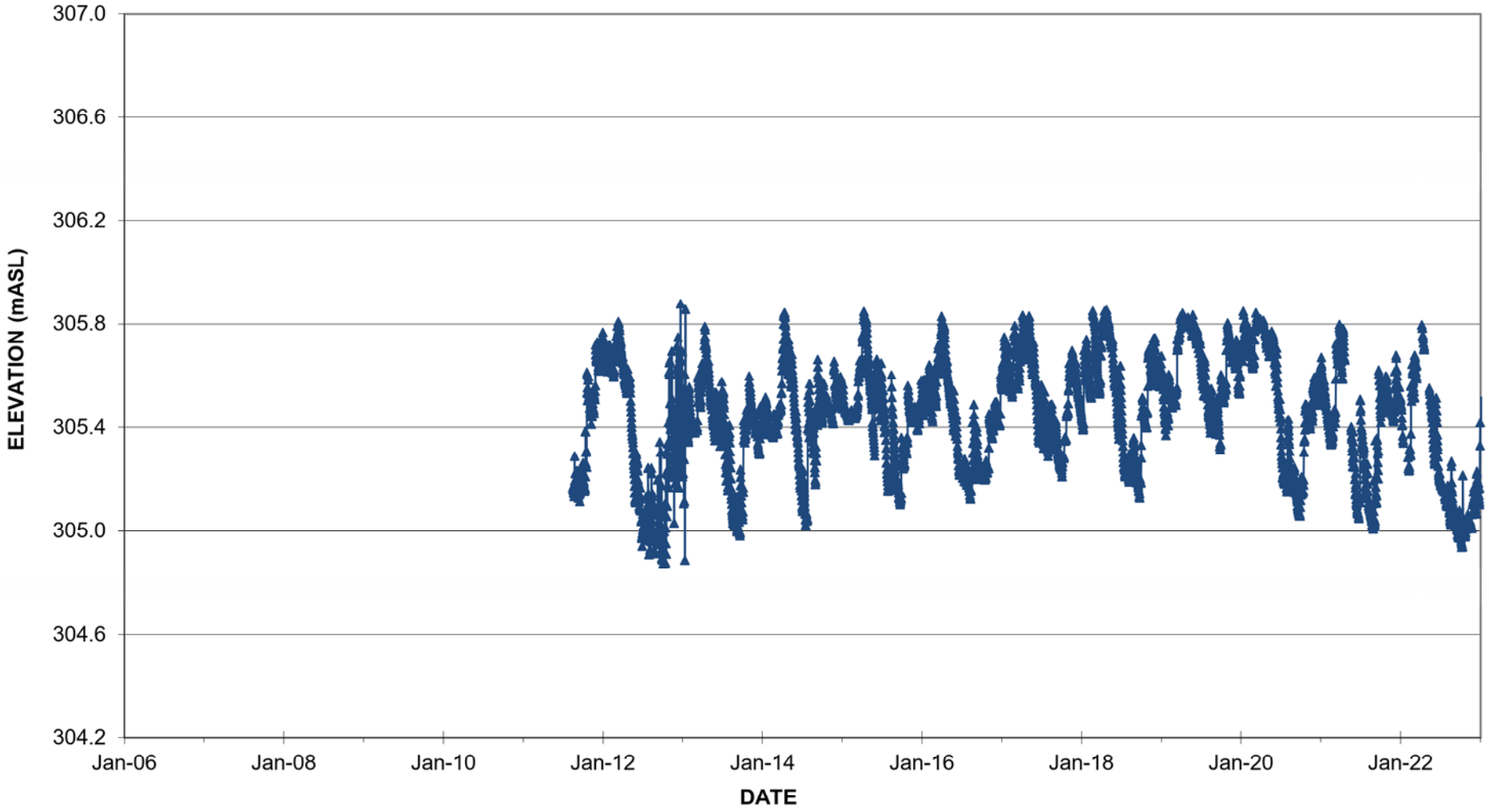
GROUNDWATER THERMOGRAPH
DP8

FIGURE B-61



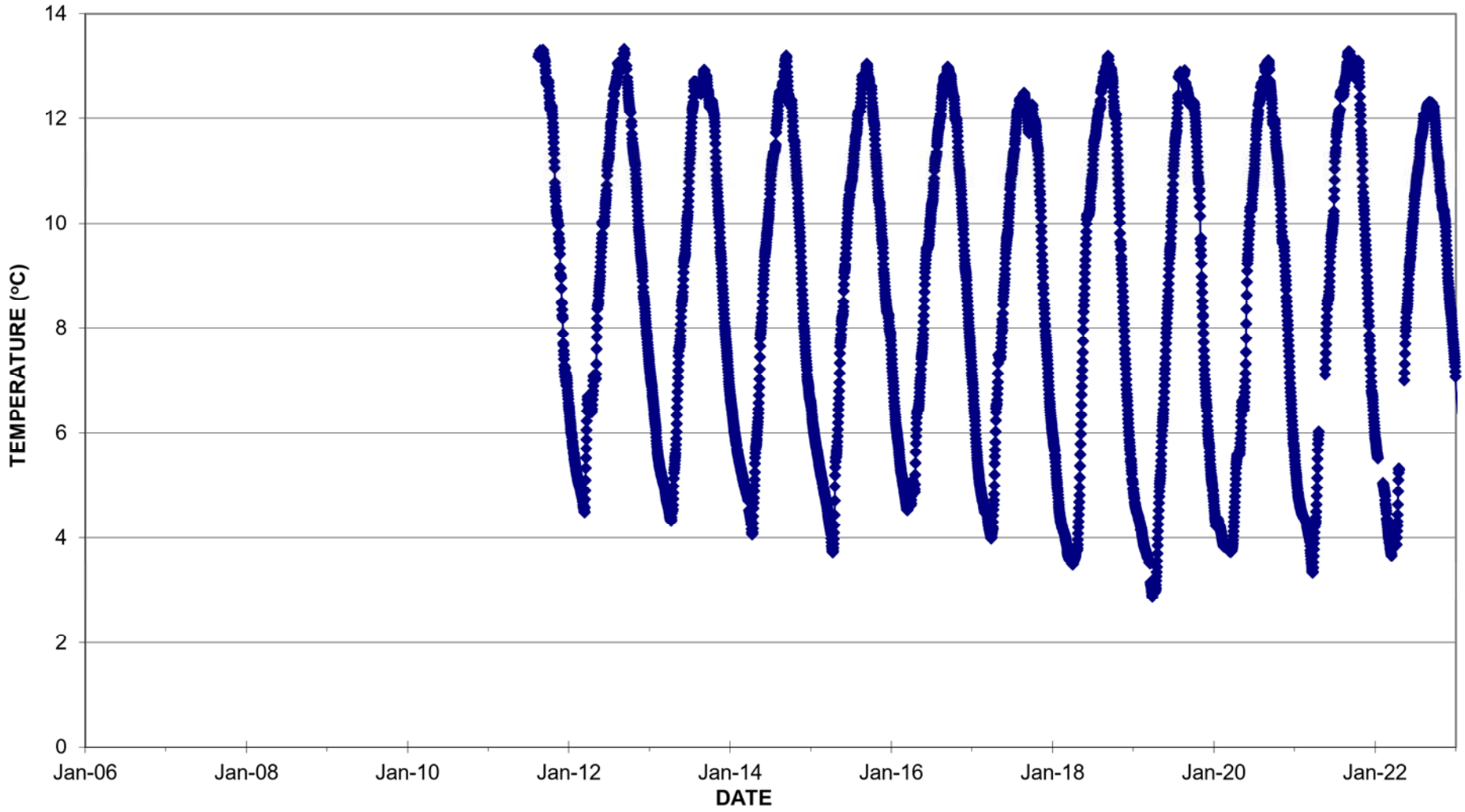
GROUNDWATER HYDROGRAPH
DP9

FIGURE B-62



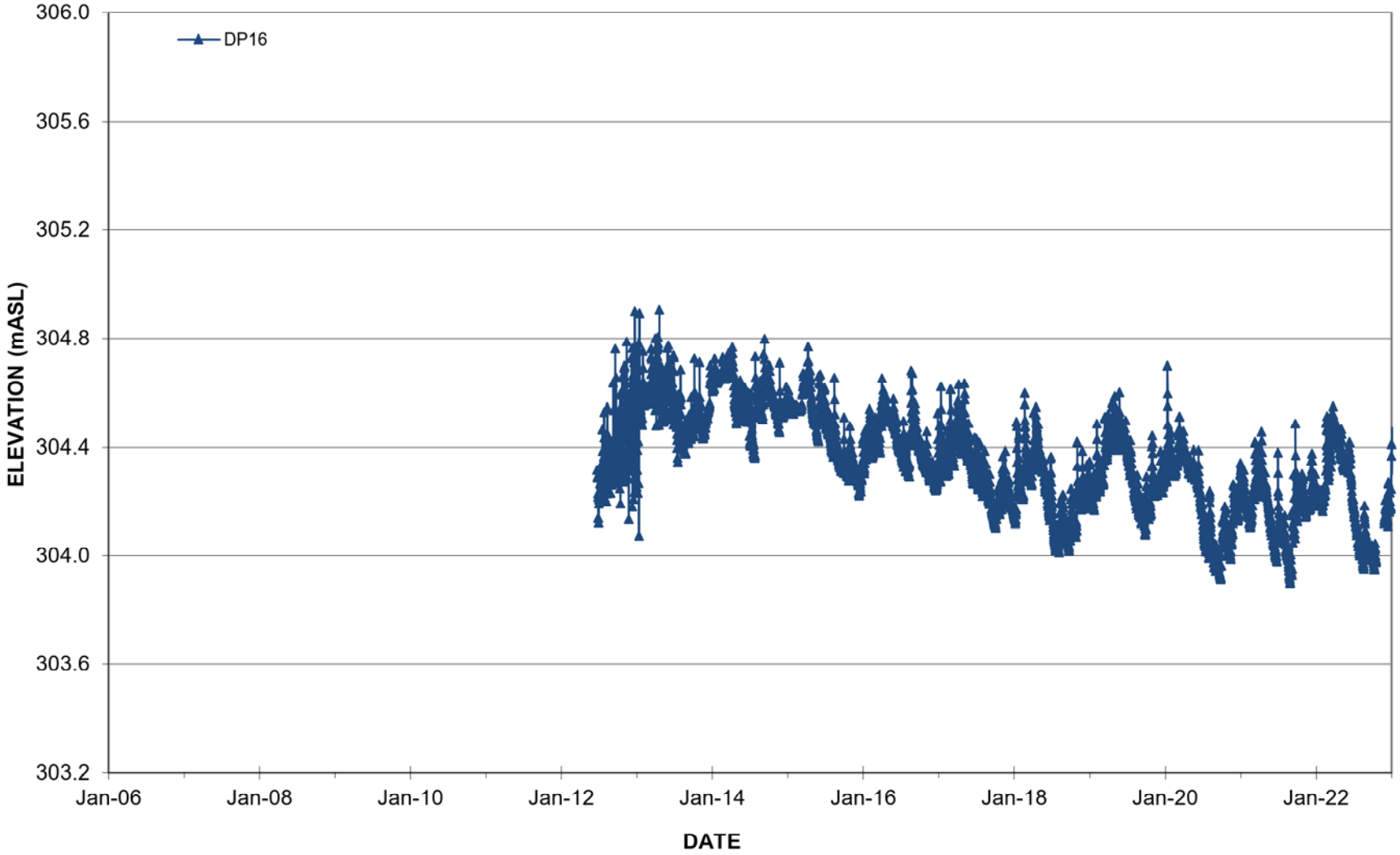
GROUNDWATER THERMOGRAPH
DP9

FIGURE B-63



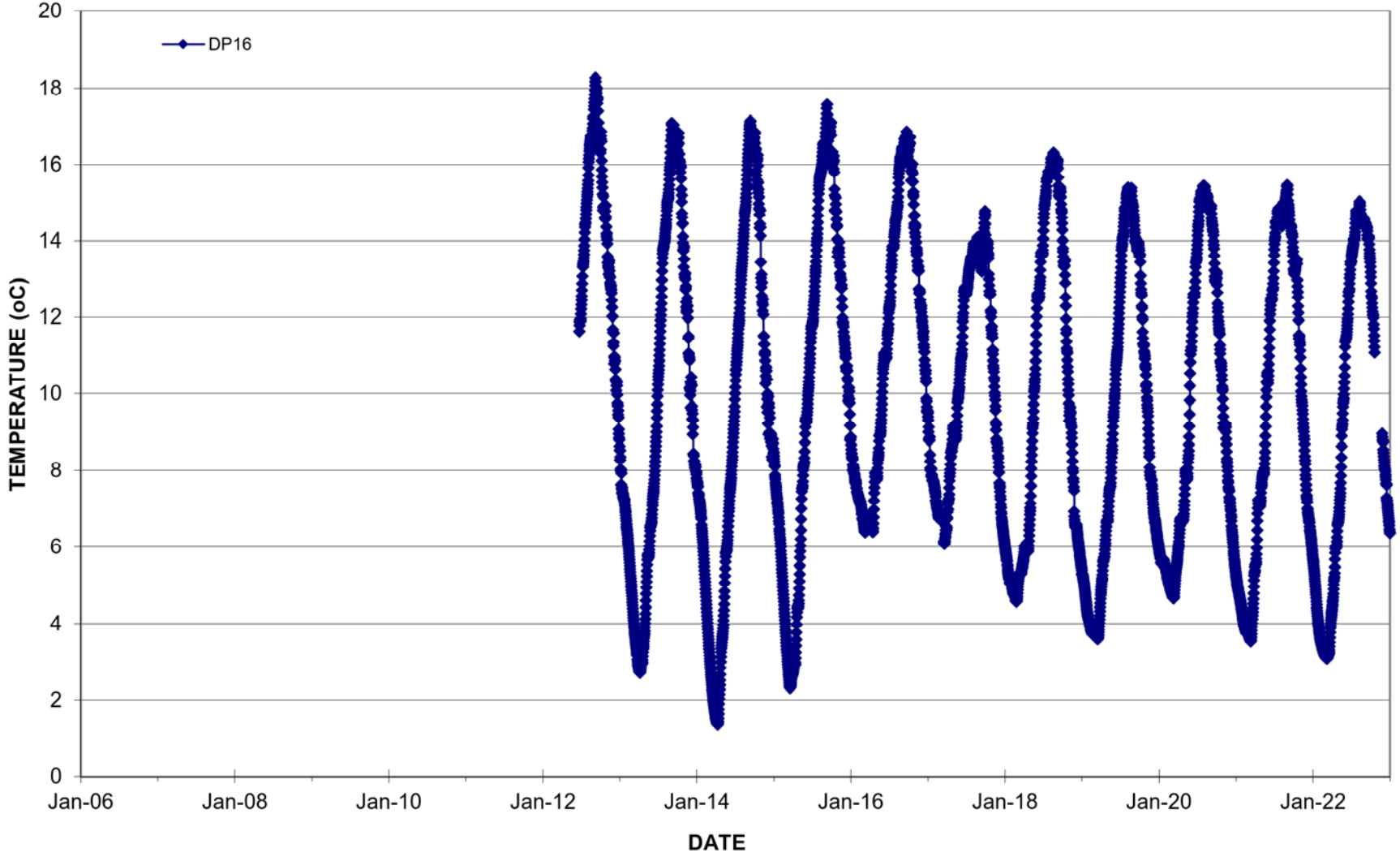
GROUNDWATER HYDROGRAPH
DP16

FIGURE B-64



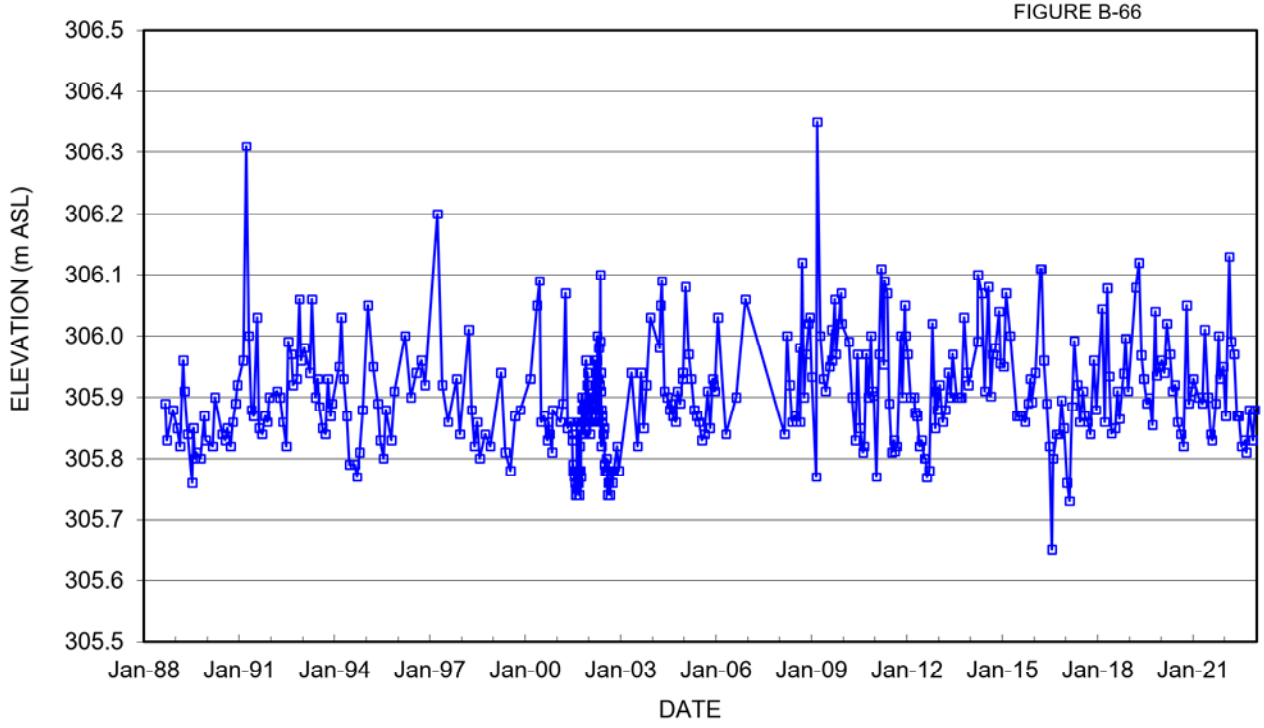
GROUNDWATER THERMOGRAPH
DP16

