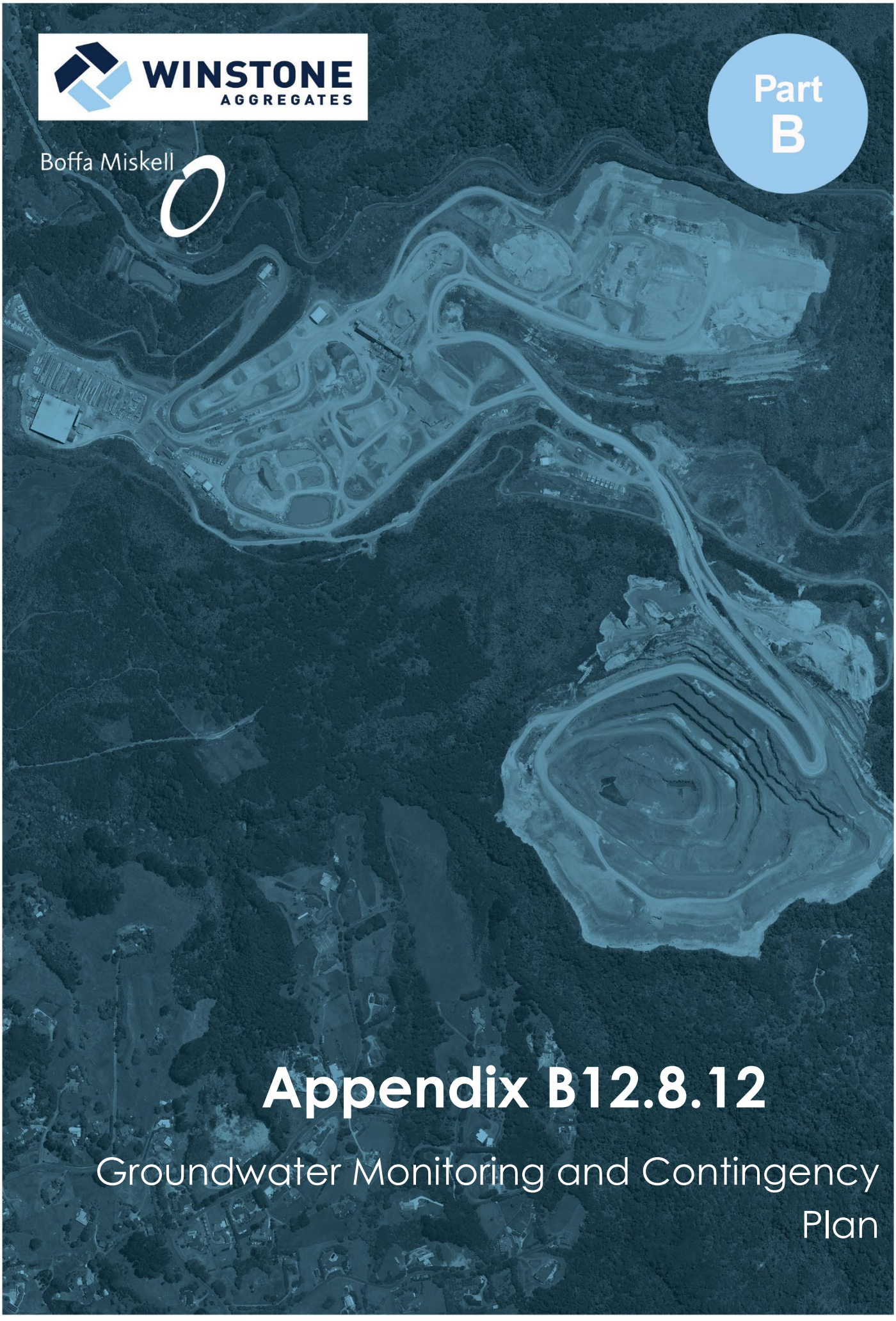
WINSTONE AGGREGATES

Boffa Miskell

Part B



Appendix B12.8.12

Groundwater Monitoring and Contingency Plan

Hunua Quarry

Groundwater Monitoring and Contingency Plan

PREPARED IN ACCORDANCE WITH RESOURCE CONSENT XXXXX

June 2026

Hunua Quarry

Groundwater Monitoring and Contingency Plan

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Hunua Quarry

Groundwater Monitoring and Contingency Plan

1.0 Introduction

This Groundwater Monitoring and Contingency Plan has been prepared as required by condition 3 of resource consent XXXXX

This Monitoring and Contingency Plan contains all management and operational procedures, monitoring requirements, methodologies and contingency measures necessary to comply with conditions of consent for resource consents XXXXXX

Resource consents were granted by Auckland Council to divert, take, use and discharge groundwater from the Hunua Road Pit and the Symonds Hill Pit. The consents contain conditions that control these activities. In the event that there is a discrepancy between this management plan and the conditions within the resource consent, the conditions of consent shall take precedence.

This plan includes a monitoring and reporting schedule which integrates the requirements relating to pit groundwater inflow, quarry pit water levels, bore water levels, and monitoring requirements contained within consent XXXXX.

Purpose:

The Groundwater Monitoring and Contingency Plan is designed to ensure that the groundwater effects associated with the ongoing development of the Symonds Hill Pit at Hunua Quarry are monitored, reported and managed effectively.

Objectives:

The objectives of the Groundwater Monitoring and Contingency Plan are:

1) To ensure that all groundwater and connected surface water monitoring required by resource consent is undertaken and reported appropriately
2) To provide appropriate management methods to mitigate drawdown effects on groundwater users and baseflows

2.0 Requirement for a Groundwater Monitoring and Contingency Plan

Conditions 44 and 45 of Consent YYY require a Groundwater Monitoring and Contingency Plan that meets the following conditions:

44. The objective of the Groundwater Monitoring and Contingency Plan (GMCP) is to detail the measures and procedures to be implemented to monitor groundwater and connected surface water, and to to mitigate the drawdown effects on other groundwater users and baseflows in the Mangapū and Waipokapū Streams to ensure compliance with Conditions 161 – 188.

