
I hereby give notice that a hearing by commissioners will be held on:

Dates: Monday 24 February 2019
Wednesday 26 February 2019
Thursday 27 February 2019
Friday 28 February 2019
Wednesday 04 March 2019
Thursday 05 March 2019
Friday 06 March 2019
Monday 09 March 2019
Wednesday 11 March 2019
Thursday 12 March 2019
Friday 13 March 2019

Time: 9.30am

Meeting Room: Council Chamber

Venue: Level 3, Henderson Civic Building,
6 Henderson Valley Road, Auckland

HEARING REPORT (VOLUME TWO)
WOODLANDS PARK ROAD / MANUKA ROAD,
WAIMA (TITIRANGI)
WATERCARE SERVICES LTD

COMMISSIONERS

Chairperson Philip Brown
Commissioners Hugh Leersnyder
Michael Parsonson
Juliane Chetham

Larissa Rew
HEARINGS ADVISOR

Note: The reports contained within this document are for consideration and should not be construed as a decision of Council. Should commissioners require further information relating to any reports, please contact the hearings advisor.

WHAT HAPPENS AT A HEARING

At the start of the hearing, the Chairperson will introduce the commissioners and council staff and will briefly outline the procedure. The Chairperson may then call upon the parties present to introduce themselves to the panel. The Chairperson is addressed as Mr Chairman or Madam Chair.

Any party intending to give written or spoken evidence in Māori or speak in sign language should advise the hearings advisor at least five working days before the hearing so that a qualified interpreter can be provided.

Catering is not provided at the hearing. Please note that the hearing may be audio recorded.

Scheduling submitters to be heard

A timetable will be prepared approximately one week before the hearing for all submitters who have returned their hearing attendance form. Please note that during the course of the hearing changing circumstances may mean the proposed timetable is delayed or brought forward. Submitters wishing to be heard are requested to ensure they are available to attend the hearing and present their evidence when required. The hearings advisor will advise submitters of any changes to the timetable at the earliest possible opportunity.

The Hearing Procedure

The usual hearing procedure is:

- The applicant will be called upon to present his/her case. The applicant may be represented by legal counsel or consultants and may call witnesses in support of the application. After the applicant has presented his/her case, members of the hearing panel may ask questions to clarify the information presented.
- The relevant local board may wish to present comments. These comments do not constitute a submission however the Local Government Act allows the local board to make the interests and preferences of the people in its area known to the hearing panel. If present, the local board will speak between the applicant and any submitters.
- Submitters (for and against the application) are then called upon to speak. Submitters may also be represented by legal counsel or consultants and may call witnesses on their behalf. The hearing panel may then question each speaker. The council officer's report will identify any submissions received outside of the submission period. At the hearing, late submitters may be asked to address the panel on why their submission should be accepted. Late submitters can speak only if the hearing panel accepts the late submission.
- Should you wish to present written information (evidence) in support of your application or your submission please ensure you provide the number of copies indicated in the notification letter.
- Only members of the hearing panel can ask questions about submissions or evidence. Attendees may suggest questions for the panel to ask but it does not have to ask them. No cross-examination - either by the applicant or by those who have lodged submissions – is permitted at the hearing.
- After the applicant and submitters have presented their cases, the chairperson may call upon council officers to comment on any matters of fact or clarification.
- When those who have lodged submissions and wish to be heard have completed their presentations, the applicant or his/her representative has the right to summarise the application and reply to matters raised by submitters. Hearing panel members may further question the applicant at this stage.
- The chairperson then generally closes the hearing and the applicant, submitters and their representatives leave the room. The hearing panel will then deliberate "in committee" and make its decision.
- Decisions are usually available within 15 working days of the hearing.

A NOTIFIED NON-COMPLYING ACTIVITY RESOURCE CONSENT APPLICATION BY WATERCARE SERVICES LTD

TABLE OF CONTENTS		PAGE NO.
VOLUME ONE		1 - 748
Reporting officer's report		5 - 170
Attachment One	Application documents	171 - 204
	Please note that only the site management plan (attachment K) has been included here. The full application documents are available at this link: https://www.aucklandcouncil.govt.nz/have-your-say/have-your-say-notified-resource-consent/notified-resource-consent-applications-open-submissions/Pages/ResourceConsentApplication.aspx?itemId=328&applNum=BUN60339273	
Attachment Two	Further information – August 2019	205 - 538
Attachment Three	Further information – November 2019	539 - 748
VOLUME TWO		749 - 1062
Attachment Four	Specialist reviews	749 - 962
Attachment Five	Designation 9324	963 - 966
Attachment Six	Submissions and Local Board comments	967 - 968
	These have been reproduced separately and are available at this link: https://www.aucklandcouncil.govt.nz/have-your-say/hearings/find-hearing/Pages/resource-consent-hearing-documents.aspx?HearingId=251	
Attachment Seven	Submission summary table	969 - 974
Attachment Eight	High Court decision – Titirangi Protection Group	975 - 998
Attachment Nine	Auckland Plan 2050 – Map 22	999 - 1002
Attachment Ten	Recommended conditions	1003 - 1058
Attachment Eleven	Experience and qualifications	1059 - 1062

Reporting Officer, Richard Blakey, Reporting Planner

Reporting on an application regional resource consents an a land use consent (NES Soil) for earthworks, vegetation removal and associated activities related to the Huia Replacement Water Treatment Plant. at Woodlands Park Road / Manuka Road, Waima (Titirangi). The reporting officer is recommending, subject to contrary or additional information being received at the hearing, that the application be **CONSENTED** to, subject to certain conditions.

ATTACHMENT FOUR
SPECIALIST REVIEWS

Technical memo – Specialist Unit

To:	Richard Blakey, Consultant Planner
From:	Carl Tutt, Earthwork and Streamwork Specialist
Date:	10 December 2019

1.0 APPLICATION DESCRIPTION

Application and property details

Applicant's Name:	Watercare
NewCore numbers:	BUN60339273 LUC60339274 (earthworks) LUS60339442 (streamworks)
Activity type:	Earthworks and Streamworks
Purpose description:	44,800m ² of earthworks along with the reclamation and subsequent realignment of 53m of intermittent stream.
Site address:	Woodlands Park Road, Waima

2.0 PROPOSAL, SITE AND LOCALITY DESCRIPTION

2.1 Proposal relevant to this consent only

The applicant is seeking resource consent for bulk earthworks across 44,800m² along with the reclamation and subsequent diversion of 53m of intermittent stream to establish a replacement water treatment plant (WTP) for the Huia dam.

A full description of the proposal is provided in the following application documents:

- *'Huia Replacement Water Treatment Plant (WTP) Project'*, version 1, prepared by Tonkin & Taylor Ltd, dated July 2019. (hereafter referred to as the application report)
- *'Stormwater and Erosion and Sediment Control Report'*, version I, prepared by Cook Costello, dated 12 July 2019.
- *'Stream Ecological Valuation Plan'*, prepared by Boffa Miskell, dated 26 July 2019.
- *'Addendum to Stream Ecological Valuation Plan'*, prepared by Boffa Miskell, dated 26 November 2019.

- 'Assessment of Ecological Effects', version 1, prepared by Boffa Miskell, dated 26 July 2019.

In brief:

- A maximum of two years of bulk earthworks have been assumed for each individual earthwork site; the replacement water treatment plant, reservoir 1 and reservoir 2. Some bulk earthwork will be undertaken consecutively and others concurrently.
- Earthworks will be restricted to the standard earthworks season, being 1 October – 30 April of any year.
- The main methods of sediment and erosion controls proposed are in accordance with the guidelines in Auckland Council's Guidance Document 005 – *Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05)*.
- 53m of stream reclamation is proposed on Yorke stream. A 70m long diverted stream channel will be constructed 3 years after the reclamation.
- 45m of stream daylighting will occur on a tributary of the Armstrong stream.

2.3 Site Description

The site is on land owned by Watercare and is designated in the Auckland Unitary Plan: Operative in Part (AUP:OP) for 'Water supply purposes – water treatment plants and associated structures'. The proposed project spans three sites owned by Watercare which have a total area of 15 hectares. The land parcel on which the proposed replacement Huia Water Treatment Plant (WTP) is located has an area of 4.2ha, the proposed Reservoir 1 parcel is 6.4+ha and the existing WTP site on which Reservoir 2 is proposed is 4.0+ha. The three sites are all accessed from Woodlands Park Road and collectively referred to as 'the Project Site.' The works footprint is 4.48ha in total, 3.5ha of which comprises indigenous vegetation.

Two sub catchment streams flow through the sites, the Armstrong Gully and Yorke Gully, both ultimately discharging into Little Muddy Creek, part of the wider Manukau Harbour. The sites are identified as part of an extensive Significant Ecological Area (SEA_T_5539) in the AUP that extends across the vegetation of the Waitakere Ranges. Although modified by resource exploitation and human settlement, the Waitakere Ranges ecosystem is nationally significant as one of the largest areas of coastal and lowland forest with intact sequences remaining in the Auckland region.

3.0 REASON FOR CONSENT – EARTHWORKS AND STREAMWORKS

3.1 Reasons for consent

Earthworks

Land use consent for earthworks is required under the provisions of chapter E26 of the

Auckland Unitary Plan: Operative in Part (AUP:OP) for the following reasons.

E26.5.3.2 (A106 and A107) – **Restricted discretionary** activity for earthworks greater than 2,500m² where the land has a slope equal to or greater than 10 degrees and earthworks greater than 2,500m² within the sediment control protection area, respectively.

E26.6.3.1 (A118) – **Discretionary** activity for earthworks greater than 2,500m² or 2,500m³ within a significant ecological area.

Streamworks

Streamworks consent is required under the provisions of chapter E3 of the Auckland Unitary Plan: Operative in Part (AUP:OP) for the following reasons.

E3.4.1 (A19) – **Non-complying** activity for Diversion of a river or stream to a new course and associated disturbance and sediment discharge within a significant ecological area.

(A34) – **Discretionary** activity for an Erosion control structure less than 30m in length when measured parallel to the direction of water flow complying with the standards in E3.6.1.14 within a significant ecological area.

(A49) – **Non-complying** activity is required for new reclamation or drainage including filling over a piped stream within a significant ecological area.

4.0 TECHNICAL ASSESSMENT OF EFFECTS

4.1 Assessment of effects on the environment

The applicant identifies and assesses the effects of the proposed earthworks and streamworks activity on the environment that are likely to arise and any mitigating factors in section 7 of the application report. Specifically, section 7.4 for earthworks and 7.3 for streamworks. The applicant has identified that the potential effects from undertaking earthworks and streamworks activity on site include the discharge of sediment laden water into the receiving environment and disturbance and alteration to the natural stream system. The applicant concludes that by undertaking the bulk earthworks in the earthworks season, as well as adopting robust erosion and sediment controls, the effects of earthworks on the receiving environment will be appropriately managed. The applicant also concludes that through a combination of onsite stream mitigation and offsetting, the overall effects on the freshwater aquatic environment will be appropriately managed.

Earthworks

An assessment of the technical aspects of the earthworks and erosion and sediment control methodologies has been undertaken. Provided the erosion and sediment control devices are designed and constructed in accordance with GD05, which has been proposed, it is considered the potential effects resulting from sediment discharges can be managed appropriately.

The applicant has provided the breakdown of the proposed earthworks areas, anticipated volumes and maximum cut/fill depths in the below table.

	WTP Site	Reservoir 1	Reservoir 2
Area	2.7 ha	0.88 ha	0.9 ha
SEA Area	2.5 ha	0.6 ha	0.4 ha
Cut	41,460m ³	44,000m ³	6,000m ³
Fill	30,400m ³	500m ³	11,000m ³
Total volume	71,860m ³	44,500m ³	17,000m ³
Approx. volume within SEA*	68,000m ³	43,000m ³	Up to 7,000m ³
Max cut depth	13m	16m	4m
Max fill depth	10m	3m	10m

The applicant proposes a variety of erosion and sediment controls (ESC) to be established across the site. The earthworks have been divided into three sites around the junction of Woodlands Park Road and Manuka Road. For the remainder of this document these sites will be referred to as reservoir 1 (R1), reservoir 2 (R2) and replacement water treatment plant site (WTP). Earthworks at each of these sites has been staged in relation to the construction methodology.

Erosion Control

Four stabilised construction entrances (SCE) will be established off Woodlands Park Road. For R1, due to constraints requiring one-way truck movement, two SCE will be required, one for ingress and one for egress. R2 and WTP will each have one single SCE with R2 utilising the existing Huia water treatment plant entry point. Each SCE will have a wheel wash facility which will ensure that the trucks are free of soil prior to leaving the site. Sediment laden water from the wheel wash will be diverted towards one of the onsite sediment treatment devices. This will ensure the entrances of the sites do not become a source of sediment, reducing the risk of construction vehicles tracking sediment out onto the public roads.

Clean water diversions will be established along the northern boundaries for R1 and R2 and the north eastern boundary of WTP. Each of the three sites with clean water flows will be directed around the earthwork site into the nearest watercourse. Any sections of the clean water diversions that exceed a gradient of 2% will be lined. The clean water diversions will limit the amount of clean water entering the site, thereby reducing the potential for overland flows to entrain sediment.

Exposed areas will be progressively stabilised as earthworks are completed and all exposed surfaces will be stabilised prior to 30th April in any given year unless a winter works exemption is approved. A seasonal restriction to this effect has been recommended.

Sediment Control

For sediment control the applicant has further divided the three sites into appropriately sized sub catchments. The primary sediment control devices will be sediment retention ponds (SRP). Four SRP have been proposed across the three sites. R1, R2 and WTP will each have one SRP sized to a volume equal to 3% of the devices contributing catchment, 0.89ha (SRP3), 0.88ha (SRP4) and 0.42ha (SRP2) respectively and designed in accordance with GD05. The WTP will have a second larger SRP located in the south eastern portion of the site. This pond is to be sized to a volume equal to 2% of the

contributing catchment, 1.96ha (SRP1). Given site constraints this pond will not have the recommended length to width ration and will be approximately 2.1m deep. To increase the retention time and achieve a similar sediment control efficiency of a pond designed in accordance with GD05, silt fence baffles will be installed, altering and increasing the flow path length through the pond. To ensure functionality and prevent potential short circuiting during larger rainfall events, the baffles will extent to a height equivalent to the maximum pond depth. This design is deemed appropriate and is similar to SRP designed on other construction sites where physical constraints exist (e.g. NZTA's Northern Corridor Improvement project).

The locations of these sediment control devices has been determined by the existing contours and requirements to minimise overall ecological impacts while still achieving the required sediment control efficiencies.

Dirty water diversion bunds will be used to channel sediment laden water towards the forebay of the respective treatment devices. Drop out pits will be installed along the dirty water diversion channels in accordance with GD05. These drop out pits allow heavier sediment particles to drop out before they enter the sediment retention device, reducing the load on the device and allowing for easier maintenance.

All SRPs will discharge into various watercourses on site. SRPs associated with R1 and R2 will discharge into the Armstrong stream. On the WTP site, the western SRP will discharge into the Manuka tributary of the Armstrong stream while the eastern SRP will discharge into the Yorke stream. All discharges will ultimately end up in Little Muddy Creek and the Manukau Harbour.

A mix of silt fences and super silt fences will be installed along the perimeters of the site to impound and treat sediment laden water from small catchments where it is unable to be diverted towards a SRP. Silt and Super silt fences impound and treat sediment laden water prior to discharging to the receiving environment. Silt fences will also be installed downslope of the SRP locations prior to construction of the respective devices. This will capture and treat any sediment laden runoff generated during device construction. A different sediment control device is required to treat runoff from Catch 2H (drawing number C102) as the currently proposed super silt fence is not sufficient for this location. This is further discussed below.

Rainfall activated chemical treatment has been proposed for each SRP along with batch dosing as an option for treating water impounded in any excavation pits prior to dewatering. Chemical treatment is used to improve the efficiency of sediment retention devices. As per GD05 guidance, a chemical treatment management plan (CTMP) is required prior to any earthworks commencing has been recommended below.

A large portion of the bulk earthworks are excavations of up to a maximum of 16m. Given the depths, some of the excavations are likely to encounter groundwater and dewatering of stormwater and groundwater from the excavations will be required. Key components of the dewatering plan have been noted in the application documents. During excavation stormwater and groundwater will be directed to a low point in the base of the excavation. Dewatering pumps will be connected to floats which can provide continuous pumping. In the case of a large amount of stormwater entering an excavation, pumping shall cease until 100mm clarity is achieved either through settlement alone or through chemical treatment.

Dewatering from R1 and R2 excavation pits will be pumped towards SRP3 and SRP4 respectively. Dewatering of the WTP site's excavation pit will be pumped towards SRP1. Additional contingencies need to be in place if the water comes into contact with fresh concrete as this water may need to be pH balanced before discharge. A recommendation for a dewatering plan has been included below.

