DRAFT

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Technical Specialist Memo - Groundwater

To:	Colin Hopkins – Lead Planner & Doug Fletcher – Principal Project Lead
From:	Philip Kelsey, Consultant Hydrogeologist, Earthtech Consulting Limited – Water Allocation
Qualifications & Relevant Experience:	I hold the qualification(s) of: Bachelor of Science in Geology with Honours from University of Otago and Master of Science in Engineering Geology with Honours from the University of Canterbury, and have 38 years of experience in the fields of hydrogeology, engineering geology and geotechnical engineering. I am a full member of the New Zealand Hydrological Society, National Groundwater Association (USA), International Association of Hydrogeologists and New Zealand Geotechnical Society. I have prepared expert evidence and technical assessments for resource consent applications, plan changes, and notices of requirement for designation, and have appeared as an expert witness before consent authorities and the Environment Court on multiple occasions.
Preparation in Accordance with the Code of Conduct:	I confirm that I have read the Environment Court Practice Note 2023 – Code of Conduct for Expert Witnesses (**Code**), and have complied with it in the preparation of this memorandum. I also agree to follow the Code when participating in any subsequent processes, such as expert conferencing, directed by the Panel. I confirm that the opinions I have expressed are within my area of expertise and are my own, except where I have stated that I am relying on the work or evidence of others, which I have specified.
Date:	19 September 2025

1.0 APPLICATION DESCRIPTION

Application and property details

Fast-Track project name:	Drury Quarry Expansion – Sutton Block
Fast-Track application number:	FTAA-2503-1037 (EPA reference) + BUN60449474 (Auckland Council reference)
Site address:	121 MacWhinney Drive, Drury; 1189 Ponga Road, Drury; 2113 and Ponga Road, Papakura

2.0 Executive Summary / Principal Issues

See Section 5.

3.0 Documents Reviewed

- PDP (2025a). Proposed Sutton Block Expansion Groundwater and Surface Water Effects Assessment. Prepared for Stevenson Aggregates Limited. 25 March 2025.
- PDP (2025b). Drury Quarry – Sutton Block Expansion, Auckland. Auckland Council Further Information Request on Groundwater. 12 August 2025.
- PDP (2025c). Drury Quarry – Sutton Block Expansion, Auckland. Auckland Council Further Information Request on Groundwater. 5 September 2025.
- PDP (2025d). Drury Quarry – Sutton Block Expansion, Auckland. Auckland Council Further Information Request on Groundwater. 18 September 2025.
- Tonkin & Taylor (2025). Stevensons Drury Quarry – Sutton Block – Fast Track Application s30 Update. Email 26 March 2025.
- Conditions – Drury Quarry Sutton Block. Applicant Updated Conditions Set 17 September 2025.

4.0 Additional Reasons for Consent Not included in AEE

No comment.

5.0 Specialist Assessment

Proposal

The proposed quarrying of the Sutton Block to RL-60m involves up to 230m of groundwater level drawdown which has a predicted zone of influence extending to 7.5km to the north, south and east of the pit. From the conceptual groundwater model, westerly propagation of groundwater drawdown is controlled by the Drury Fault which is expected to act as a hydraulic barrier to groundwater flow.

The predicted groundwater inflow for the maximum RL-60m quarrying depth is 19,426m³/d and 7,090,517m³/yr.

Associated effects relate to groundwater resource availability, plus groundwater level drawdown effects on streams and existing supply water bores. Cumulative effects need to be considered from the dewatering associated with Stevensons Drury Quarry and Hunua Symonds Hill Quarry.

Groundwater Resource Availability

The proposed dewatering take of 7,090,517m³/yr is from the Hunua West Aquifer. With the predicted dewatering influence extending out to 7.5km, groundwater will be drawn in from both the Hunua West and the adjacent Hunua Wairoa groundwater aquifers.

Auckland Council CAWA (Coastal and Water Allocation) has advised that only quarry groundwater use is considered for the project water availability assessment as the unused balance is pumped back to streams.

Tonkin & Taylor (TT) (2025) advised that the proposed Sutton Block Quarry water use is 124,830m³/yr. In terms of a simplistic equal recharge approach within the maximum zone of influence, the respective groundwater allocation is as follows:

i.	Hunua West	71,490m³/yr
ii.	Hunua Wairoa	53,340m³/yr
		124,830m³/yr

CAWA confirmed on 10 July 2025 to the reviewer that there is sufficient resource water availability in both the Hunua West and Hunua Wairoa greywacke aquifers for the proposed 124,830m³/yr Sutton Block water use.