45. The GMCP must include:

(a) the purpose, objectives, and scope of the GMCP;

(b) the monitoring locations, including abstraction points, groundwater monitoring bores, stream gauging sites, and any substitute monitoring locations approved by the Council;

(c) the monitoring requirements, methods, frequency, and parameters for:

(i) groundwater abstraction volumes;

(ii) groundwater levels;

(iii) groundwater inflow to the quarry sump;

(iv) groundwater quality;

(v) stream flow monitoring; and

(vi) any augmentation flow monitoring;

(d) procedures for collection, recording, management, and submission of monitoring data to the Council;

(e) the trigger levels, thresholds, or criteria for identifying actual or potential non-compliance with the conditions of this consent, including any adverse trends in groundwater levels, groundwater quality, stream flows, or mean annual low flow correlations;

(f) the contingency measures to be implemented where monitoring identifies that:

(i) groundwater abstraction limits may be exceeded;

(ii) monitoring bores become inoperable, inaccessible, or unsuitable;

(iii) stream flows or specific discharge fall below the required levels; or

(iv) augmentation flows are required, or require adjustment, to achieve compliance with this consent;

(g) the procedures and timeframes for implementing contingency measures, including investigation, reporting, remedial action, and notification to the Council;

(h) roles and responsibilities for implementation of the GMCP; and

(i) procedures for review and updating of the GMCP to respond to updated monitoring results, changes in site conditions, or any changes required by the Council acting in accordance with these conditions.

3.0 Monitoring Schedule

The following monitoring is required to be undertaken as required by resource consents XXXX. A location plan of monitoring points is attached as Appendix A.

The reporting schedule is presented in Section 4. Procedures for undertaking monitoring are presented in Section 5.

Abstraction and Take Limits

The total daily abstraction of groundwater from the Symonds Pit Sump and the Mangapū Stream Bore (HUN14/8), including groundwater inflow to the sump, must not exceed 5,820 m^3/day averaged over any seven (7) consecutive days. The water take and use from these sources must not exceed 2,610m^3/d when averaged over any seven (7) consecutive days.

The total annual abstraction of groundwater from the Symonds Pit Sump and the Mangapū Stream Bore (HUN14/8), including groundwater inflow to the sump must not exceed 2,124,300 m^3 averaged over the twelve month period commencing 1 June and ending 31 May of any year. The water take and use from these sources must not exceed 952,650 m^3 when averaged over the same twelve month period.

Daily Rainfall Measurements

Rainfall will be measured on each working day and a record will be kept of each date and corresponding rainfall measurement. An automated rainfall gauge will be used to measure and record rainfall.

Groundwater Level Monitoring

Groundwater levels in groundwater monitoring bores and farm bores (Appendix A - locations and Appendix B – borehole schedules) and water levels in the dewatering sumps in the Symonds Hill Pit will be measured at monthly intervals.

In the event of any groundwater monitoring bore being destroyed, becoming inoperable, the water level dropping below the bottom of the bore, or the bore landowner not allowing access, the bore will be substituted with another groundwater monitoring bore with the written approval of the Auckland Council.

Groundwater level measurements in groundwater monitoring bores and farm bores will be undertaken using a water level dip meter and recorded to the nearest centimetre. The bores will be surveyed with elevations referenced to mean sea level.

Water level measurements in the quarry pit sump will be undertaken by survey or made from surveyed reference marks established adjacent to the quarry pit sumps. Surveys and survey marks will be referenced to mean sea level. Water levels in the quarry pit sumps will be measured to the nearest centimetre.

Records will be kept of the date and corresponding water level for each bore and quarry pit sump.

Total Volume of Water Pumped from the Quarry Pit Sump

Water meters compatible with an electronic storage device will be maintained on the outlet of the dewatering pumps pumping from the Symonds Hill pit sump. The meters will be capable of measuring to an accuracy of at least plus or minus 5% and will display to at least 1 cubic metre.

The water meter within the Symonds Hill Pit will be read at 15 minute intervals and an electronic record maintained.

Access to check compliance will be provided.

Groundwater Inflow Measurement

The rate at which groundwater is diverted into the Symonds Hill Pit is required to be measured at annual intervals.

The rate of inflow will be measured over no less than a five day period during dry weather by pumping water from the Symond Hill pit sump at a rate which generally maintains a constant water level in the pit sumps over this period.

Any variation in water level in the quarry pit sumps will be taken into account when determining the volume pumped.

The quarry pit sump pump meter reading will be analysed for the groundwater component of the total water pumped during the five day pumping period.

Augmentation Flow Rate Monitoring

The rate and volume of water discharged to Mangapū (Symonds) Stream and Waipokapū (Hays) Stream as augmentation flow from the Symonds Hill Pit is required to be measured with a data logger recording a continuous (15 minute) record of flow and volume.

A water meter compatible with an electronic storage device will be maintained on the augmentation pipe line to Mangapū (Symonds) Stream and Waipokapū (Waipokapū (Hays) Stream). The water meter will be capable of measuring to an accuracy of at least plus or minus 5% and will display to at least one cubic meter increments.

A certificate of confirmation verifying the in-situ accuracy of new water meters will be submitted to the Auckland Council within one month of installing the water meter to the Waipokapū (Hays) Stream, and the most up to date certificate for the Mangapū (Symonds) Stream will also be provided to Auckland Council. Subsequent certificates of confirmation verifying the accuracy of water meters will be submitted to the Auckland Council at intervals of not greater than 5 years.

A data logger attached to the water meter will record continuous (at 15 minute intervals) the date and time, flow rate and the total quantity of water being discharged as an augmentation flow to Mangapū (Symonds) Stream and Waipokapū (Waipokapū (Hays) Stream)

Stream Flow Monitoring

Waipokapū (Hays) Stream

The flow in Waipokapū (Hays) Stream at points upstream and downstream of Hunua Quarry will be measured twice annually during dry weather conditions within the period commencing 1 January and ending 30 April.

An additional gauging stations will be established in the first summer monitoring period (1 January to 30 April) in the Waipokapū Stream at the Hunua Road Bridge and will be measured at the same intervals as above.