An assessment of the project's sediment generation based on the universal soil loss equation (USLE), estimates that approximately 167 tonnes of sediment could be discharged downstream to both the Yorke and Armstrong gullies during the two years bulk earthworks are expected to occur. This USLE assumes that the bulk earthworks for the individual sites (R1, R2 and WTP) take two years to complete. The USLE also calculates the pre development sediment discharge at approximately 3.4 tonnes per annum. On a per annum comparison this is a downstream sediment loading of approximately 25 times the baseline discharge into the Little Muddy Creek. For comparison, if this activity was to be undertaken without any ESC in place the sediment discharges over the two year construction period could be over 1,000 tonnes.

While this is a large amount of potential sediment discharged downstream, the USLE does not take into account additional management measures such as site stabilisation or diverting dirty water into excavation pits when large rainfall events occur. It has been calculated as if bulk earthworks will occur year round for two years, whereas this will not be the case. The application documents state that exposed areas will be progressively stabilised as earthworks are completed and all exposed surfaces will be stabilised prior to 30th April in any given year unless a winter works exemption is approved. A seasonal restriction to this effect has been recommended.

This has been calculated based on the currently provided erosion and sediment control plan. On a per device sediment loss, a potential 43.57 tonne discharge from catchment 2H indicates the inadequacy of a super silt fence as a sediment control device in this location. This is because this section is quite steep and contains two flow paths. GD05 recommends that super silt fences should only be used for sheet flows and not concentrated flows. It is recommended that the super silt fence is changed to one or two decanting earth bunds. Decanting earth bunds would be better suited to manage potential sediment discharges in this location. A recommendation that a final ESCP be provided ahead of earthworks commencing, to address this aspect of the works, has therefore been included below.

Additional site management methodologies can be employed to ensure that sediment discharges remain minimal, retaining as much sediment on site as possible. These additional management actions can be linked to triggers such as forecast rainfall, sediment pond efficiencies and downstream freshwater monitoring. Actions that could be taken if trigger levels are reached include stabilising the site, diverting dirty water into excavation pits and making amendments to the erosion and sediment controls. While many of these measures are considered best practice, due the sensitive receiving environment a requirement for an adaptive management plan has been recommended that details specific monitoring requirements, trigger levels and management actions.

Lastly, the provided erosion and sediment control plan is for consenting purposes only. While the provided plan is appropriate for the most part, minor amendments will increase the protection of the receiving environments from potential sediment discharges. As such, provision of a finalised erosion and sediment control plan designed by the appointed

contractor which is in general accordance with the consent plan, has been recommended.

Earthwork Summary

The earthworks erosion and sediment controls proposed are largely in accordance with GD05 which is considered best practice. Some amendments to the erosion and sediment control plan have been recommended. Provided the erosion and sediment controls are installed and constructed in accordance with the application report, supporting documentation and any additional requirements as necessary by the guidance outlined in GD05 and recommendations below, it is considered the resulting effects on the environment from sediment discharges during the earthworks will be appropriately managed.

Streamworks

Methodology

The streamworks methodology is briefly described in the Stormwater and Erosion and Sediment Control Report (Cook Costello, May 2019). A clean water diversion will be installed along the north eastern and eastern boundaries of the WTP site. This will remove all flows feeding the Yorke stream from this site except for what falls on the site during rainfall events. Following construction of the WTP the clean water diversion will be transformed into the new stream channel. Details on the final stream design are scant, however, some preliminary design features have been included in drawings C460 version F and C463 version D. Further design details including proposed channel width (0.5m) have been stated in the Stream Ecological Valuation Plan along with a SEV assumptions table. Daylight of a portion of the Armstrong stream will also be undertaken with two sections of pipe being removed and a portion of new stream channel being constructed to reconnect the upstream and downstream reaches. The final stream designs need to incorporate the SEV assumptions considered when quantifying stream mitigation and offset requirements. Recommendations to this effect have therefore been included below to ensure the accepted ecological assumptions are factored into the final stream design along with monitoring requirements. These recommendations will help ensure the new stream channel achieves the expected ecological value.

Avoidance

The overall effects of reclamation, being the permanent loss of aquatic habitat, potential injury and mortality of native fauna, and loss of other stream ecosystem services, are significant. Other potential effects of the proposed streamworks activities include the uncontrolled release of sediment laden water downstream the impact section to the receiving environment and disturbance of retained streambed areas.

Appropriate avoidance of the loss of all other streams adjacent to the three construction footprints has been demonstrated in the Ecological Effects Assessment and application report. Direct stream impacts in the Armstrong Gully system have been avoided. Due to the required construction footprint of WTP, impacts on the headwater stream sections of the Yorke gully system are unable to be avoided. These impacts on the upper Yorke Gully system are being managed through a combination of mitigation and offsetting.

Accountancy

In order to quantify the impacts and ensure effects are appropriately managed, Stream Ecological Valuations (SEV) were undertaken and Environmental Compensation Ratios (ECR) calculated. This method is commonly applied in the Auckland Region for calculating stream function and determining subsequent mitigation and offset requirements. The application report has demonstrated appropriate accountancy in this regard.

Like for Like and Proximity

To address these impacts, it is proposed to divert the Yorke Stream and daylight three culverted and piped sections of the Armstrong stream. Chapter E3, policy 4, a and b mention two specific principles of offsetting: proximity and like for like. The proposed stream offset site is located in the neighbouring Armstrong Gully. It is a stream tributary which originates on the WTP site before flowing under Manuka Road and joining the Armstrong Stream beyond the existing treatment plant's detention dam. This site is proximal to the impact location, being approximately 300m west of the impact location, and ultimately discharging into the same Little Muddy Creek catchment. While this offset stream has a similar average width, it was initially classified as a permanent stream, however, recently the applicant changed their classification of it to intermittent. On balance, daylighting this section Armstrong stream is deemed appropriate in this instance as it is similar in character (size and shape), close to the impact site and within the same catchment.

Mitigation and Offsetting

The proposed stream diversion is considered to be mitigation whereas the stream daylighting is considered to be offsetting. SEV were undertaken and ECR were calculated to determine the quantum of stream enhancement required to achieve no net loss. Four SEV's were undertaken on multiple reaches of the Yorke and Armstrong streams respectively. Along with these SEV's three visual assessments were undertaken on the ephemeral stream sections and two habitat assessments were undertaken on an unimpacted intermittent tributary of the Yorke stream, and on the Armstrong stream tributary upstream of Manuka Road.

A full SEV was undertaken on the intermittent Yorke stream along with a new SEV on the Armstrong tributary which contains the culverted and piped sections.

The SEV scores for the Yorke Stream are as follows

Impact stream current	Impact stream potential	Impact stream impact	Mitigation stream current	Mitigation stream potential
SEVi-C	SEVi-P	SEVi-I	SEVm-C	SEVm-P
0.84	0.84	0.00	0.00	0.65

The scores above reflect that the stream in its current state has a high ecological value, noting no change between the current and potential SEV scores. It also indicates that while the stream is being diverted, the stream diversion will result in a permanent decrease in the ecological function of this intermittent stream.

From these SEV numbers an ECR was able to be calculated. The formula for an ECR is

$$ECR = [(SEVi-P - SEVi-I) / (SEVm-P - SEVm-C)] \times 1.5$$

This results in an ECR of 1.94

The current stream is 53m long and averages 0.45m wide. Given the available space for a stream diversion it has been determined that 70m linear length, at 0.5m wide is available to achieve an adequately functioning stream (grade and alignment). An ECR of 1.87 calculates that the 70m stream diversion would account for 75.7% of the stream impacts. This leaves a residual 5.8m² of aquatic habitat to be offset.

To address these residual stream impacts, stream offsetting has been proposed in the form of daylighting 45m of the Armstrong stream, as mentioned above. This section of Armstrong stream has been divided into upper and lower sections due to a change in stream physical characteristics. The upper section contains 15m of pipes with an average width of 0.47m. the downstream section is piped, and it is proposed to construct a 30m stream channel with an average width of 0.5m.

The following SEV scores have been used in the Armstrong stream upper section

Impact stream potential	Impact stream impact	Offset stream current	Offset stream potential
SEVi-P	SEVi-I	SEVm-C	SEVm-P
0.84	0.00	0.2	0.74

This results in an ECR of 2.33.

Daylighting the 15m of the upper Armstrong stream channel accounts for an additional 3m² of Yorke stream impacts, resulting in a residual 2.8m² of aquatic habitat to be offset.

The following SEV scores have been used in the Armstrong stream lower section

Impact stream potential	Impact stream impact	Offset stream current	Offset stream potential
SEVi-P	SEVi-I	SEVm-C	SEVm-P
0.84	0.00	0.2	0.58

This results in an ECR of 3.32.

Daylighting this 30m lower section of Armstrong stream sufficiently accounts for the remaining 2.8m² of stream bed impact area.

On balance, the SEV numbers applied to the streams subject to this application are appropriate and it has been demonstrated through the ECR calculations that the impacts on the Yorke stream are able to be managed within the Watercare site. This conclusion is specifically based on the proposed SEVm-P scores being achieved and it is considered appropriate to recommend monitoring to ensure that these SEVm-P values are indeed achieved. It would be appropriate to provide interim '5 and 10 years after restoration' SEV values against which to measure success. This approach is considered appropriate in these circumstances and it is recommended that monitoring is undertaken ensuring that these values are met.

Timescale effects

Ecological equivalence also needs to take into account associated effects the anticipated three year delay between the stream impact and the new diversion channel being created may cause. This has not been adequately considered in the application documents. The applicant suggests that some ecological function can be incorporated into the clean water diversion channel, however, while this clean water diversion will provide some hydrological function during rainfall, it is impractical to attempt to incorporate ecological function into this due to proposed grades of the diversion channel.

The Armstrong tributary daylighting can be undertaken while the bulk earthworks for the WTP and R1 are undertaken with the Yorke diversion channel being created following construction of the WTP. This would allow a portion of the stream offset package to be underway at the same time the stream impact is being undertaken. While this would not wholly address the timescale effects, timescale effects of this impact are reduced as downstream of the WTP site there is excessive stream bank erosion and slumping which is causing a complete barrier to fish passage. Additionally, the impact section of the Yorke stream is a headwater section of stream so there would be no severing of upstream/downstream connectivity as there would be if this was a section of permanent stream. The intermittent nature of the stream hydrology will still be altered as groundwater interactions may also be impacted depending on the material the clean water diversion channel is lined with and surface water flows will be restricted to rainfall events. Given this site-specific context, the proposed works methodology would be considered an appropriate order of operations in this instance. A recommendation has been included below to ensure appropriate timing in this regard.

Following daylighting and stream diversion channel creation, ongoing monitoring is recommended to ensure that the mitigation and offsetting activities achieve the anticipated SEV scores.

In order to ensure that no net loss is achieved in perpetuity, an appropriate maintenance and protection mechanism should also be established. The applicant has proposed that the entire Yorke and Armstrong stream enhancement areas be covenanted to achieve ongoing protection and prevent future degradation. I concur with this aspect of the proposal.

Streamworks Summary

The streamworks application has demonstrated alternatives considered to avoid stream impacts, with all impacts on freshwater ecology being appropriately mitigated and offset. On balance, provided this activity is undertaken in accordance with the details and recommendations in application documents, and recommendations set out below it is considered that the application results in a no net loss of aquatic ecological function and the adverse effects will be sufficiently managed.

Affected parties

The application has been publicly notified and the following comments are provided.

Earthwork Erosion and Sediment Control Submissions

A number of submissions raised issues on the earthworks and erosion and sediment controls. The below is not an exhaustive list of all submissions that mentioned erosion and sediment controls, but it does identify key issues that were raised.

- The inadequacy of sediment controls and potential sediment discharges (4781, 4783, 4827, 4975, 5146, 5172, 5206, 5230, 5242, 5261, 5078, 5278, 4822, 5153, 5266, 5004, 5061, 4773, 5240, 5065, 4765-Titirangi Protection Group, 5032 – Forest and Bird, 5206, 5273)
- The size of SRP1 (5230, 5261, 4765)
- Accounting for increased rainfall in Waitakere (5273)
- Adequacy of recommended conditions (5032)
- Extent of earthworks/plant footprint (4790, 4865, 4896, 5169, 5278, 4892, 5201, 5221)
- Duration of Earthworks (4868, 5021)
- Earthworks within a SEA (5278, 5281)

The overall footprint of the earthworks has been reduced from what was initially proposed. It is currently at a size that provides erosion and sediment controls to be properly established. Overall, bar some minor alterations, the sediment controls proposed are in accordance with industry best practice. Sediment retention pond 1, while an odd shape, will still function as a sediment pond and is deemed appropriate given the site constraints. Additional management techniques and monitoring such as device, and downstream freshwater monitoring, will ensure the devices function properly throughout the earthworks phase of the development. If it is found that a device is not functioning to appropriate standards, then investigations will be undertaken to identify and resolve any issues. There will ultimately be sediment discharged from the site, however, provided the devices are functioning correctly it is expected that the resulting sediment discharges will be managed appropriately. The anticipated sediment discharge, as calculated in the USLE has used the latest HIRDSv4 rainfall data from the rainfall gauge on the existing water treatment plant. This is an accurate representation of expected rainfall in this location of the Waitakere Ranges. Finally, appropriate erosion and sediment control consent conditions have been recommended below to ensure that the effects of sediment discharge are kept to a minimum.

Streamworks Submissions

A number of submissions raised issues on the streamworks and freshwater ecology of the site. The below is not an exhaustive list of all submissions that mentioned streamworks but a does identify key issues that were raised.

- Culverting streams (4781, 4783, 5242)

- Reclamation and Diversion of streams (4865, 4866, 4868, 5242, 5261, 5061, 4947, 4890, 5273)
- Adequacy of diversion channel (5287 – Department of Conservation, 5206)
- Timing of impact in relation to mitigation/offset occurring (5206, 5273)
- Hydrological changes (5242, 5206, 5273)

No streams are proposed to be culverted or piped as part of this application and existing piped sections of the Armstrong stream are going to be removed and daylighted. Reclamation of the Yorke intermittent stream is required, and a subsequent diversion channel will be made to shift the alignment of the stream. This diversion channel will not achieve a SEV value comparable to the current stream due to reduced riparian margins along the true right bank, some armouring of steeper sections, hydrological changes and an outfall from the dry pond. However, whilst the final channel designs are yet to be determined, recommendations below will require that the SEV assumptions are incorporated into channel design along with ongoing monitoring to ensure that the diverted Yorke stream achieves the predicted form and function. The same monitoring will apply to the daylighting sections of the Armstrong stream.

Regarding timing, typically stream offsetting activities are undertaken within 6-12 months of the impact occurring, depending on the type of impact. As this application is anticipating a delay of three years, this delay needs to be factored into the offset package. As described above, given the unique nature of this intermittent stream, undertaking a portion of the stream enhancement work now and the remainder three years later is deemed acceptable.

5.0 STATUTORY CONSIDERATIONS

5.1 Other Statutory documents

The following statutory documents are considered relevant to the planner's assessment of the application:

- **National Policy Statement: Freshwater Management 2014 (amended 2017) (NPS:FM)**

As the application relates to works within and around streams, the NPS Freshwater Management is considered relevant to this application. Objectives of the NPS: Freshwater Management centre on safeguarding the life supporting capacity, ecosystem processes and indigenous species of water bodies in terms of water quality and quantity.

- **New Zealand Coastal Policy Statement 2010 (NZCPS)**

As the application relates to works and discharges to streams which ultimately flow into the marine environment, the NZCPS is considered relevant to this application. Objectives of the NZCPS centre on safeguarding the integrity, form, functioning and resilience of the coastal environment along with sustaining its ecosystems.

5.2 Duration of consent: Section 123

Earthworks: LUC60339274

The applicant has requested a 20 year duration and a 10 year lapse date for the earthworks activity to account for construction delays with reservoir 2. It is considered that based on the nature of the earthworks a duration term of **20 years** and **10 year** lapse date is appropriate given the proposed construction timeframes. However, due to the longer than normal duration, a review condition has also been recommended.

Streamworks: LUS60339442

Due to the permanent nature of stream reclamation, diversion and daylighting there is no requirement to set a duration for this consent. A **10 year** lapse date has been included to account for any delays in construction.

6.0 RECOMMENDATION AND CONDITIONS

6.1 Adequacy of information

The above assessment is based on the information submitted as part of the application. It is considered that the information submitted is sufficient to enable the consideration of the above matters on an informed basis:

- a) The level of information provides a reasonable understanding of the nature and scope of the proposed activities as they relate to the Auckland Unitary Plan: (Operative in Part).
- b) The extent and scale of any adverse effects on the environment are able to be assessed.