FIGURE B-65



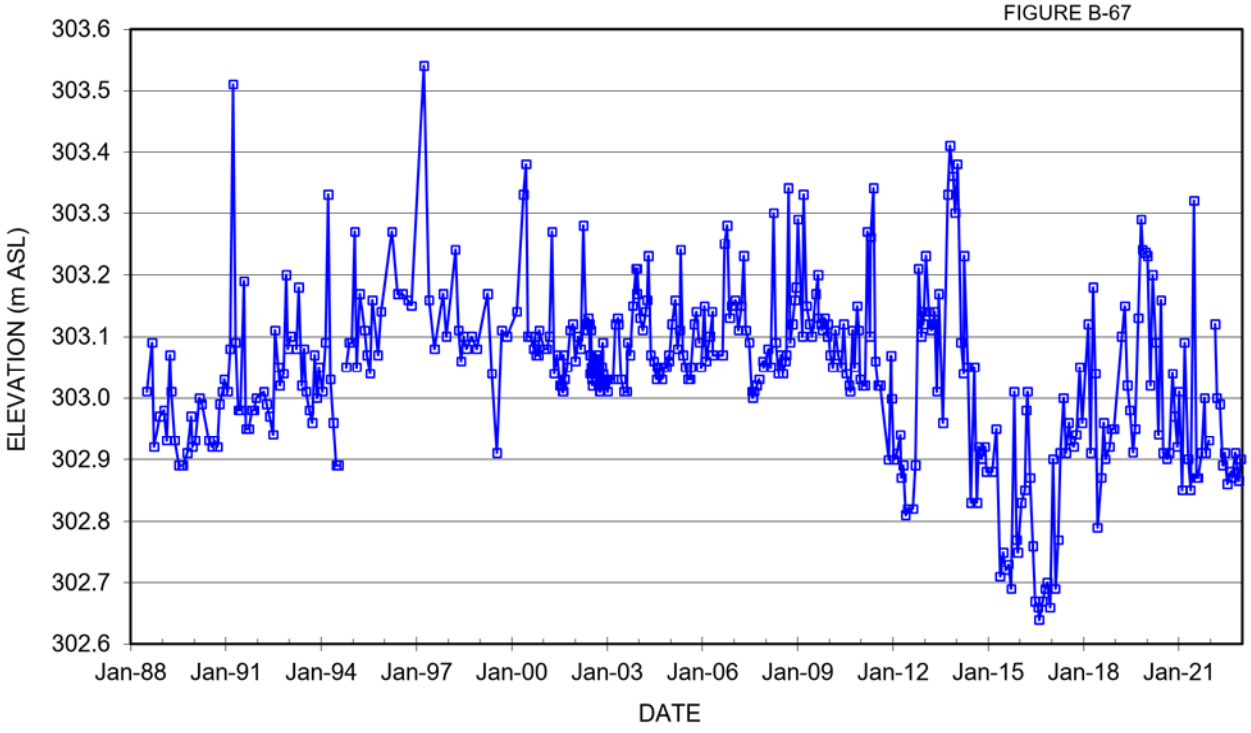
SURFACE WATER HYDROGRAPH
SW1

FIGURE B-66



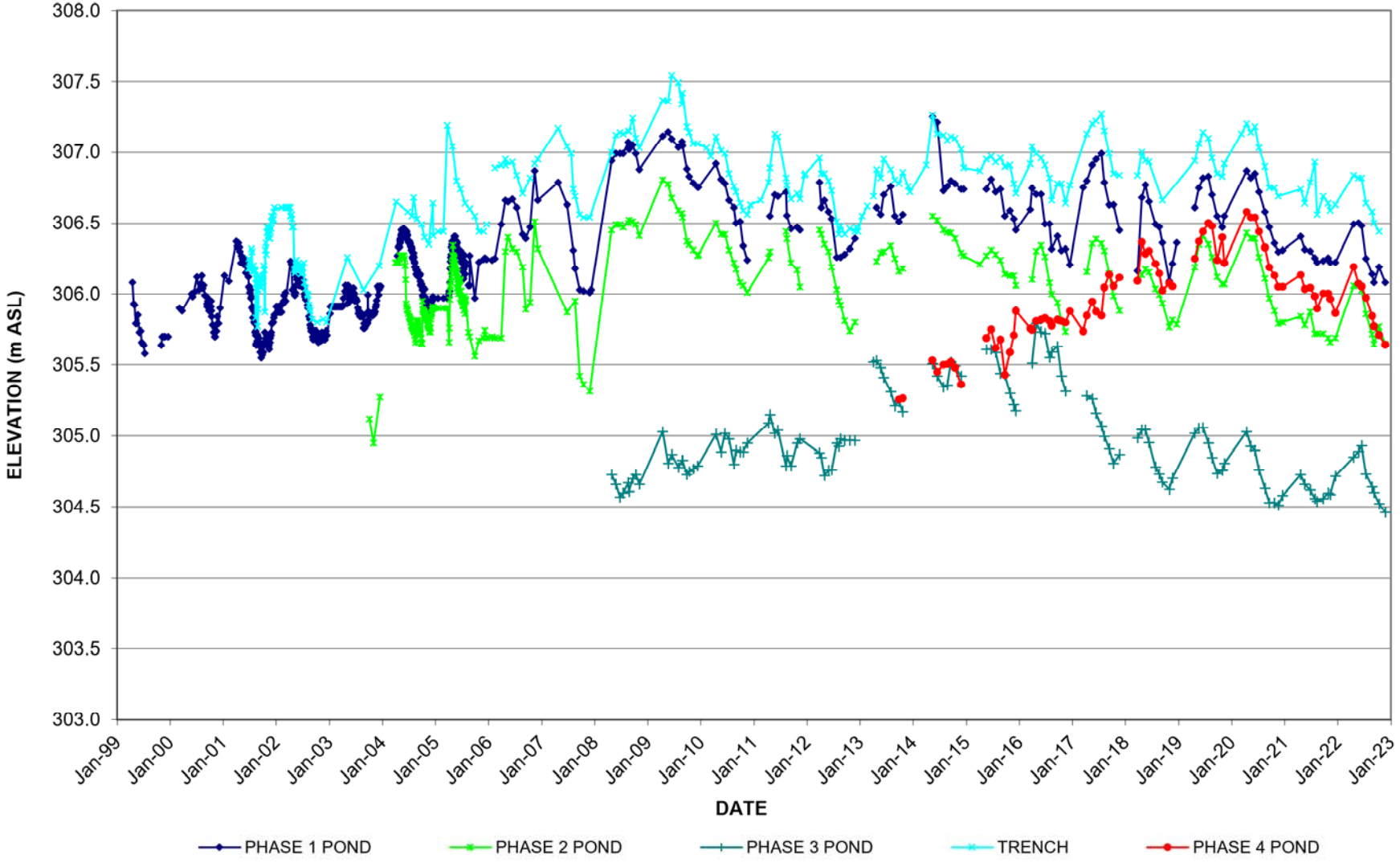
SURFACE WATER HYDROGRAPH
SW2

FIGURE B-67



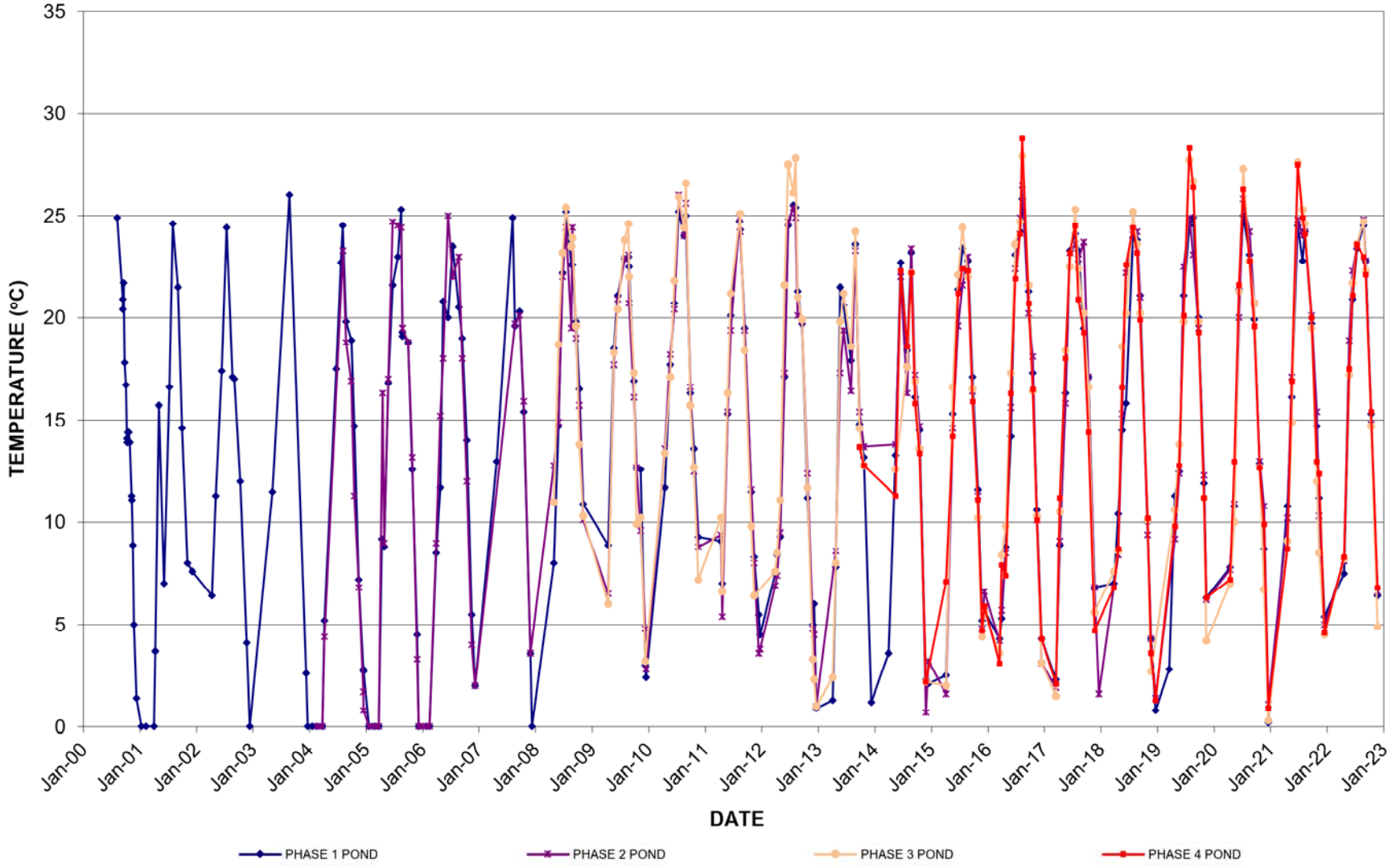
POND HYDROGRAPH

FIGURE B-68



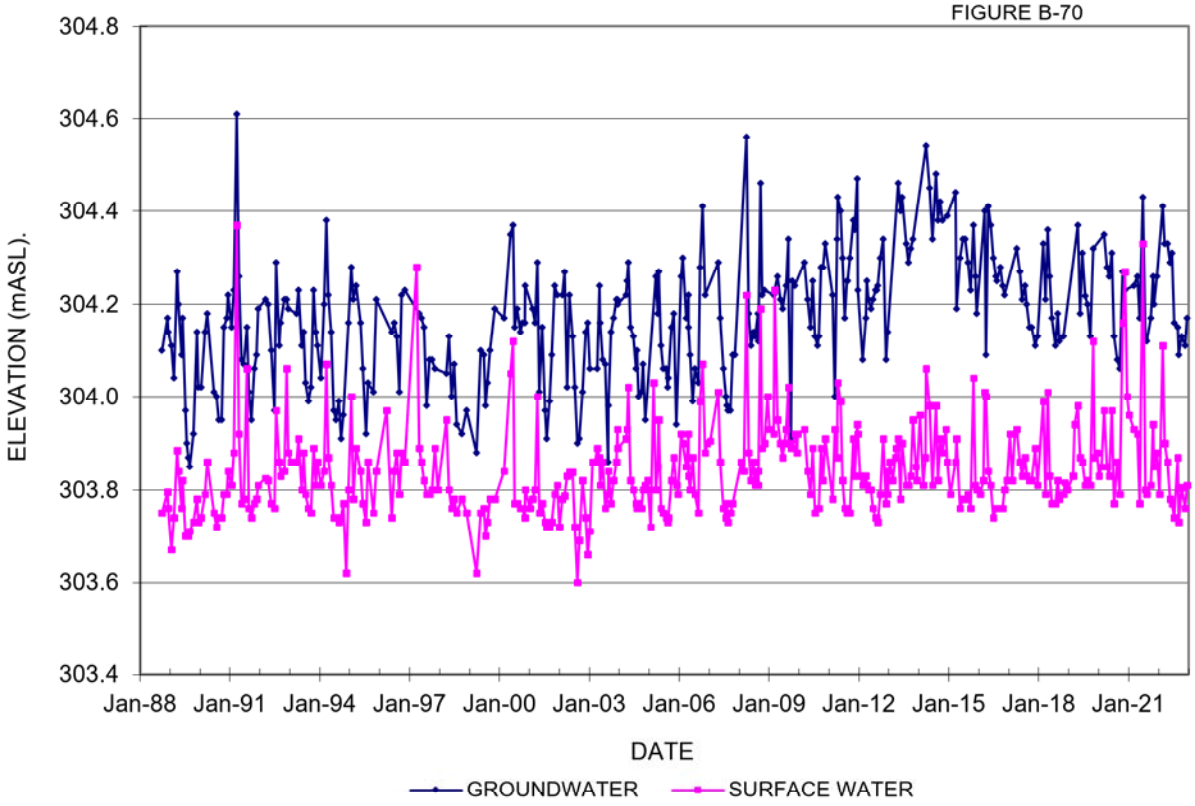
POND THERMOGRAPH

FIGURE B-69



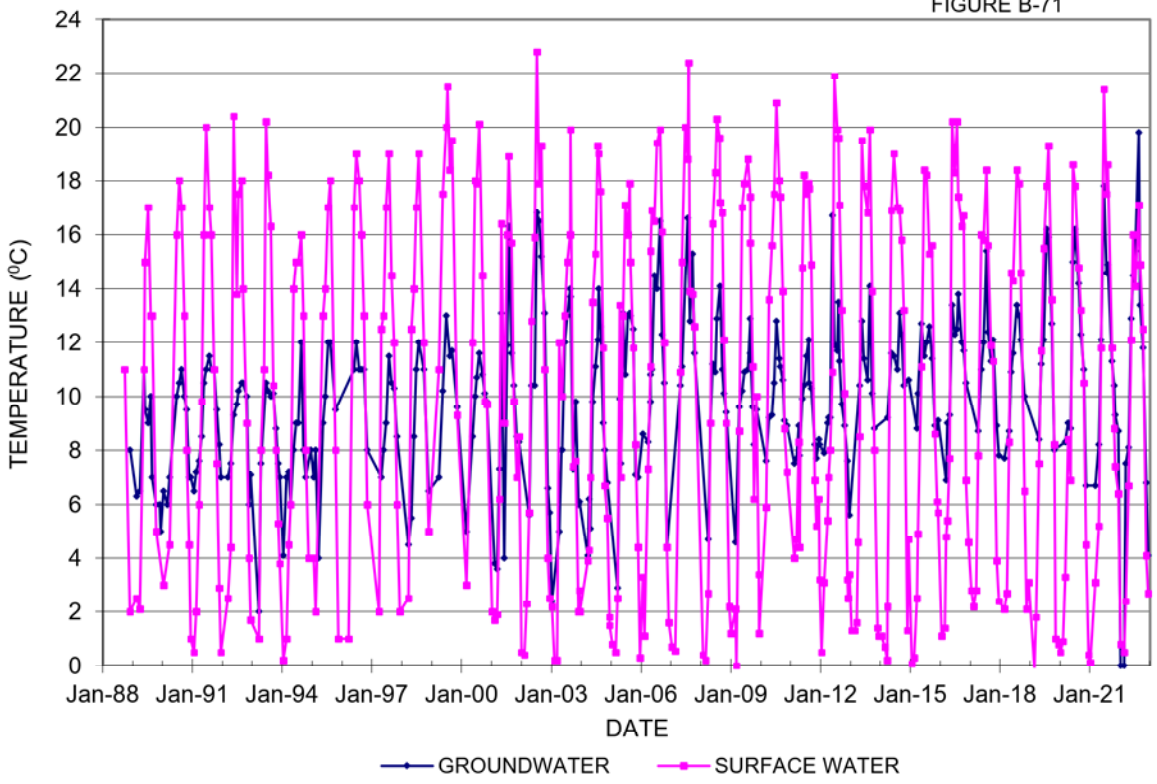
GROUNDWATER/SURFACE WATER HYDROGRAPH
DP1