Schedule C: Waipokopu Stream Low Flow Gauging Sites		
Gauging Site	**Easting**	**Northing**
Upstream Site	1778510	5894630
Downstream Site	1777002	5894655
Bridge Site	1775733	5894655
RL 40[1]	1776264.88	5895491.45

Note:

(a) RL 40 is the replacement for Downstream site in future, if required) should regional groundwater levels drop below RL65m at Downstream site. In order to provide for the augmentation initiation methodology, the consent holder must select at least one more additional gauging site above RL35m and below RL45m, within the Waipokopu Stream, to ensure at least two stream flow measurements are taken where there is expected to be an existing regional groundwater contribution to baseflow. The selection of the gauging site location(s) must include consultation with council. The location of the RL 40 to be advised as part of the Annual Monitoring Report. The location of the RL 40 to be advised as part of the Annual Monitoring Report

Should an alternative location be required, it must be approved in writing by the Council having considered accessibility and the sustainability of each location for stream flow measurement.

Mangapū (Symonds) Stream

The flow in Mangapū (Symonds) Stream in the vicinity of the Symonds Hill Pit is required to be measured monthly during the summer period.

The flow in Mangapū (Symonds) Stream will be measured annually on two occasions in separate months during dry weather conditions between 1 January and 30 April at the below locations in the Mangapū (Symonds) Stream.

Schedule B: Mangapū Stream Low Flow Gauging Sites		
5894655	5894655	5894655
Upstream1 (Fork)	1777824	5893193
Upstream 2 (Bridge)	1778320	5893320
Diversion-1	1778094	5892968
Downstream	1777471	5893630
RL 55	1777174	5893528
Coal Mine Road	1776765	5893585
Kauri View Road	1776385	5893770
Ponga Road Culvert	1775495	5893690
61 Ponga Road (upstream)	1775090	5893410
61 Ponga Road (downstream)	1774550	5893030

The locations of stream gauging stations are shown on the Monitoring Location Plan in Appendix A.

Should an alternative location be required, it must be approved in writing by the Council having considered accessibility and the sustainability of each location for stream flow measurement.

Water Quality Monitoring

Symonds Hill Pit Sump

Water quality monitoring will be undertaken within the Symonds Hill Pit sump within six months of intercepting the regional groundwater table, at annual intervals thereafter.

Samples will be analysed for the following parameters:

a) pH
b) Temperature
c) Conductivity at 25^0C (mS/m)
d) Potassium (K)
e) Chloride (Cl)
f) Silica (SiO_2)
g) Sulphate (SO_4)
h) Total Alkalinity (as Calcium Carbonate, $CaCO_3$)

i) Calcium Hardness (as Calcium Carbonate, $CaCO_3$)
j) Magnesium Hardness (as Calcium Carbonate, $CaCO_3$)
k) Sodium (Na)
l) Dissolved Oxygen (O)
m) Nitrate Nitrogen (N)
n) any other parameters required to obtain an ion balance for the sample of between 95 and 105%

Symonds Hill Pit Groundwater Monitoring Bores

Groundwater samples will be taken from any new or substitute groundwater monitoring bores associated with the Symonds Hill Pit within three months of construction, and analysed for the same parameters as for the Symonds Hill Pit sump water.

Sampling of groundwater monitoring bores will be taken once the bore has been purged by pumping for sufficient time to allow the volume of water contained in the bore to be completely replaced three times by water from the surrounding rock. Record shall be kept of the length of time and approximate rate of pumping required to purge the bore.

Mangapū (Symonds) Stream Augmentation Flow

Water temperature and dissolved oxygen will be measured at fortnightly intervals between 1 November and 31 May at approximately the same time on each day of measurement whenever an augmentation discharge is made to Mangapū (Symonds) Stream. The measurement of temperature and dissolved oxygen will be taken within the augmentation flows to Mangapū (Symonds) Stream and in Mangapū (Symonds) Stream immediately upstream and downstream of the augmentation flow discharge point. The measurements will be undertaken when the augmentation flow has been occurring for at least one hour.

Water and dissolved oxygen concentration measurements will be made in the field. The temperature will be measured to an accuracy of ± 0.5degrees Celsius and the dissolved oxygen concentration will be measured to an accuracy of ± 0.2 milligrams per litre.

The receiving environment shall meet the following criteria:
- The water temperature of Symonds Stream and Hays Stream below the augmentation flow discharge point shall be equal to or less than the water temperature above the discharge point; and
- The dissolved oxygen concentration below the discharge point shall be equal to or greater than 6 milligrams per litre.

<u>Technical Review At Intermediate Drawdown Steps</u>

Reduction in groundwater levels must be carried out in steps. The groundwater level in the Symonds Hill Pit site at the first step must be not lower than RL25 metres, the second step not lower than RL-5 metres and the third step not lower than RL-30 metres.

A Technical Review must be undertaken no less than 3 months prior to commencing each of the two successive steps of dewatering identified in Condition 167. The Review must include an analysis of monitoring data, a comparison of actual groundwater level values to

predicted values, and an assessment of any implications these results may have for on-going management of any actual or potential adverse effects as a consequence of dewatering. The Technical Review must provide a more detailed analysis and interpretation of monitoring data than the Annual Monitoring Report required in accordance with Condition 66. The Consent Holder must forward the Technical Review to the Council within one (1) month of the completion of the Review.

The timing of the technical review will be programmed following the pit sump of the Symonds Hill Pit reaching RL45m.