6.2 Recommendation

The assessment in this memo does not identify any reasons to withhold consent, and the aspects of the proposal considered by this memo could be granted consent, subject to recommended conditions, for the following reasons:

- Subject to the imposition of consent conditions, it is considered that the potential effects on the receiving environment from sediment discharges, as well as the potential effects associated with the disturbance to aquatic environments will be appropriately managed.
- The sensitivity of the receiving environment to the adverse effects of the potential sediment discharges will not be compromised given the application of suitable control technologies and appropriate on-site management techniques.

6.3 Conditions

The applicant has proposed erosion and sediment controls in accordance with the guidance recommended in Auckland Council Guidance Document 005. It is considered appropriate however, to include a standard suite of earthworks and streamworks consent

conditions relating to the installation, maintenance and monitoring of erosion and sediment controls and the protection of the surrounding environment. The inclusion of these conditions is consistent with similar earthworks and streamworks operations granted consent for in the Auckland region and will ensure that the effects of the proposed works will be managed appropriately.

6.4 General conditions

The following general conditions are recommended:

X.1 The earthworks and streamworks shall be undertaken in accordance with the following plans and information unless superseded in accordance with condition **X.4**:

Reports: *'Huia Replacement Water Treatment Plant (WTP) Project'*, version 1, prepared by Tonkin & Taylor Ltd, dated July 2019.

'Stormwater and Erosion and Sediment Control Report', version I, prepared by Cook Costello, dated 12 July 2019.

'Stream Ecological Valuation Plan', prepared by Boffa Miskell, dated 26 July 2019.

'Addendum to Stream Ecological Valuation Plan', prepared by Boffa Miskell, dated 26 November 2019.

'Assessment of Ecological Effects', version 1, prepared by Boffa Miskell, dated 26 July 2019.

Plans: *'Erosion and Sediment Control Plan - Overall Plan'*, drawing number C100, Rev.C, prepared by Cook Costello, dated 21 May 2019.

'Erosion and Sediment Control Plan – Sheet 1', drawing number C101, Rev.C, prepared by Cook Costello, dated 21 May 2019.

'Erosion and Sediment Control Plan – Sheet 2', drawing number C102, Rev.E, prepared by Cook Costello, dated 4 November 2019.

'Erosion and Sediment Control Plan - Drainage Pond Enlargement', drawing number C102A, Rev.A, prepared by Cook Costello, dated 4 November 2019.

'Erosion and Sediment Control Plan – Sheet 3', drawing number C103, Rev.A, prepared by Cook Costello, dated 21 May 2019.

'Drainage Pond Details Proposed Dry Pond', drawing number C460, Rev.F, prepared by Cook Costello, dated 10 July 2019.

'Stream Diversion Long Section and Cross Section', drawing number C463, Rev.D, prepared by Cook Costello, dated 21 May 2019.

Advice Note:

In the event that minor amendments to the above plans are required, any such amendments should be limited to the scope of this consent. Any amendments which affect the performance

of the controls may require an application to be made in accordance with section 127 of the RMA. Any minor amendments should be provided to the Team Leader – Compliance Monitoring North West 2 prior to implementation to confirm that they are within the scope of this consent.

Earthworks

Pre-commencement meeting

X.2 Prior to the commencement of any earthworks activity, the consent holder shall hold a pre-start meeting that:

- is located on the subject site;
- is scheduled **not less than five days** before the anticipated commencement of earthworks;
- includes Auckland Council Monitoring Advisor(s); and,
- includes representation from the contractors who will undertake the works.

The meeting shall discuss the erosion and sediment control measures, the earthworks methodology and shall ensure all relevant parties are aware of and familiar with the necessary conditions of this consent.

The following information shall be made available at the pre-start meeting:

- Timeframes for key stages of the works authorised under this consent;
- Resource consent conditions;
- Erosion and Sediment Control Plans;
- Chemical Treatment Management Plan;
- Adaptive management plan;
- Dewatering plan; and,
- Stream daylighting plan.

A pre-start meeting shall be held prior to the commencement of any earthworks activity in each period between October 1 and April 30 that this consent is exercised.

Advice Note:

To arrange the pre-start meeting please contact the Team Leader – Compliance Monitoring North West 2 on monitoring@aucklandcouncil.govt.nz, or 09 301 0101. The conditions of consent should be discussed at this meeting. All additional information required by the Council should be provided 2 days prior to the meeting.

X.3 Prior to the commencement of earthworks at the site, a Chemical Treatment Management Plan (CTMP) shall be submitted for the written approval of the Team Leader – Compliance Monitoring North West 2. The plan shall include as a minimum:

- a) Specific design details of the chemical treatment system based on a rainfall activated dosing methodology for the site's sediment retention ponds and batch dosing methodology for dewatering the excavation pits;
- b) Monitoring, maintenance (including post storm) and contingency programme (including a record sheet);

- c) Details of optimum dosage (including assumptions);
- d) Results of initial chemical treatment trial;
- e) A spill contingency plan; and,
- f) Details of the person or bodies that will hold responsibility for long term operation and maintenance of the chemical treatment system and the organisational structure which will support this system.

Advice Note:

In the event that minor amendments to the CTMP are required, any such amendments should be limited to the scope of this consent. Any amendments which affect the performance of the CTMP may require an application to be made in accordance with section 127 of the RMA. Any minor amendments should be provided to the Team Leader – Compliance Monitoring North West 2 prior to implementation to confirm that they are within the scope of this consent.

X.4 Prior to the commencement of earthworks activity on the subject site, finalised Erosion and Sediment Control Plans (ESCP) shall be prepared in accordance with Auckland Council's Guidance Document 005 – Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05) and the preliminary erosion and sediment control plans provided in the application (condition X.1). These finalised plans shall include, but not limited to:

- Specific erosion and sediment control works (location, dimensions, capacity) in accordance with GD05;
- supporting calculations and design drawings;
- details of construction methods;
- monitoring and maintenance requirements;
- catchment boundaries and contour information;
- cut and fill isopach plan; and,
- details relating to the management of exposed areas (e.g. grassing, mulching).

This ESCP shall be submitted to the Team Leader – Compliance Monitoring North West 2 on monitoring@aucklandcouncil.govt.nz. No earthworks activity on the subject site shall commence until confirmation from council is provided that the ESCP is satisfactory.

Advice note:

In the event that minor amendments to the ESCP are required, any such amendments should be limited to the scope of this consent. Any amendments which affect the performance of the ESCP may require an application to be made in accordance with section 127 of the RMA. Any minor amendments should be provided to the Team Leader – Compliance Monitoring North West 2 prior to implementation to confirm that they are within the scope of this consent.

X.5 Prior to the commencement of earthworks activity on the subject site a dewatering plan shall be prepared for dewatering any surface water and/or groundwater that becomes impounded in the excavation pits. This dewatering plan shall include, but not limited to:

- Dewatering methodology;
- Pump size and specifications;
- Discharge locations; and,

- Impounded water treatment methodologies in accordance with the approved CTMP.

This dewatering plan shall be submitted to the Team Leader – Compliance Monitoring North West 2 on monitoring@aucklandcouncil.govt.nz. No earthworks activity on the subject site shall commence until confirmation from council is provided that the dewatering plan is satisfactory.

- X.6 Prior to commencement of earthworks activity on the subject site an Adaptive Management Plan (AMP) shall be submitted for the written approval of the Team Leader – Compliance Monitoring North West 2. This AMP shall set out a monitoring programme of onsite devices and the downstream receiving environment. Specific trigger levels shall be set which can be used to trigger management actions if specified limits are exceeded. The AMP shall include but not be limited to;
- Baseline testing;
 - Trigger levels;
 - Weather monitoring (rainfall, forecasting etc.);
 - Freshwater monitoring (water quality, MCI, sediment deposition etc.);
 - Erosion and Sediment control device monitoring (inlet/outlet turbidity etc.);
 - Reporting requirements (exceedance, quarterly, annual); and,
 - Management actions.
- X.7 Consent LUC60339274 (earthworks) shall expire fifteen (20) years from the date of issue unless it has been surrendered or cancelled at an earlier date pursuant to the RMA.
- X.8 Pursuant to section 125 of the RMA, consent LUC60339274 shall lapse 10 years after the date it is granted unless:
- The consent is given effect to: or
 - The Council extends the period after which the consent lapses.
- X.9 The conditions of this consent may be reviewed by the Auckland Council pursuant to Section 128 of the Resource Management Act 1991, (with the costs of the review process being borne by the Consent Holder), by giving notice pursuant to Section 129 of the Act, in one or more of the following times:
- Within one year of initiation of the earthworks;
 - And/or at two yearly intervals after that time.

The purpose of the review may be for any of the following purposes, namely:

- To deal with any adverse effect on the environment which may arise from the exercise of this consent or upon which the exercise of the consent may have an influence and which becomes apparent, or is found appropriate, to deal with at a later stage, and in particular but without limiting the ambit of this clause to:
 - Insert conditions, or modify existing conditions, to require the consent holder to identify the character or nature of any discharges authorised by this Consent and to report the results of that monitoring to the Auckland Council; and/or

- b) Insert conditions, or modify existing conditions to require the consent holder to monitor the effects of any discharges authorised by this consent on the local receiving environment and to report the results of that monitoring to the Auckland Council;
- ii) Insert conditions, or modify existing conditions, requiring the consent holder to adopt the Best Practicable Option to remedy, mitigate or minimise any adverse effects on the environment resulting from the discharges authorised by these consents, including remedying or mitigating any adverse effect on the environment which may arise from the exercise of these consents and which it is appropriate to deal with at a later stage.
- X.10 All sediment retention ponds shall be chemically treated in accordance with the approved Chemical Treatment Management Plan (CTMP). Any amendments to the CTMP shall be submitted in writing to the Team Leader Compliance Monitoring Northern West 2, for written certification prior to implementation.
- X.11 Prior to each stage of earthworks commencing, an as-built certificate signed by a suitably qualified and experienced person shall be submitted to the Team Leader – Compliance Monitoring North West 2, to certify that the erosion and sediment controls specific to that stage have been constructed in accordance with the approved erosion and sediment control plans and GD05.
- Certified controls shall include the stabilised entrance ways, sediment retention ponds, super silt fences, silt fences and clean and dirty water diversion bunds. The certification for these measures shall be supplied immediately upon completion of their construction. Information supplied, if applicable, shall include:
- a) Contributing catchment area;
- b) Shape and volume of structure (dimensions of structure);
- c) Position of inlets/outlets; and,
- d) Stabilisation of the structure;
- X.12 Erosion and sediment control measures shall be constructed and maintained in accordance with Auckland Council's Guidance Document 005 – Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region, and any amendments to this document, except where a higher standard is detailed in the documents referred to in conditions above, in which case the higher standard shall apply.
- X.13 There shall be no deposition of earth, mud, dirt or other debris on any road or footpath resulting from earthworks activity on the subject site. In the event that such deposition does occur, it shall immediately be removed. In no instance shall roads or footpaths be washed down with water without appropriate erosion and sediment control measures in place to prevent contamination of the stormwater drainage system, watercourses or receiving waters.

Advice Note:

In order to prevent sediment laden water entering waterways from the road, the following

methods may be adopted to prevent or address discharges should they occur:

- provision of a stabilised entry and exit(s) point for vehicles
- provision of wheel wash facilities
- ceasing of vehicle movement until materials are removed
- cleaning of road surfaces using street-sweepers
- silt and sediment traps
- catchpit protection

In no circumstances should the washing of deposited materials into drains be advised or otherwise condoned.

It is recommended that you discuss any potential measures with the Council's monitoring officer who may be able to provide further guidance on the most appropriate approach to take. Please contact the Team Leader – Compliance Monitoring North West 2 for more details. Alternatively, please refer to Auckland Council's Guidance Document 005, Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region.

- X.14 Upon completion or abandonment of earthworks on the subject site all areas of bare earth shall be permanently stabilised against erosion to the satisfaction of Team Leader – Compliance Monitoring North West 2.

Advice Note:

Should the earthworks be completed or abandoned, bare areas of earth shall be permanently stabilised against erosion. Measures may include:

- the use of mulching;
- top-soiling, grassing and mulching of otherwise bare areas of earth;
- aggregate or vegetative cover that has obtained a density of more than 80% of a normal pasture sward; and

The on-going monitoring of these measures is the responsibility of the consent holder. It is recommended that you discuss any potential measures with the Council's monitoring officer who will guide you on the most appropriate approach to take. Please contact the Team Leader Northern Monitoring for more details. Alternatively, please refer to Auckland Council Guidance Document GD05, Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region.

- X.15 The operational effectiveness and efficiency of all erosion and sediment controls and associated measures specifically required as a condition of resource consent or by the earthwork methodology shall be maintained throughout the duration of the earthworks activity, or until the site is permanently stabilised against erosion.

- X.16 The sediment and erosion controls at the site of the works shall be inspected on a regular basis and within 24 hours of each rainstorm event that is likely to impair the function or performance of the erosion and sediment controls. A record shall be maintained of the date, time and any maintenance undertaken in association with this condition which shall be forward to the Team Leader – Compliance Monitoring North West 2 on request.

Seasonal Restrictions

- X.17 No earthworks or streamworks on the site shall be undertaken between 1 May to 30 September in any year, without the prior written approval of the Team Leader – Compliance Monitoring North West 2. Revegetation/stabilisation is to be completed by 30 April in accordance with measures detailed in GD05 and any amendments to this document.

Advice Note:

Any 'Request for winter works' submitted in accordance with condition (X.17) will be assessed against criteria in line with the information required to assess a comprehensive application. Principally that will focus on the level of risk, the propensity to manage that risk with contingency planning and a 'track record' of good compliance with consent conditions. Each 'Request for winter works' submitted, should include the following:

- *Description of works proposed to be undertaken between 30 April and 1 October and the duration of those works;*
- *Details of proposed measures to prevent sediment discharge from these specific works, particularly during periods of heavy rainfall;*
- *Details of area(s) already stabilised;*
- *Revised erosion and sediment control plan detailing stabilisation to date and time line/staging boundaries showing proposed progression of stabilisation;*
- *Contact details for contractor who will undertake stabilisation of the site including date(s) expected on site;*
- *Alternatives/contingencies proposed if the contractor referred to above becomes unavailable;*
- *Details of site responsibilities, specifically who is responsible for erosion and sediment controls and stabilisation processes over the specified period.*

Adaptive Management

- X.18 The requirements of the Adaptive Management Plan (condition X.6) and any subsequent revisions shall be implemented throughout the duration of the earthworks activity on the sites.
- X.19 A Freshwater Baseline Report containing the pre-construction in-stream monitoring shall be provided to the Team Leader – Compliance Monitoring North West 2 for written approval prior to any earthworks or streamworks commencing. The minimum requirements of this report shall be;
- a) Freshwater Monitoring sites shall be located both upstream and downstream of each earthwork site on both the Yorke stream and on the Armstrong stream. The locations of these monitoring sites will allow water quality to be tested as freshwater flows into the site and downstream of the site.
 - b) The pre-construction environmental conditions shall be represented by:
 - i. Water quality (turbidity, pH, etc.);
 - ii. Sediment deposition over a transect; and,
 - iii. Macro Invertebrate sampling.

- X.20 Pre-rain forecast inspections as defined within the AMP must be undertaken at a minimum of 24 hours prior to the forecasted event. If the forecast is not made available within 24 hours of the proposed event, all reasonable attempts shall be made to inspect the site prior to the proposed event.
- X.21 An earthworks catchment which has been stabilised as a result of a trigger level exceedance as defined and required by the Adaptive Management Plan may only be re-opened on the written approval of the Team Leader – Compliance Monitoring North West 2.
- X.22 Any proposed revisions to the Adaptive Management Plan must be submitted to the Team Leader – Compliance Monitoring North West 2 for written approval prior to formalising and implementing the revised Adaptive Management Plan.
- X.23 If in the Council's opinion, there are changes required to be made to the AMP as a result of observing inefficiencies on site or identified within the site reporting, Council may request that the AMP be updated to address these inefficiencies. If a request is made, the revised plan shall be submitted to the Team Leader – Compliance Monitoring North West 2 within five working days of the request for written approval prior to implementation.

Advice Note:

The AMP is a live document and updates are expected to address any unforeseen circumstances or changes in the earthworks methodology as the site responds through its adaptive monitoring regime to ensure the potential for sediment discharges are minimised. The consent holder shall make available, all monitoring results and data as required by the AMP upon the request of Auckland Council.