FIGURE B-70



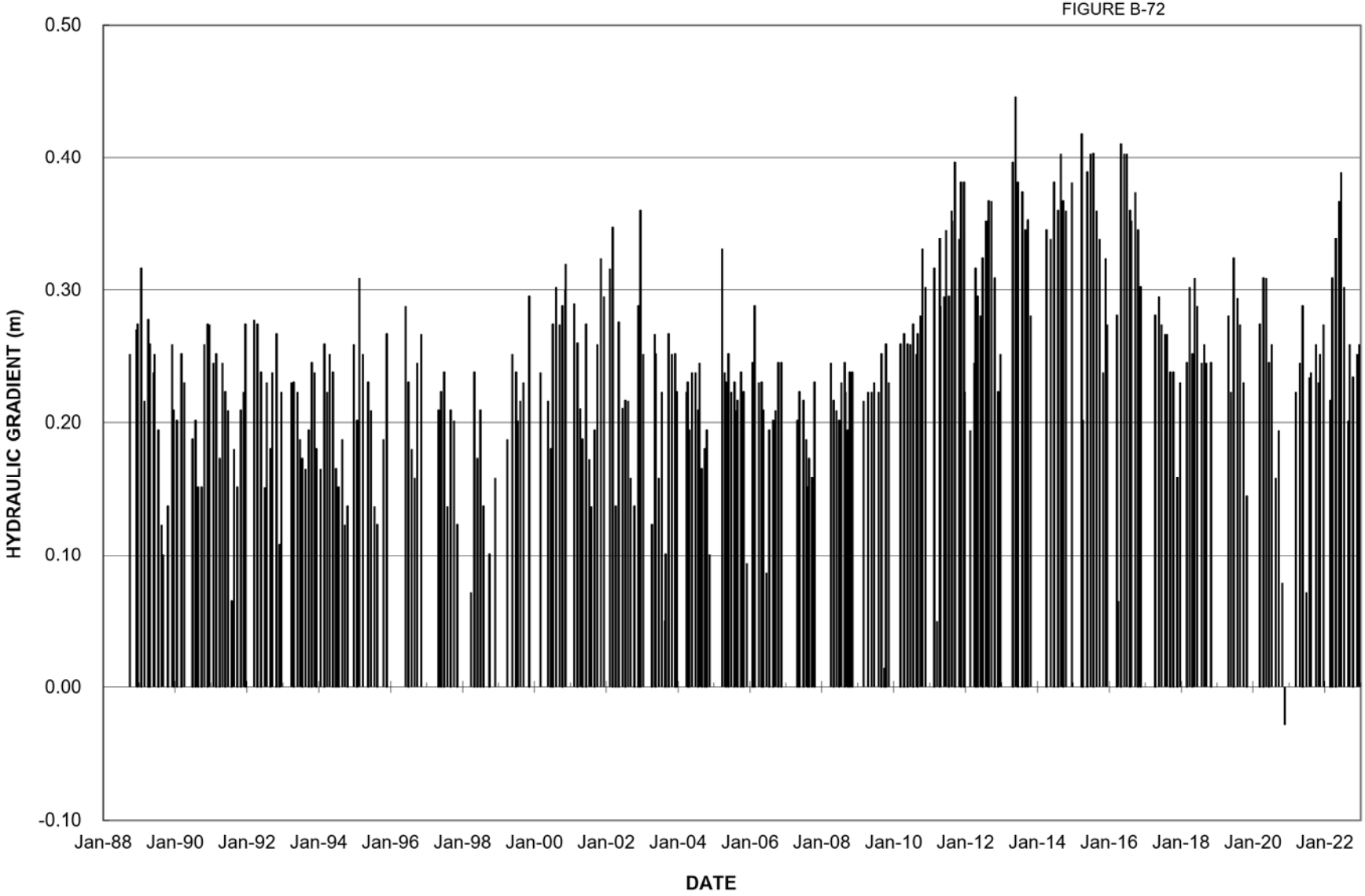
THERMOGRAPH
DP1

FIGURE B-71



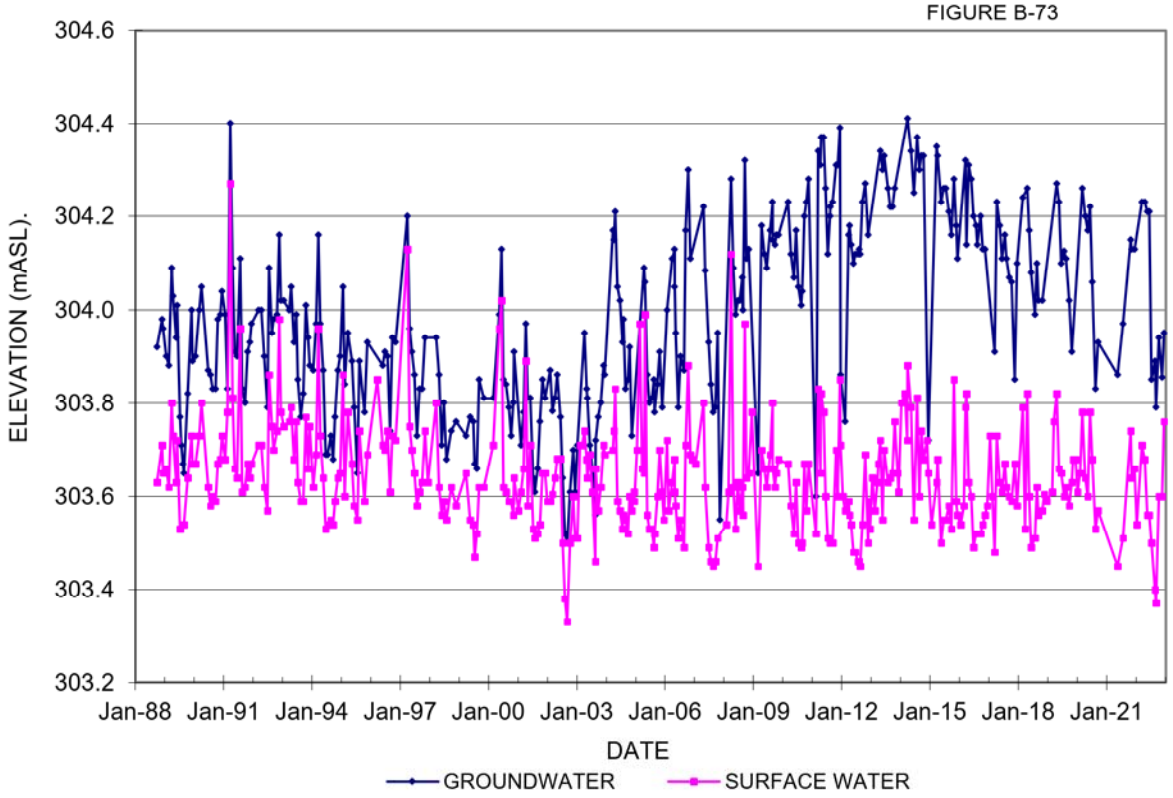
VERTICAL HYDRAULIC GRADIENT
DP1

FIGURE B-72



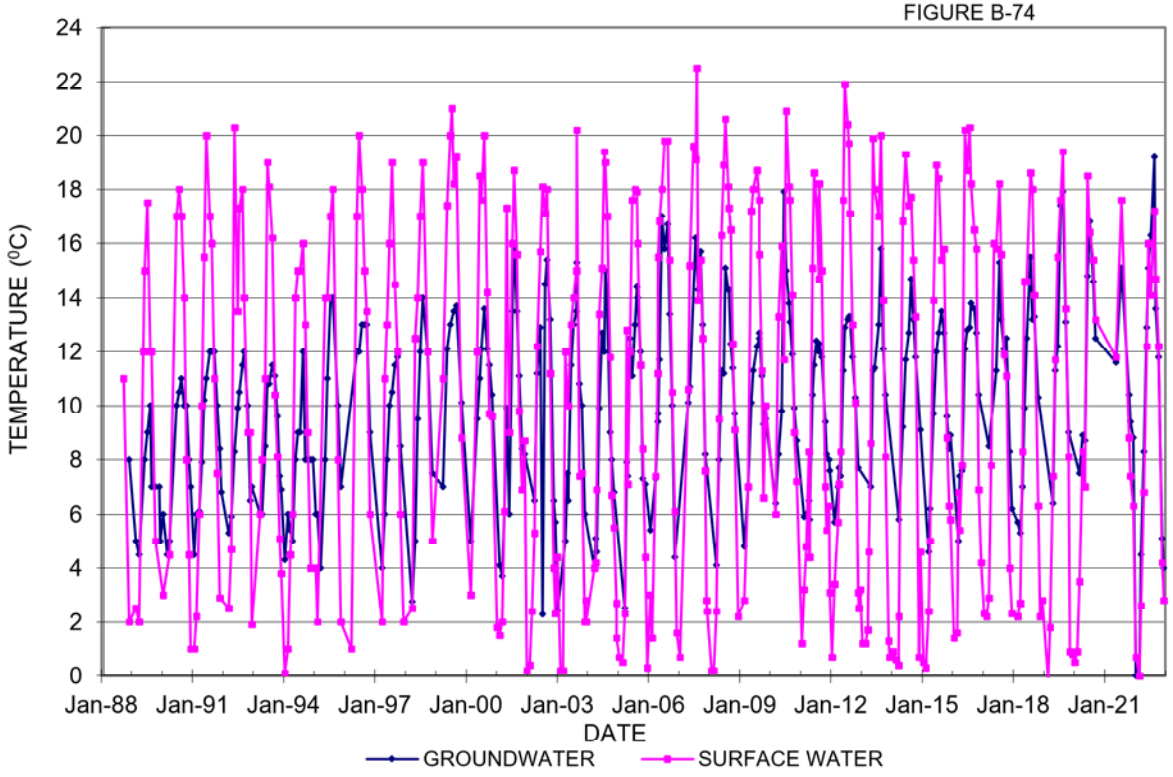
GROUNDWATER/SURFACE WATER HYDROGRAPH
DP2

FIGURE B-73



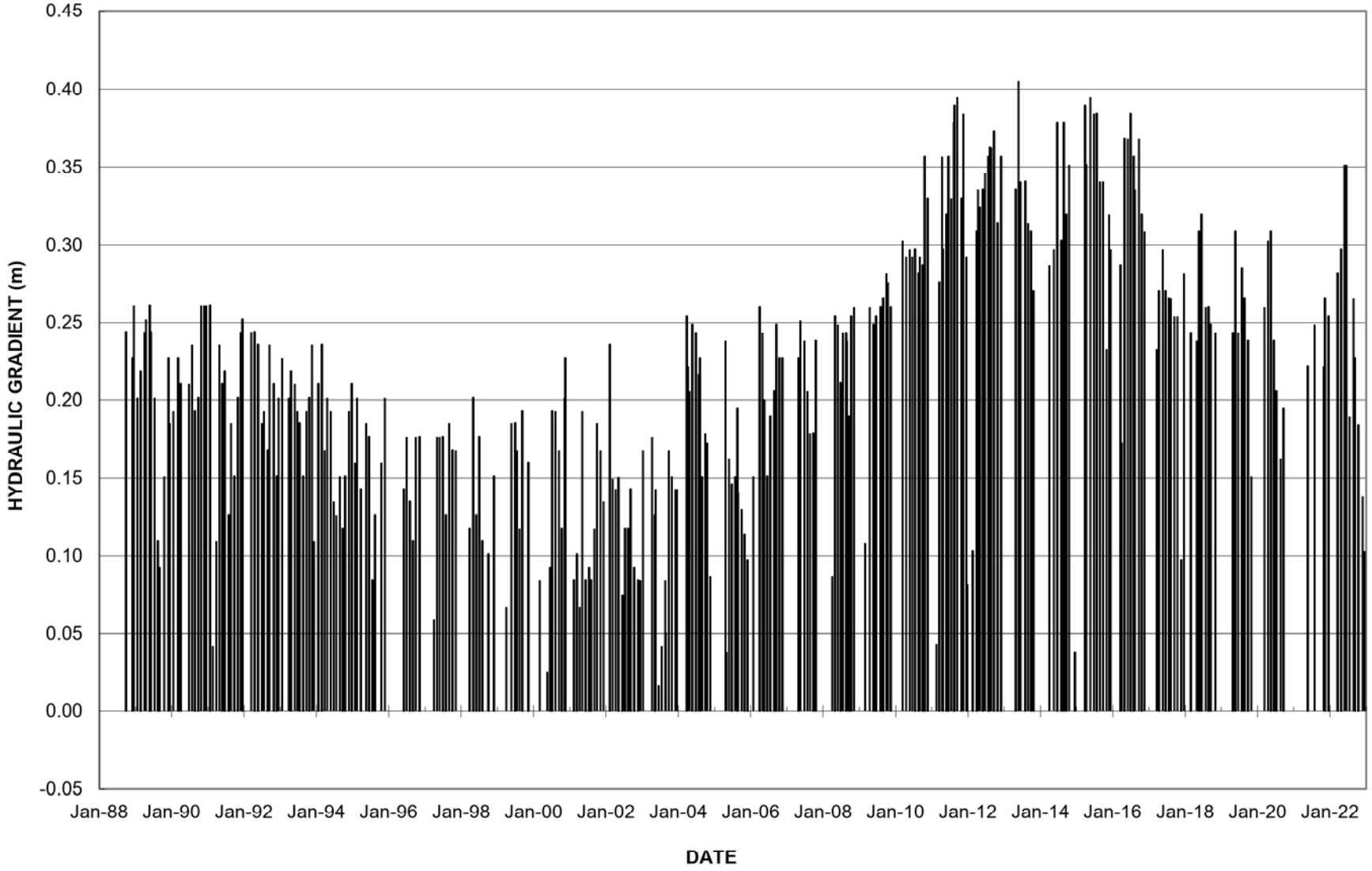
THERMOGRAPH
DP2

FIGURE B-74



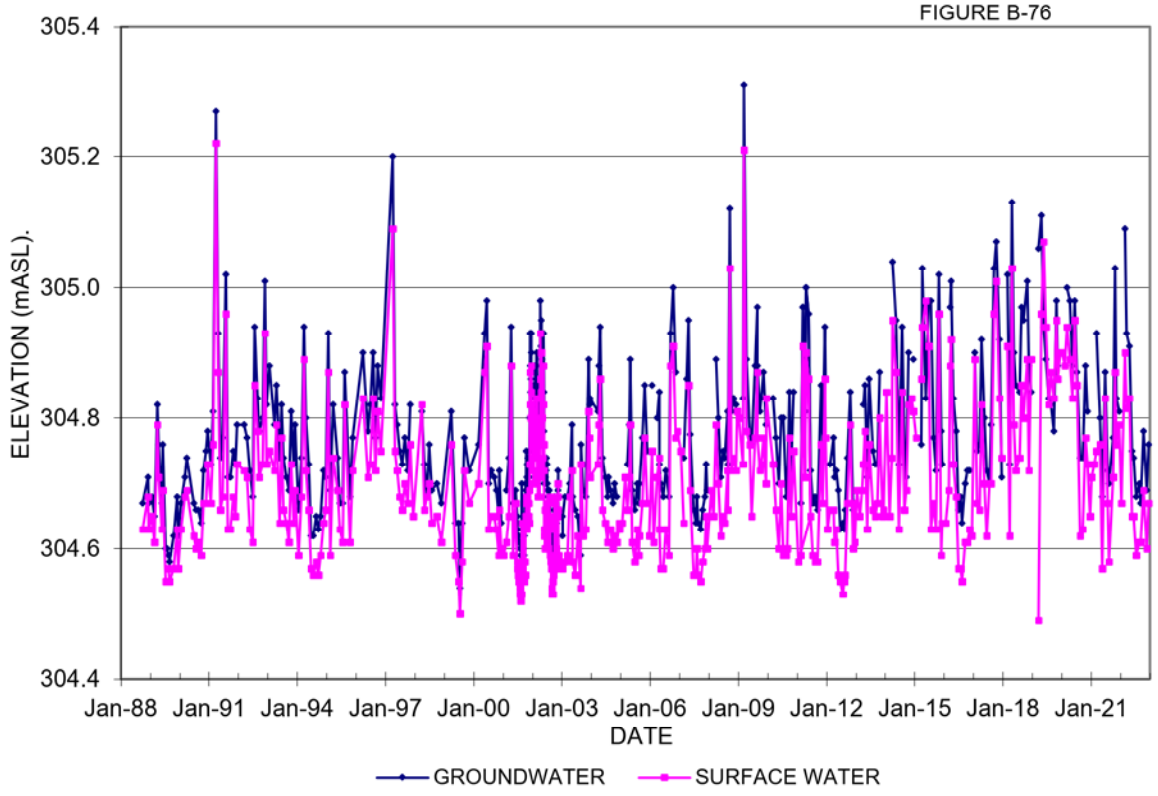
VERTICAL HYDRAULIC GRADIENT
DP2

FIGURE B-75



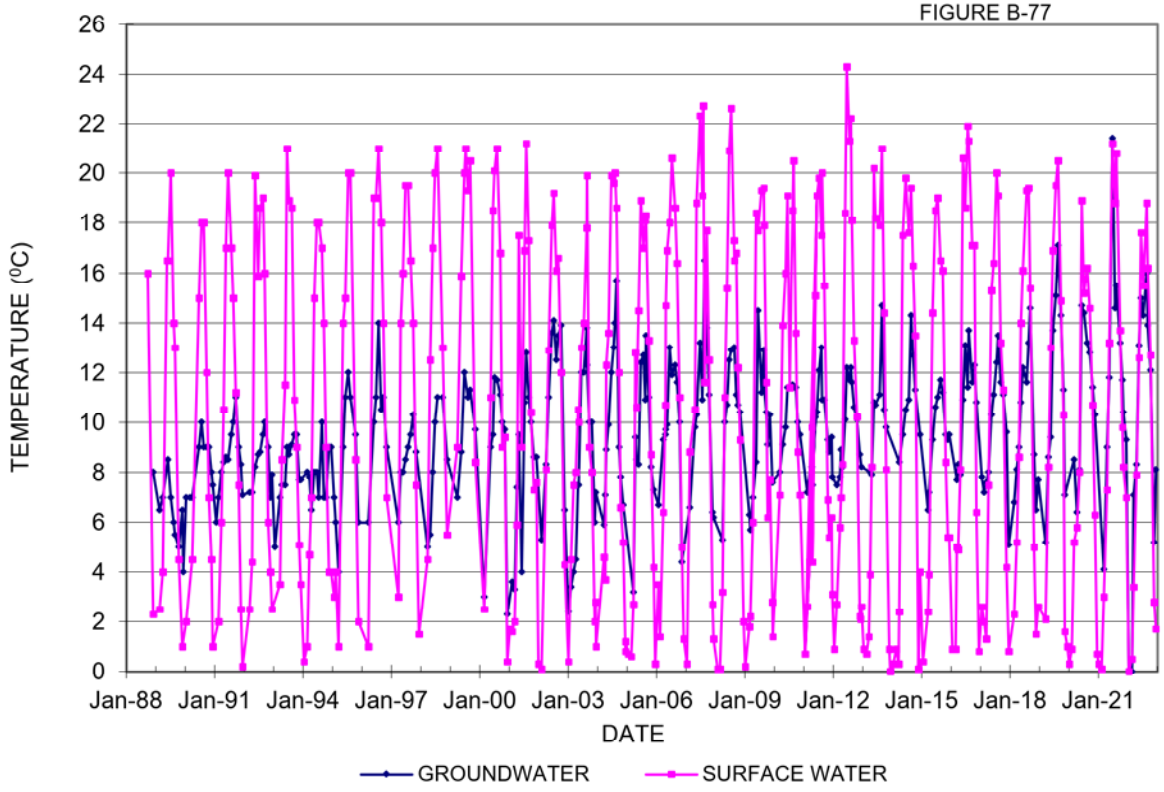
GROUNDWATER/SURFACE WATER HYDROGRAPH
DP3