Surface Water Effects

Quarry dewatering drawdown is expected to reduce baseflows to a number of streams within the 7.5km radius zone of influence. The attached Figure 1 "Proposed Monitoring Bores to East of Hunua Fault" shows the predicted reduced baseflow effects for:

i. NT1 Stream
ii. Peach Hill Stream
iii. Maketu Stream
iv. Hingaia Tributary
v. Mangawheau Stream

Surface water effects are considered to be less than minor with mitigation using stream augmentation. Proposed augmentation is to be sourced from the Sutton Block quarry pit or new bores located in more distant catchments.

Amendments to stream augmentation conditions 138 to 164 are proposed. Figure 1 shows two additional bore locations to the conditions set with:

i. MK1 shallow and deep from PDP (2025c). Located in upper Maketu Stream catchment.
ii. MG1 shallow and deep proposed by the reviewer, located in Mangawheau Stream catchment.

The MK1 and MG1 bores are required to monitor groundwater drawdown associated with baseflow reduction effects. PDP(2025d) supports the MK1 bore pair with installation within six months following the issuing of the consent. The reviewers recommended MG1 pair is not supported by PDP(2025d) on the basis of expected drawdown being less than the about 20m predicted by the envelope of effects.

The reviewer remains of the view that the MG1 bore set is still required as there is no monitoring proposed between distances of 1km (at MK1 where 100m of groundwater drawdown is predicted) and the 7.5km radius of dewatering influence. The applicant is not proposing any specific groundwater level monitoring within the Mangawheau Catchment where stream augmentation may be required after Stage 3 Quarrying (See attached Figure S1). The conditions attached to this Tech Memo propose both MK1 and MG1 bore sets being required.

Figure S1 shows the Hays Stream, Symonds Stream, lower reaches of NT1 and Peach Hill Stream as currently being augmented. Augmentation is being carried out by the existing Drury and Hunua Quarries. All of these augmented streams are located within the predicted zone of dewatering influence of the Sutton Block quarrying.

New Condition 158 is proposed to assess the requirements of stream augmentation by the Applicant when augmentation ceases by existing consent holders.

Groundwater Users

From Appendix L of PDP (2025a), 346 bores are listed as being potentially subject to groundwater level drawdown from Stage 5 quarrying to RL-60m.

The reviewer has examined selected greywacke aquifer bore logs from eleven locations and found that at five locations (bore IDs 700, 5581, 21300, 21718 and 28017) predicted groundwater levels will fall to below existing submersible pumps (recommended pump depths from drillers' logs). This is considered an adverse effect, as existing bore owners would be prevented from accessing their groundwater supply. On the basis of the eleven bore sample, the predicted quarry groundwater drawdown is expected to adversely affect a reasonable number of existing bore owners.

To adequately monitor groundwater drawdown effects on neighbours bores both MK1 and MG1 bores are required.

The reviewer understands that under the Fast Track process, adversely affected third parties may not be included in the consenting process. Therefore, the acceptability of the adverse effects on bore owners depends on groundwater supply mitigation by the consent holder.

The 17 September 2025 draft condition set does not include groundwater supply mitigation conditions. Therefore, the reviewer has added these as new Conditions 165 to 170. These new conditions have been sourced from the existing Stevensons Quarry dewatering consent WAT60277068.

In summary, the reviewer supports the application, provided the attached conditions are accepted.

6.0 Section 67 Information Gap

The reviewer has raised s67 queries related to the following areas:

i. Regional groundwater drawdown predictions.
ii. Groundwater drawdown and ground settlement west of the Drury Fault.

iii. Groundwater supply bores – adverse effects.
iv. Stream augmentation flow water quality.
v. Stream augmentation – cumulative effects.
vi. Post-quarrying augmentation – NT1 stream.
vii. Groundwater level monitoring at MK1 and MG1.

The above areas have been responded to by PDP (2025b), PDP (2025c) and PDP(2025d). Outstanding matters relate to the monitoring of groundwater drawdown east of the quarry at MG1 plus mitigation of adverse effects on bore owners. These matters have been addressed by the reviewer with:

i. New monitoring bore set MG1 shallow and deep in Mangawheau Catchment – added to Schedule A of conditions.
ii. Proposed new Conditions 165 to 170.

7.0 Recommendation

The reviewer supports the application, provided the attached conditions are accepted.

8.0 Proposed Conditions

Condition Review

Review as requested changes - additions in red and deletions in ~~strikeout~~.