Streamworks

- X.24 Pursuant to section 125 of the RMA, consent LUS60339442 shall lapse 10 years after the date it is granted unless:
- c) The consent is given effect to: or
 - d) The Council extends the period after which the consent lapses
- X.25 Prior to streamworks commencing a Stream Restoration Plan shall be prepared and submitted to the Team Leader – Compliance Monitoring North West 2. The Stream Restoration Plan shall incorporate all recommendations from the Addendum to Stream Ecological Valuation Plan (Boffa Miskell, November 2018), including the SEVm-P assumptions for the diversion channel and daylighting sections. The Stream Restoration Plan shall consist of the following;
- a) Yorke intermittent stream diversion channel design including stream bank grades.
 - b) Armstrong stream daylighting channel design including stream bank grades.
 - c) Long and Cross sections of the stream channels demonstrating habitat heterogeneity in accordance with SEVm-P assumptions (including a minimum length of 70m for the Yorke stream diversion channel).

- d) All Riparian Planting, true right and left bank riparian widths are to be in accordance with SEVm-P assumptions.
- e) Plans identifying riparian planting zones. All measurements must be clearly depicted on the plans.
- f) Appropriate species list of eco-sourced plants including planting densities to be applied across new planting areas and any infill planting areas.
- g) All riparian planting shall be in accordance with the *Auckland Regional Council Riparian Zone Management Strategy for the Auckland Region*, Technical Publication 148, June 2001 (TP148).
- h) A monitoring and maintenance plan for a period of no less than ten years to ensure that a 90% survival rate and canopy closure is achieved.
- i) A weed management plan to ensure that the planting areas remain weed free for the length of the monitoring and maintenance period of ten (10) years.
- j) A programme to monitor scour and erosion at the downstream extent of the proposed diversion channel. If monitoring identifies new erosion that is attributable to the Project by a suitably qualified engineer, the Consent Holder shall implement remedial action in the form of stream stabilisation measures or similar;

X.26 The Stream Restoration Plan detailed above, shall be completed within the following timeframes.

- a) The Armstrong stream daylighting shall be undertaken during the first earthworks season of land disturbance having commenced with riparian enhancement undertaken the following planting season.
- b) The Yorke stream diversion channel shall be created following completion of earthworks on the replacement water treatment plant site. Riparian enhancement of this stream shall be undertaken the following planting season.
- c) All plantings shall be carried out between the months of May to August. Written confirmation in the form of a planting completion report shall be provided to the Team Leader – Compliance Monitoring North West 2, within 30 working days of the stream planting works being completed. This report shall confirm the species and number of plants planted and that the planting has been completed in accordance with the approved plans.

X.27 Written confirmation in the form of an Offset and Compensation Report shall be provided to the Team Leader – Compliance Monitoring North West 2, within 30 days of the offset and compensation work being implemented and completed, confirming that the works have been completed in accordance with the approved Offset and Compensation Plan.

X.28 Plant maintenance in accordance with the Stream Restoration Plan shall occur for 10 years. The 10-year period shall commence once all the naturalisation works for each respective stream have been completed. The Team Leader – Compliance Monitoring North West 2 shall be notified once the naturalisation planting has been completed.

Advice Note:

The ten year period can only commence once all planting has been completed to the satisfaction of Team Leader – Compliance Monitoring North West 2.

- X.29 The consent holder shall ensure that all machinery operates from the stream banks at all times. No machinery shall enter the wetted cross section of the watercourses at any time.
- X.30 All machinery shall be operated in a way, which ensures that spillages of fuel, oil and similar contaminants are prevented, particularly during stabilisation and machinery servicing and maintenance. Refuelling and lubrication activities shall be carried out away from any water body such that any spillage can be contained so it does not enter the watercourse associated with this consent. The use of grouts and concrete products shall also be limited adjacent to the watercourse with all mixing of products carried out outside the 100 year floodplain area such that any spillage can be contained so it does not enter the watercourses, associated with this consent.
- X.31 The consent holder shall monitor the SEV of the mitigation sites and the constructed stream channels at three (3), five (5) and ten (10) years after completion of the Armstrong stream daylighting and Yorke stream diversion channel creation respectively, or until the monitoring shows that the offsetting site or constructed stream channels have achieved the predicted SEV values (Table 1 and Appendix 2 of 'Addendum to Stream Ecological Valuation Plan', prepared by Boffa Miskell, dated 26 November 2019), whichever time period is the lesser. Monitoring shall be undertaken at times that avoid transient conditions, such as flood events.
- X.32 Where the monitoring concludes that the SEV values of the mitigation streams and constructed stream channel have not reached the predicted SEV value within ten (10) years of completion, a Further Offset Works Plan shall be prepared and submitted to the Team Leader – Compliance Monitoring North West 2 for approval. The Further Offset Works Plan shall include, but not be limited to the repair or improvement of mitigation works along the existing offset stream reaches to meet the predicted SEV values and further monitoring until such time that the requirements of the Further Offset Works Plan are achieved.

a) SEV values to be met are;

Yorke Stream Diversion	Upper Armstrong Daylighting	Lower Armstrong Daylighting
0.65	0.74	0.58

Advice Note:

In the event that a suitably qualified freshwater ecologist determines that the predicted SEV values when planted vegetation matures are unlikely to be met, offsite mitigation works may be required. The Future Offset Works Plan can address this and must ensure no net loss of ecological function based on the SEV values of the stream reach that have been lost.

- X.33 The consent holder shall provide the Further Offset Works Plan within 6 months of the monitoring required by Condition **X.31**, and shall implement any additional offsetting identified in the approved Further Offset Works Plan within 6 months of the written approval by the Team Leader – Compliance Monitoring North West 2, or during the next planting season (whichever is appropriate to the measures adopted).

- X.34 Within two months of each round of monitoring being completed, the consent holder shall provide the SEV assessments and associated calculations used for the monitoring of sites required by Condition **X.31** to the Team Leader – Compliance Monitoring North West 2 for certification and comparison against the SEV values required to be met in condition **X.32**

Covenant

- X.35 Within 6 months of construction of the stream diversion channel the consent holder shall enter into a covenant in accordance with section 108 of the Resource Management Act 1991 that are in favour of Auckland Council for [site's legal description]. The consent holder shall contact Council to initiate the preparation of the covenant. A copy of the updated Computer Register and /or Certificate of Title showing that the covenant has been registered shall be provided to Council within 6 months of completion of the Armstrong stream daylighting and Yorke stream diversion (referenced in Condition **X.25**).
- a) The covenant shall:
- i. Secure the protection in perpetuity of all Stream Restoration areas, including riparian margins and as specified in the conditions of this consent (condition **X.25**);
 - ii. Ensure that the area is maintained free of pest animals, noxious weeds, exotics and environmental pest plants;
 - iii. Not do anything that would prejudice the health or ecological value of the areas of native bush to be protected, their long term viability and/or sustainability; and,
 - iv. Not (without the prior written consent of the Team Leader Compliance Monitoring North West 2 and then only in strict compliance with any conditions imposed by the Team Leader Compliance Monitoring North West 2) cut down, damage or destroy, or permit the cutting down, damage or destruction of the vegetation or wildlife habitats within the areas to protected.
- b) The covenant shall:
- i. be drafted by the Council's nominated Solicitor at the Consent Holder's cost; and
 - ii. and be registered against the Computer Register(s)(NZ62B/924, NA62B/925, NZ60C/619 and NZ77B/260) to the affected land by the Consent Holder at their cost; and
 - iii. require the Consent Holder to:
 1. 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
 2. 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.

7.0 REVIEW

Memo prepared by:

Carl Tutt




Specialist Advisor

Date:

10 December 2019

Technical memo reviewed and approved for release by:

David Hampson



pp.

Team Leader, Earth, Streams and Trees, Specialist Unit, Resource Consents

Date:

10 December 2019

Technical Memo – Ecology

To:	Richard Blakey, Consultant Planner
From:	Dr Carol Bergquist, Senior Ecologist
Date:	20 November 2019
Applicant's name:	Watercare Services
Application Number:	BUN60339273: Water Treatment Plant Replacement
Application Type:	Vegetation clearance from a Significant Ecological Area
Site Address:	Woodlands Park Road, Waima

1. Summary of Proposal

1.1 The proposal is to construct a new Water Treatment Plant and two new reservoirs at the junction of Woodlands Park and Manuka Roads in the Waitakere Ranges. The proposed project spans three sites owned by Watercare which have a total area of 15 hectares. The land parcel on which the proposed replacement Huia Water Treatment Plant (WTP) is located has an area of 4.2ha, the proposed Reservoir 1 parcel is approximately 6.4ha and the existing WTP site on which Reservoir 2 is proposed is approximately 4.0ha. The three sites are all accessed from Woodlands Park Road and collectively referred to as 'the Project Site.' The works footprint is 4.3ha in total, 3.5ha of which comprise indigenous vegetation.

1.2 The relevant application documents reviewed in preparation of this report include:

- Huia Water Treatment Plant Replacement. Assessment of Ecological Effects. Boffa Miskell, 21 May 2019.
- Huia Replacement Water Treatment Plant (WTP) Project, Final AEE, Tonkin & Taylor Limited, July 2019
- Consenting Phase Site Layout Development Report, GHD, May 2019
- Reservoir Site Layout Development Report, Beca Limited, 22 May 2019
- Indicative Construction Methodology, Alta, 23 May 2019
- Proposed Conditions, May 2019
- Section 92 responses to requests for further information.

- 1.3 This review of the application is restricted to the adverse effects of the proposed vegetation clearance on the SEA and the adequacy of measures to avoid, remedy and mitigate those effects.

2. Site Description

- 2.1 The site at the junction of Woodlands Park Road and Manuka Road is land owned by Watercare and is wholly designated in the Auckland Unitary Plan, operative in part (AUP:OP) for 'Water supply purposes – water treatment plants and associated structures.'

Both the WTP and Reservoir 1 sites are almost completely vegetated in native bush and the existing WTP site is approximately half vegetated in native bush with the remainder developed as part of the existing Huia WTP. The sites are identified as part of an extensive Significant Ecological Area (SEA_T_5539) in the AUP:OP that extends across the vegetation of the Waitakere Ranges. The area meets all five criteria for qualifying as SEA (representativeness; threat status and rarity; diversity; steppingstones, migration pathways and buffers; uniqueness or distinctiveness). The site is also within the Waitakere Ranges Heritage Area, protected by the Waitakere Ranges Heritage Area Act 2008. Although modified by resource exploitation and human settlement, the ecosystems of the Waitakere Ranges Heritage Area are nationally significant as one of the largest areas of coastal and lowland forest with intact sequences remaining in the Auckland region.

3. Reasons for Consent

- 3.1 Land use consent for vegetation removal from an SEA is required under the following provisions of the AUP: OP:

For network utilities, vegetation clearance in an SEA requires consent as Restricted Discretionary Activity under E26.3.3.1 (A77) as it does not meet the Standard E26.3.5.2:

- (1) The proposal involves vegetation removal on both the reservoir site and the replacement WTP site that will include trees over 6m in height and 600mm in girth, and
- (2) Vegetation removal will also result in the removal of more than 20m² of vegetation within a SEA.

4. Review of Assessment of Environmental Effects submitted with the Application

The Assessment of Ecological Effects (AEE) prepared by Boffa Miskell describes the ecological values present in the 15ha site, assesses the ecological effects associated with the proposed WTP development and proposes measures to avoid, remedy, mitigate, offset or compensate for the significant adverse ecological effects.

The flora and fauna surveys undertaken by Boffa Miskell as well as the analysis of ecological integrity has identified a gradient in the quality and condition of ecosystems within the Project Site. However, the Project Site forms part of a largely intact forested corridor that extends around the head of the catchment connecting forest in the Lower Nihotupu Reservoir and Little Muddy Creek catchments.

The AEE acknowledges the ecological significance of the Project Site which supports the resilience and ecological integrity of the Little Muddy Creek catchment and forms part of a network of forested areas within the wider Waitakere foothills that together make an important contribution to the provision of lowland kauri-podocarp forest in the landscape.

In ranking the ecological values by following EIANZ (2018) guidelines, the AEE determined that the Project Site rates as High for three out of four assessment matters (rarity/distinctiveness, diversity/pattern and ecological context). Therefore, the Project Site achieves an overall ecological value ranking of Very High.

The AEE states that the WTP and reservoir footprints together encompass 4.3ha of the 15ha Project Site and that the footprint was designed to avoid permanent watercourses and to avoid areas with the highest ecological integrity. Hence, the proposed location of Reservoir 1 was re-located to avoid a stand of mature kauri.

The AEE identifies the ecological effects of the proposed project as:

- Removal of 3.5ha of intact native forest and scrub (some aged at 80-120 years) for the three footprints of the WTP, Reservoir 1 and Reservoir 2 within the centre of the 15ha site.
- Edge effects from forest clearance creating new margins to remaining bush areas.

- Changes to the hydrology of the Reservoir 1 site with ground water draw down and settlement as the reservoir structure will be 15m below existing ground level.

- Loss of threatened/at risk flora – with the proposed forest clearance of kanuka-dominated forest, manuka and climbing rata species – threatened or at risk from myrtle rust.

- Risk of the spread of kauri dieback disease with earthworks in the proximity of kauri trees.

- Disturbance to or loss of fauna species, particularly herpetofauna, native birds, bats and invertebrates.

- Effects on freshwater ecology with the WTP requiring diversion of an intermittent stream reach in the Yorke Gully, and the NH2 shaft for Reservoir 1 requiring loss of 300m² riparian vegetation from the Armstrong Gully stream and Reservoir 2 requiring the loss of 700m² of riparian vegetation from the Armstrong_manuka stream.

- Catchment scale effects as the proposed clearance and development introduces localised fragmentation into the vegetated corridor across the top of the Little Muddy Creek catchment, and the gap created will further reduce connectivity across the local landscape and between mature and regenerating forest patches in the Project Site.

The AEE, in assessing the magnitude of ecological effects used the three assessment matters (rarity, diversity and ecological context) and has determined the overall magnitude of effects as Moderate. This translates into the level of effect as being High.

5. Main Issues and Discussion

5.1 Terrestrial ecological effects that can be avoided, remedied or mitigated on site include:

- With proposed development for 4.3ha of the 15ha site, ecological value assessments, ecosystem classification and integrity evaluation have enabled the avoidance of areas of the highest value; that is swamp maire-pukatea-kahikatea swamp and kauri-podocarp forest, as well as individual mature kauri trees and permanent stream reaches. (avoid)
- Replanting forest margins to reduce edge effects. (remedy)
- Minimising disturbance to native fauna by undertaking bat, bird nesting and lizard survey/rescue/salvage before clearance. An Hochstetter's frog survey is recommended to be included as populations are found throughout the Waitakere Ranges. (mitigate)
- Tree protection methodology for at-risk trees (arborist report/recommendations have not been included in the application). (mitigate)
- Kauri dieback protocols. (avoid/mitigate)

5.2 Proposed offsetting of effects includes:

- Weed and pest control in remaining bush through the proposed Waima Biodiversity Management Plan. In addition, the proposed stream diversion channel and all other stream enhancement measures will be protected through mechanisms such as a QEII covenant.
- Riparian planting to offset the loss of 0.1ha riparian vegetation in total (700m² from the Armstrong_manuka stream south of Woodlands Road and 300m² for the NH2 shaft of Reservoir 1 from the Armstrong Gully stream north of Woodlands Road).

5.3 Residual ecological effects that cannot be avoided, remedied or mitigated on site are noted as:

3.5ha of forest clearance comprising:

- 2.5ha kanuka-mahoe, mahoe, and kanuka-mamangi forest types and including 34 canopy and emergent trees for the WTP (kahikatea likely to be 80-120 years old,

rewarewa, pohutukawa and others).

- 0.6ha kanuka and kanuka-kahikatea forest including 8 kahikatea and 1 rewarewa canopy/emergent for Reservoir 1.
- 0.4ha of kanuka-mamangi and mahoe forest including 2 emergent totara for Reservoir 2.

Residual effects are not just the area of trees removed but also the biomass, productivity and ecosystem services that this biomass provides. Estimate of the area containing this functioning ecosystem/biosphere is: For the mature forest of 3.5ha at an average height of 10m (conservative) = 350,000m³ of biosphere.

And every year of its existence, this total biosphere provides:

- Water uptake and transpiration – cooling and moisturising the air
- Oxygen production – conditioning the air for respiration
- Carbon sequestration
- Organic debris and nutrients for soil conditioning
- Shelter/refuge for bats, lizards, frogs, birds and invertebrates
- Nectar, fruits and seeds to feed bats, birds, lizards and invertebrates
- Seed source and nurse protection for regenerating forest.
- Maintaining water quality in streams and downstream reservoirs.
- Amenity values
- Intrinsic values

The loss of this biosphere means the loss of on-going forest productivity, ecosystem services, and localised fragmentation into the vegetated corridor across the top of the Little Muddy Creek catchment that is now relatively intact. While the proposed forest clearance amounts to a small proportion of the native forest present in the Little Muddy Creek catchment, the gap created will further reduce connectivity across the local landscape, and connectivity between mature and regenerating forest patches in the immediate environs of the Project Site.