Monitoring Bore Construction & Maintenance

Table 1: Monitoring Summary

	Location	Parameter	Frequency
Daily Rainfall Measurements	Hunua Quarry	Rainfall	Daily – automated rainfall gauge
Groundwater Level Monitoring	Groundwater Monitoring Bores	Groundwater levels	Monthly
	Symonds Hill Pit sump	Pit sump water level	Monthly
Quarry Pit Pumping	Symonds Hill Pit	Pumping Volumes	Weekly water meter reading – Daily during February
Groundwater Inflow	Symonds Hill Pit	Groundwater inflow	Annually during dry weather
Stream Flow Monitoring	Mangapū (Symonds) Stream - upstream	Stream flow	Annually on two occasions in separate months between 1 January and 30 April
	Mangapū (Symonds) Stream - downstream	Stream flow	Annually on two occasions in separate months between 1 January and 30 April
Water Quality Monitoring	Symonds Hill Pit Sump	Water chemistry	Annual intervals
	Bore HUN14/8	Water chemistry	Annual intervals
	Replacement Symonds Hill Pit Groundwater Monitoring bores	Groundwater chemistry	Within 3 months of construction
	Mangapū (Symonds) Stream Augmentation Flow (augmentation flow and in Mangapū (Symonds) Stream upstream and downstream of the discharge)	Water temperature and dissolved oxygen	Fortnightly between 1 November and 31 May when augmentation flows are undertaken
	Waipokapū (Hays) Stream Augmentation Flow (augmentation flow and in Waipokapū (Hays) Stream upstream and downstream of the discharge)	Water temperature and dissolved oxygen	Fortnightly between 1 November and 31 May when augmentation flows are undertaken

4.0 Monitoring Methodologies

Quarry Pit Groundwater Inflow Measurement

The rate at which groundwater is diverted into the Symonds Hill Pit sump will be measured at annual intervals.

This rate of inflow will be measured over a five day period during dry weather by pumping water from the sump at a rate which generally maintains a constant water level in the pit sump over the measurement period. The sources of inflow in the quarry pit sump will be noted including rainfall during and prior to the groundwater inflow measurement being undertaken. Any variation in water level in the dewatering sump will be taken into account when determining the volume pumped.

The record will include details of the measurement procedure employed, records of rainfall prior to and during the measurement, the dimensions of the surface area of the quarry pit sump, and the time and corresponding water level measurements within the quarry pit sump.

The quarry pit sump water meter readings will be analysed for the groundwater component of the total volume of water pumped during the measurement period.

Stream Flow Monitoring and Analysis Methodology

Stream flow measurements will be undertaken in Mangapū (Symonds) Stream, Waipokapū (Hays) Stream, Taitaia Stream or Waihoihoi Stream

Flow will be measured during dry weather conditions using a current meter to measure flow over a minimum of 20 vertical intervals. The flow measurements will be undertaken by a suitably qualified and experience person using appropriately calibrated and maintained equipment.

Stream flow measurement records will include details of the method, dates and times of the procedure employed, all measurements taken, and flow calculations.

Practices for Water Chemistry Monitoring

Water chemistry monitoring will be undertaken during dry weather conditions.

Samples for laboratory analysis will be collected, stored and transported in appropriate sample bottles supplied by the testing laboratory. When sampling, sample bottles for general chemistry will be rinsed with sample water and then filled leaving a small headspace.

Sampling of groundwater monitoring bores will be taken once the bore has been purged by pumping for sufficient time to allow the volume of water contained in the bore to be completely replaced three times by water from the surrounding rock. A record will be kept of the length of time and approximate rate of pumping required to purge the bore.

A record will be kept of the time and date of the sampling. Samples will be submitted to an accredited laboratory for testing. Standard method detection limits will be used for each test.

Measurement of dissolved oxygen and water temperature will be taken in the field using appropriately calibrated and maintained equipment. Water temperature will be measured to an accuracy of ± 0.5degrees Celsius, dissolved oxygen concentration will be measured to an accuracy of ± 0.2 milligrams per litre.

A record will be kept of the time and date of each of the field measurements.

Practices for Bore Water Level Monitoring

Groundwater level measurements in groundwater monitoring bores and farm bores will be undertaken using a water level dip meter and recorded to the nearest centimetre. The bores will be surveyed with elevations referenced to mean sea level.

Prior to taking groundwater level measurements in farm bores, wherever possible measurements will be undertaken when water levels have fully recovered to non-pumping levels. Recovery to non-pumping levels will be verified by taking a series of four or more water level measurements over a half hour period that are within 0.02m of each other.

Records will be kept of the date and corresponding water level in each groundwater monitoring bore or farm bore.

5.0 Reporting Schedule

Notification of Groundwater Level Trigger

The Auckland Council will be notified within seven days of a Groundwater Drawdown trigger levels being equalled or exceeded in any of the deep groundwater monitoring bores in Schedule A (Appendix B) or in any of the private bores 830, 20013, 20479 and 21474 (Glasgow Bore). The notification will specify which bore trigger(s) have been exceeded and the quantum of the exceedance for each bore.

Water level drawdowns will immediately cease at the Symonds Hill Pit and drawdown will not be recommenced unless it can be demonstrated that the trigger levels can be complied with to the written satisfaction of the Auckland Council.

Notification of Flow Decrease in Mangapū (Symonds) Stream

Auckland Council will be notified in the event that the recognised MALF as per the calculation methodology described in Condition XX decreases by more than 5% in the Mangapū (Symonds) Stream.

Notification of Flow Decrease in Waipokapū (Hays) Stream

Auckland Council will be notified in the event that the recognised MALF as per the calculation methodology described in Condition XX decreases by more than 5% in the Waipokapū (Hays) Stream.

Sudden Loss of Water Supply

Within 24 hours of the notification of a sudden loss of a water supply, a report will be submitted to the Auckland Council containing the results of the investigation, the steps that

have been and are to be taken in response and whether these steps have been agreed with the claimant.

Claim of Bore Interference or Spring/Stream Flow Depletion

A report will be prepared and submitted to the Auckland Council within one month of written notification of any new or repeated claim of bore interference or stream or spring flow depletion within 500 metres of the Symonds Hill Pit Drawdown Zone or in Waipokapū (Hays) Stream, Mangapū (Symonds) Stream or Waihoihoi Stream to their confluence with Slippery Creek.

Water Supply Mitigation Plan

A Water Supply Mitigation Plan will be developed and submitted to the Auckland Council within 14 days of a written requirement from the Auckland Council following groundwater drawdowns greater than the drawdown triggers in groundwater monitoring bores identified in Appendix B.

Quarterly Reporting

The following will be reported to the Auckland Council and Watercare Services Limited within 20 working days of 28 February, 31 May, 31 August, and 30 November of each year: The Quarterly Report due 20 working days following the 31 May will be incorporated into the Annual Report due 30 June.