FIGURE B-76



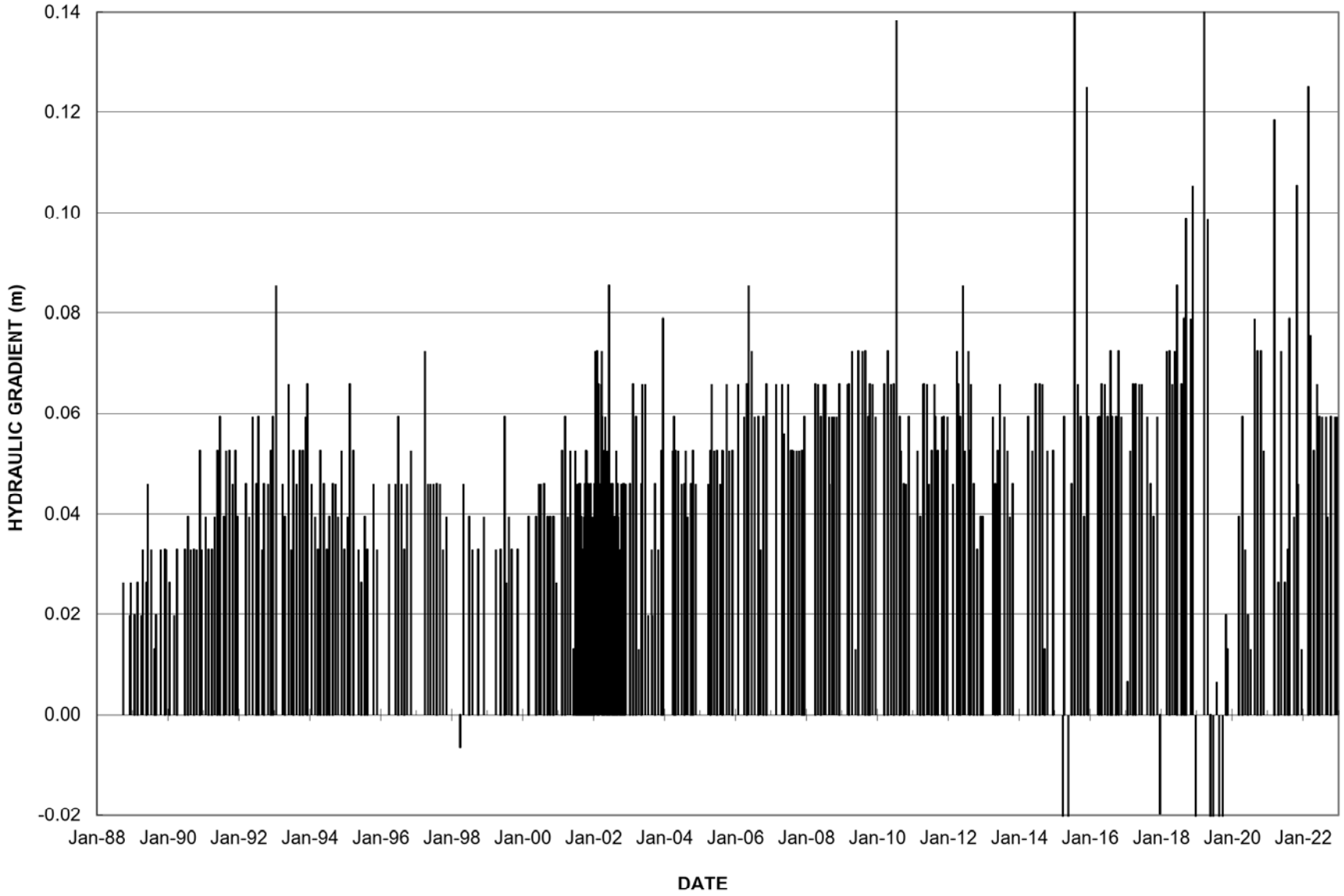
THERMOGRAPH
DP3

FIGURE B-77



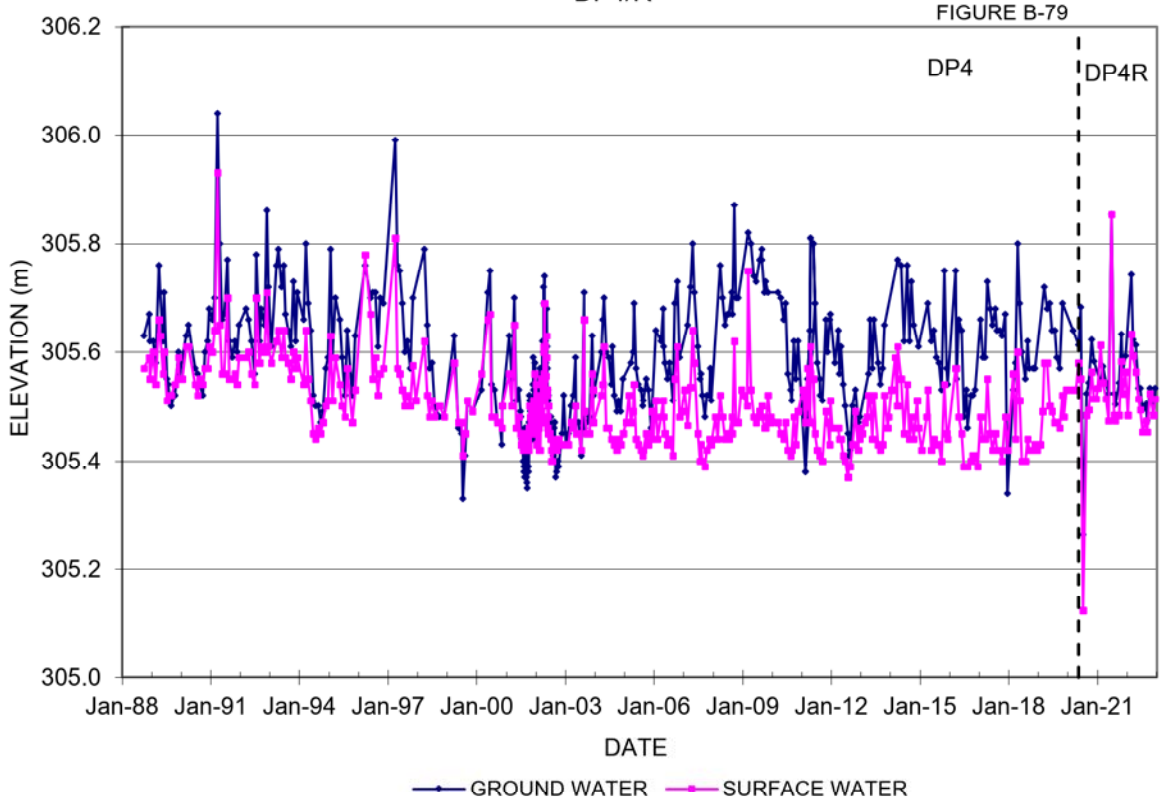
VERTICAL HYDRAULIC GRADIENT
DP3

FIGURE B-78



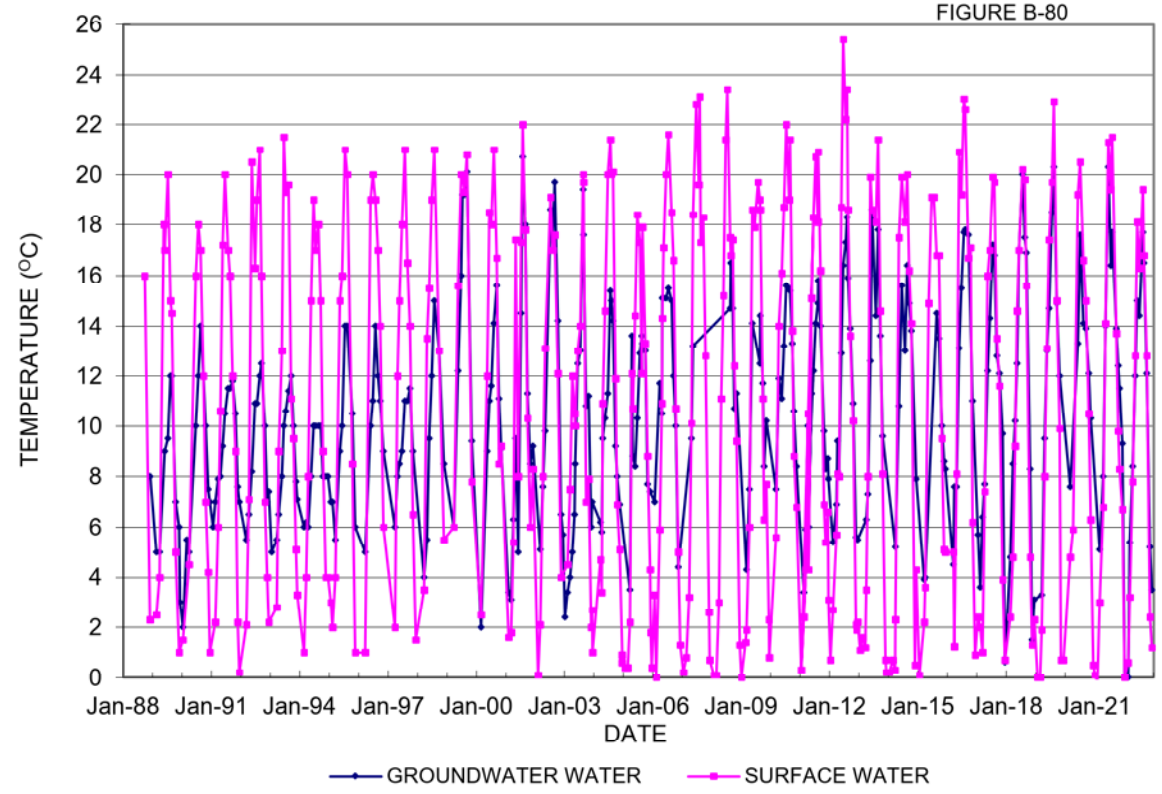
GROUNDWATER/SURFACE WATER HYDROGRAPH
DP4/R

FIGURE B-79



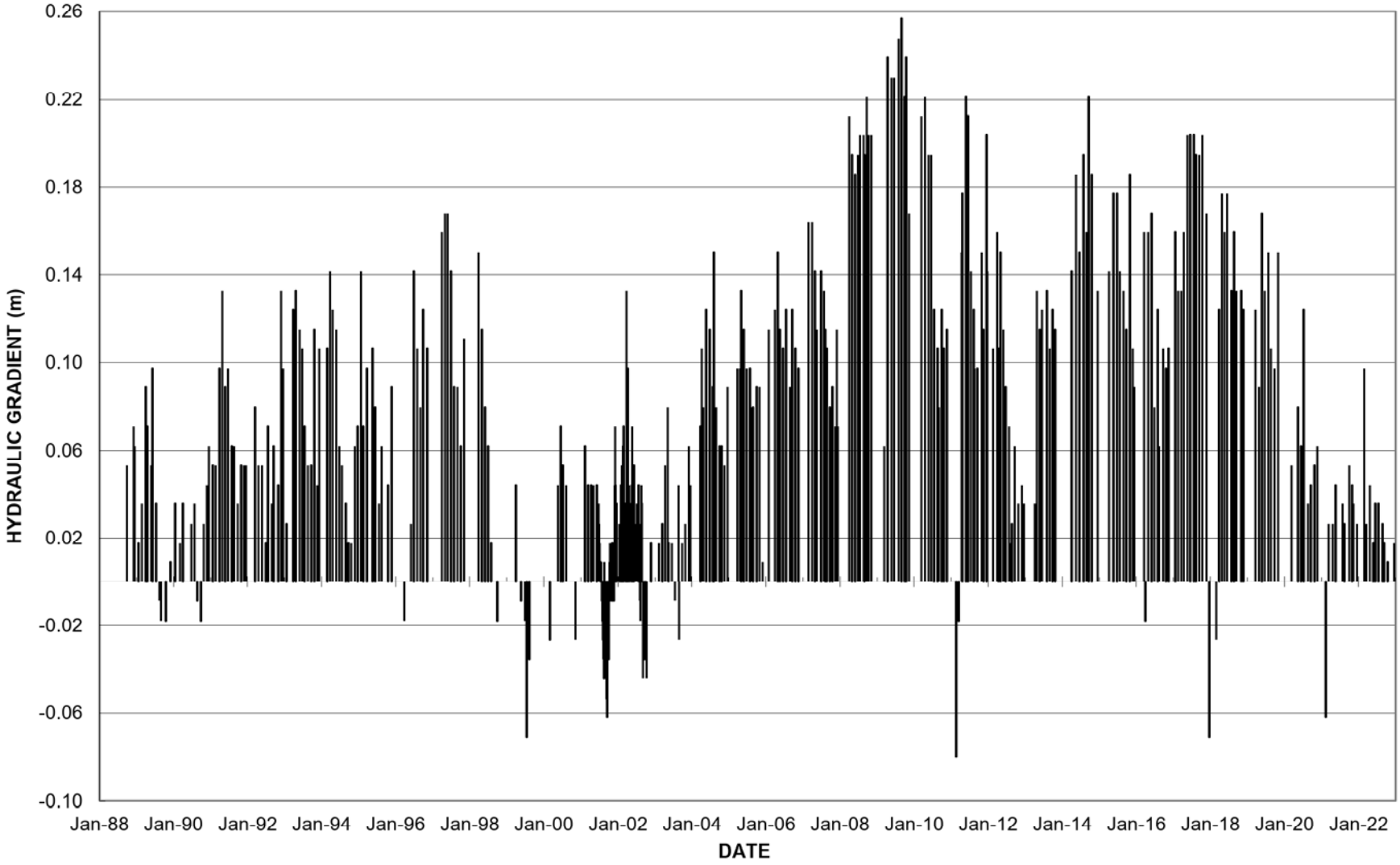
THERMOGRAPH
DP4/R

FIGURE B-80



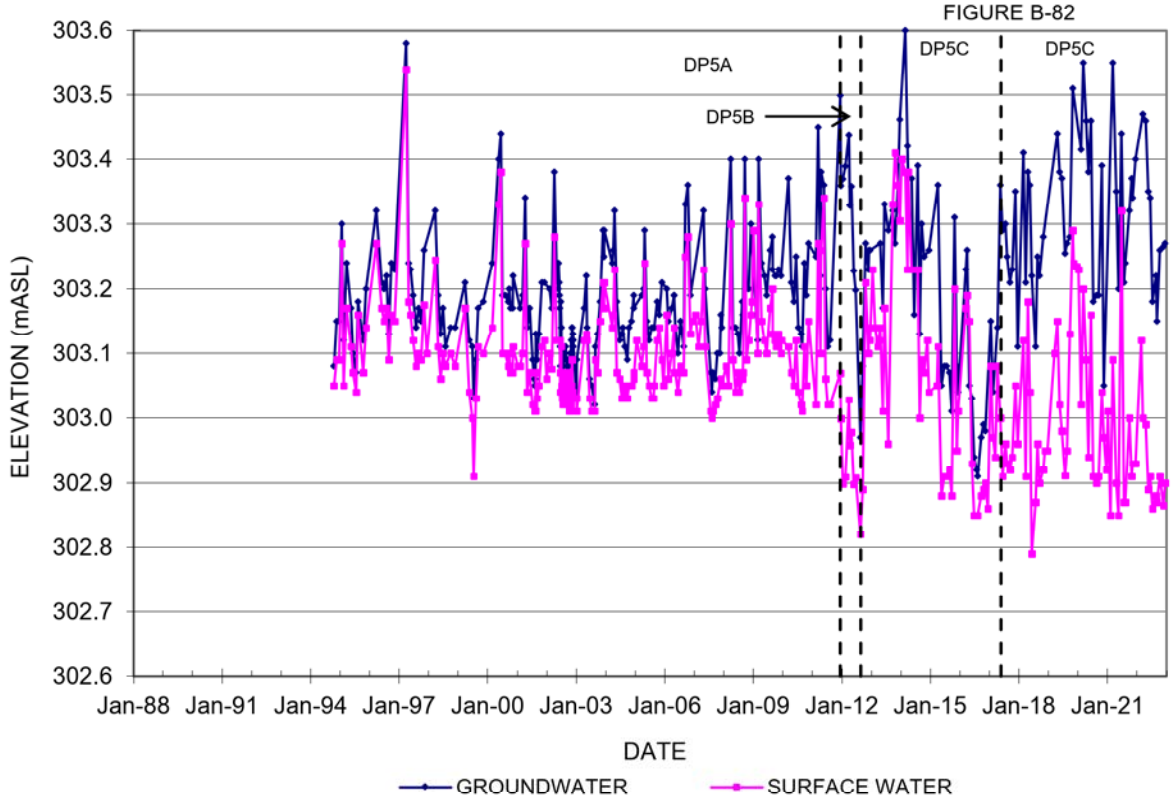
VERTICAL HYDRAULIC GRADIENT
DP4/R

FIGURE B- 81



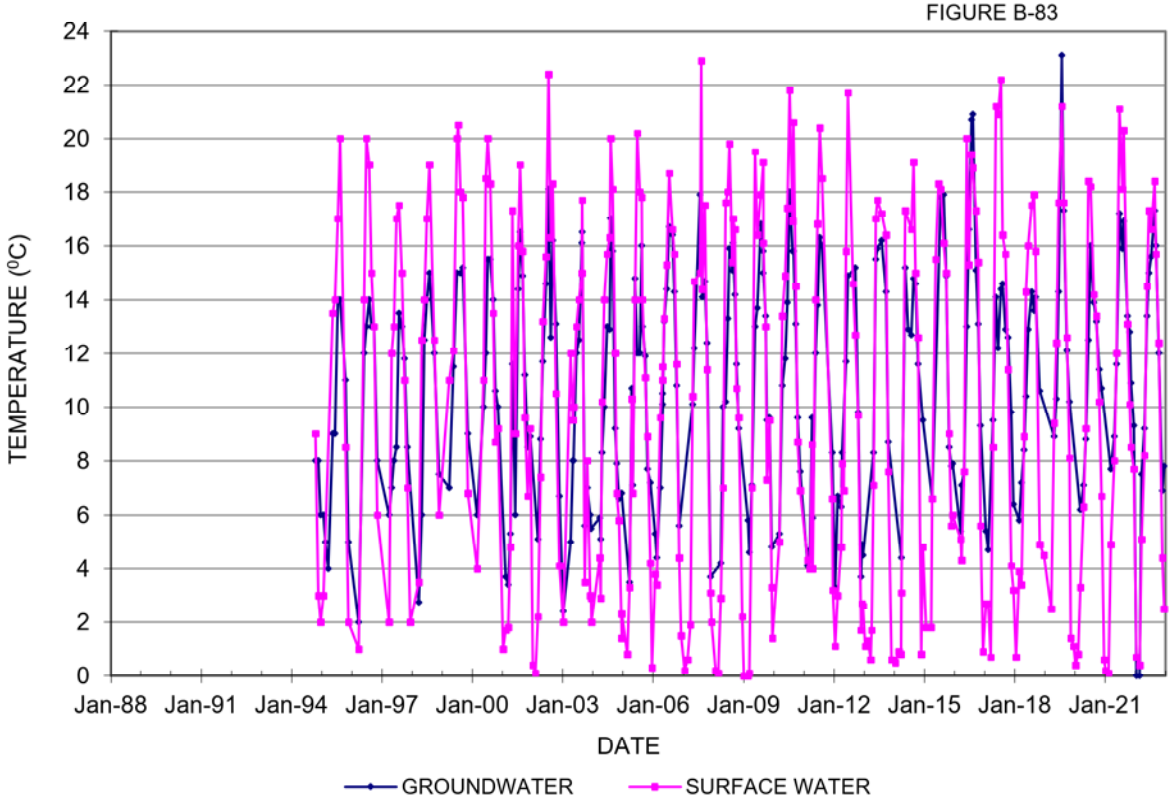
GROUNDWATER/SURFACE WATER HYDROGRAPH
DP5A/B/C/CR