- Unknown quantum of native fauna species through displacement or mortality including bats, birds, herpetofauna (which includes Hochstetter's frog) and invertebrates.

I concur with Boffa Miskell's description and assessment of ecological values of the Project Site as Very High. However, in my view there will also be major alteration to key elements/features to the baseline (existing) condition through the sheer quantum of vegetation loss to the centre of the Project Site, including the loss of kahikatea forest aged at 80-120 years. This will fundamentally change the forested character and ecological values of the core local area and effects will be permanent.

6. Consideration of Submissions on Ecological Matters

The ecological matters raised in submissions are considered below. Note that not all submissions on each topic are necessarily listed individually. Where relevant, cross references are made to the assessment of effects within section 5. A number of submitters including the Department of Conservation (5287) and Forest & Bird (5032) have made comments with respect to conditions of consent and Watercare advise that an amended and updated list of conditions to respond to the points raised in submissions, and also to reflect updates following matters raised in the most recent Section 92 further information request.

6.1 Site selection and requirement to avoid

Submissions including 5242 – Waima and Woodlands Park Residents & Ratepayers Association (WWPRRA), 5146 – Titirangi R&RA, 5287 – Director-General of Conservation, 5230 – Titirangi Protection Group, 4765 – Simon Kitson, 5078 – Gina Mitchell, 5140 – Simon Grant, 4865 – Olaf Klesse, 5305 – Save Our Kauri, 5297 – Waitakere Ranges Local Board, 4890 – Dr Peter Farnsworth, 4900 – Heather Moffat, 4827 – P Marks & C Percy, 4829 – David Blake, 5029 – Lisa Prager, 5167 – Helen Kerr, 5273 – Dr Cyril Hamiaux, 5055 – Rebecca Breen, 5056 – Matthew Breen, 5110 – Kay Millar, 5116 – Louis Neto, 5132 – Helen Jansen, 4869 – Sarah Welford, 4773 – Katja Jacobs, 4780 – Berthine Bruinsma, 4789 – Huia Hamon, 4793 – Karyn Elizabeth Honey, 4795 – Nathan May, 4813 – Julia Digby, 4837 – Ronja V Schipper, 4841 – Chris Good, 4842 – Susan Beach and others oppose the application and consider that the site selection process has failed to take into account the mitigation hierarchy imposed by the AUP for SEAs in Chapter D9 and Appendix 8, where the appropriateness of minimising/mitigating/offsetting can only be considered after all practicable avoidance options have been considered. Among the sites considered by

Watercare, Parker Road North and Woodlands Park Road are both equal on balance of technical, environmental and cost matters. However, there is no SEA on the Parker Road site, so all the adverse biodiversity effects that Watercare acknowledge cannot be avoided, minimised or mitigated on the Woodlands Park Road site can be completely avoided by selecting the alternative location.

The WWPRRA (submission 5242) does not consider that the application has gone far enough in seeking to avoid effects and impacts. Constructing the replacement WTP at a different site would avoid the significant ecological losses on the chosen site, though it is accepted that losses of some kind will be incurred wherever the WTP is located. The decision to select the Manuka Road site for the plant appears to have been made based on it having a water supply purposes designation rather than it being the site with the minimum impact of all the sites considered in terms of ecological impact. Submitters believe that the applicant has failed to adequately avoid or even minimise the ecological effects of replacing the Huia WTP. They accept that the applicant has moved Reservoir 2 in order to avoid effects on the high value ecosystem on the Manuka Road site. However, they consider that insufficient investigation was undertaken to assess moving both reservoirs to a different location and even using a different site for the replacement plant to enable effects to be avoided completely in this area.

The remaining ecosystem will suffer significant edge effects as a result of the development of Reservoir 1 on this site and it also encroaches on patches of kaihikatea-pukatea forest (WF8, a critically endangered ecosystem type, Singers et al 2017) principally along the toe of the escarpment and surrounding the small watercourse. Reservoir 1 has also had the buffer reduced from 10m to 3m which will completely change the forest character of the neighbourhood.

The shaft of the NH2 (a new connection to a planned main trunk water line receiving bulk water from the reservoirs) is inside this area of high ecological value and within riparian margins of the Armstrong Gully.

Effects have therefore not been avoided in this high value ecosystem and have been underestimated.

The submitters are seeking the following relief:

That the application is declined.

Officer comment

The adverse ecological effects of developing the Woodlands Park Road site is summarised in section 4 of this report and could be avoided by selecting an alternative and less ecologically significant site.

6.2 Landscape scale effects, fragmentation, wildlife corridor, downstream effects

Submissions including 5287 – Director-General of Conservation, 5146 Titirangi R&RA, 5133 – The Tree Council, 5032 – Royal Forest & Bird Protection Society, 5055 – Rebecca Breen, 5025 – Te Kawerau a Maki, 5004 – Waituna Action Group, 5253 – Chantal Bayley, 4916 – Jacqueline Brasfield, 4865 – Olafe Klesse, 5230 – Titirangi Protection Group, 4975 – Fiona Holden, 5170 – Dr Anne Gaskett, 5273 – Dr Cyril Hamiaux, 5078 – Gina Mitchell, 5132 – Helen Jansen, 5140 Simon Grant, 5261 – Little Muddy Creeks Estuary Rehabilitation Project, 4781 - Aaron Bessem, 4822 – Melissa Williams and others oppose the application as the loss of 3.5ha of indigenous vegetation from the site weakens and reduces the connectivity with the rest of the Waitakere forest, increases edge and fragmentation effects, reducing the resilience of the forest to all existing and emerging negative stresses and pressures. The applicants state that the most significant ecological impact is the loss of connectivity and fragmentation that will affect the catchments of Little Muddy Creek and Lower Nihotupu which connect in turn to the Manukau Harbour and the rest of the Waitakere Ranges Regional Park. These corridors are an integral part of the Northwest Wildlink connecting the Ranges to the Hauraki Gulf Islands.

The submitters are seeking the following relief:

That the application is declined.

Officer comment

An attempt to quantify the proposed ecological loss is examined in section 5 of this report. The ecological damage and biodiversity loss from this site, and the impact on ecological connectivity across the Waitakere Ranges will be permanent. However, the remaining 11 hectares will still provide connectivity around the Project Site. The proposed compensation package provides for ecological enhancement of the Waima catchment over a 10-year period but currently provides no certainty of on-going maintenance of the enhanced

condition on a permanent basis. Even if the proposed ten years of pest control is effective, unless control measures are continued to maintain low or zero pest levels, particularly predator levels, pest populations will recover.

6.3 Climate change, vegetation loss

Submissions including 5242 – Waima and Woodlands Park R&RA, 5153 - Allergenic, 4885 – Wiriha Community Garden, 4916 – Jacqueline Brasfield, 4865 – Olaf Klesse, 4866 – Michelle Powles, 4890 – Dr Peter Farnworth, 5230 – Titirangi Protection Group, 4765 – Simon Kitson, 4829 – David Blake, 4906 – Hiliary Louise Jackson, 4924 – George Bernard Schofield, 4975 – Brent Courtney, 5029 – Lisa Prager, 5239 – Toni Reid, 5055 – Rebecca Breen, 5078 – Gina Mitchell, 5116 – Louise Neto, 5120 – Jocelyn Maud Service, 5121 – R K T & A Holt, 5132 – Helen Jansen, 5136 - Julian Moore, 5138 – Catherine Wright, 9001 – Belinda Groot, 5287 – Director-General of Conservation, 5069 – Lynne Ridge, 5127 – Puna Consultants, 5146 – Titirangi R&RA, 5064 – Dr Sasha Matthewman, 5093 – Sadie Iris Reid, 5098 – Hazel Poppy Reid, 5028 – Waitakere Ranges Protection Society, 5032 – Royal Forest & Bird Protection Society, 5025 – Te Kawerau a Maki, 5020 – Dr Oleg Medvedev, 5004 – Waituna Action Group, 4868 - Trudy Vlnkenvleugel, 4878 – Anne Taylor, 5206 – Manuka Road Residents Society, 4785 – Max Tongue, 4786 – Anita Kirker, 4787 - Maia Green, 4827 – P Marks & C Percy, 5026 – Theresa Marie Partridge, 5167 – Helen Kerr, 5170 – Dr Anne Gaskett, 5185 – Jeremy Thomas Gray, 5253 – Chantal Bayley, 5273 – Dr Cyril Hamiaux, 4834 - Maree Isobel Hill and Philip Edward North, 4866 – Michelle Powles, 4975 – Brent Courtney, 5081 – Claire Ellery, 5082 – Tom Ma & Winnie Ye, 5110 – Kay Millar, 5140 – Simon Grant, 5141 – Stephen Olding, 5152 – David Little & family, 4767 – Jessica Wilson, 4770 – Matthew Borsos, 4771 - Gonzalo Enrique Deza Santiago, 4777 – Stuart Robertson, 4779 – Mark Atkinson, 4781 – Aaron Bessem, 4782, Scott Allan, 4788 – Marijke Hansford, 4790 – Lisa Rainger, 4791 - Eunice Ann Stott, 4792 – Craig Donaghey, 4793 - Karyn Elizabeth Honey, 4794 – Anna-Maria Stylianou, 4795 – Nathan May, 4796 – Lani Kereopa, 4802 – Shamus Jenner, 4804 – Nasha Sidhu, 4806 – Judy Ann Newton, 4808 – Anna Swann, 4809 – Katy Atkin, 4811 – Jaimee Wood, 4812 – Andy Shudall, 4816 – Linda Gwilliam, 4817 – Kelly Waldegrave, 4819 – Anneliese Keugler, 4820 – Aaron Povey, 4822 – Melissa Williams, 4832 – Katrina Mathers, 4835 – Lily Paige Wood, 4836 – Thomas Clive Wood, 4837 – Ronja V Schipper, 4840 – Joseph Lawrie, 4842 – Susan Beach, 4843 – Shane Wiles, 4846 – Patrick Doherty, 4857 – Andrea Cook, 4869 –

Sarah Welford, 4789 – Huia Hamon, 4836 – Thomas Clive Wood, 4870 - Lucy Tremaine, 9002 – D & J Hutchings and others oppose the application.

The submitters do not want to lose so much native bush from the area which they see as part of the Waitakere Ranges Regional Park, and which they enjoy as part of Clark's Bush walking track. The forest of the Waitakere Ranges is at the heart of the Waima community and the reason they chose to live where they do.

In addition, they ask why remove so many trees in the face of the climate change emergency, as declared by Council in June 2019 and why Watercare hasn't provided an assessment of the climate impacts of their proposal, as required under clause 1.1.8 of the Auckland Council CCO Accountability Policy which requires CCOs such as Watercare to consider the climate impact of their strategies and plans?

The submitters are seeking the following relief:

That the application is declined.

Officer comment

The outstanding residual effects of the loss of up to 3.5ha of functioning native forest ecosystems must be offset or compensated for. The applicant has proposed a compensation package which is addressed in a separate specialist report.

6.4 Loss of native fauna – long-tailed bat, Hochstetter's frog, lizards and invertebrates

Submissions including 4916 – Jacqueline Brasfield, 4865 – Olaffe Klesse, 5146 – Titirangi R&RA, 5032 – Royal Forest & Bird Protection Society, 5020 - Dr Oleg Medvedev, 4885 – Wirihana Community Garden, 5004 – Waituna Action Group, 4866 – Michelle Powles, 4868 - Trudy Vlnkenvleugel, 4785 – Max Tongue, 4786 – Anita Kirker, 4787 – Maia Green, 4829 – David Blake, 4975 – Brent Courtney, 5170 – Philip Gray, 5185 – Jeremy Thomas Gray, 5239 – Toni Reid, 5055 – Rebecca Breen, 5078 – Gina Mitchell, 5110 – Kay Millar, 5121 – R K T & A Holt, 5132 – Helen Jansen, 5138 – Catherine Wright, 4834 – M I Hill & P E North, 5038 – Tina Marie Samuelu, 5230 – Titirangi Protection Society, 4765 – Simon Kitson, 4827 – Penny Marks & Caroline Percy, 4975 – Brent Courtney, 5287 – Director-General of Conservation, 5140 – Simon Grant, 5026 – Theresa Marie Partridge, 4767 – Jessica Wilson, 4790 – Lisa Rainger, 4791 – Eunice Ann Stott, 4793 - Karyn Elizabeth Honey,

4794 - Anna-Maria Stylianou, 4796 – Lani Kereopa, 4806 – Judy Ann Newton, 4809 – Katy Atkin, 4822 – Melissa Williams, 4836 – Thomas Clive Wood, 4835 – Lily Paige Wood and others oppose the application.

The submitters question whether the loss of fauna is under-estimated given that native lizards are hard to find. The bat surveys were inconclusive with unconfirmed recordings, and an acknowledgement that many suitable roosting sites were found. Removal of suitable bat habitat would limit future expansion in numbers of bats. The magnitude of invertebrate loss, including new and rare species as yet not described has been raised as a concern.

The submitters raise the issue that the proposed development is inconsistent with the 2014 Muddy Creek’s Local Area Plan, and flies in the face of environmental awareness and guardianship instilled in the local children at Woodlands Park School.

Another matter raised is the principles in the Auckland Council’s Biodiversity Strategy (2012) that set out the underlying values and approaches to guide how the Council (and CCOs) will be seen as a leader in effective biodiversity management on its own land and in guiding others. Submitters question how this proposal sits with the direction of the Council’s Biodiversity Strategy.

The submitters are seeking the following relief:

That the application is declined.

Officer comment

With forest clearance, it is inevitable that there is huge loss of fauna. Even if lizard rescue, bat surveys and avoidance of peak bird breeding season is undertaken, huge loss would be likely to occur in my view. In addition, birds moving away from the Project Site will encounter resident birds defending their feeding territories. Similarly, relocated lizards will have to fight for a new space to occupy. So, an ecologically sound outcome is likely to be more complex than simply moving fauna species to a new location.

Watercare advise that they are undertaking further surveys for bats, lizards; including the nocturnal use of tree warps to detect geckos, and Hochstetter’s frog. Watercare also advise that further confirmation of site locations for invertebrate species of interest documented post-lodgement of the resource consent application will be confirmed.

However, even with knowing the scale of potential loss, it would be practically impossible to rescue and relocate even a small percentage of the fauna expected to be affected by the works. This potential loss is even more significant when considering the risk status of the species affected such as long-tailed bat, Hochstetter's frog, two of the three skink species and three gecko species

6.5 Loss of kauri

Submissions including 5132 – Helen Jansen, 5138 – Catherine Wright, 9001 – Belinda Groot, and 5140 – Simon Grant, 9002 – D & J Hutchings oppose the application.

The submitters state that kauri dieback is a huge concern in the Waitakere Ranges, and to Auckland Council. Residents have received letters from Council threatening \$20,000 fines for breaching closed tracks in Kauri Protection Zones for fear that dirt transported on shoes could transmit the disease. Watercare are proposing to move 100,000 cubic metres of dirt in and around these zones. The loss of trees will result in erosion, and dirt being washed downhill towards the healthy and genetically diverse kauri forests below the development area; forests which include three of the oldest Kauri in the Auckland region (the oldest of those is less than a hundred metres downhill of the development site). Are there any measures which could be adequate to protect those trees from potentially infected runoff they ask?

Another concern raised by the submitters is that only those kauri with a trunk diameter greater than 20cm were counted during site surveys, leaving smaller regenerating kauri unaccounted for and arbitrarily deflating the reported numbers of potentially affected trees as a result. One submitter has provided evidence that kauri of up to 20 cm diameter is upwards of 80 years old and so established enough to be reasonably confident about their long-term survival. The number of kauri less than 20 cm DBH affected by the proposal is unknown and yet these are the trees which assure the future survival of kauri as a species.

Furthermore, the submitters suggest the ecological report is inadequate as it does not refer to the sensitive root systems of kauri trees or how the additional stress on these trees as a result of site construction could make them more vulnerable to kauri dieback disease. Kauri dieback was not considered at all in the site selection process.

There are no kauri dieback protocols in existence for work on this scale. The submitters don't even know if the shoe washing efforts currently in place are sufficient so how can

anyone ensure that the thousands of truck movements through Titirangi won't spread the disease further?

The submitters are seeking the following relief:

That the application is declined.