- Locations and elevations of new or existing boreholes surveyed in the previous three months.
- Copy of stratigraphic log, plus any hydraulic or water chemistry test results, for bores constructed in the previous three months.
- Water meter records for the previous three months from the Symonds Hill Pit sump water meters.
- Rainfall Record for the previous three months.
- Groundwater level monitoring results (boreholes) for the previous three months.
- Note of any augmentation flow to Mangapū (Symonds) Stream or Waipokapū (Hays) Stream
- Water temperature and dissolved oxygen monitoring record of Mangapū (Symonds) Stream augmentation flow (augmentation flow and upstream and downstream in Mangapū (Symonds) Stream of the discharge to Mangapū (Symonds) Stream) for the previous three months.
- Mangapū (Symonds) Stream and Waipokapū (Hays) Stream Augmentation Flow water meter record for the previous three months.
- Water meter record for the previous three months from the Symonds Hill pit sump water meters.
- Groundwater level monitoring results (boreholes) for the previous three months.
- Annual rate of groundwater inflow test results (if undertaken in previous three months).
- Annual Symonds Hill Pit sump and HUN14/8 water chemistry (if undertaken in previous three months).

- Annual Waipokapū (Hays) Stream and Mangapū (Symonds) Stream flow gauging results (if undertaken in previous 3 months).
- Groundwater level monitoring results (boreholes, Symonds Hill pit sump) for the previous three months.

Annual Reporting

An Annual Report containing all water level monitoring information, water chemistry and the results of stream flow measurements for the year ending 31 May will be prepared and submitted to the Auckland Council and Watercare Services Limited by 30 June each year.

The report will provide an analysis of all data collected, and will examine and evaluate compliance with consent conditions and any effects on the environment during the previous year and since the consents were granted.

In detail, the following will be contained within the annual report:

- Locations and elevations of new or existing boreholes surveyed in the previous 12 months.
- Copy of stratigraphic log, plus any hydraulic or water chemistry test results, for bores constructed in the previous 12 months.
- Water meter records for the previous 12 months from the Symonds Hill Pit sump water meters.
- Results of annual rate of groundwater inflow test into the Symonds Hill Pit sump.
- Rainfall Record for the previous 12 months.
- Groundwater level monitoring results (boreholes) for the previous 12 months.
- Details of any augmentation flow to Mangapū (Symonds) Stream and Waipokapū (Hays) Stream.
- Water temperature and dissolved oxygen monitoring record of Mangapū (Symonds) Stream augmentation flow (augmentation flow and upstream and downstream in Mangapū (Symonds) Stream of the discharge to Mangapū (Symonds) Stream) for the previous 12 months.
- Mangapū (Symonds) Stream and Waipokapū (Hays) Stream Augmentation Flow water meter record for the previous 12 months.
- Details of any claim of sudden loss of a water supply including results of any investigations, Emergency Water Supply Action Plans and any consequence action undertaken in the previous 12 months.
- Details of any Water Supply Mitigation Plans implemented as a result of groundwater levels being drawn down more than seasonal variation plus 5 metres within the area defined by the outer perimeter of the Inferred Drawdown Zones, plus 600 metres to the west of the 30-70 metre zones. The loss may be from a stream at any site within the area defined by the outer perimeter of the Inferred Drawdown Zones; plus Hays, Symonds and Waihoihoi Streams westward to their confluence with Slippery Creek.
- Details of any Emergency Water Supply Action Plan or Water Supply Mitigation Action Plan prepared or implemented in the previous 12 months.
- The results of any independent report commissioned by Winstone Aggregates as a result the groundwater drawdown having a potential adverse effect on the Watercare Hays Creek dam structure, reservoir yield or stream flows undertaken in the previous

12 months including any options for avoiding, remedying or mitigating the potential adverse effects and the methods proposed or undertaken to do so.

- The results of any review or report of the groundwater predictions and model as a result of any shallow groundwater monitoring bore equalling or exceeding its trigger value, and any resultant assessment of the impact on shallow groundwater supply bores and the subsequent design and implementation of Monitoring and Contingency Plan for shallow water bores reported upon, undertaken or implemented in the previous 12 months.
- Groundwater level monitoring results (boreholes) for the previous 12 months.
- Annual Waipokapū (Hays) Stream and Mangapū (Symonds) Stream flow gauging results.
- Water meter records for the previous 12 months from the Symonds Hill Pit quarry sump water meters.
- Results of annual rate of groundwater inflow test into the Symonds Hill Pit quarry sump.
- Results of Mangapū (Symonds) Stream flow gauging for the previous 12 months.
- Groundwater level monitoring results (boreholes) for the previous 12 months.
- Groundwater level monitoring results (quarry pit water levels – Symonds Hill pit for the previous 12 months.
- Details of any investigation or report, including any resultant Water Supply Mitigation Plan, of any claim of bore interference or spring flow depletion within 500 metres of the edge of the Symonds Hill Pit undertaken or completed in the previous 12 months.
- Results of Symonds Hill Pit quarry sump water chemistry monitoring undertaken in previous 12 months.
- Results of any new or replacement groundwater monitoring borehole water chemistry monitoring undertaken in the previous 12 months.
- Water temperature and dissolved oxygen monitoring results from Mangapū (Symonds) Stream.
- Results of correlation graphs for MALF of all gauging stations, including the required augmentation rates for each augmentation point.

5.0 Contingency Plans

Waipokapū (Hays) Stream adjacent to Hunua Quarry

A correlation must be prepared for the purpose of quantifying the specific discharge for the mean annual low flow (MALF) of all the gauging stations (including the diversion stream (Diversion-1 after Stage 2). The flow correlation must relate to the natural stream flow data collected in accordance with the requirements of the conditions of this consent, for the period since data commenced and ending 30 April each year, with concurrent flows at the Auckland Council Mangawheau Stream flow site at Aldridge Road, Hunua (site number 08529) and any other relevant site as required in writing by the Southern Council, Resource Consents and Compliance. The correlation graphs, values for r2, y intercept, slope, regression expression and MALF for all stations must be completed, interpreted and submitted to the Council within 10 working days after 30 April each year.