	Land Use Condition	**Commentary**
Authorised quantities for taking and use		
131	The consent holder must ensure: (a) The daily quantity of groundwater taken and used must not exceed 19,426 cubic metres; (b) The annual quantity of groundwater taken and used over the 12 month period commencing 1 June of any year and ending 31 May of the following year must not exceed 7,090,517 cubic metres; and (c) The groundwater inflow to the Site's quarry pit must be measured annually by monitoring the volume of water required to be pumped out of the sump in order to maintain a constant water level elevation	

	over five (5) consecutive days or by another suitable method as described in the certified Groundwater Monitoring Plan (GMP).	
Groundwater levels		
132	Groundwater levels within the Site's pit sump must not be drawn down below a reduced level of RL-60 metres below mean sea level.	
133	Groundwater levels in the Site's monitoring bores must not be lower than Schedule A trigger levels (Appendix 1) unless the procedure in Condition 134 ~~138~~ is followed and that results in an amendment to the levels in Schedule A.	
134	In the event that groundwater is drawn down as result of the exercise of this consent in any of the monitoring bores in Schedule A (Appendix 1) to a level that equals or lower than trigger levels in Schedule A, then: (a) The consent holder must notify the ~~Manager~~ Council in writing and by telephone of the exceedance of trigger levels within 5 working days and immediately cease any further lowering of the sump water level at the Stevenson Quarry pit sump; (b) The notification must specify which monitoring bore trigger(s) have been reduced below the quantum for each bore; (c) The consent holder must, in consultation with the ~~Manager~~ Council, engage an expert or experts to implement a review of and report on the groundwater drawdown data, the conceptual groundwater model, confirmation of the cause of the trigger level and whether any consequent adverse environmental effects are anticipated, and if so how such effects must be mitigated. The	

	report must be provided to the ~~Manager~~ Council for written approval; (d) The consent holder must not recommence further drawdown unless it is demonstrated to the satisfaction of the ~~Manager~~ Council, that either: (i) The trigger levels in Schedule A (Monitoring Bore Trigger Values) can be complied with; or (ii) The ~~Manager~~ Council approves in writing a change to trigger level(s) in Schedule A. Such approval will be based on the consent holder technical review in (c) above; and (e) The ~~Manager~~ Council may initiate a review of the consent conditions in accordance with s128 of the RMA, where approval of recommencement of the drawdown under (d) above is not forthcoming.	
Technical review at intermediate drawdown steps		
135	Reduction in regional groundwater levels in the sump must be carried out in three steps: (a) The first step must not be lower than RL90m; (b) The second step must not be lower than RL60m; and (c) The third step must not be lower than RL-60m.	
136	At each of the steps, the water level must be held at this level for a minimum of two years; and	
137	A Technical Review must be undertaken no less than 3 months and no more than 6 months prior to commencing the second and third steps of dewatering. 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 ongoing management of any actual or potential adverse effects as a consequence of dewatering.	
Freshwater monitoring *Pre-augmentation baseline monitoring of temperature, ~~and~~ dissolved oxygen and chemistry*		
138	A baseline survey comprising continuous baseline monitoring (one upstream, two downstream and the augmentation source) of water temperature, ~~and~~ dissolved oxygen and monthly water chemistry (cations, anions, nutrients, metals pH, and electrical conductivity), at a minimum of four locations at each of the sites (where augmentation is to occur), must be undertaken within the period commencing 1 December and ending 31 March, prior to implementing any augmentation programme.	Baseline survey needs to incorporate stream chemistry.
Water temperature and dissolved oxygen		
139	The consent holder must ensure that no stream-flow augmentation results in (after reasonable mixing): (a) A downstream water temperature increase of 3°C or more compared to the temperature immediately upstream of the augmentation discharge point; and (b) A dissolved oxygen concentration less than 6 milligrams per litre.	
140	If the results of samples obtained from the stream monitoring locations required in Condition 142 show an increase in the parameters listed in (a) above caused by the exercise of this consent over a consecutive period of 3 months, the consent holder must prepare and submit to the Council a mitigation plan outlining mitigation measures to be implemented to address such effects.	
141	The obligation to measure dissolved oxygen concentration and temperature in accordance with this condition may be dispensed with or	

	the monitoring interval changed at the ~~Manager~~ Council's discretion, upon the ~~Manager~~ Council receiving technical information which satisfies the ~~Manager~~ Council that the dissolved oxygen concentration below the discharge point has consistently, over the previous 2 years, been equal to or greater than 6 milligrams per litre and the temperature increase during the same period has consistently been less than 3°C.	
Stream flow monitoring sites (gauging stations)		
142	Four gauging stations must be established at the locations shown in Figures 17 and 18, Recommended Monitoring Plan, prepared by PDP, dated December 2024. Station NT1 must be established prior to any quarrying below the RL170m regional groundwater level. All remaining stations must be established before the ~~first of either or~~ the sump water level drops below RL90m. The coordinates of these additional gauging sites are: (a) NT1-Southern Tributary (NT1-8): 1777203 / 5889940. (b) Mangawheau Stream Upstream: 1782251.88 / 5890666.55. (c) Hingaia Tributary Upstream 1777890.62 / 5886344.48. (d) Hingaia Tributary Downstream: 1776632.16 / 5886327.15. (e) Maketu Stream Upstream (MK1): 1778421 / 5889312 *Advice Note:* *(a) The selection of the above future gauging stations may include consultation with Council.* *(b) The locations of the above new gauging stations are approximate and need to be confirmed following consultation with the landowners.*	Station NT1 needs to be established at an earlier stage of quarrying. Have requested establishment prior to quarrying below RL170m. Maketu Stream Upstream site needs to be added (MK1).