FIGURE B-82



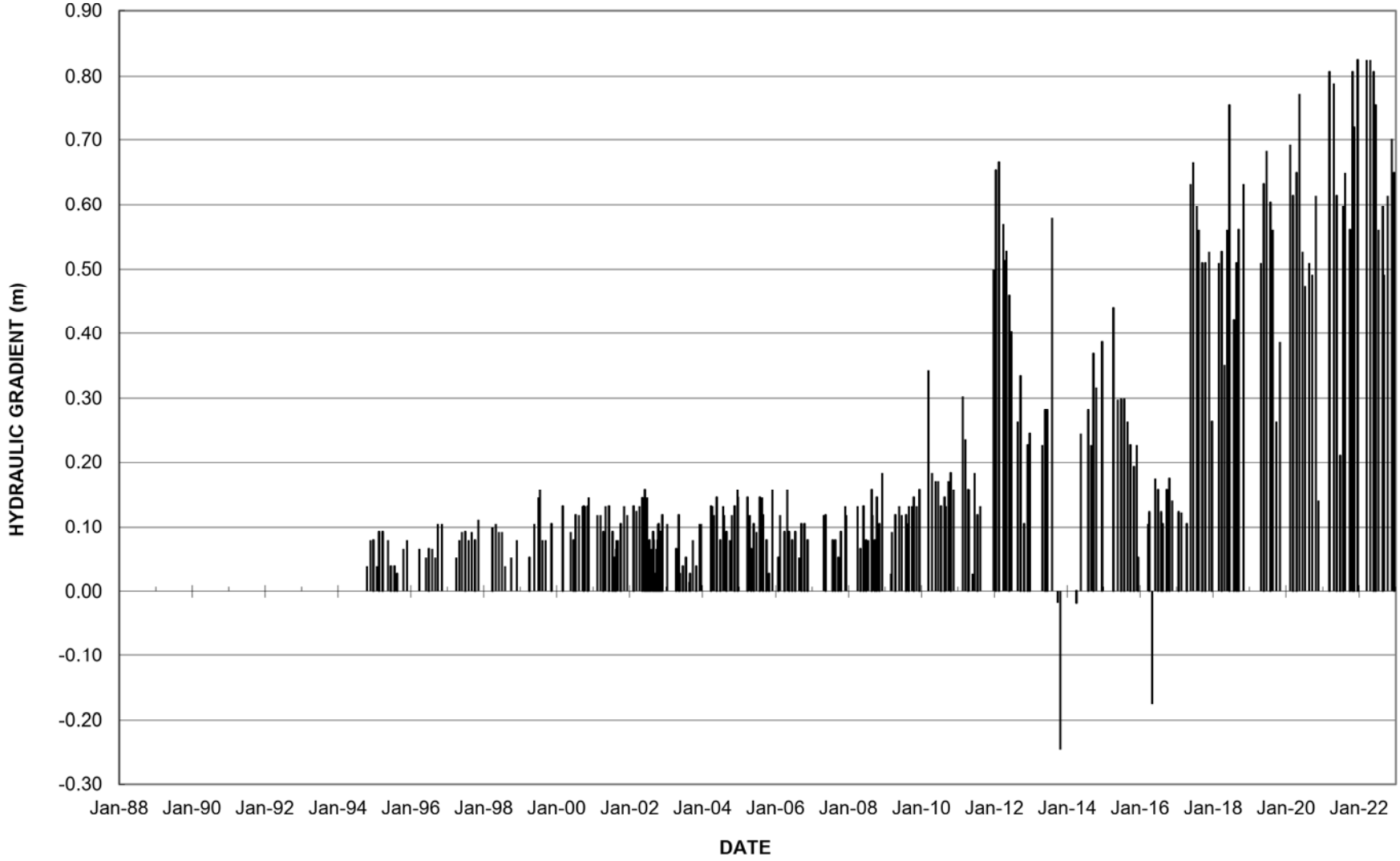
THERMOGRAPH
DP5A/B/C/CR

FIGURE B-83



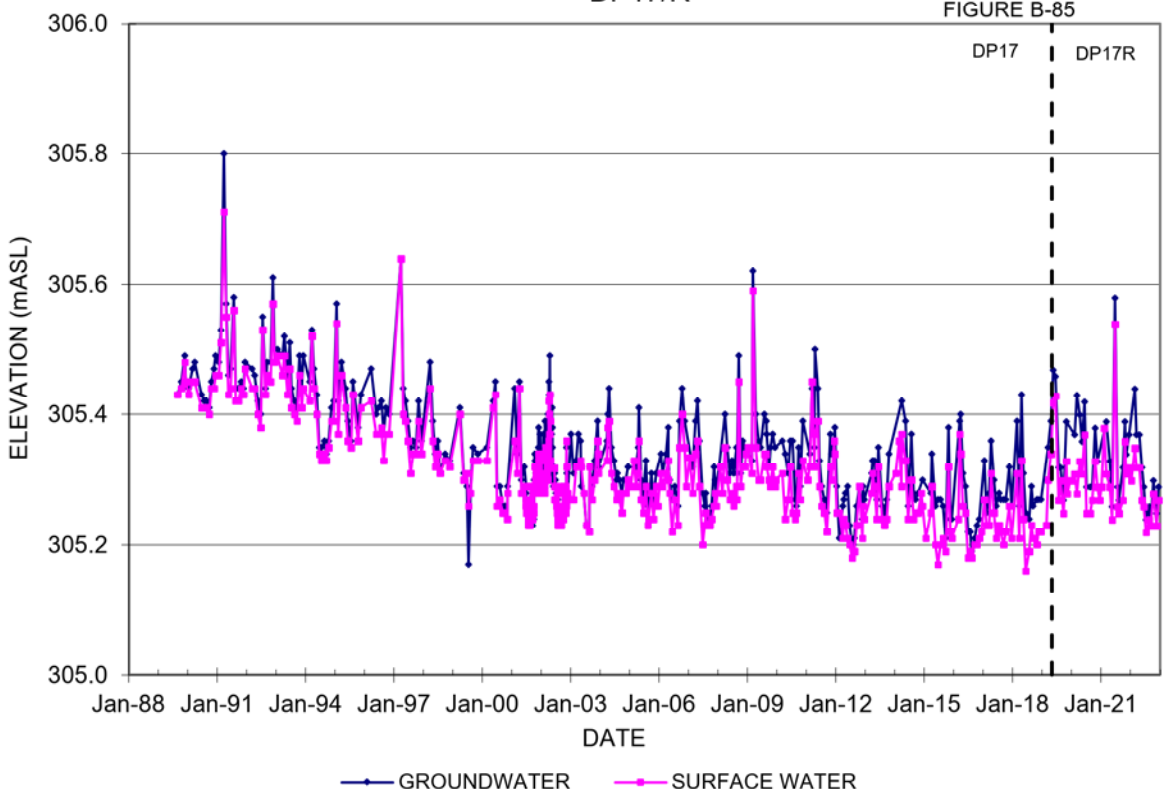
VERTICAL HYDRAULIC GRADIENT
DP5A/B/C/CR

FIGURE B-84



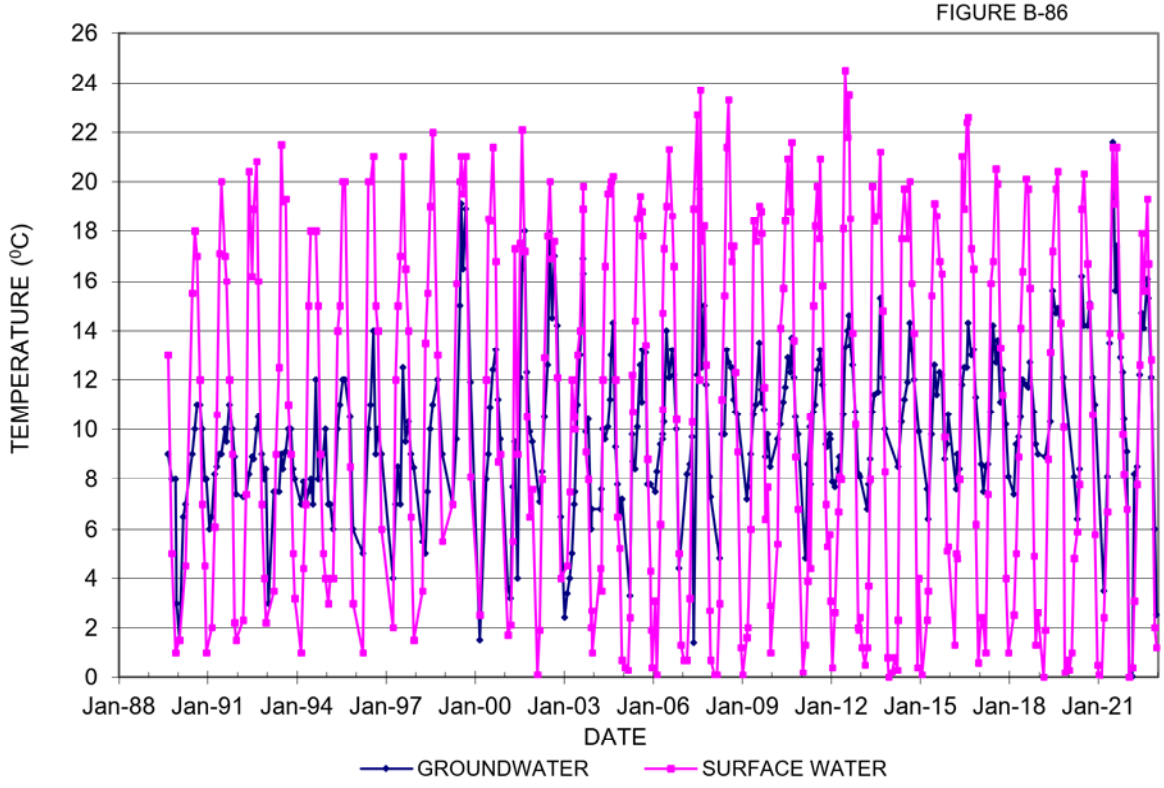
GROUNDWATER/SURFACE WATER HYDROGRAPH
DP17/R

FIGURE B-85



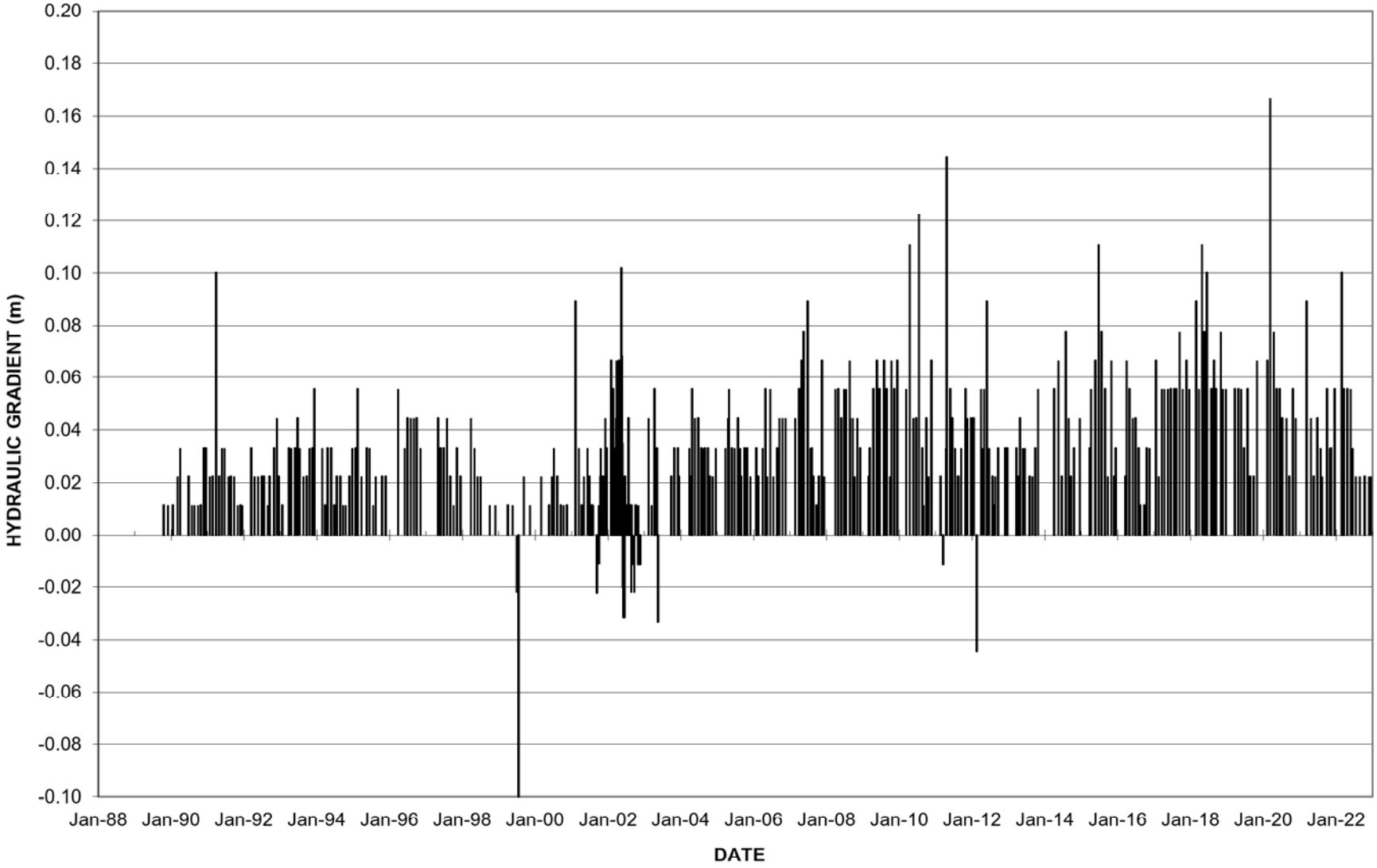
THERMOGRAPH
DP17/R

FIGURE B-86



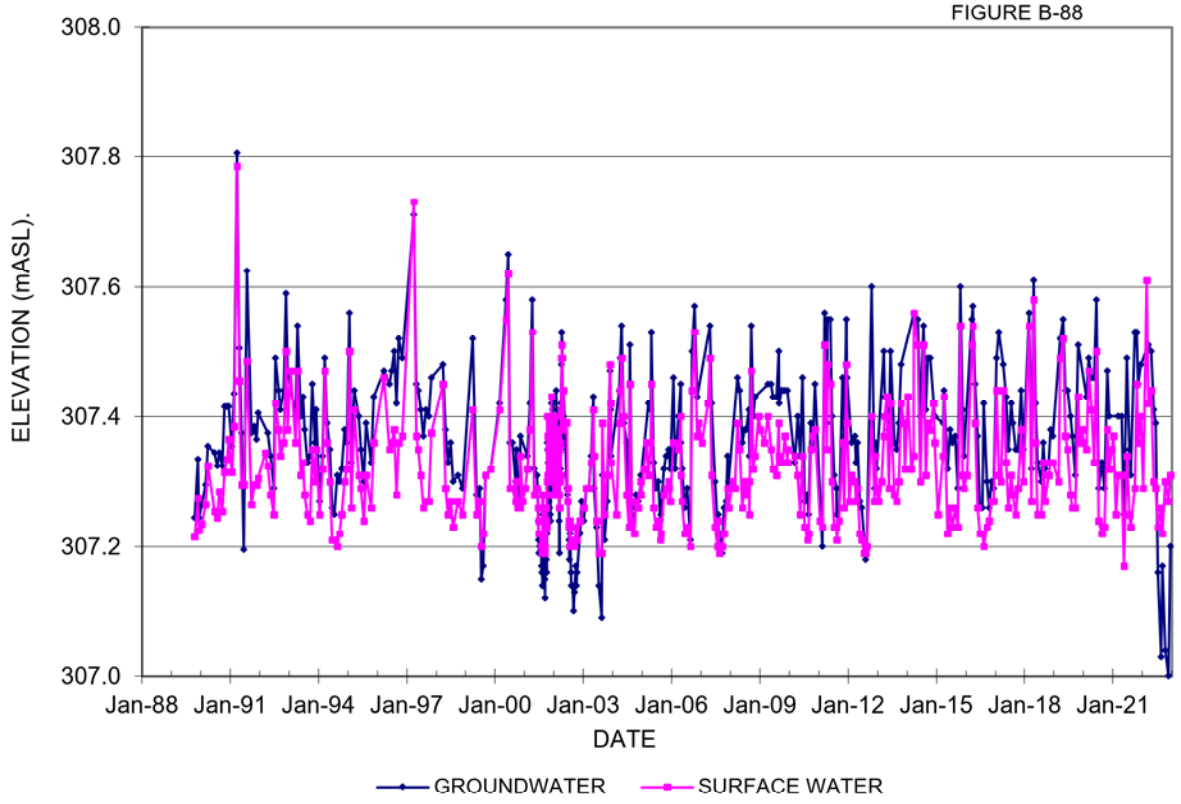
VERTICAL HYDRAULIC GRADIENT
DP17/R

FIGURE B-87



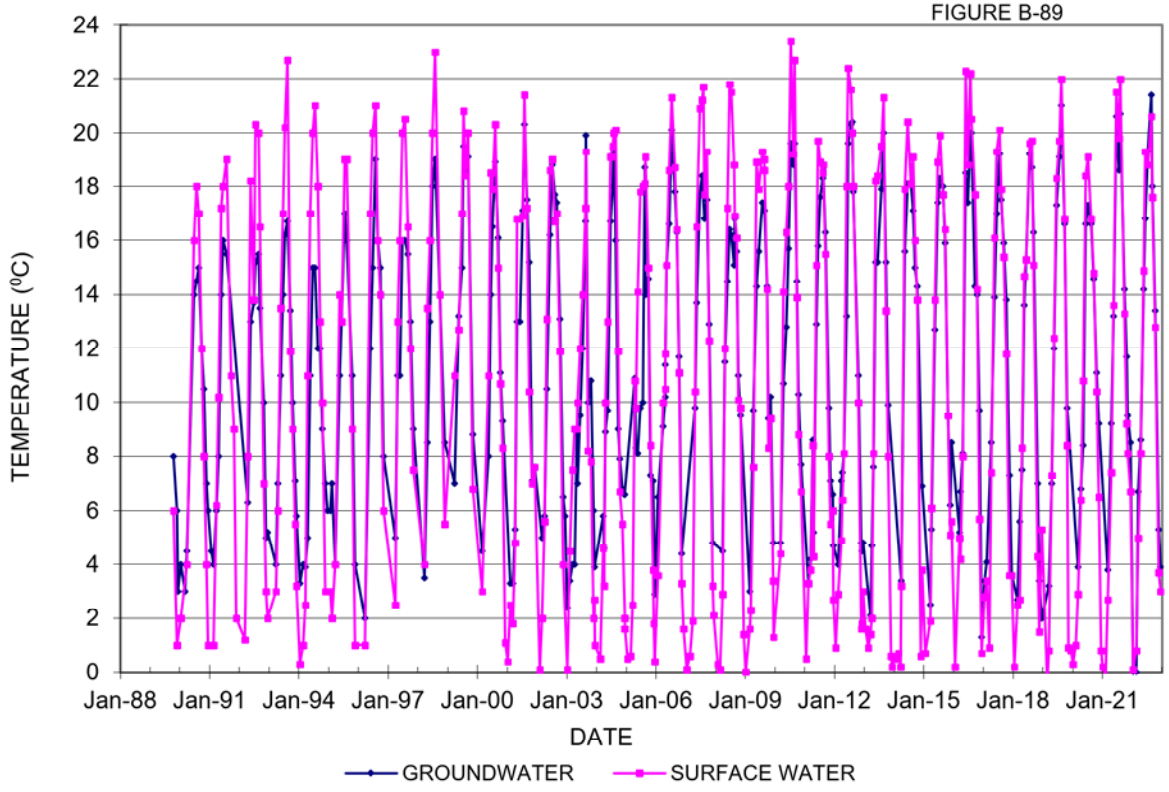
GROUNDWATER/SURFACE WATER HYDROGRAPH
DP18