In the event that more than 5% drop in the recognised MALF of the above gauging stations on Mangapū Stream, Waipokapu Stream and the diverted stream, the Consent Holder must

augment flows upstream of the Waipokapu Stream (Downstream Site), Mangapū Stream (RL 55 Site) and the diverted Stream (Diversion-1 Site) at a constant rate by at least the maximum difference between the MALF and the average specific discharge flow for each station in a way to compensate for any loss of flow. The required augmentation rates for each station should be presented in the annual monitoring report.

Where the specific discharge measured at the Upstream Site (i.e. Mangapū Stream Upstream-2 or Waipokopu Stream Upstream falls more than 5% below its established MALF, the reduction shall be attributed to drought conditions. In such circumstances, the augmentation requirement for any downstream site shall be adjusted proportionally to reflect the natural reduction in flow. The adjusted augmentation flow to be maintained at any downstream site shall be the downstream site's MALF reduced by the same percentage by which the upstream site's current flow falls below its MALF. For example, if the upstream reference site flow is recorded at 70% of its MALF (a 30% reduction due to drought), the Consent Holder shall only be required to augment the downstream site to 70% of MALF.
If insufficient data has been collected to meet the requirements of this condition, then the commencement date of the augmentation flows can be changed following receipt of written confirmation from Council.

In addition, the consent holder may, following receipt of written confirmation from Council, change the augmentation rate if the monitoring, as required by this consent or any additional flow gauging identifies that augmentation flows are excessive or insufficient.

Mitigation of Sudden Loss of Water Supply

This management plan requires Winstone Aggregates to investigate and report on any claim of loss of a water supply from a bore or spring within the the area defined by the outer perimeter of the Inferred Drawdown Zones, plus 600 metres to the west of the 30-70 metre zones. The loss may be from a stream at any site within the area defined by the outer perimeter of the Inferred Drawdown Zones; plus Hays, Symonds and Waihoihoi Streams westward to their confluence with Slippery Creek. The Inferred Drawdown Zones are as shown on Figure 20 of the report “Hunua Quarry Development: Groundwater Effects Assessment” Pattle Delamore Partners Ltd, 30 March 2026.

Should Auckland Council notify Winstone Aggregates of any sudden loss of water supply, the following actions will be undertaken:

1. The claimant will be contacted and the sudden loss of water supply will be investigated within 12 hours of being notified of the claim.
2. An Emergency Water Supply Plan shall be offered to the claimant within 24 hours of being notified of the claim unless in the opinion of the Auckland Council it is unreasonable to do so on the available evidence.
3. Winstone Aggregates will report to Auckland Council within 24 hours of being notified of the claim the results of the investigation, the steps that have been taken in response and whether these steps have been agreed by the claimant.
4. The Emergency Water Supply Action Plan will be ready to be implemented within 2 working days of the report to the Auckland Council unless otherwise agreed by the Auckland Council on the basis of the investigations undertaken.

The requirements for an Emergency Water Supply Action Plan and any consequent action may be cancelled in the event that the Auckland Council is satisfied that the loss of water is not caused by drawdown of groundwater level in the Symonds Hill Pit.

Mitigation of Effects on Bores or Springs

This management plan requires Winstone Aggregates in the event that groundwater drawdown at selected groundwater monitoring bores is greater than the seasonal variation plus 5m to investigate and, if a result of dewatering the Symonds Hill Pit, to offer to develop and implement a Water Supply Management Plan with the occupiers of properties with, and/or owners of affected deep greywacke aquifer bores with Auckland Council bore ID numbers 830, 4313, 20141 and 20255.

In the event that groundwater drawdown, as measured in accordance with Conditions of this consent is greater than seasonal variation + 5 metres in any of the Papakura- Clevedon Road monitoring bores HUN12/4L, ID 1216, and ID 20013 listed in Schedule A (or any bore substituted in accordance with the requirements of Condition 2019) then the Consent Holder must investigate the cause and, if caused by drawdown of groundwater level at the Symonds Hill Pit or Symonds Stream augmentation bore, must offer to develop and implement a Water Supply Mitigation Plan with the occupiers of properties with, and/or owners of affected deep greywacke aquifer bores with Auckland Council bore ID numbers 5421, 20479 and 21368.

In the event that groundwater drawdown, as measured in accordance with Conditions of this consent is greater than seasonal variation + 5 metres in any of the Basal Waitemata monitoring bores WA3U and WA5U listed in Schedule A (or any bore substituted in accordance with the requirements of Condition 2019) then the Consent Holder must investigate the cause and, if caused by drawdown of groundwater level at the Symonds Hill Pit or Symonds Stream augmentation bore, must offer to develop and implement a Water Supply Mitigation Plan with the occupiers of properties with, and/or owners of affected Basal Waitemata aquifer bores with Auckland Council bore ID numbers 4251, 4271, 5005, 4999, 4320, 20496 and 20497

Monitoring and farm bore locations are shown on the Symonds Hill Pit Inferred Drawdown Zone, as well as the relevant drawdown triggers are contained in Schedule A.

To determine whether groundwater drawdown in a monitoring bore has been caused by drawdown of groundwater level at the Symonds Hill Pit or Symonds Stream augmentation bore, and/or whether a private bore is affected, the Consent Holder must provide relevant information to the Council, including a review of bore static water level records (including any measured by the Consent Holder), seasonal variation in water levels, bore operating water level (during normal pumping) and the specific capacity record of the bore.

Subject to any landowner accepting an offer made in accordance with the requirement of conditions of this consent, a Water Supply Mitigation Plan must be developed and submitted to the Council and owner or user within 14 days of the Council's written requirement, for review by the Council and owner, and written approval of the owner or user, and any approved Plan implemented within 14 days of the owner or user's written approval. The

Council will advise the Consent Holder in writing if any aspects of the Water Supply Mitigation Plan are considered to be inconsistent with achieving compliance with the conditions of this consent.