	The exact locations of the gauging site must be presented in the GMP.	
143	The flow must be measured and recorded on two occasions in separate months during dry weather conditions and on the tail of any stream flow recession at a suitable range of flows, and within the period commencing 1 December and ending 31 March.	
144	The flow records must include details of the method, dates and times of the gauging procedure employed, all measurements taken, flow calculations and stream flow site catchment area. If stream flows are measured with a current meter, then measurements must be completed at 20 verticals across the stream. All field measurements and procedures must be as in the Hydrologists Field Manual, DSIR 1991, or as agreed in writing with the ~~Team Leader~~ Council.	
Stream flow maintenance and recommended augmentation programme for Maketu and NT-1 streams		
145	The consent holder must: (a) Augment the Maketu and NT1-8 streams from 1 November to 31 May each year if the flow at Mangawheau Station (site number 08529) falls below 160 litres per second (200% of the site mean annual low flow). (b) In the event that the Mangawheau Stream flow site is disestablished or becomes inoperable, an alternative monitoring site and corresponding flow threshold must be specified in writing by the ~~Manager~~ Council and must be complied with.	
146	Augmentation rates must be in accordance with the rates specified in Schedule B.	

	Schedule B: Augmentation of Maketu and NT1-8 Streams **Quarry Stage** | **Pit Long-Term GW Inflow + Mustow GW** (m^3/d) | **Pit Long-Term GW Inflow + Mustow GW** (L/s) | **Maketu (% of Sump Water)** | **NT1-8 (% of Sump Water)** Stage 2 | 0 to 4,362 | 0 to 51 | 10 | 0 Stage 3 | 4,362 to 10,942 | 55 to 127 | 10 | 0 Stage 4 | 10,942 to 18183 | 127 to 210 | 6 | 0.2 Stage 5 | 18,183 to 18426 | 210 to 213 | 6 | 0.2	
147	The augmentation discharge points must be upstream of the stream reaches that may potentially be affected by the dewatering caused by the exercise of this consent.	
148	The source of this augmentation flow for the Maketu and NT1-8 Streams must be either from the Sites's sump or via an abstraction bore within the SAL property (E1778418/N5889315).	
149	The groundwater quality in the sump or in this potential augmentation bore must be analysed and the results must be provided in the annual monitoring report and compared against the baseline water quality in the Maketu and NT1-8 Streams before any augmentation. Augmentation can only commence once a freshwater ecologist has certified that the water quality is suitable for augmentation.	Freshwater ecologist to consider baseline water quality (condition 138) as part of assessment of suitability of quarry water for stream flow augmentation.
150	For the Maketu Stream: (a) Augmentation as per Schedule B to commence at Stage 2, when the sump water level reaches RL90m.	
151	For the NT1-8 (Southern Tributary): (a) No stream flow augmentation is required for this tributary (sourced from sump water) before Stage 3.	
Stream flow maintenance and recommended augmentation programme for Mangawheau Stream and Hingaia Tributary Stream		
152	The consent holder must:	

	(a) Augment the Mangawheau Stream and Hingaia Tributary from 1 November to 31 May each year once both the following occur: (i) if the flow at Mangawheau Station (site number 08529) falls below 160 litres per second (200% of the site mean annual low flow); and (ii) Once the sump water level reaches RL60.	
153	In the event that the Mangawheau Stream flow site is disestablished or becomes inoperable, an alternative monitoring site and corresponding flow threshold must be specified in writing by the ~~Manager~~ Council and must be complied with.	
154	The augmentation rates for the Mangawheau Stream and Hingaia Tributary must be determined annually and will be reported in the annual monitoring report in accordance with Condition~~s 161 and 162~~ (...).	
155	The augmentation must be undertaken only if three consecutive years (i.e. 6 rounds of stream flow gauging) of reduced specific discharge (L/s/km2) for the new gauging stations have been detected that: (i) Can be attributed to the Site's dewatering; and (ii) Is not caused by drought conditions.	
156	The augmentation source will be from bore (s).	
157	The groundwater quality in the proposed augmentation bore must be analysed and the results must be provided in the annual monitoring report and compared against the water quality in the baseline Mangawheau Stream and Hingaia Tributary Stream before any augmentation. Augmentation can only commence once a freshwater ecologist has	Groundwater quality and proposed augmentation bore needs also to be certified by a freshwater ecologist as being suitable for stream flow augmentation.