FIGURE B-88



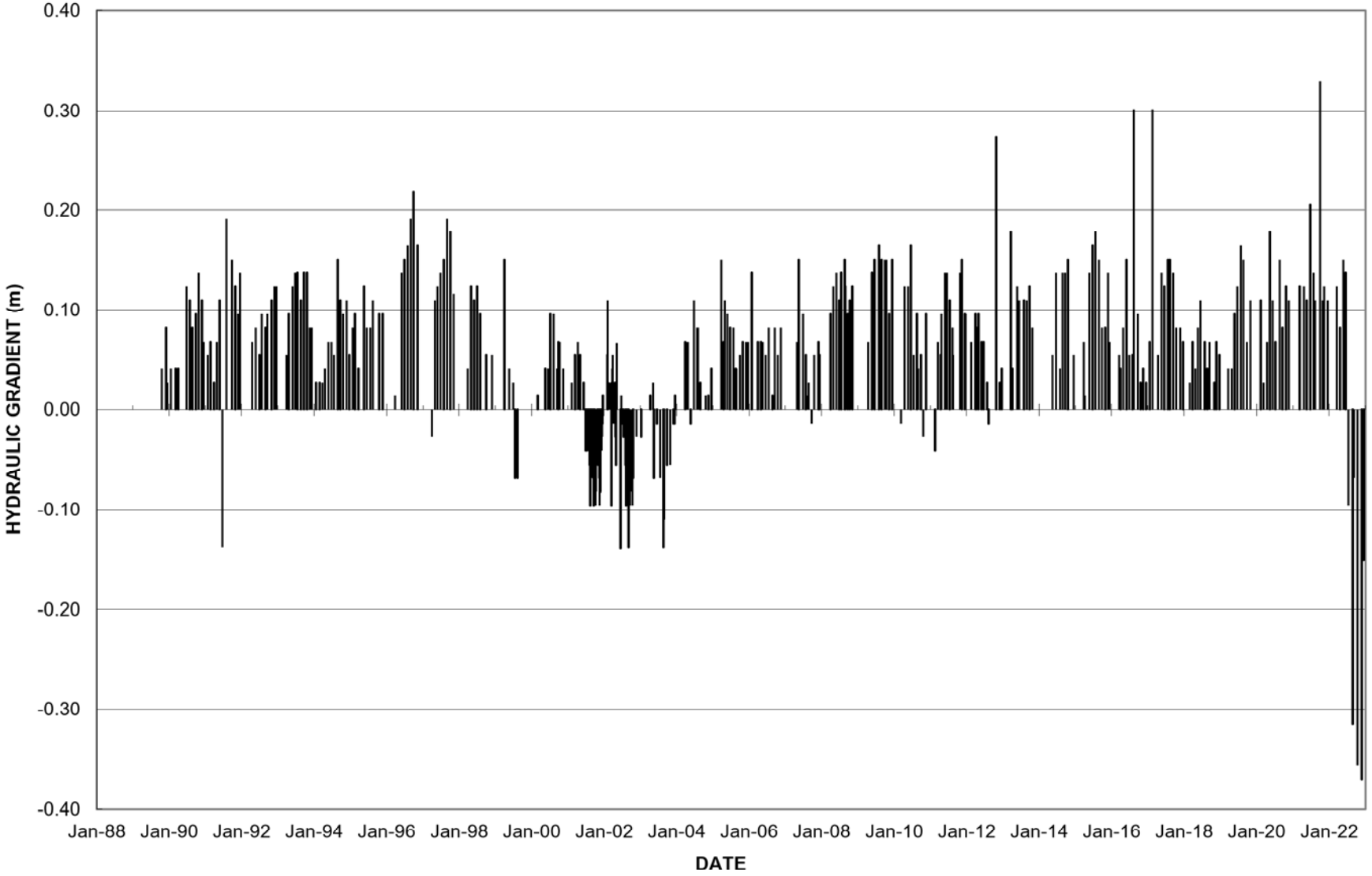
THERMOGRAPH
DP18

FIGURE B-89



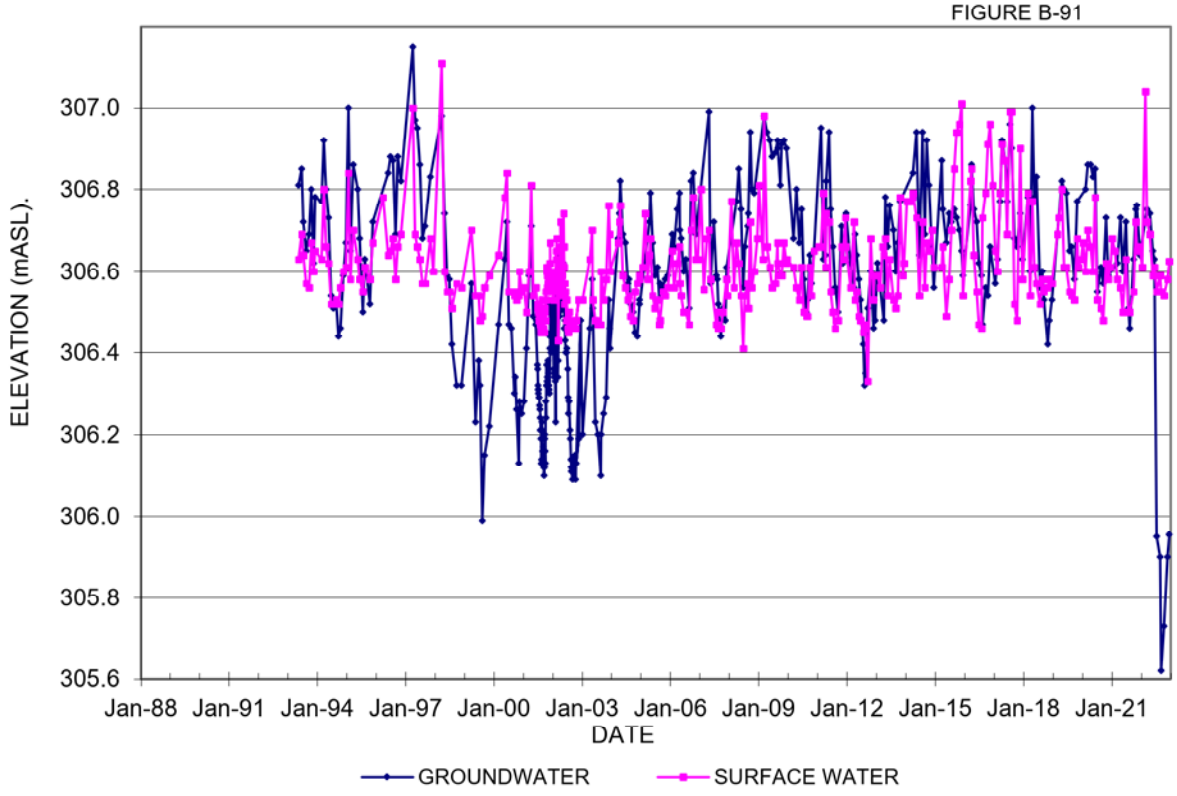
VERTICAL HYDRAULIC GRADIENT
DP18

FIGURE B-90



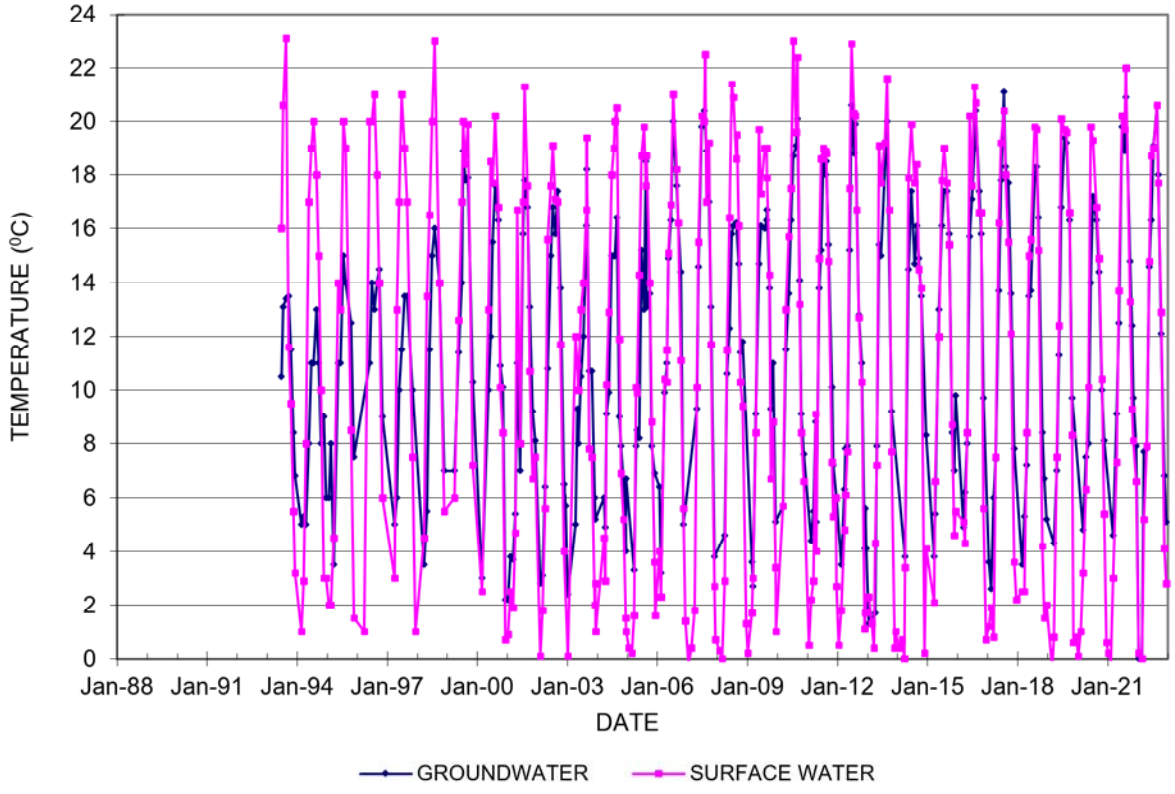
GROUNDWATER/SURFACE WATER HYDROGRAPH
DP19

FIGURE B-91



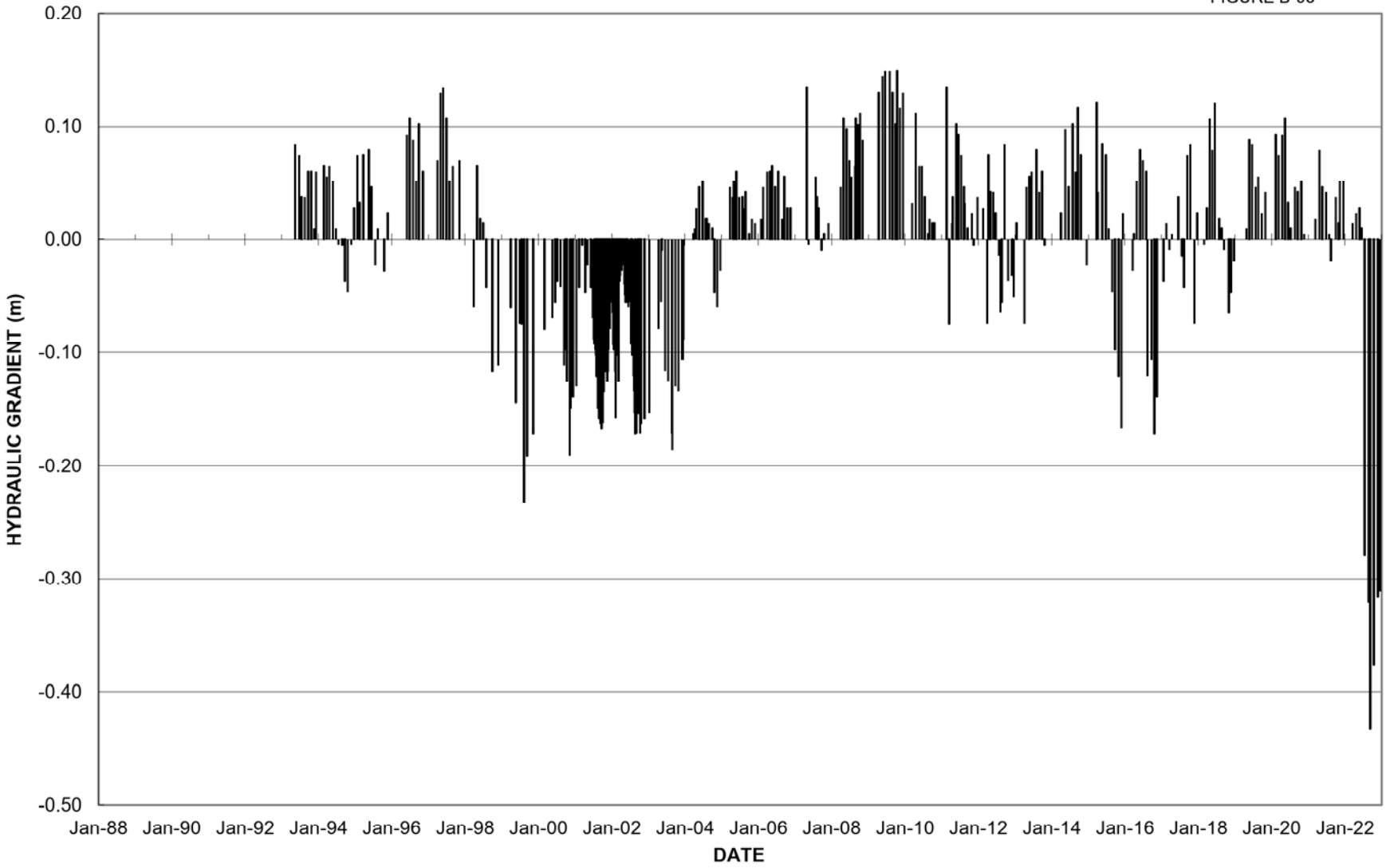
THERMOGRAPH
DP19

FIGURE B-92



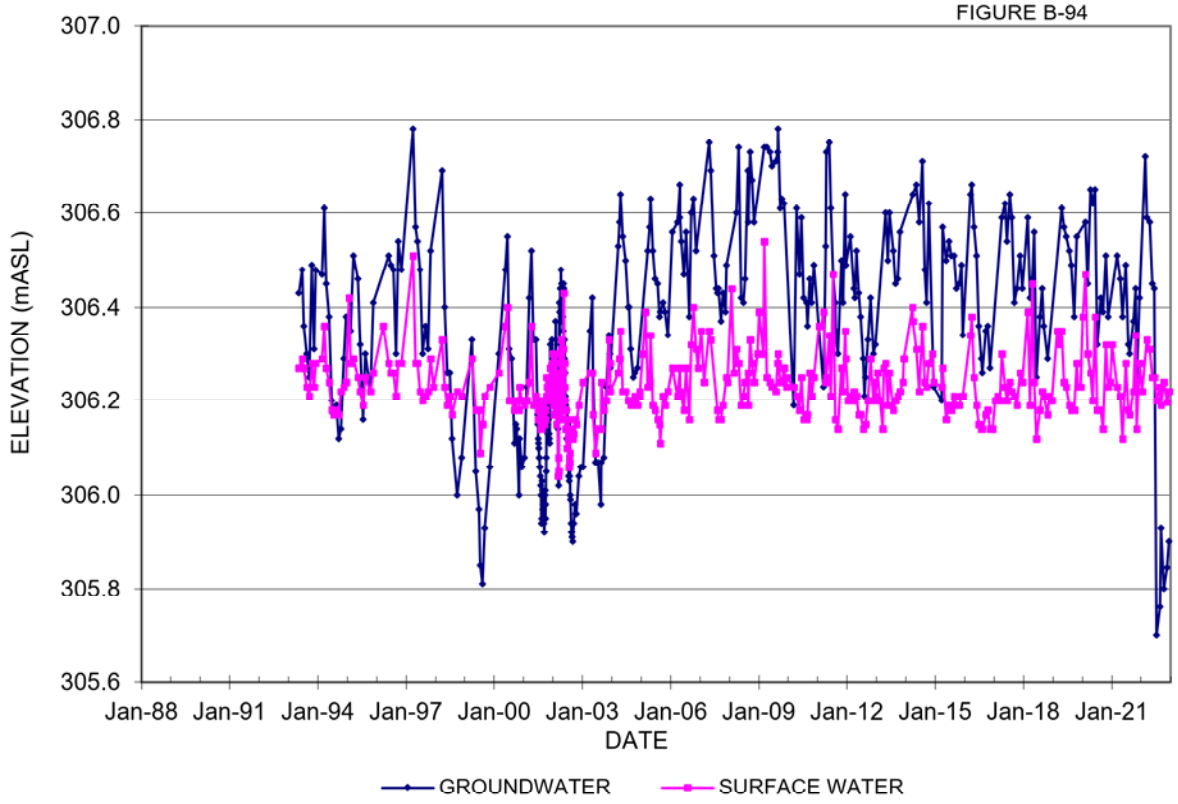
VERTICAL HYDRAULIC GRADIENT
DP19

FIGURE B-93



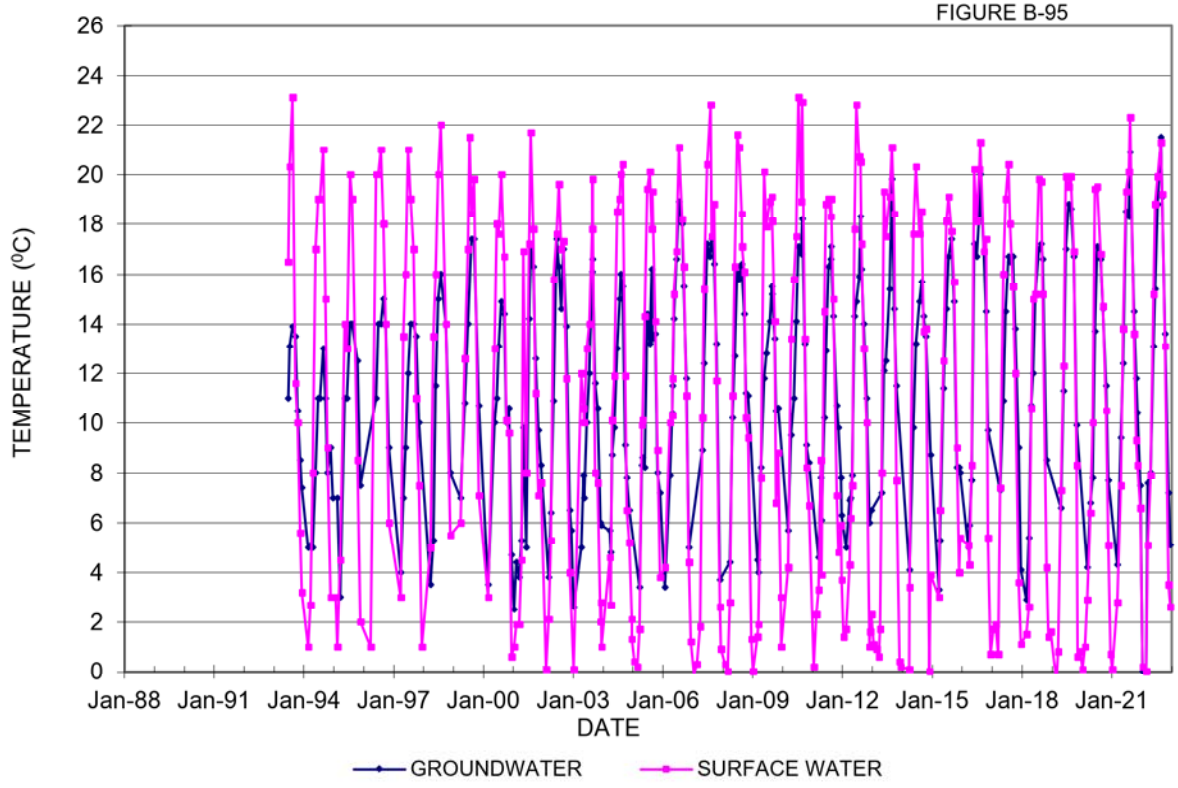
GROUNDWATER/SURFACE WATER HYDROGRAPH
DP20