Offers of mitigation may include but not be limited to:

(a) Lowering a pump;

(b) Replacing a pump;

(c) Deepening a bore;

(d) Providing a new bore; and

(e) Providing an alternative equivalent water supply

Any development and implementation of an Emergency Water Supply Action Plan or a Water Supply Mitigation Plan in response to a claim of sudden loss of water supply, groundwater drawdown, a claim of bore interference, or a claim of stream or spring flow depletion in accordance with the requirements of Conditions 204 to 210 inclusive must not prevent the Consent Holder being required in writing by the Council, to offer to develop and implement a new subsequent Water Supply Mitigation Plan for the same bore owner or user, or stream or spring user should similar conditions or circumstances arise in the future.

Hays Creek Dam and Reservoir

If Watercare Services Limited (WSL) notifies the Consent Holder and the Council that either WSL's or the Consent Holder's monitoring indicates that the drawdown authorised by this consent is having a potential adverse effect on the dam structure, the yield from the reservoir, or the stream flows, the Consent Holder must, within one month, commission an independent expert mutually agreed with WSL to review the relevant monitoring data, and, if the expert considers it necessary, procure further data, to enable a report to be prepared by the expert forthwith. The report is to state whether or not the potential adverse effects at WSL's facilities or the variations in WSL or the Consent Holder's monitoring information are a result of the dewatering authorised by this consent. If the report states that the dewatering is:

i) not causing the adverse effect or not causing the variation in monitoring information, no further action will be required of the Consent Holder; or

ii) likely to be causing the adverse effect or causing the variation in monitoring information, the Consent Holder must, in consultation with the Council and WSL, identify options for avoiding, remedying or mitigating the potential adverse effects, and implement the method that represents the best practicable option for doing so.

Ground Settlement Contingency Condition

In the event that groundwater drawdown is such that monitoring bore HUN12/8U on Hunua Road equals or exceeds the trigger value in Schedule A then:

(a) The Consent Holder must cease any further drawdown at the Symonds Hill Pit and within seven (7) days must notify the Council in writing and by telephone of the exceedance of trigger levels. Drawdown must not recommence without the Council's written approval;

(b) The Consent Holder must in consultation with the Council, engage an expert or experts at the Consent Holder's cost to implement a review of and report on the groundwater drawdown data and the conceptual groundwater model;

(c) If the review and report at (b) determines that a recommencement of drawdown at the quarry is likely to draw down groundwater in materials west of the Drury Fault, then the potential effects of drawdown induced ground settlement west of the fault must also be assessed by an appropriate expert, acceptable to the Council, at the Consent Holder's cost; and

Should the Consent Holder wish to recommence drawdown and seeks the Council's approval under (a) following the review and report at (c), the Council, on a reasonable interpretation of the reviews findings, may require the Consent Holder to first design and implement a monitoring and contingency plan to the Council's satisfaction, that will protect any potentially affected buildings and structures from adverse differential settlement

7.0 Hunua Quarry Site Management

The Hunua Quarry Manager is responsible for implementing the key groundwater management measures discussed in this Plan as well as making day-to-day decisions that can affect groundwater and its management in and around the both the Hunua Road and Symonds Hill Pits.

The Hunua Quarry Manager is also responsible for future development decisions that may affect groundwater and its management in the Symonds Hill Pit. The Hunua Quarry Manager may delegate some or all of these responsibilities. Any such delegation will be documented and recorded. Records will be available at the Hunua Quarry site office. Details of personnel responsible for the maintenance of this Plan, and of the related record keeping and reporting requirements will be included within each Annual Report.

Hunua Quarry Management will remain aware of all potential adverse effects of groundwater management issues, and shall be active in identifying actual and potential groundwater issues.

<u>General Responsibilities</u>

Winstone Aggregates

Winstone Aggregates is required to submit this Groundwater Monitoring and Contingency Plan for review and written approval of the Auckland Council.

Any changes to this plan will be submitted to the Auckland Council for review prior to becoming operational.

Winstone Aggregates, as the consent holder, has a general responsibility to implement all consent conditions and to abide by this plan, as well as all other Management Plans relevant to the operation of Hunua Quarry.

At a site level, the Hunua Quarry Manager is responsible for, and manages, all site operations at Hunua Quarry. This responsibility includes ensuring that all site personnel and contractors operating on site are familiar with the requirements of these documents and are undertaking their activities in accordance with those requirements.

Winstone Aggregates Staff

Every Winstone Aggregates employee has a duty to avoid, remedy or mitigate any adverse environmental effect arising from an activity carried out by them or on their behalf. To achieve this, every Winstone Aggregates employee has a duty to adopt the best practicable option in terms of groundwater management in the Symonds Hill Pit.

Contractors

While working in and around the Symonds Hill Pit, every contractor has a duty to avoid, remedy or mitigate any adverse environmental effect arising from an activity carried out by them or on their behalf. Every contractor also has a duty to adopt the best practicable option with relevance to groundwater management in the Symonds Hill Pit, to ensure that activities relating and affecting groundwater and its management do not breech conditions.

Auckland Council

Auckland Council is required to review this Groundwater Management Monitoring and Contingency Plan to ensure it meets the requirements of Condition XX. The Auckland Council may also review this plan at not less than 12 month intervals and require such reasonable modifications as are considered by the Council to be necessary.

The Auckland Council also has enforcement officer duties, which in part, are to assess the operation in terms of compliance with conditions of consents.

The Auckland Council will advise Winstone Aggregates in writing if consents are to be reviewed in accordance with section 128 of the Resource Management Act 1991.

Technical Experts

Technical experts will from time to time provide advice and technical expertise with respect to groundwater, pit dewatering and its effects on the environment. To effectively achieve this, an understanding of consent conditions and this Plan, as well as all other Management Plans relevant to the operation of the Hunua Quarry, will be required.

8.0 Audit and Review of Groundwater Management Plan

This plan will be reviewed when there are any substantial changes in activities at the Symonds Hill Pit which may have an effect on groundwater, or when there is a need to incorporate new and/or different groundwater monitoring, reporting or management practices.

The plan may also be reviewed to include up-dated monitoring information, new or additional groundwater monitoring bores or information, or variations to conditions of consent.

Any revision of the GMCP will be submitted to the Auckland Council for review and written approval of consistency with consent conditions prior to a change being implemented.