	certified that the water quality is suitable for augmentation.	
Stream flow maintenance and recommended augmentation programme for Hays Stream, Symonds Stream and Peach Hill Stream		
158	The consent holder must: (a) On the cessation of existing augmentation by other consent holders of any of the Hays, Symonds and Peach Hill streams, the consent holder must prepare a technical report by a SQEP to determine any augmentation requirements by the consent holder. The technical report is to include any revisions to the GMP. (b) The technical report requires Council approval. (c) Augmentation recommendations listed in the technical report need to be carried out by the consent holder.	Condition required to determine ongoing stream augmentation by the Applicant when existing consent holders are no longer required to mitigate this effect in the Hays, Symonds and Peach Hill streams.
Annual review and adjustment of stream flow augmentation rates		
~~157~~159	The augmentation rate for all streams (Conditions 145 to 158 ~~149 to 160~~) must be modified if required based on the stream flow data. Any changes must be determined annually and will be reported in the annual monitoring report. The rates must be based on the actual loss of stream flow using the trend analysis of downstream/upstream ratios of specific discharge (MALF) versus time and must be implemented in the subsequent dry conditions between 1 November to 31 May. The detailed methodology to define the quantity of any losses must be outlined in the GMP.	
Surface water monitoring report (all streams)		
~~158~~160	The consent holder must submit by 30 June of each year, to the ~~Manager~~Council, a report of the results of surface water monitoring required under Conditions (...) ~~131, 138, 139, 149, 154, and 157, and 158~~ ~~135, 142, 144, 154 and 148~~. The report must provide an overall	

	analysis of stream flow measurements and the location of the monitoring sites. The report must consider all data collected, evaluate compliance with the consent conditions, and identify any mitigation measures required.	
Surface water NT1-8 southern tributary augmentation covenant		
~~159~~161	Prior to the commencement of quarrying activities on the Site, the consent holder shall have a land covenant prepared under section 108(2)(d) of the RMA to require the ongoing augmentation of the NT1-8-Southern Tributary in accordance Conditions 145 to 149, 151 and 157 for so long as dewatering activities occur the site that reduce groundwater levels below RL 60, for registration on the Records of Title for the Site.	Reviewer has not checked these conditions.
~~160~~162	The draft covenant shall be submitted to Council, Team Leader – Compliance Monitoring South for approval prior to being registered.	Reviewer has not checked these conditions.
~~161~~163	The covenant shall be registered on the Records of Titles for the Site within one month of obtaining Council approval of the covenant and a copy of the updated Records of Title shall be provided to the Team Leader – Compliance Monitoring South.	Reviewer has not checked these conditions.
~~162~~164	The covenant shall require the consent holder to: (a) Be responsible for all legal fees, disbursements and other expenses incurred by the Council in connection with the covenant, and procure its solicitor to give an undertaking to the Council for payment of the same; and (b) Indemnify the Council for costs, fees, disbursements and other expenses incurred by the Council as a direct or indirect result of the Council being a party to this covenant.	Reviewer has not checked these conditions.
Mitigation of sudden loss of water supply		

165	The Manager (or nominated Council staff acting on the Manager's behalf) may notify the Consent Holder (or their appointed representative) by way of phone (in person, voicemail or text message) or in writing (by email or post) of a new or repeat claim of the sudden loss of water supply. The loss may be from a bore, stream or spring at any site within the area defined by the outer perimeter of the Stage 5 Zone of Influence for the dewatering level at RL-60m. The loss may be from a stream at any site within the area defined by the outer perimeter of the Stage 5 Zone of Influence. The drawdown zone is shown on *"Figure 17, Recommended Monitoring Plan prepared by Pattle Delamore Partners Limited dated December 2024*". (a) The Consent Holder (or their appointed representative) shall, within twelve (12) hours of the notification of claim, contact the claimant and investigate the claim of sudden loss of water supply and shall offer an emergency Water Supply Action Plan to the claimant unless in the written opinion of the Manager received within twenty-four (24) hours of the claim, it is unreasonable to do so on the available evidence. (b) The Consent Holder shall, within twenty four (24) hours of the notification of claim, report in writing to the Manager, 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. (c) The Emergency Water Supply Action Plan shall be offered to the claimant and be ready to be implemented within two (2) working days of the report to the Manager, unless agreed otherwise by the Manager by way of phone or in writing on the basis of the Consent Holders investigations.	Conditions 165 to 171 required to provide groundwater bore mitigation to existing users. These conditions have been adopted from the existing Stevensons Quarry groundwater dewatering conditions set.