FIGURE B-94



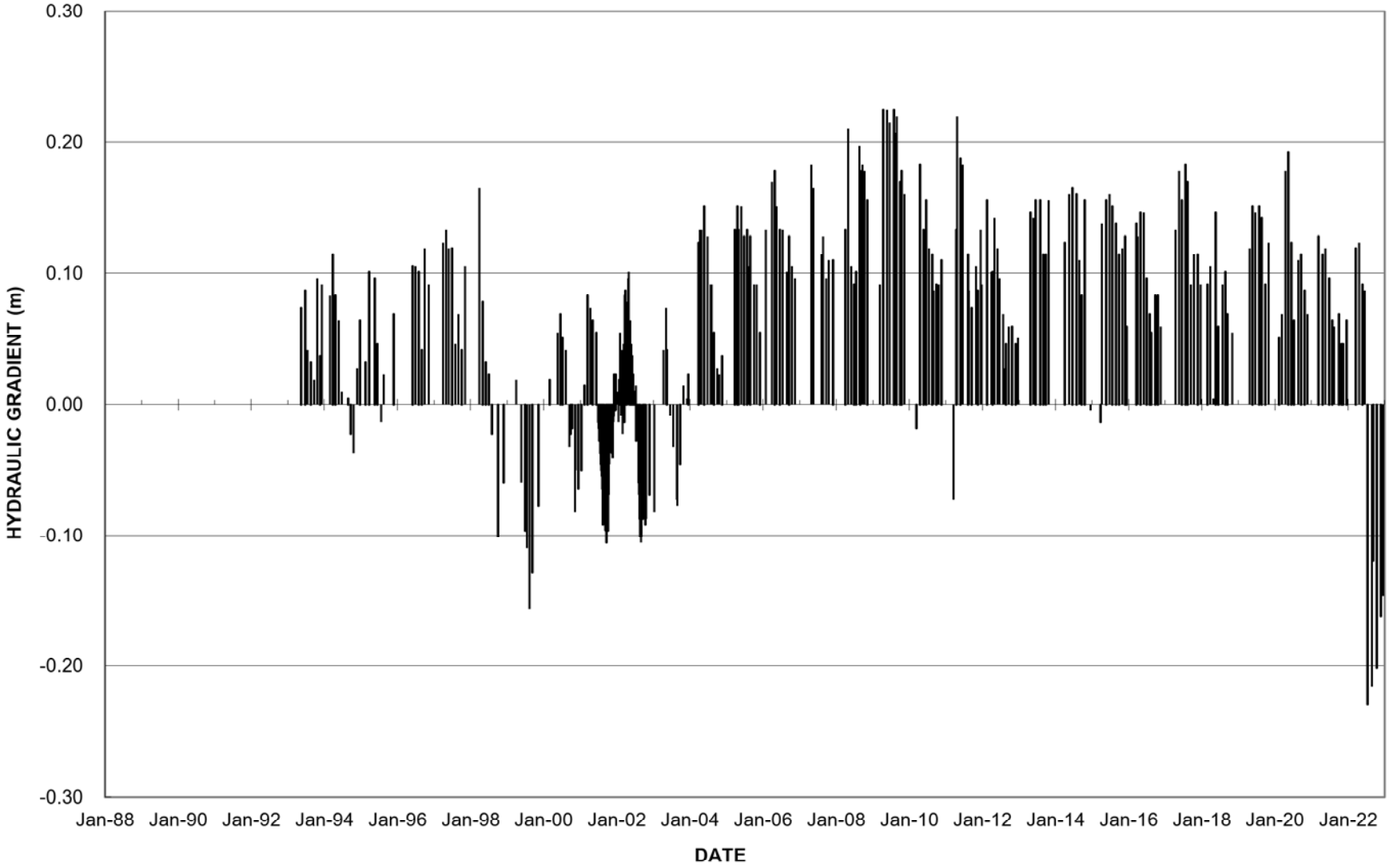
THERMOGRAPH
DP20

FIGURE B-95



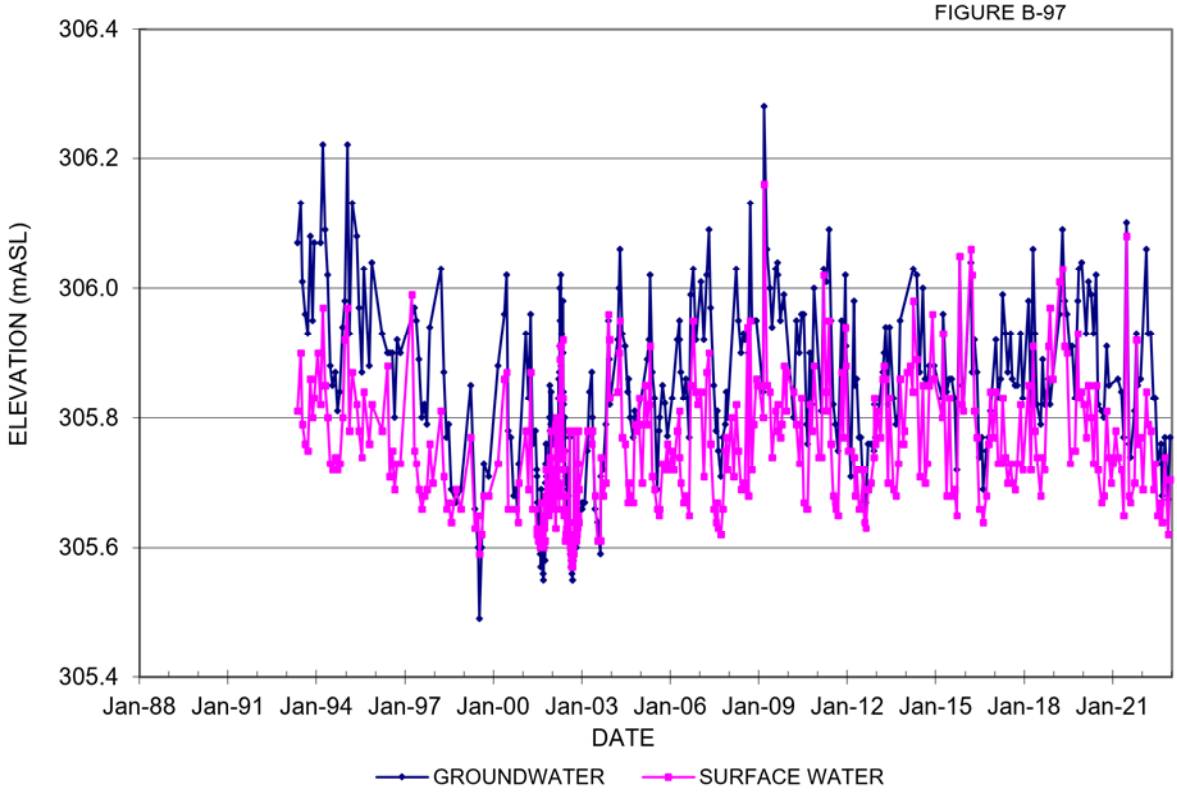
VERTICAL HYDRAULIC GRADIENT
DP20

FIGURE B-96



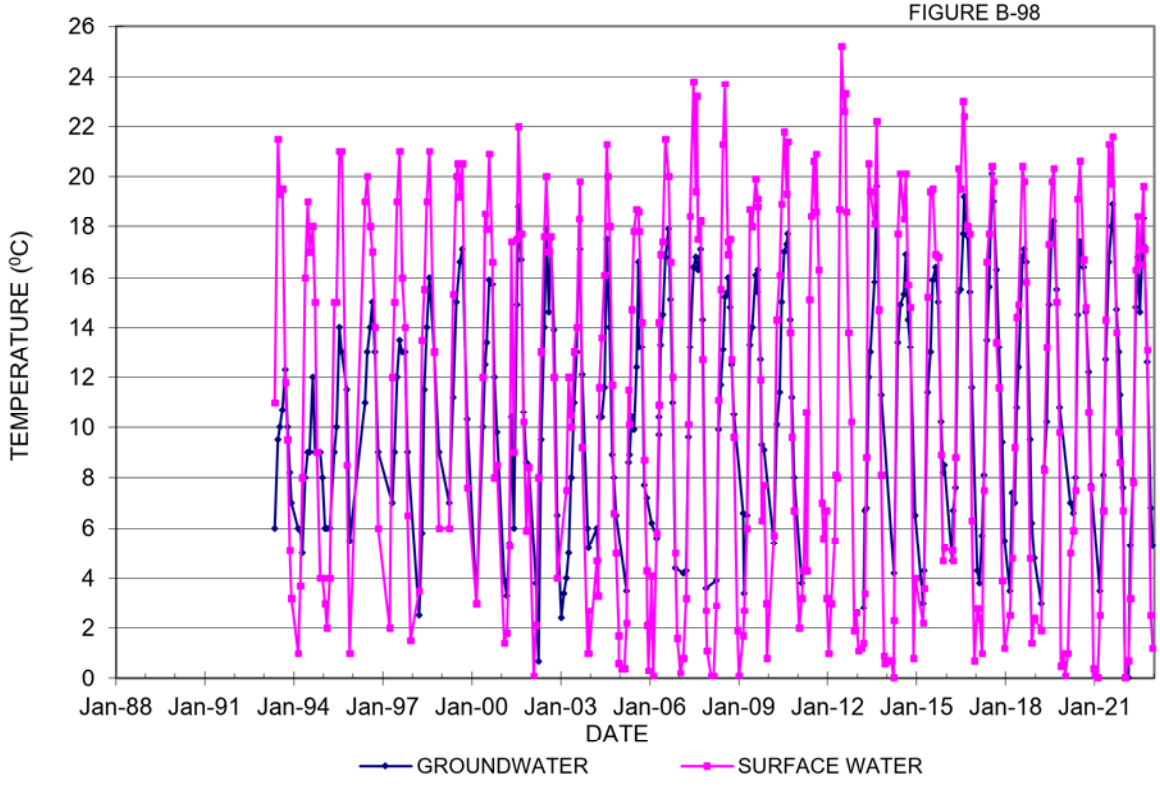
GROUNDWATER/SURFACE WATER HYDROGRAPH
DP21

FIGURE B-97



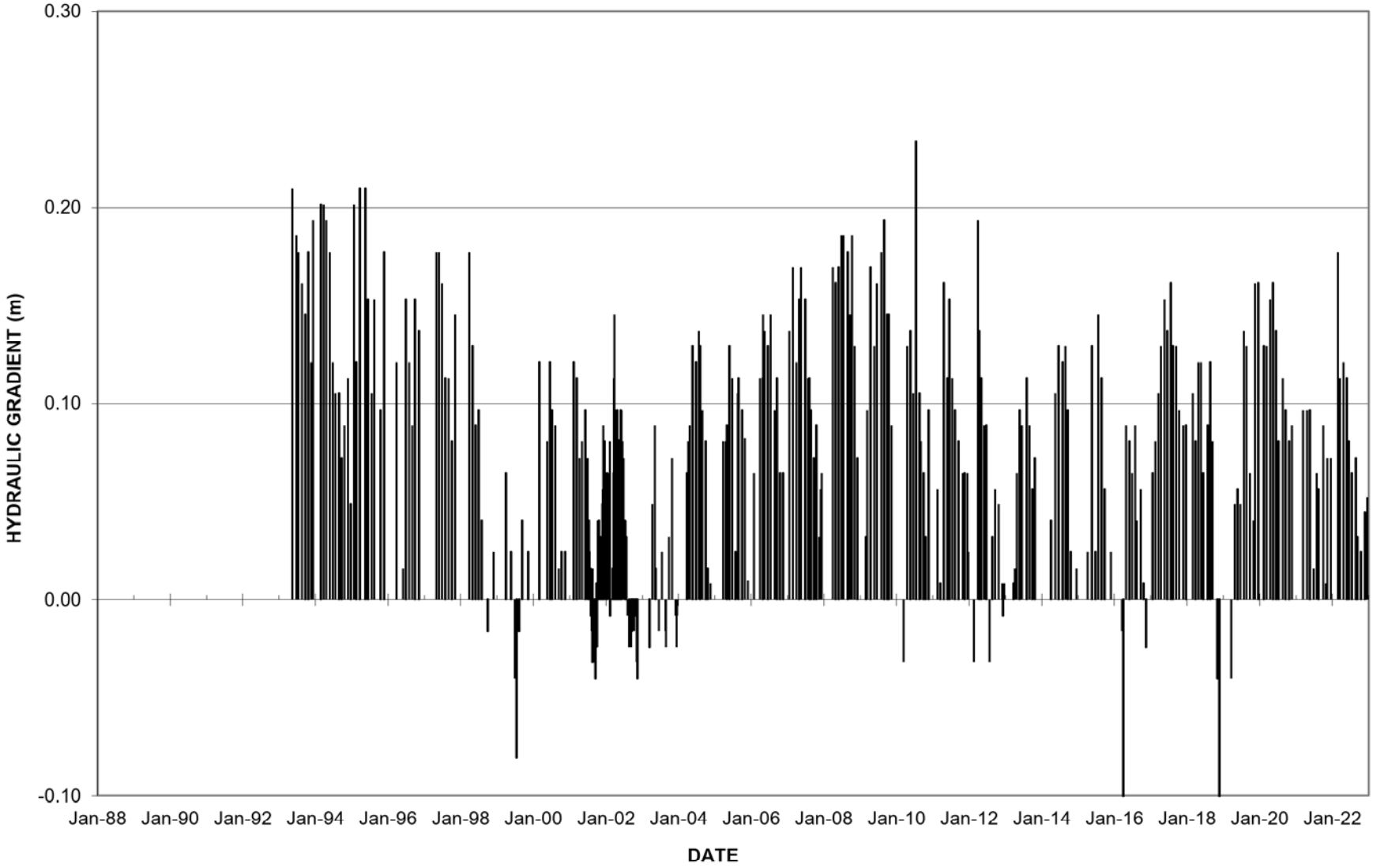
THERMOGRAPH
DP21

FIGURE B-98



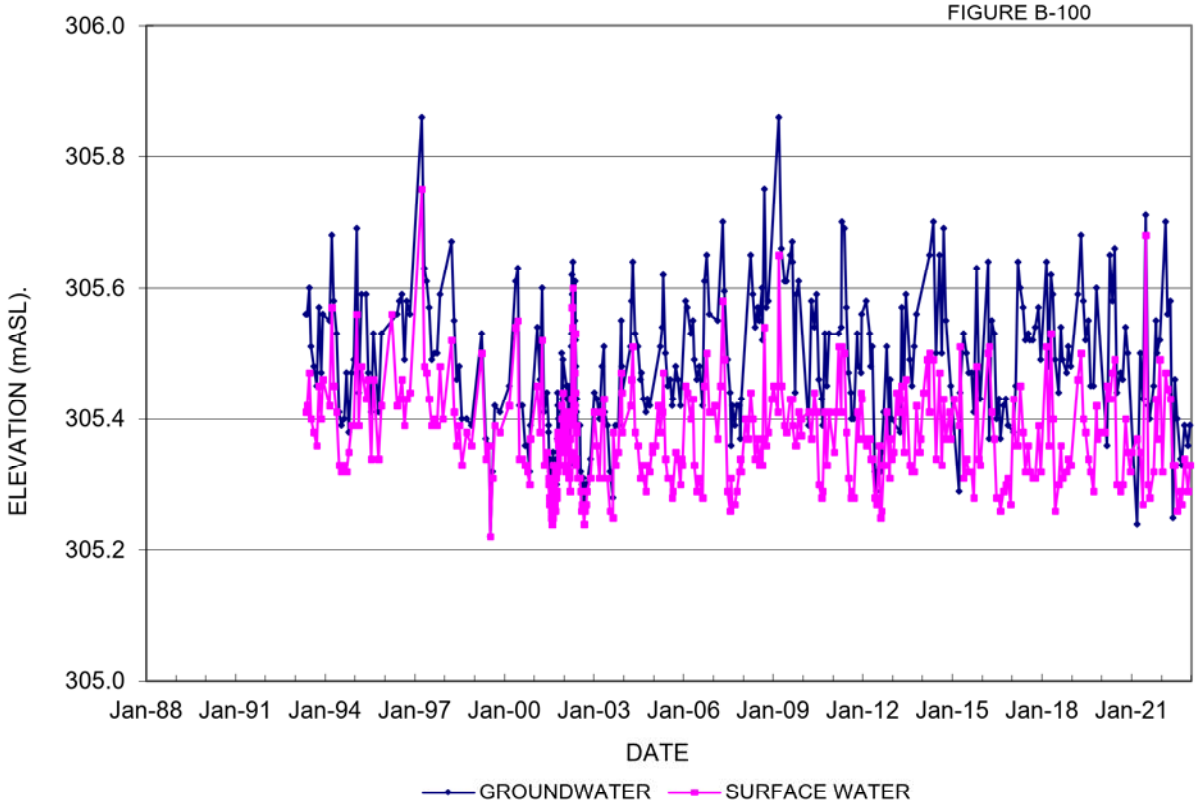
VERTICAL HYDRAULIC GRADIENT
DP21

FIGURE B-99



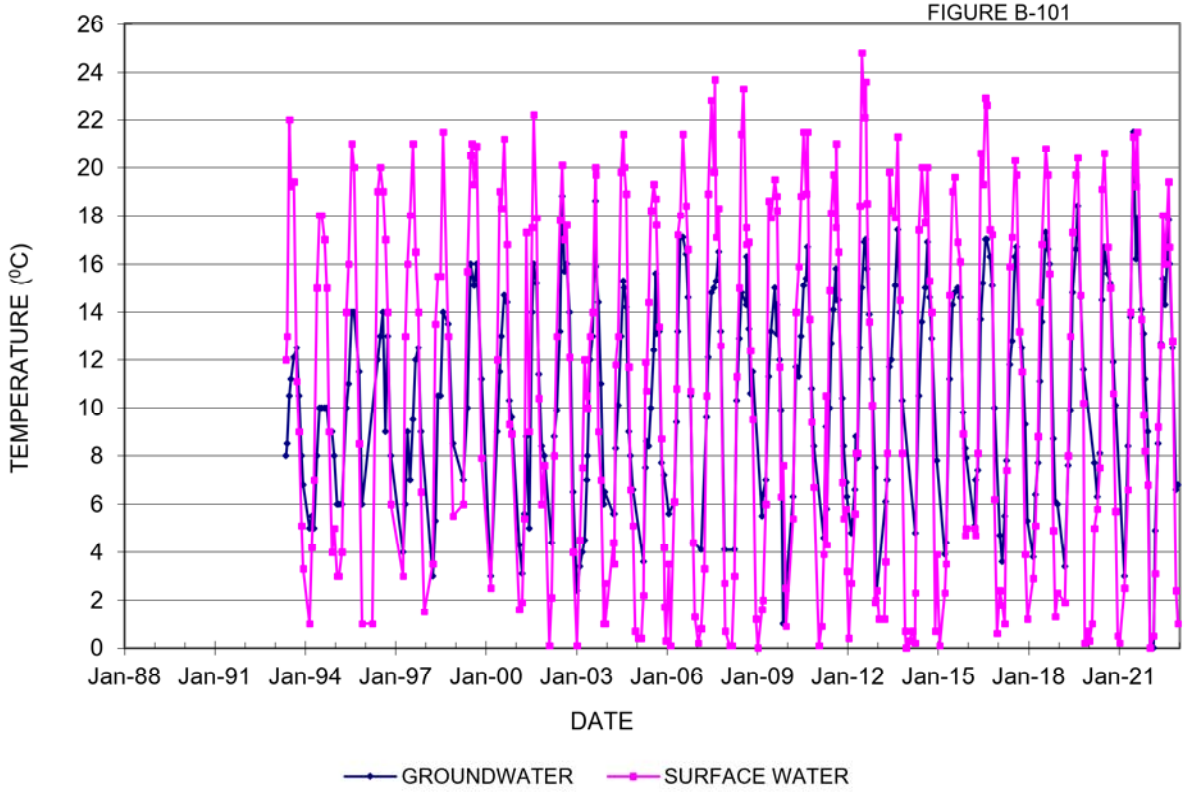
GROUNDWATER/SURFACE WATER HYDROGRAPH
DP22