Officer comment

The risk of spreading kauri dieback disease is being addressed in a separate specialist report. However, the issue of disturbance of root zones rendering kauri vulnerable to pathogens is a valid point. It is relevant to the kauri knoll which will remain; although earthworks are reasonably close and will change the immediate environmental conditions for the trees. It appears that there are a number of reasonably large kauri that are in close proximity to the works footprints in the Project Site and will have earthworks within their '30m radius' if not within their actual root zones. Stringent tree protection methodologies will be required to ensure their survival.

The matter of the many kauri on the site less than 20cm DBH not being considered is acknowledged. However, the s92 response from Boffa Miskell states that "no kauri trees are to be removed" and "no regenerating kauri were observed within the proposed WTP or reservoir footprints (occasional small seedlings may be present but not observed)." Further, Boffa Miskell "does not expect that kauri forest is the future successional trajectory of these stands (of secondary kanuka forest) in the absence of fire or some other significant relatively large-scale forest disturbance."

The Project Site is surrounded by kauri-podocarp-broadleaf forest which is the predominant ecosystem type in the Waima catchment so it would be surprising if the regenerating patches of kanuka did not become mature kauri-podocarp broadleaf forest over time. Particularly as there is a stand of mature kauri close to the location of Reservoir 1 and so there will be kauri seed in the seed bank in the Project Site.

6.6 Riparian margins

Submissions including 5287 – Director-General of Conservation, 5004 – Waituna Action Group and 5230 – Titirangi Protection Group oppose the application.

The Waituna Action Group, supported by the Titirangi Protection Group, submits that the Yorke and Armstrong Gullies provide high quality freshwater habitats. The catchment streams in general have significant importance that the Waituna Action Group has been working to enhance; resulting in high quality habitats. They provide significant habitat for endangered species such as Hochstetter's frog, redfin bully, longfin eel and inanga. These species are sensitive to damage of riparian disruption to streams, banks and margins, sedimentation and run-off which the proposal will generate.

The Director-General of Conservation submits that insufficient information is provided about proposed works within the riparian margins of the permanent section of the Armstrong Stream. The lack of detail regarding how far the works will extend into the riparian margins is concerning. With the current information gaps, it is not possible to fully understand the potential ecological effects of works within the riparian margin of the Armstrong Stream. The applicant's section 92 further information on this issue is considered inadequate, and in the absence of an appropriate assessment of effects it is not possible to quantify potential effects on freshwater values. It is not appropriate to leave this issue to management plans that are prepared by the applicant following the grant of resource consents,

The submitters are seeking the following relief:

That the application is declined.

Officer comment.

As it has not been possible to quantify potential effects on freshwater habitat values for native freshwater fish, riparian restoration plans were again requested to include bank profiles, weed removal, revegetation plans, planting schedules and a 5-year maintenance period for riparian margins of streams that are affected by the proposed works. Watercare have confirmed that "a full Ecological Management Plan and a Stream Valuation Plan (including riparian management plan) will be submitted to Council prior to the hearing."

6.7 Submissions in support of the application

Although it appears that there are 8 neutral submissions and 20 submissions in support of the application with only one stating support for the vegetation removal (5008), nine of these

(4794, 4932, 5311, 4893, 4999, 5014, 5034, 5258 and 5259) appear to oppose the loss of bush from the site and are in support of the submission from the Titirangi Protection Group.

7. Conclusion and Recommendation

There are some adverse ecological effects that can be remedied, mitigated or offset on site with implementing the ecological conditions recommended in section 8 of this technical memo. However, there are also outstanding and significant residual effects that cannot be adequately mitigated. The proposal directly conflicts with the provisions and expected outcomes for the SEA overlay. However, there is also the long-standing Designation underlying the SEA overlay that has recently been tested through the Environment Court and High Court with the decision that the Designation provides for the water treatment upgrade. Because of this unique circumstance of the underlying Designation and provided that the compensation package can offer adequate and permanent ecological restoration and enhancement for the Waima Catchment, the proposal is considered to be acceptable.

8. Conditions

- 8.1 Regardless of whether measures to offset or compensate for the outstanding residual ecological effects are adequate or not, conditions of consent to mitigate effects on-site include the following:
- X.1 The Consent Holder shall prepare an Ecological Management Plan (EMP) for the Project Site to identify how the Project will avoid, remedy and mitigate potential adverse effects on the ecological values and biodiversity of the area within the Project Site; as well as a methodology for pre- and post-works monitoring. The EMP shall address how the Project will avoid, remedy and mitigate actual and potential adverse effects on ecological values including:
- Vegetation and habitats
 - Individual large trees close to the works footprints
 - Herpetofauna (skinks, geckos and native frogs)
 - Native bats

- Avifauna, and
- Streams

X.2 The EMP shall provide details on site-specific ecological management and mitigation measures that will be implemented on the Project Site which shall include:

- a) Vegetation protection and clearance protocols, including surveying and demarcation of the works area by protective or super-silt fencing, and other protocols for minimising accidental encroachment and damage to individual trees and vegetation outside of the works footprint. This shall include input from a suitably qualified and experienced arborist and including on-site monitoring where required as identified in the EMP.

- b) Management measures and protocols to avoid, remedy or mitigate the impacts of development (vegetation clearance, earthworks and construction) on fauna within the Project Site, including:
 - ❖ An Herpetofauna Management Plan (HMP) shall be prepared by a suitably qualified herpetologist holding the appropriate DoC permit to handle herpetofauna detailing a lizard and Hochstetter's frog survey, capture, salvage and relocation programme. The HMP is to be implemented within the delineated earthworks footprint by a herpetologist immediately prior to and during any vegetation clearance. Lizard salvage must be carried out between October and April as site clearance proceeds to coincide with peak lizard activity. A DoC-permitted herpetologist shall also check for presence and include management actions for Hochstetter's frog which occurs within the Waitakere Ranges.

A DoC authorised herpetologist will need to be present during vegetation clearance in high quality habitat areas within the works footprint to direct clearance and the relocation of woody debris and to capture and relocate lizards if required. Lizards will be captured by hand and held in individual cloth bags in a secure but aerated container and will be released within 4 hours at a pre-determined release site.

Methods will include (in order of preference):

- i. Visual inspection and destructive searching of potential habitat features (including trees and ground cover habitats).
- ii. Supervised felling where high-quality lizard habitat cannot be adequately searched (e.g. tall, dense tree species), felling should be supervised to allow a herpetologist to search through fallen trees for resident lizards.
- iii. Passive dispersal – placing the felled vegetation outside of the works footprint to allow lizards to disperse. This method is not preferred as a standalone lizard management tool but may be suitable in some instances such as lower-quality potential habitat or following hand-searching if trees must be felled out of season.

Native forest remnants within the Project Site that will remain undisturbed by site development works are the preferred location for translocated fauna. Intensive pest control and habitat enhancement is required in and around release sites prior to translocation of any target fauna.

- ❖ A pre-clearance bat survey shall be undertaken by a suitably qualified and experienced field ecologist holding a permit from the Department of Conservation (DoC) certifying the holder as competent for bat research and management skills. Bat surveying to occur during months where the night temperatures will not fall below 10⁰ C (November-March) for ten consecutive nights immediately prior to any felling of trees in suitable bat roosting areas. Pre-clearance bat monitoring will ensure possible roost trees are not occupied at the time of clearance, avoiding injury or mortality of bats. If bats are confirmed to be occupying a tree scheduled for removal, a buffer will be placed around the active roost within which no works can be undertaken until the roost is vacated. If active roosts are identified immediately adjacent to the development footprint, a 50m buffer will be retained for the duration of roosting to preserve microclimate conditions and protect the tree/s from windthrow.

- ❖ Vegetation clearance within the works footprints is to take place outside the native bird breeding season (August-February inclusive). Otherwise, pre-felling checks are required to check for nests of native birds if vegetation clearance is to be undertaken during the breeding season. An appropriately qualified and experienced field ornithologist will undertake all avifauna work including the sighting and deployment of acoustic recorders, analysis of sound files and nest surveys. The nest survey protocol is as follows:
 - i. Any vegetation scheduled for removal shall be surveyed for nests within 24 hours prior to clearance
 - ii. If an active nest is identified during the visual inspection, all vegetation removal within 20m of the nest is to cease until the Project Ornithologist has confirmed that the nest has failed, or the chicks have fledged. This area shall be clearly demarcated to ensure the vegetation is not accidentally felled.
 - iii. Once an area of vegetation has been confirmed clear of active nests, vegetation clearance shall be initiated as soon as possible to prevent birds establishing further nests.

- c) A Revegetation Plan to be prepared using plant material eco sourced from the Waitakere Ecological District for all parts of the Project Site that are outside the project development area. This shall include riparian planting and mitigation, restoration or offset planting such as:
 - Exposed bush edges, old tracks and open areas shall be revegetated with fast-growing forest edge species to buffer the forest interior, inhibit weed encroachment and accelerate natural regeneration;

 - Edge habitats shall be planted with low-growing lizard-friendly species such as pohuehue and shrubby *Coprosma* species to enhance these areas as habitat for lizards;

- Riparian buffer zones adjacent to watercourses within the Project Site shall be planted with species to buffer and enhance the watercourse and adjacent forest areas.

d) Weed and animal pest management to be undertaken through those parts of the Project Site that are outside the project development area.

X.3 The Consent Holder shall submit the EMP to Council at least twenty (20) working days prior to the commencement of works (excluding site investigations, demolition and removal of buildings and structures, and establishment of site entrances and fencing provided that no vegetation clearance is required) for approval that the EMP complies with the requirements of conditions X.1 and X.2 above. The EMP shall be prepared by a suitably qualified person with reference to relevant specialists as required.

Signature:



Memo – Kauri Dieback Disease

To:	Richard Blakey, Consultant Planner
From:	Dr Murray Fea, Senior Biosecurity Advisor – Plant Pathogens
Date:	29/11/2019
Applicant's name:	Watercare Services Ltd
Application Number:	BUN60339273
Application Type:	Water Treatment Plant Replacement
Site Address:	Woodlands Park Road

1. Summary

1.1 Application

Watercare Services Limited has applied to Auckland Council for regional resource consents and a land use consent under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES Soil) for enabling earthworks, vegetation removal and associated activities related to the Huia Replacement Water Treatment Plant (WTP) project.

The application relates to three sites owned by Watercare as follows: the Replacement WTP site on the corner of Manuka Road and Woodlands Park Road; a new reservoir located on the northern side of Woodlands Park Road (Reservoir 1); and the existing Huia WTP site (where a second 25 ML reservoir is to be located once the existing Huia WTP has been decommissioned).

The application also includes enabling earthworks to provide for the North Harbour 2 watermain valve chamber and tunnelling reception shaft within the Reservoir 1 site. The proposal involves earthworks and vegetation removal, including in a Significant Ecological Area (SEA) overlay, and stream works including the reclamation and diversion of intermittent stream. Resource consents are also sought for the diversion and discharge of groundwater and stormwater, and the disturbance of potentially contaminated land. The application will be assessed overall as a non-complying activity. The land on which the WTP and reservoirs are located is designated under the Auckland Unitary Plan for 'Water supply purposes – water treatment plants and associated structures' (designation reference 9324 – Huia and Nihotupu Water Treatment Plants). Works undertaken in accordance with this designation do not require a land use consent (other than in respect of the NES Soil).

1.2 Kauri Dieback Disease

Kauri dieback is an incurable fatal disease of New Zealand kauri (*Agathis australis*). The causal agent is *Phytophthora agathidicida*, a microscopic soil oomycete that can spread through movement of contaminated soil or water. It is now found in geographically discrete pockets of the region on both public and private land. The Waitākere Ranges to the west of the region is thought to be the most heavily infected area of forest not only in the Auckland region but throughout the natural distribution of kauri in New Zealand.

Various steps have been taken by both Auckland Council and the Ministry for Primary Industries to prevent the spread of kauri dieback both within the Waitakere Ranges and beyond. Auckland Council has obligations under both the Resource Management Act 1991 and the Biosecurity Act 1993 to prevent the spread of kauri dieback disease.

In accordance with the national kauri dieback joint agency programme, Auckland Council considers any kauri tree within the region to be potentially infected and, as such, works around kauri are to be avoided and all activities within a “Kauri contamination zone” (KCZ = an area with radius equal to three times the canopy dripline of any kauri, the estimated reach of kauri roots) have to be carried out in accordance with suitable hygiene protocols.

1.3 The relevant application documents reviewed in preparation of this report include:

- Huia Water Treatment Plant Replacement. Assessment of Ecological Effects. Boffa Miskell, 21 May 2019.
- Huia Replacement Water Treatment Plant (WTP) Project, Final AEE, Tonkin & Taylor Limited, July 2019
- Consenting Phase Site Layout Development Report, GHD, May 2019
- Reservoir Site Layout Development Report, Beca Limited, 22 May 2019
- Indicative Construction Methodology, Alta, 23 May 2019
- Proposed Conditions, May 2019
- Stormwater and Erosion and Sediment Control Report, Cook and Costello, May 2019
- Huia Replacement WTP - BUN60339273, Response to second Section 92 Request for Further Information, Tonkin and Taylor, November 2019.

1.4 This review of the application is restricted to the adverse effects of kauri dieback disease that may be caused on the site, the risk of vectoring kauri dieback disease, and the adequacy of proposed measures to avoid, remedy, or mitigate those effects.

2. Site Description

The project site is at the junction of Woodlands Park Road and Manuka Road on land owned by Watercare Services Ltd, and is designated in the Auckland Unitary Plan, operative in part (AUP:OP) for ‘Water supply purposes – water treatment plants and associated structures.’

Both the WTP and Reservoir 1 sites are almost completely vegetated in native bush and the existing WTP site is approximately half-vegetated in native forest with the remainder developed as part of the existing Huia WTP. The sites are identified as part of an extensive

Significant Ecological Area (SEA_T_5539) that extends across the vegetated area of the Waitakere Ranges. The area meets all five criteria for qualifying as an SEA (representativeness; threat status and rarity; diversity; stepping stones, migration pathways and buffers; uniqueness or distinctiveness). The site is also within the Waitakere Ranges Heritage Area, protected by the Waitakere Ranges Heritage Area Act 2008. Although modified by resource exploitation and human settlement, the Waitakere Ranges ecosystem is nationally significant as one of the largest areas of coastal and lowland forest with intact sequences remaining in the Auckland region. There is a scheduled mature kauri (AUP Schedule 10 ID: 1836) at the western corner of the WTP site, with proposed construction footprint partially within its rootzone (three times the canopy dripline). The project site and adjoining properties contain kauri (*Agathis australis*) of various age classes including ancient individuals. Council records include instances of disease symptoms on some of these trees (including within the project site), and the causal organism *Phytophthora agathidicida* has been identified by laboratory diagnosis on adjacent properties upslope of the project.

The site is surrounded by kauri, including mature individuals immediately adjacent to the project site boundary with works proposed within their rootzones. Immediately downslope of the project site are several significant kauri considered to be the oldest remaining in the region according to the New Zealand Tree Register (AR/1441, 1443 and 1444).

Regional parkland adjacent to the southern boundary of the project site has been closed by Auckland Council, to protect trees from kauri dieback disease and prevent its spread. A significant kauri in that closed park has works proposed by the application within its rootzone, and the other kauri downslope of the site are also put at risk by the proposed work by way of run-off and contamination of groundwater. The proposed activities therefore directly contradict the purpose of the park closure.

The site is located in the Waitākere Ranges, in which Council has closed regional parkland and walking tracks due to the prevalence of kauri dieback disease and the associated risks of the disease being spread by park visitors. Mana whenua Te Kawerau a Maki have put in place a rāhui over the Waitākere Ranges Heritage Area due to the threat of kauri dieback disease. In addition, The Ministry for Primary Industries has put controlled area notices in place to enforce biosecurity requirements on the walking tracks that remain open. In these ways, people are asked and required to diligently avoid all risk of spreading kauri dieback disease within or from the Waitākere Ranges. The proposed activities directly counteract these initiatives.

In addition to the project site, kauri dieback disease is present at the Parau Landfill site, which the applicant has suggested may be an option for disposal of cut material.

3. Planning context

Auckland Council's Unitary Plan (operative in part) either infers or is specific on the Council's responsibilities for kauri dieback through maintaining and protecting regional biosecurity.

In particular, Chapter B4 aims to protect outstanding natural features and landscapes, notable trees, and in the Waitakere Ranges Protection Area, policy B4.4.2.2 aims to prevent

activities from releasing pest species likely to harm native plants and animals and their habitats.

Chapter D9 contains objectives and policies for ensuring that adverse effects on SEAs are managed. Adverse effects are considered to include the things set out in D9.3.2 including changes which result in increased threats from pests on indigenous biodiversity and ecosystems.