The Auckland Council may review this plan at not less than 12 month intervals and require such reasonable modifications as are considered by the Auckland Council to be reasonably necessary.

9.0 Operational and Quality Assurance Procedures

Quality assurance of monitoring data is intimately linked to the entire monitoring process, from the choice of site, choice of instrumentation, proficiency of staff, calibration and maintenance processes, data storage, and retrieval and analysis systems. The final product (groundwater monitoring data) will only ever be as good as the systems that produce it.

No monitoring record is ever complete. There will inevitably be periods of missing data – some deliberate and necessary, such as calibration periods – but there will also be unforeseen events, such as equipment failures, power outages, bias and drifts. Even in the most diligently operated monitoring networks it is difficult to reach anything close to 100% valid data for long-term monitoring. The calculation of data normally excludes downtime for routine calibrations and maintenance while the percent valid data calculation includes this down time. Slight bias, drifts or calibration shifts can often be dealt with, but complete outages need special consideration.

Appendix A

Monitoring Location Plan

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Appendix B

Borehole Schedules

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Symonds Hill Pit – Monitoring Bore Schedule

Schedule A – Monitoring Bores and Trigger Levels							
Bore	Map Reference NZTM	Collar Elevation RL(m)	Screen Interval RL(m)	Depth GW (m, RL) Sept 2025	Formation	Screen Length (m)	Drawdown Trigger Values (m, RL)
HUN12/1U	1777118 / 5892865	149.76	135.8 – 129.8	141.42	Greywacke	6	130.21
HUN12/1L	1777122 / 5892866	149.80	17.8-5.8	45.72	Greywacke	12	-66
HUN12/2U	1778103 / 5891943	258.79	226.7-220.7	243.45	Greywacke	6	224.96
HUN12/2L	1778104 / 5891939	259.008	99.5 – 87.5	179.77	Greywacke	12	55.1
HUN12/3U	1776392 / 5895751	100.43	51.2-45.2	58.52	Waitemata	6	43.02
HUN12/3L	1776395 / 5895750	100.53	-30.5- -36.5	28.99	Greywacke	6	-95.2
HUN12/4U	1777313/ 5897789	73.71	44.7-38.7	42.96	Waitemata	6	38.21
HUN12/4L	1777311/ 5897785	73.34	11.5 – 0.5	55.68	Greywacke	12	20
HUN12/5U	1775995 / 5894949	45.63	27.6 – 20.6	28.64	Waitemata	6	18.51
HUN12/5L	1775991 / 5894948	45.72	-46.8 – -52.8	30.54	Greywacke	6	-96
HUN12/6U	1776022 / 5891368	55.67	34.7 – 31.7	35.94	Greywacke	6	28.43
HUN12/6L	1776025 / 5891369	55.86	12.9 – 0.9	34.12	Volcanics	12	27.14
HUN12/7U	1780450 / 5893900	181	30m below ground level		Greywacke	x + SV	TBC
HUN12/7L	1780450 / 5893900	181	TBC		Greywacke	x + SV	TBC
HUN12/8U	1775555 / 5894902	27.39	22.4 – 19.4	24.56	Scoria / Alluvium	3	21.37
HUN12/8L	1775559 / 5894905	27.44	6.4 - 0.4	22.26	Basalt / Scoria	+6	19.83
HUN05/2L	1778799 /	142.16	7.16 – 1.16	124.42	Greywacke	+6	6.2

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	5894587						
830	1776103 / 5893220	62.12	-3 – -3.4	48.37	Greywacke	31	-66
20013	1776109/ 5898810	39.83	-26.2- -147.9	25.62	Greywacke	121.7	xx
1218	1775614 5898253	51.0	-7.8 - -51.0	27.0			
421	1775479 5892910	31.59	-4.4 - -28.4	13.85	Volcanic		
21817	1775198 5892910	28.5	-10.5 - -32.0	13.71	Volcanic		
20479	1776578 / 5896896	127.11	44.3 – 9.7	43.92	Greywacke	34.6	9
21474 (Glasgow)	1779246 / 5894408	194.72	123.2 – 93.3	159.7	Greywacke	29.9	153.19
HUN25/1L	1777654/ 5893543	108.6	1.6 **–** -4.4	57.1	Greywacke	6	-58
HUN25/1U							

Advice Notes:

(a) Bore coordinates are based on the survey results following the drilling of the bores set out in the Hunua Groundwater Monitoring and Contingency Plan 2015 (GMCP).

(b) Collar Elevation is also known as 'Bore Head Elevations'.

(c) Drawdown Trigger Values are obtained from the Groundwater and Surface Water Effects Assessment.

(d) Bores HUN12/7U and HUN12/7L to be drilled when the groundwater level drawdown in the Glasgow monitoring bore (21474) is greater than seasonal variation plus 10 metres (RL 148.19m).

(e) TBC – means to be confirmed with Auckland Council after drilling in accordance with Conditions 15, and which takes account of physical and practicable access for construction and monitoring

(f) SV – means seasonal variation defined by determining the 99% probability (2.58 times the standard deviation of the data) for the first 12 months of data collection. Data from a second 12 months of monitoring will be used to recalculate the natural groundwater range if the 95% confidence limits of the second 12 month monitoring data set overlap with the 95% confidence limits of the first 12 month monitoring data set.

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Monitoring bores of construction (screen interval and geological formation) and locations as specified in Schedule A shall be maintained. In the event of:

a) any of the monitoring bores being destroyed;
b) becoming inoperable;
c) the water level being or dropping below the bottom of the bore; or
d) the bore landowner not allowing access,

then that bore shall be substituted with another constructed, or otherwise identified as suitable, with the written approval of the Council. For an existing private bore, the substitute bore may be an existing Winstone series monitoring bore. Access to the bore locations shall be maintained for sampling, monitoring and compliance purposes.

Drawdown trigger elevations are as determined in the Hunua Quarry Development: Groundwater Effects Assessment, 2026 undertaken by Pattle Delamore Partners.

Borehole information and construction details will be submitted to the Auckland Council following the completion of drilling.

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Appendix C

Symonds Hill Pit Inferred Drawdown Zone

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Appendix D

Resource Consents – Conditions of Consent

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