FIGURE B-100



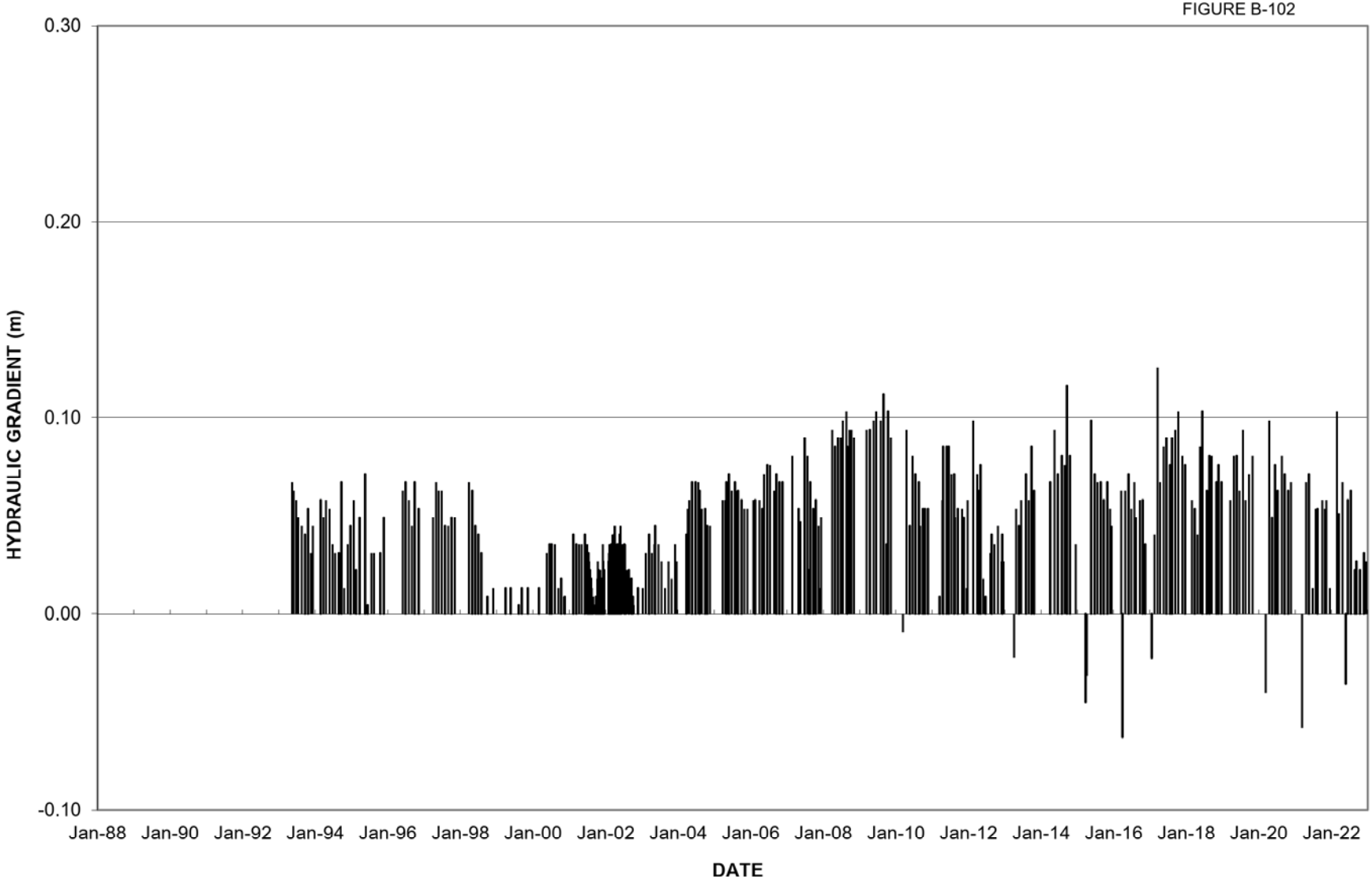
THERMOGRAPH
DP22

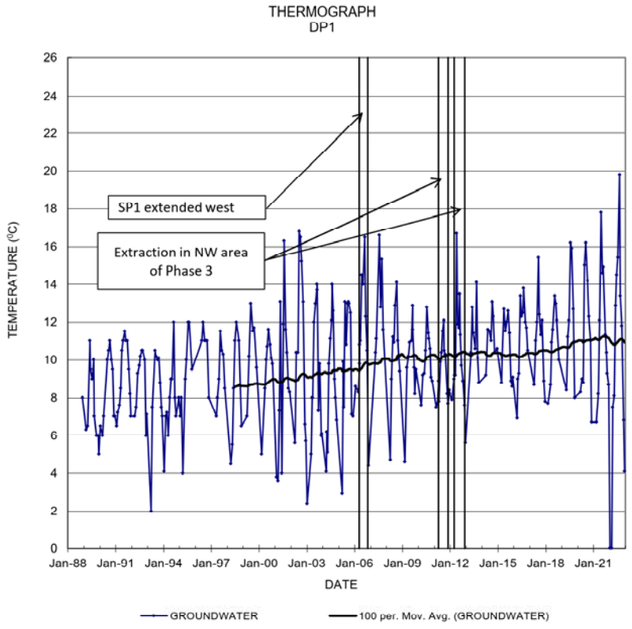
FIGURE B-101

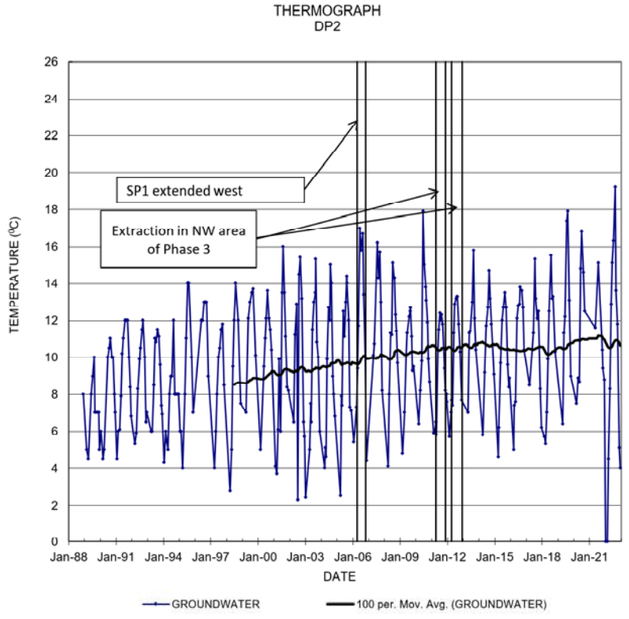


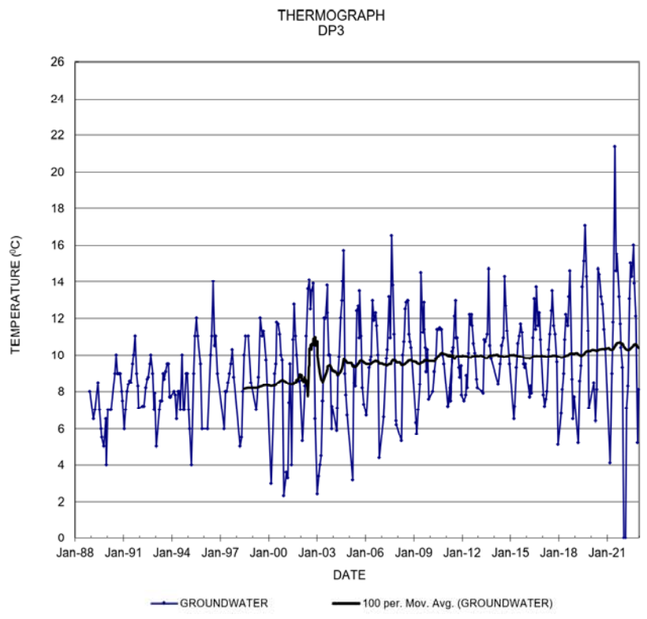
VERTICAL HYDRAULIC GRADIENT
DP22

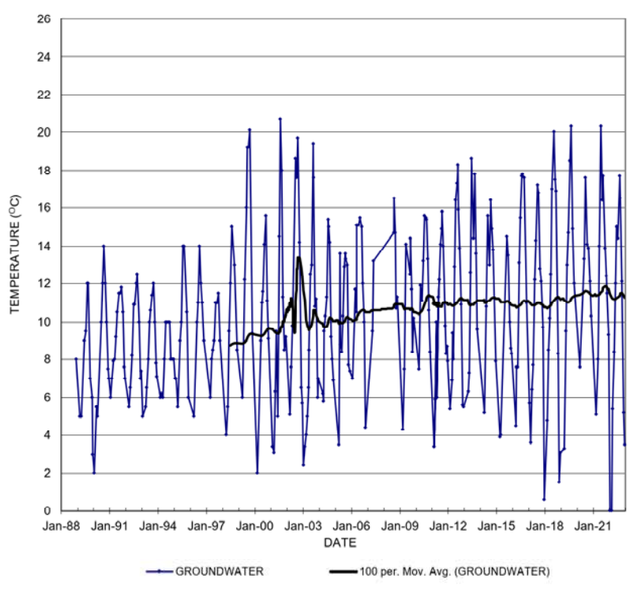
FIGURE B-102

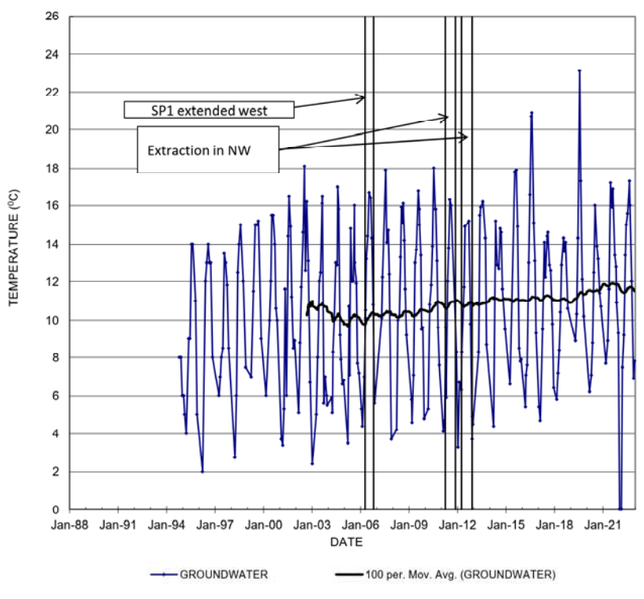


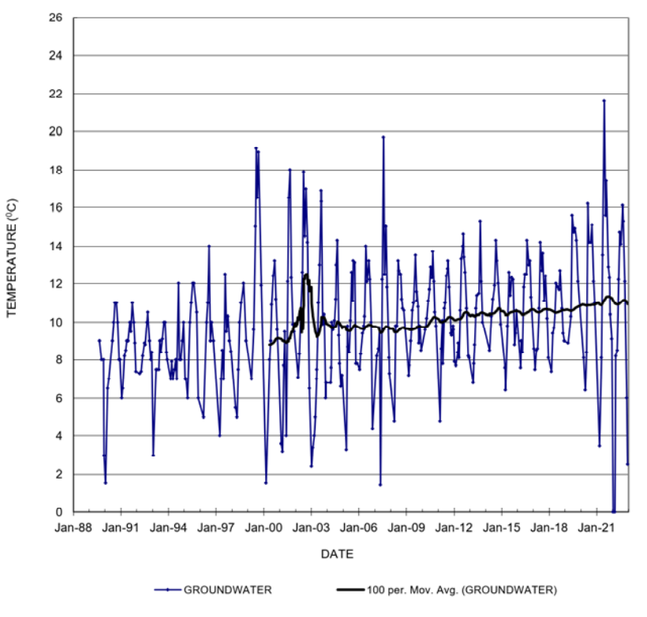

THERMOGRAPH
DP1
TEMPERATURE (°C)
SP1 extended west
Extraction in NW area of Phase 3
DATE
GROUNDWATER
100 per. Mov. Avg. (GROUNDWATER)

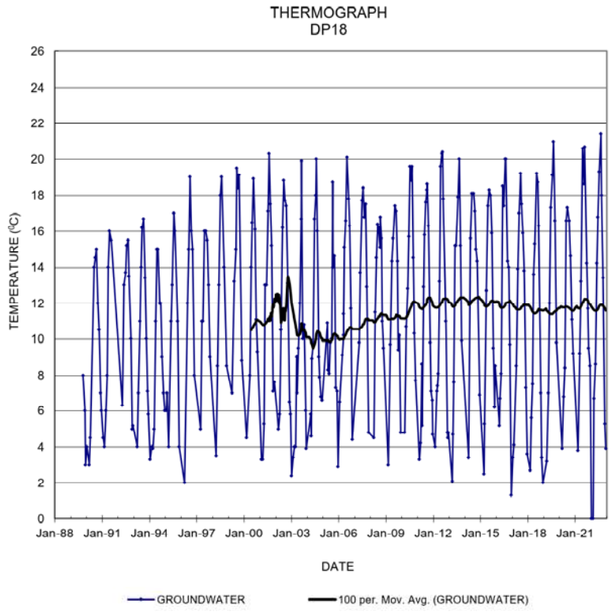

THERMOGRAPH
DP2
TEMPERATURE (°C)
SP1 extended west
Extraction in NW area of Phase 3
DATE
GROUNDWATER
100 per. Mov. Avg. (GROUNDWATER)

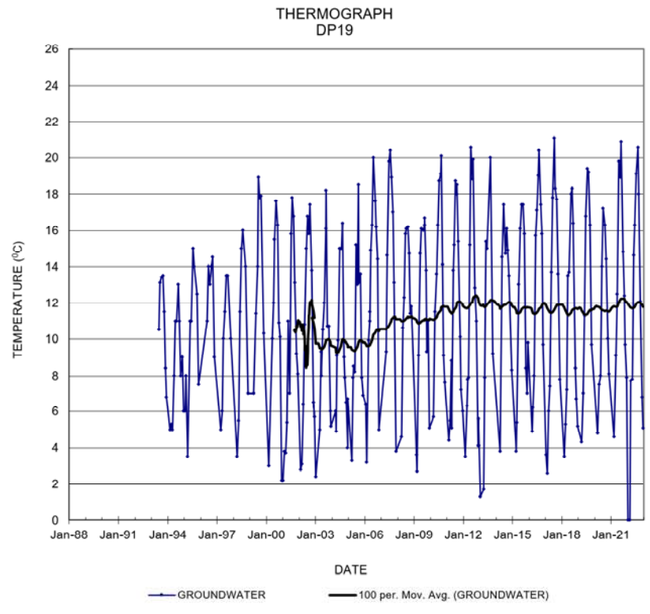

THERMOGRAPH
DP3
TEMPERATURE (°C)
DATE
GROUNDWATER
100 per. Mov. Avg. (GROUNDWATER)

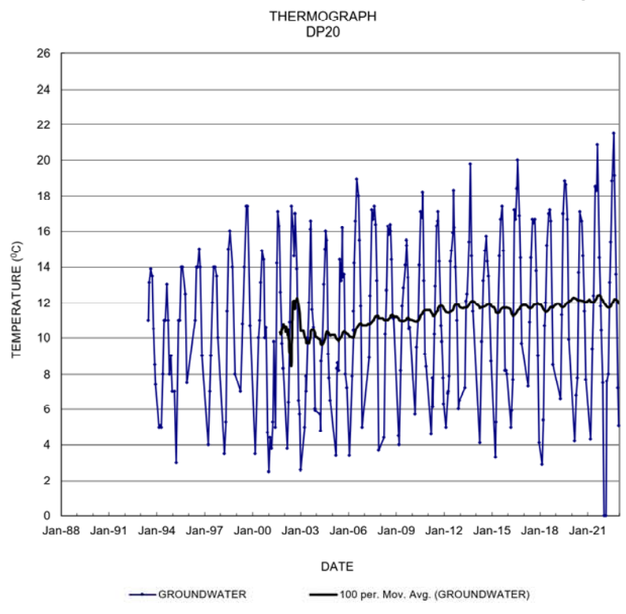

THERMOGRAPH
DP4/R
TEMPERATURE (°C)
DATE
GROUNDWATER
100 per. Mov. Avg. (GROUNDWATER)


THERMOGRAPH
DP5A/B/C/CR
TEMPERATURE (°C)
SP1 extended west
Extraction in NW
DATE
GROUNDWATER
100 per. Mov. Avg. (GROUNDWATER)


THERMOGRAPH
DP17/R
TEMPERATURE (°C)
DATE
GROUNDWATER
100 per. Mov. Avg. (GROUNDWATER)


THERMOGRAPH
DP18
TEMPERATURE (0C)
DATE
GROUNDWATER
100 per. Mov. Avg. (GROUNDWATER)


THERMOGRAPH
DP19
TEMPERATURE (0C)
DATE
GROUNDWATER
100 per. Mov. Avg. (GROUNDWATER)


THERMOGRAPH
DP20
TEMPERATURE (0C)
DATE
GROUNDWATER
100 per. Mov. Avg. (GROUNDWATER)

THERMOGRAPH
DP21
TEMPERATURE (0C)
DATE
GROUNDWATER
100 per. Mov. Avg. (GROUNDWATER)

THERMOGRAPH
DP22
TEMPERATURE (0C)
DATE
GROUNDWATER
100 per. Mov. Avg. (GROUNDWATER)