E12.7.1.1(i) and E12.8.1.1.(k) allow assessment of the potential effects on significant ecological and indigenous biodiversity values. Controlling effects on indigenous biodiversity values in this site requires control of kauri dieback vector and exacerbation risks.

Chapters E11 (Land Disturbance – Regional), E26 (Infrastructure) and E15 (Vegetation Management and Biodiversity) provide explicit rules in relation to managing the spread of kauri dieback, with a suite of standard resource consent conditions being developed which relate to activities within a distance equal to three times the dripline radius of kauri. Chapter E15 contains objectives and policies which maintain indigenous biodiversity, in particular policy E15.3.(5) enables activities which enhance the ecological integrity and functioning of areas of vegetation, including for biosecurity, safety and pest management and to control kauri dieback, and policy E15.3.(8) recognises and provides for the management and control of kauri dieback as a means of maintaining indigenous biodiversity.

In addition to these explicit objectives and policies, the Council's more general responsibilities to maintain and protect the region's biodiversity offer the potential for additional conditions to be imposed, where appropriate, on applicants' activities which could result in adverse impact on biodiversity via the potential spread of kauri dieback disease.

4. Review of Assessment of Effects

The application recognises that kauri dieback is a significant threat to the future of the Waitakere Ranges Heritage Area's forest ecosystems, but is deficient in regards to the assessment of kauri dieback biosecurity risk posed by the works. Section 7 of the application identifies and assesses effects on the environment, including brief mention of the risk of spread of kauri dieback disease (7.5.4.), noting that "*mature kauri trees are present in the immediate vicinity of the proposed replacement WTP footprint and reservoirs (occasional kauri seedlings and saplings were also encountered within the WTP footprint). The likelihood that kauri dieback disease is present is relatively high.*" This is an accurate assessment, as kauri dieback disease is known within the vicinity of the site, including directly upslope of it.

However, the application has not identified potential risks relating to kauri dieback, for example the risk of introducing *P. agathidicida* to the site, spreading it within or away from the site, stressing and damaging kauri in the site and thereby making them susceptible to pathogens already present, creating a corridor of susceptible hosts between the infected trees upslope of the site and the high-value kauri downslope, exposing soil containing propagules to erosion and thereby releasing it from the site into the surrounding kauri stands and catchment containing ancient kauri, or any other disease risks.

The application states that there are no mature kauri in the project footprint, meaning that they will not need to be felled. However, the application fails to mention kauri with works

proposed within their rootzones, which will damage the subsoil parts of the trees, impair their root function, and / or make them susceptible to kauri dieback disease. Edge-effects induced by clearing the other vegetation around the kauri may also have a similar impact. Of particular concern is the mature kauri tree standing close to the boundary at the north-western corner of Clark’s Bush, which has construction footprint and associated fill incursion to the northern section of its rootzone. Kauri rely on a delicate network of surface feeder roots and an associated duff layer. Damaging the surface roots via compaction of hardfill on top of them exposes them to infection risk, and destroys the specific structure of the feeder root network, which will potentially kill the tree or weaken it to the point where disease will kill it subsequently. As the loss of this tree and others in a similar situation elsewhere in the site have not been considered in the assessment of effects (because they won’t be felled directly), commensurate remedy or mitigation measures have not been proposed. The trees on the kauri knoll north of Woodlands Park Road are similarly threatened, in particular by the proposed site accessway passing through the rootzones at the western end of the knoll. The construction of the accessway and subsequent high-volume use by heavy vehicles, plant and machinery associated with the works will severely compromise the health of those trees and expose them to risk of infection by propagules carried on those vehicles. The accessway will also presumably feature vehicle and personnel wash-down facilities, which pose kauri dieback vector risks associated with run-off.

The assessment of ecological effects prepared by Boffa Miskell points out that the site “...is part of a wider area of adjoining kauri forest and regional parkland.” (p.4). and “...forms part of a network of forested areas within the wider Waitakere foothills that together make an important contribution to the provision of lowland kauri-podocarp forest in the landscape.” (p. 59). The assessment classifies the kauri and kauri-podocarp forest areas as having the highest and second-highest ecological integrity ranks (rank 1 and 2), and recognises that these are threatened ecosystems. The assessment maps large kauri and intact kauri forest within the site, and cautions that individual kauri saplings and seedlings are also sparsely scattered throughout the site. However, without a detailed arborist’s report it is not possible to evaluate the exact extent of kauri and rootzones that will be impacted by the works.

The assessment identifies the potential for edge-effects to impact upon the kauri-podocarp forest adjacent to the south-western corner of the WTP boundary as being of particular concern, stating that these effects can undermine the health and stability of mature forest trees. Impaired health of kauri is a known risk factor for infection by *P. agathidicida* and other *Phytophthora* and onset of the disease they cause. The assessment is therefore correct that edge effects impacting upon this stand of kauri is a particular concern, not only because of the direct edge effects, but also because of the resulting increased susceptibility to kauri dieback disease.

The assessment also notes that “Likely symptoms of kauri dieback were observed on a single large kauri tree within the mature kauri forest stand in the north-western quarter of the Project Site” (p.29) and points out that human disturbance is generally regarded as a key vector of the disease. This highlights the risk of vectoring kauri dieback disease within, among, and away from the sites.

In addition, it correctly acknowledges that the movement of plant, machinery, equipment and people between sites during construction work is a key pathway for the spread of kauri dieback disease. This highlights the risk that the proposed work poses of spreading the disease from the known symptomatic trees to / among the other stands on the site and the neighbouring properties that contain kauri with rootzones extending into the site. This matter

also applies to the wider area due to the large number of vehicle, equipment and personnel movements that will be required from the site over the course of the proposed work period. Due to the scale of the project and the volume of spoil that is likely to be transported out of the site, the risk of moving kauri dieback propagules through (for example) sediment tracking, is very high.

Due to the above, there is great potential for spread or exacerbation of kauri dieback disease in the site(s) to impact on the individual kauri and kauri ecosystem both on the site and in the wider area. Because of the ecological value of the kauri forest in the catchment, and the presence of ancient individuals providing keystone and connective ecological functions within it, the impact of kauri dieback disease developing in or spreading into the area would be very high.

The application has not considered risks posed by the potential use of Parau sludge disposal site as a landfill for cut material. The eastern end of the currently active area of that site is bounded by a stand of diseased kauri in an advanced state of dieback and death. Some of the trees in that stand have rootzones extending into the disposal field. Any vehicle or equipment movements between that location and the project site would therefore pose an extreme risk of carrying *P. agathidicida*, both in regard to threatening the kauri in and around the project site and those *en route* due to sediment tracking.

5. Discussion

I agree with the applicant's statement that the likelihood that kauri dieback disease is present is relatively high, and Boffa Miskell's acknowledgement that the movement of machinery, equipment and people between sites during construction work is a key pathway for the spread of kauri dieback disease.

Due to the entire site being an area of likely kauri dieback presence, and having kauri throughout and adjacent to the site, it is not possible for the proposed activity to avoid this risk on this site. Because there is no cure for kauri dieback disease, and no practical way of removing *P. agathidicida* from a site once introduced, it is also not possible to remedy any spread that is caused or disease that is induced. Furthermore, due to the time taken for kauri to reach a mature phase, the loss of ancient individuals in and adjacent to the site will not be reversible within a meaningful timeframe.

Kauri dieback hygiene protocols have been proposed to reduce the risk, however these are deficient in several ways, most critically:

- The protocols state that kauri with DBH <20 cm will not be considered for establishing KCZs. This does not correspond with the contamination risk, which is equal for kauri of all ages and size classes.
- The protocols state that drainage and storm water run-off will be diverted away from kauri trees, however the erosion and sediment control plans prepared by Cook and Costello appear to contradict this.

- It is not clear how the applicant proposes to manage the significant volumes of practically contaminated wastewater that will be generated by cleaning all vehicles and equipment at each entry and exit of any of the sites, as stipulated in the kauri dieback hygiene protocols.

Therefore the application is not able to avoid or remedy kauri dieback risks on the site, and as it stands the proposed mitigation is inadequate. This leaves residual effects to be covered by offsetting, however the compensation proposed will not provide the supposed benefits it claims in regard to kauri and kauri dieback impact.

In the case that the applicant plans to dispose of cut material at the Parau sludge disposal site, kauri dieback risks associated with using that site will also need to be managed.

Adequacy of S92 Response to Request for Further Information

In relation to kauri dieback disease, Auckland Council requested from the applicant 1) a comprehensive draft hygiene management plan, and 2) a proposed method to mitigate *P. agathidicida* being transported via site run-off and discharge from erosion and sediment control devices.

The applicant's response stated that a draft kauri dieback management plan will be prepared and submitted to Council for review prior to the hearing. At time of writing (29/11/2019) this has yet to be received. Assessment of the ability of the applicant to manage kauri dieback disease risks in the site is therefore not possible.

In regard to erosion and sediment controls, the applicant has stated that prevention of sediment discharges will also prevent movement of *P. agathidicida*. However there is no evidence that this is the case, and no reason to expect that *P. agathidicida* propagules (which can be as small as 2.5 microns in diameter) would be filtered by standard sediment control devices such as decanting settlement ponds and silt fences. This also fails to acknowledge that the erosion and sediment control devices are expected to operate at efficiencies that will still result in 165 tonnes total sediment loss during the bulk earthworks stage. While there are established acceptable margins of sediment loading expected to have minor impact on receiving aquatic environments, the same is not true for the kauri in the receiving catchment, which could be killed outright by the introduction of even a minute number of *P. agathidicida* propagules.

6. Consideration of Submissions on Kauri Dieback Disease

The matters relating to kauri dieback disease raised in submissions are considered below.

Submissions including 4764 (Simon Kitson), 4769 (Michael Clark), 4781 (Aaron Bessum), 4829 (David Blake), 4890 (Dr Peter Farnworth), 4895 (Michelle Clayton), 4954 (Julie Knight), 5020 (Dr Oleg Medvedev), 5230 (Titirangi Protection Group), 5232 (Prof. John Morgan), 4865 (Olaf Klesse), 4878 (Anne Taylor), 4975 (Brett Courtney), 5055 (Rebecca Breen), 5056 (Michael Breen), 5078 (Gina Mitchell), 5120 (Jocelyn Maud Service), 5138 (Catherine Wright), 5172 (Justine Cormack), 5222 (Kate Brookson-Morris), 5239 (Tony Reid) oppose the application and point out the inconsistency with Auckland Council closing parts of the Waitakere Ranges and/or this site in particular due to the risk of kauri dieback disease spread.

Many of them (4781, 4829, 4890, 4865, 4878, 5056, 5120, 5172, 5222, 5253 among others) consider this a travesty considering the impact that park closures have had on their and their community's lives, with the basis of the closures being that even a speck of soil on a shoe poses an unacceptable vector risk.

Officer comment: These submissions highlight the certainty of credibility damage to Auckland Council's (and community, volunteer, national programme and our treaty partner's) significant efforts and investment to date in engagement, compliance and behaviour change in the Waitakere Ranges in order to minimise kauri dieback spread. The task of convincing and enabling park users to adhere to hygiene practices has been arduous and costly, in part due to the challenge of convincing users that their efforts will make a difference in the presence of other likely vectors, such as mammalian pests, vehicle movements and commercial or industrial activities. Many local community groups have ceased, modified or relocated their activities at considerable cost in order to honour and comply with Auckland Council's advice, the requirements of the controlled area notices imposed by MPI and the rahui placed by Te Kawerau a Maki. The same applies to local residents who are currently enduring denied access to the forest. Allowing large-scale earthmoving and construction activities in this area will fly in the face of these efforts and sacrifices, damage the trust on which positive steps have relied, and reverse much of the progress that has been made to date. This compromises the biosecurity measures for kauri dieback that have been put in place throughout the Waitakere Ranges.

Submissions including 4781 (Aaron Bessum), 4785 (Max Tongue), 4954 (Julie Knight), 5020 (Dr Oleg Medvedev), 5032 (Royal Forest and Bird Protection Society of New Zealand Inc.), 5133 (The Tree Council), 5146 (Titirangi Residents and Ratepayers Association), 4827 (Penny Marks & Caroline Percy), 4834 (Maree Isobel Hill & Phillip Edward North), 4975 (Brett Courtney), 5038 (Tina Maree Samuelu), 5078 (Gina Mitchell), 5239 (Tony Reid), 5253 (Chantal Bayley), 9006 (Wendy Gray), 9005 (Tom Ang), 5305 (Save our Kauri Trust) and (5287 (Dept. of Conservation) oppose the application and point out that kauri are a threatened species.

Officer comment: These submissions highlight the risk faced by kauri and the fact that further endangering them runs counter to the objectives and policies of the AUP relating to threatened species. Submissions including 5230, 5138, 9006, 9005, 5305 and 4975 also highlight the risks posed to kauri due to works on/next to their sensitive root structures, meaning that many will likely be killed despite not being felled directly.

Submissions including 4781 (Aaron Bessum), 4785 (Max Tongue), 4890 (Dr Peter Farnworth), 4954 (Julie Knight), 5020 (Dr Oleg Medvedev), 5032 (Royal Forest and Bird Protection Society of New Zealand Inc.), 5064 (Dr Sasha Matthewman), 5133 (The Tree Council), 5146 (Titirangi Residents and Ratepayers Association), 5206 (Manuka Road Residents Society), 5230 (Titirangi Protection Group), 5232 (Prof. John Morgan), 5242 (Waima and Woodlands Park Residents & Ratepayers Association), 4764 (Simon Kitson), 4827 (Penny Marks & Caroline Percy), 4834 (Maree Isobel Hill & Phillip Edward North), 4865 (Olaf Klesse), 4866 (Michael Powles), 4878 (Anne Taylor), 4975 (Brett Courtney), 5078 (Gina Mitchell), 5120 (Jocelyn Maud Service), 5170 (Prof. Anne Gaskett), 5172 (Justine Cormack), 5253 (Chantal Bayley), 5305 (Save our Kauri Trust) and 5287 (Dept. of

Conservation) oppose the application on the grounds that kauri dieback disease vectoring via run-off, sediment discharge and spoil transport (among others) will not be avoidable and threatens the kauri in the site and/or downslope of the site and/or wherever spoil ultimately ends up. Many also point out that the standard kauri dieback hygiene protocols are not adequate for works of this scale and that some of the applicant's proposed mitigation measures are not feasible.

Officer comment: The submitters are correct to point out that avoidance of effects relating to kauri dieback disease will be practically impossible using currently available best practice. This is because the avoidance of soil movement is the only surefire way to avoid risk of vectoring the microscopic, soil-dwelling pathogen, but earthmoving and soil disturbance are fundamental to the proposed activities. Standard mechanisms for preventing sediment movement such as ESC devices do not suffice to prevent the spread of *Phytophthora*.

Submissions including 4890 (Dr Peter Farnworth), 5020 (Dr Oleg Medvedev), 5032 (Royal Forest and Bird Protection Society of New Zealand Inc.), 5146 (Titirangi Residents and Ratepayers Association), 5230 (Titirangi Protection Group), 5242 (Waima and Woodlands Park Residents & Ratepayers Association), 4764 (Simon Kitson), 4834 (Maree Isobel Hill & Phillip Edward North), 4866 (Michael Powles), 4975 (Brett Courtney), 5055 (Rebecca Breen), 5172 (Justine Cormack), 5239 (Tony Reid), 5305 (Save our Kauri Trust), and 5253 (Chantal Bayley) oppose the application and point out that Auckland's oldest and largest remaining kauri, which are recorded as scheduled trees, are within the vicinity of the site and in some cases directly in the flowpath of run-off.

Officer comment: These submissions highlight the (increasingly rare) keystone ecological function that is at stake, not to mention the social, cultural and heritage values represented by these trees. Due to the lifespan of kauri, the keystone ecological services provided by these individuals are not replaceable in a meaningful timescale. Endangering them runs counter to the objectives and policies of the AUP relating to indigenous biodiversity and notable trees.

Submissions including 5133 (The Tree Council), 5146 (Titirangi Residents and Ratepayers Association), 5120 (Jocelyn Maud Service), 5172 (Justine Cormack) oppose the application and point out that the compensation package intended to offset impacts due to kauri dieback disease is ill-informed and inadequate because it either doubles-up on existing services provided for free by Auckland Council, or won't provide any benefits in relation to kauri dieback disease or kauri conservation.

Officer comment: These submissions are correct in their assessment of the proposed compensation package. There are no currently proven methods to "make improvements to the health and resilience of remnant kauri forest" in regard to kauri dieback disease. The proposed key actions of the WBMP are not likely to deliver benefit for kauri or protect them from kauri dieback disease.

Submissions including 4988 (Auckland Conservation Board) are neutral in regard to the submission but point out that kauri dieback disease is a key biodiversity threat in the region

and request to be consulted on kauri dieback vector risks and measures taken to mitigate those risks.