	(d) The requirement for an Emergency Water Supply Action Plan and any consequent action may be cancelled in the event that the Manager is satisfied that the water loss is not caused by drawdown of groundwater level at the Stevenson Quarry.	
Mitigation of effects on bores identified in the application		
166	In the event that groundwater drawdown, as measured in accordance with conditions of consent indicate to the Managers satisfaction that groundwater drawdown in any of the water supply bores within the outer perimeter of the Stage 5 Zone of Influence is adversely affected due to the exercising of this consent, the consent holder shall offer to develop and implement a Water Supply Mitigation Plan with the owners of bores.	
Mitigation of claim of bore interference or spring/stream flow depletion		
167	If required in writing by the Manager, the Consent Holder shall investigate and report to the Manager within one month of the date of the written requirement of any new or repeat claim of bore interference or stream or spring flow depletion. The claim may be from any site within the area defined by the outer perimeter of the Stage 5 Zone of Influence. Specific investigations may include a review of rainfall records, spring flow, groundwater takes, surface water takes and stream flow records; or a review of a bores static water level records; bore operating water level (during normal pumping); and the specific capacity record of relevant bores to assess whether an effect from drawdown of groundwater level at the Drury Quarry Expansion–Sutton Block has developed on the bore, spring or stream in question. The report shall be of a standard that is approved by the Manager.	
168	If in the Manager's opinion, based on the investigation and reporting required as part of this consent, the bore, stream or spring has,	

	or is likely to have been affected by drawdown of groundwater at Drury Quarry Expansion–Sutton Block, and if required in writing by the Manager, the Consent Holder shall offer to develop and implement a Water Supply Mitigation Plan in agreement with the Manager and bore, stream or spring user.	
Water supply mitigation plan		
169	Subject to any landowner accepting an offer made in accordance with conditions 166 to 168, a Water Supply Mitigation Plan shall be developed and submitted to the Manager and owner or user, within 14 days of the Manager's written requirement, for review by the Manager and owner. After written approval of the owner or user, any approved Plan shall be implemented within 14 days. The Manager 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 (e) Providing an alternative equivalent water supply	
170	Any development and implementation of an Emergency Water Supply Action Plan or a Water Supply Mitigation Plan in response to a claim of a 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 165 to 170 shall not prevent the consent holder to offer and 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.	
Ground settlement contingency condition		
171	In the event that groundwater drawdown is such that monitoring bores (SG9, SG10, AC ID 21134, SG4, SG8 and BH103-New) west of the Drury Fault equals or exceeds the trigger values in Schedule A then: (a) The consent holder shall notify the Manager in writing of the exceedance of trigger levels within 7 days. (b) The notification shall specify which monitoring bore trigger(s) have been exceeded and the quantum of exceedance for each bore. (c) The consent holder shall, in consultation with the Manager, engage a SQEP to undertake a review of and report on the groundwater drawdown data and the conceptual groundwater model. The report shall assess the risk of ground settlement potential and how such effects can be remedied or mitigated. This report shall be supplied to the Manager. If the review concludes there is a risk of ground settlement, it shall include a programme for monitoring settlement. (d) The consent holder shall cease and not recommence drawdown unless either:- ▪ It is demonstrated that the trigger levels in Schedule A can be complied with to the written satisfaction of the Manager or ▪ The Manager approves in writing a change to trigger level(s). Such approval will be based on the applicants technical review required in (c) above. (e) The Manager may review the consent conditions in accordance with the	Ground settlement monitoring and contingency condition is still required as the proposed Sutton Block pit is to extend to RL-60m which is deeper than the RL-45m proposed Drury Quarry final level.

	provisions of section 128 of the Resource Management Act should the Technical Review show to the satisfaction of the Manager that monitoring and mitigation provisions of this consent are not adequate, or as proposed in the review, are not adequate for the avoidance or mitigation of adverse effects. (f) The Manager may require implementation of the ground settlement monitoring programme as recommended in (c).	
Review		
~~163~~172	The conditions of this Consent may be reviewed by the Council pursuant to Section 128 of the Resource Management Act 1991, to consider the adequacy of the conditions to respond to any unforeseen environmental effects of the groundwater take and diversion permit at the time the application was considered.	

9.0 Supporting Documents

Figure 1: Proposed Monitoring Bores to East of Hunua Fault, dated 15 September 2025.

Appendix 1: Schedule A Groundwater Monitoring Bore and Trigger Levels

FIGURE 1

Proposed Monitoring Bores to East of Hunua Fault

Ref: L3690-2 dated 15/09/25

Project:

DRURY QUARRY, SUTTON BLOCK

BUN60449474-FTAA-2503-1037

AuckLand Council

EARTHTECH

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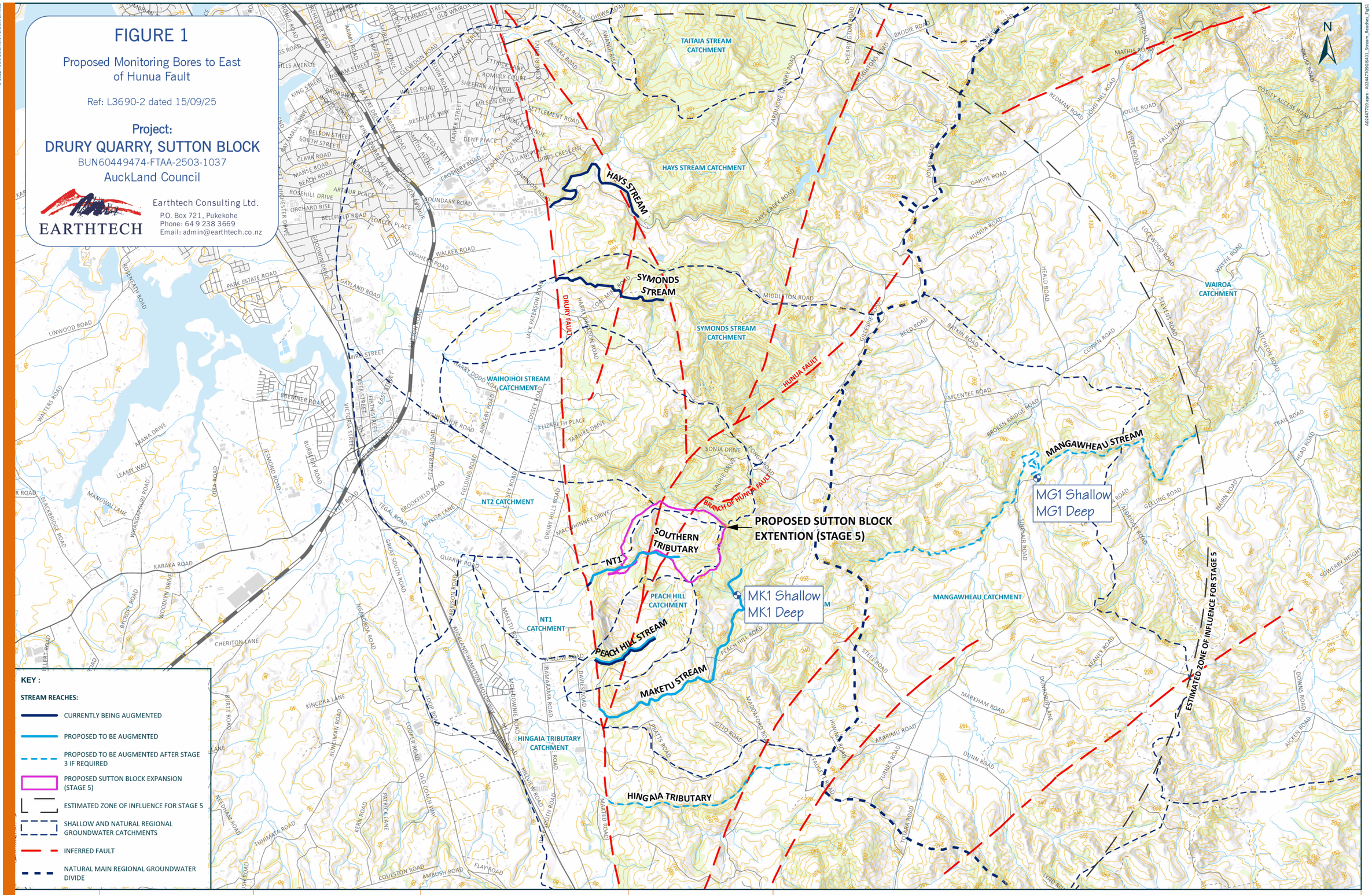

KEY :

STREAM REACHES:

- CURRENTLY BEING AUGMENTED
- PROPOSED TO BE AUGMENTED
- PROPOSED TO BE AUGMENTED AFTER STAGE 3 IF REQUIRED
- PROPOSED SUTTON BLOCK EXPANSION (STAGE 5)
- ESTIMATED ZONE OF INFLUENCE FOR STAGE 5
- SHALLOW AND NATURAL REGIONAL GROUNDWATER CATCHMENTS
- INFERRED FAULT
- NATURAL MAIN REGIONAL GROUNDWATER DIVIDE

0 500 1000
METRES

SCALE : 1:50,000 (A3)

NO.	REVISION	DATE	BY
A	FINAL	AUG 25	MS
A	ISSUED FOR REVIEW	JUL 25	MS

SOURCE:
1. CADASTRAL/TOPOGRAPHICAL INFORMATION AND INSET DERIVED FROM LINZ DATA.
2. PROPOSED SUTTON BLOCK EXPANSION (DRAWING SSQ_24_405, ISSUED SEPT 2024).
3. SHALLOW GROUNDWATER CATCHMENTS DERIVED BY PDP.
4. FAULT LINES PROVIDED BY GNS SCIENCE (2020) (NZL GNS1:250K GEOLOGY (3rd EDITION)) AND, MURRAY, S., GRAEME, F., (2005), PDP (2021).

CLIENT

STEVENSON

FIGURE

FIGURE S1: STREAM AUGMENTATION PROGRAMME FOR STREAM REACHES WHICH MAY SHOW BASEFLOW REDUCTION (from PDP, 2025b)

PROJECT

PROPOSED SUTTON BLOCK EXPANSION – GROUNDWATER & SURFACE WATER EFFECTS ASSESSMENT

A0244770905401_Stream_Reaches_Fig01.aprx - A0244770905401_Stream_Reaches_Fig01

Appendix 1: Schedule A Groundwater Monitoring Bores and Trigger Levels

Schedule A: Recommended Groundwater Monitoring Bores and Trigger Levels										
Bore Intake Zone	**Bore ID**	**Map Reference NZTM 2000 (E/N)**	**Ground Level (m, RL)**	**Screen Interval (m, RL)**	**Geol.**	**Seasonal Variations in Shallow Bores (m)**	**Predicted Drawdowns (m)**	**Estimated Pre-Quarry Groundwater Level (m, RL)**	**Groundwater Level (m, RL) August 2024**	**Proposed Trigger Level (m, RL)**
Deep greywacke bores within Hunua Greywacke Block	SG3L	1776542/5890385	157.38	0 to -5	G	-	121	64	43.95	-60
	SG3U	1776542/5890385	156.35	50-44	G	-	121	64	85.53	-60
	SG7	1777162/5892100	202.34	-3.66 to -11.66	G	-	61	64	48.1	-60
Deep greywacke bores east of Hunua Fault	SG11L	1777712/5890556	222.5	4.5 to -7.5	G	-	200	172.23	166.43	-27.77
	SG12L	1778101/5890213	277	6 to -3	G	-	206	179.46	179.59.	-26.54
	SG13	1777736/5889520	249	8 to -1	G	-	145	108.95	102.85	-36.05
	MK1 – Deep	1778421/5889312	TBC	TBC	G	TBC	100	TBC	TBC	TBC
	MG1 – Deep	1782676/5890996	TBC	TBC	G	TBC	18	TBC	TBC	TBC
	BH103	1777212/5888550	128.12	77-71	G	-	78	127.5	96.83	49.5
	BH109	1776798/5888474	81.53	50.03-47.03	G	-	72	79.91	80.33	7.91
	BH113-1	1776744/5888268	115.67	22.47-20.47	G	-	65	100	77.13	35
	22498 (SG6)	1776905/5887425	100	42-20	G	-	47	62	51.23	15
Shallow bores within Hunua Greywacke Blocks	SG1U	1775928/5891217	39.32	24-18	V	1.1	(SV+2)	38.22	38.17	35.15
	SG1L	1775928/5891217	39.17	0 to -5	V	1.98	(SV+2)	28.73	27.84	24.75
Shallow bores East of Hunua Fault	BH113-3	1776744/5888268	115.67	76-74	CM	7.25	(SV+2)	95.52	95.47	86.27
	BH104	1777227/5888410	135.97	107-101	CM	5.57	(SV+2)	123.20	122.84	115.63
	SG11U	1777709, 5890549	222.5	202.94 to 153.5	G	3.45	(SV+2)	172.92	171.87	167.47
	SG12U	1778105, 5890132	277	221 - 212	G	7.18	(SV+2)	224.39	224.01	215.21
	MK1 – Shallow	1778421/5889312	TBC	TBC	G	TBC	(SV+2)	TBC	TBC	TBC
	MG1 – Shallow	1782676/5890996	TBC	TBC	G	TBC	(SV+2)	TBC	TBC	TBC
Shallow bores west of Drury Fault	SG9	1775804/5888767	25	5 to -5	V	1.06	(SV+2)	22.65	22.66	19.59
	SG10	1775488/5888702	26.74	9.74 to -3.26	V	0.91	(SV+2)	24.15	24.15	21.24
	21134	1776144/5887966	26.7	-2 to -33	V	2.83	(SV+2)	22.11	22.29	17.28
	SG4	1775830/5897720	39.34	20 to 9	A/V	1.15	(SV+2)	37.61	37.97	34.46
	SG8	1776311/5888663	52.75	24.75 to 12.75	V	1.47	(SV+2)	39.41	39.43	35.94
	BH03-New	1776243/5888470	46.77	21.77 to 11.77	A	0.52	(SV+2)	31.72	31.92	29.20

Notes:

1. *Any existing monitoring bores with screen intervals above proposed trigger levels need to be replaced with deeper bores (to depth of at least 20m below trigger levels) prior to Stage 3 Quarry Floor at RL60m.*
2. *MK1L (deep) and MK1U (shallow) and MG1L (deep) and MG1U (shallow) shall be drilled 6 months after consent.*
3. *SV (Seasonal Variation) + 2m incorporated into trigger levels for all shallow bores.*