7. Recommendation

Adverse effects relating to kauri dieback disease risk are not able to be avoided or remedied on this site for the reasons outlined above. Mitigation of the risk will also be extremely difficult due to the pervasive, cryptic nature of the disease, the nature of the works, the location of the site and the proximity of high-value kauri stands and individuals. Available best practices based on current knowledge are not adequate to mitigate the risks posed by activity of this scale in an area that is highly likely to be contaminated with *P. agathidicida* and is situated immediately upslope of kauri forest including the oldest and largest remaining kauri in the region.

It is therefore my recommendation that the application be declined.

8. Conditions

In the eventuality that the consents are granted, I recommend that they be subject to the following conditions:

X.1 The consent holder shall ensure that the footprint of the replacement WTP and reservoirs is optimised through detailed design utilising expert arboricultural advice to ensure that, as far as practicable, the works provided for under this consent:

- a) Further reduce the extent of vegetation removal in the Significant Ecological Area (SEA);
- and
- b) Further reduce effects on individual trees of greatest significance that are located within the works footprint identified in the drawings referenced in Condition X;
- and
- c) Further reduce effects on kauri trees that have rootzones within or extending into the works footprint identified in the drawings referenced in Condition X.

X.2 Prior to commencement of works, the consent holder shall submit an updated optimised site layout report and associated plan(s) for certification confirming the works footprint and setting out the measures to further minimise impacts on vegetation in the SEA, significant trees and kauri as required by Condition X.1.

X.3 At least 40 working days prior to any works commencing at the project site, the consent holder shall submit a kauri dieback management plan (KDMP) to Auckland Council for approval by a senior advisor in the I&ES Plant Pathogens team. The purpose of the KDMP shall be to set out the protocols and monitoring to be used to minimise the risks of introducing or spreading kauri dieback disease. Any alterations to the KDMP shall require the approval of a plant pathogens team senior advisor. The KDMP shall be prepared by a suitably qualified expert with training in biosecurity, plant pathology, epidemiology or similar. The KDMP will as a minimum stipulate:

- a) The locations of all kauri within the project site and the boundaries of their rootzones, including rootzones extending into the project site from neighbouring properties.
- b) How kauri rootzones within or partially within the project sites will be protected from access, identified as KCZs and signposted to clearly communicate the delineation and protocols required in relation to the KCZ.
- c) The kauri dieback hygiene protocols to be followed by all staff, subcontractors and visitors.
- d) The tree protection protocols to be followed in order to minimise damage or stress to kauri in the project site or with rootzones extending into the project site.
- e) The content of training on kauri dieback management that will be delivered to all plant or vehicle operators, site staff, subcontractors and visitors that will access the site during the course of the works.
- f) The communication channels that will be used to notify and keep up to date all staff, subcontractors and visitors of their responsibilities to adhere to hygiene procedures and the requirements of the KDMP.
- g) How works within KCZs will be carried out in a manner that minimises the impact on the kauri and the risk of introducing or spreading *P. agathidicida* within or between KCZs.
- h) Who will supervise works within KCZs, and their authority to direct the works.
- i) Methods used to remove all soil from and decontaminate vehicles, equipment, personnel, footwear etc when entering and exiting KCZs, and how run-off from this activity will be contained and disposed of in a manner that poses minimal risk of spreading *P. agathidicida*.
- j) The design and construction methodology that will be employed in establishing and maintaining accessways that intersect KCZs such that vehicles, plant and machinery will have separation from bare soil or kauri roots adequate to avoid damaging or compacting kauri roots and avoid tracking of material into, within or out of the KCZ.
- k) How run-off from washdown facilities will be managed to avoid:
 - i. Re-contaminating equipment, vehicles etc as they leave the facility
 - ii. Creating wet or muddy conditions in the site that pose a risk of contaminating other equipment.
 - iii. Uncontained run-off or splash leaving the washdown facility.
 - iv. Creating any further biosecurity risks.
- l) How works will be planned and sequenced such that plant, vehicles and materials will be able to remain on site for the duration of the works for which they are required.
- m) How the introduction of *P. agathidicida* to the site will be avoided in regard to sourcing of brought-in materials, vehicles, equipment, plant stock or other risk goods, including inspection and testing measures to be employed in selecting source sites and suppliers.
- n) How drainage, run-off, or other water discharges from the site will be directed away from kauri and their rootzones.
- o) Procedures that will be put in place to monitor sediment tracking or deposition outside of the project site and how this will be responded to in a timely manner.
- p) How material from within KCZs will be transported to approved landfill facilities with minimal risk of material loss *en route*.
- q) Hygiene requirements and audit thereof by the project environmental team to be written into project subcontracts.
- r) Internal inspection and audit procedures and record keeping that will be undertaken by the project environmental team to assess performance regarding

the KDMP and measures that will be taken in case of non-compliance or incidents.

- s) The responsibilities of all parties involved in the project works in regard to biosecurity and the KDMP.
- t) That all records relating to content of the KDMP and any other matters relating to kauri or kauri dieback disease including training, compliance, audit, inspection, and diagnostic results shall be retained and made available to the resource consent compliance and monitoring team and/or Auckland Council Pathogens Team upon request.
- u) That the applicant will follow the protocols and procedures included in the KDMP at all times, except under the express circumstances (if any) where an exemption to any of the above might apply.

X.4 The Consent Holder shall support the establishment and ongoing involvement of a Community Liaison Group (CLG) comprised of representatives of the local community. The objectives of the CLG shall be to:

- a) Provide a means for all parties to give and receive regular updates on progress with the Project;
- b) Provide a regular forum through which information about the Project can be provided to the community;
- c) Enable opportunities for concerns and issues to be reported to and responded to by the Consent Holder; and
- d) Provide feedback on the development of the Ecological Management Plan (EMP), Waima Biodiversity Management Plan (WBMP), Construction Noise and Vibration Management Plan (CNVMP), Construction Traffic Management Plan (CTMP) and Kauri Dieback Management Plan (KDMP).

X.5 The Consent Holder shall:

- a) Consult with the CLG on the development and content of the EMP, WBMP, CNVMP, CTMP and KDMP;
- b) Provide reasonable administrative support for the CLG including:
 - i Organising meetings at a local venue;
 - ii Inviting all members of the CLG;
 - iii Distributing an agenda to each CLG member no less than five (5) working days prior to meetings;
 - iv The taking and dissemination of meeting minutes;
- c) Provide an update at least every six (6) months (or as otherwise agreed with the CLG) on compliance with consent conditions.

X.6 There shall be no deposition of earth, mud, dirt, sludge, slurry or other debris that might contain *P.agathidicida* on any road or footpath resulting from earthworks or transport activity on or from the subject site or associated sites such as landfill disposal facilities utilised in the course of the works. In the event that such deposition does occur, it shall immediately be removed.

X.7 Sediment control devices, drains, and perimeter controls treating or controlling run-off shall direct run-off away from kauri and their rootzones (three times the canopy dripline radius).

X.8 Vehicle washdown facilities shall not be located within or allow run-off or splash to enter the rootzone (three times the canopy dripline radius) of any kauri.

X.9 Fill, soil, aggregate, organic material (or other substances or goods that may harbour *P. agathidicida*) brought in to the project site shall be sourced from areas free, as established by inspection and diagnostic testing, of kauri dieback disease and without kauri in the source site.

X.10 Planting stock species lists used for planting associated with the project shall not include *Agathis* species, or species identified as hosts or carriers of *P. agathidicida* according to current scientific knowledge at the time of planting.

X.11 Where sediment control devices receive run-off or redirected water from areas that have kauri or any part of their rootzones (three times the canopy dripline radius) present within them, sludge and sediment removed from those devices shall be disposed of at an approved landfill facility.

X.12 KCZs shall be established around all kauri, with area being defined by three times the canopy dripline radius of the tree in question, including kauri with trunks outside of the project site but with rootzone extending into the project site.

X.13 All soil, organic matter or vegetation within a KCZ must be taken to an approved landfill facility or left within the KCZ.

X.14 All works shall be in accordance with the applicable best-practice guidance for works around kauri provided by the Kauri Dieback Programme, as available at <https://www.kauridieback.co.nz/how-to-guides/> and the KDMP.

X.15 No physical works shall commence without an approved KDMP.

Signature:



Murray Fea 29/11/2019

Application Number: BUN60339273
Address: Huia Water Treatment Plant Development

1. Proposal

The proposal is to construct a new Water Treatment Plant (WTP) on the corner of Manuka Road and Woodlands Park Road in Huia. The new WTP will replace the existing treatment facility since this is approaching at end of its service life.

As part of the proposal, two new reservoirs, each with 25ML capacity will be constructed. Reservoir 1 is proposed to be constructed on the northern side of the Woodland Road and will be mainly an underground basin, whereas Reservoir 2 will be within the existing WTP site. Bulk excavations and fillings will be undertaken as part of reservoirs construction. For Reservoir-1 construction existing heavy vegetation on the northern side of the Woodlands Road will require removal. Excavations of up to 15m would then require for creating a Reservoir-1 platform area. Reservoir-2 will be constructed by undertaking up to 9.0m of filling up to the existing ground within the existing WTP site.

2. Main Issues/Discussion

Geotechnical & Earthworks

The proposal included bulk earthworks for constructing two main reservoirs, tunnel shaft and associated new treatment plant facilities. It is anticipated that about 4.48ha of area will be disturbed and total of 133,360m³ of earthworks will be undertaken.

If the activity is viewed under E12 chapter of AUP than the levels of earthworks exceed both area and volume threshold and also will have additional assessment due to presence of Significant Ecological Area (SEA), however, since the site is under designation '9324 – Huia and Nihotupu Water Treatment Plants', it is proposed that the district rule assessment will form part of the Outline Plans of Works consent.

The earthworks will therefore require regional team input and recommendations and will need to be assessed under Chapter E11 – Regional Earthworks.

Development engineer has limited scope under chapter E11 and the detailed earthworks assessment will be undertaken by council's regional specialist team. However, development engineer still considered that due to scale of works it is relevant that some of the geotechnical and land stability concerns are addressed as part of the regional earthworks assessment. The policy E11.3.6 of AUP specifies consideration should be given to the land stability and safety of the surrounding land, buildings and structures and hence development engineer, based on the AUP policy continued further assessment and requested for further information/clarification on the proposal.

The Preliminary Land Stability Report ref: 30848.200, dated May 2019 prepared by Tonkin & Taylor (T&T) was reviewed as part of the geotechnical assessment. The report included assessment of earthworks effects and has identified closet structures to the proposed development. Land instability scenarios were also identified and explored further. Reservoir 1 is proposed on the site located on the northern side of the Woodlands Road will be constructed as

an underground tank and will require excavations of up to 15m. The subsoil investigation data obtained by the engineer based on previous ground investigation indicates presence of colluvium material of silt and sand followed by weathered to moderately silt and sand. A geological cross section show below extracted from the T&T report, at the Reservoir 1 location indicates an existing rock escarpment above the Reservoir 1 location.

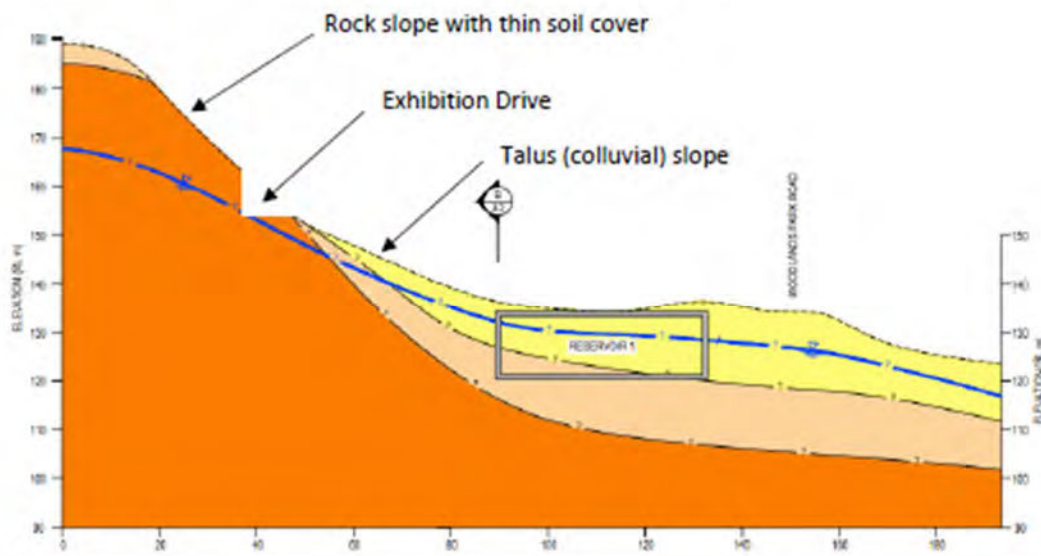


Figure 3.4: Geological section showing the escarpment located north of the Reservoir No. 1 site

From stability consideration, T&T anticipates possible instability at Reservoir 1 could be either due to rock fall from the escarpment and/or failure of the existing colluvium soil. With potential rock fall, the issue is more to do with the asset protection and should be considered in actual building and structures design. For the colluvium soils, T&T did not identify any slope instability has occurred on the site, except for reporting some minor soil creep. T&T recommends that where earthworks are undertaken in the colluvium soils appropriate retaining structures will be required and these retaining structures will be designed and installed where the material is removed from the slope. Furthermore, it is proposed installing secant piles whilst undertaking excavation for Reservoir-1 to retain the cut faces.

Reservoir No. 2 will be constructed on a building platform that consists partly of cut and partly of an engineered earth embankment. Up to 9.0m of fill is anticipated at the Reservoir 2 site. Preliminary slope stability assessments included in T&T report shows that the Reservoir No. 2 site could have a static Factor of Safety of 2.4, which is well above the typically required minimum of 1.5. Under the design earthquake loading scenario with peak ground acceleration of 0.31g, the site's FoS could reduce to 1.1. Typically, a FoS of 1.0 to 1.1 is adequate under seismic loading and depending upon the magnitude of induced displacement. The slope was also reported to have a high FoS under elevated groundwater conditions.

Furthermore, development engineer would recommend for undertaking fill induced settlement assessment for the site. Substantial filling could lead to ground settlement, especially when the underlying soils have colluvium or softer materials.

The T&T settlement assessment commentary suggests that the fill induced settlement would be greater than the possible acceptable levels for a structure of higher significance. T&T recommends that the underlying colluvium material should therefore be removed or piling foundations should be considered in the design. This approach in principal is acceptable, but further design considerations will be required at actual foundations design stage.

Development engineer would also like to highlight the potential settlement due to groundwater drawdown and its effect on the neighbouring areas including the existing Woodland Road. It is recommended that the groundwater drawdown effects are assessed by Groundwater specialist and Auckland Transport are made aware of the potential road pavement settlement and effects on serviceability.

Overall, development engineer might concur with the approach and preliminary assessment undertaken by the project geotechnical engineer, in terms of the stability of the site, however, development engineer would recommend undertaking further ground investigations to determine actual soil design parameters for the temporary and permanent retaining structures, and revise the stability assessment accordingly, especially for Reservoir-1, tunnel shaft sites and near the public road.

Furthermore, it is proposed to use soil infiltration method for complying part of the SMAF retention requirements. Though the infiltration idea is appreciable, development engineer would recommend that the geotechnical engineer considers effects of soil infiltrations on overall stability of the site including the stability of the ponds foundation and ground in vicinity of these ponds.

Since this consent is for regional works only, development engineer will recommend that during subsequent Outline Plan Works application a detailed ground investigation and slope stability assessment must be undertaken within Reservoir 1 location to identify actual subsoil parameters and detailed design for the geotechnical retaining works must be provided along with the risk assessment.

Overland flow path

Diversion of overland flow path under E36 is part of district plans rules and will therefore require to be addressed under OPW. Earthworks assessment criteria set under E26.5.7.2.2 (c), (d), also forms part of the district rules which is consideration in term of overland flow path diversion or effects are also outside the scope of the development engineer's assessment, since these are the district rule. These assessments will need to be part of the OPW application.

In terms of the stream diversion, this aspect needs to be assessed by Stream works specialist.

Stormwater Diversion

The site has two main catchments, where the surface runoff gets discharge.

Catchment A – is the area that discharges into the Armstrong Gully and

Catchment Y – is the area which discharges any surface runoff into the Yorke Gully.

The existing Huia WTP site impervious area runoff is currently being discharged into the existing dry pond located on the south of the existing facility. From the predevelopment HEC-HMS model results, it appears that the discharge rate through the existing dry pond, Armstrong Gully and Yorke Gully are 0.164m³/s, 1.277m³/s and 0.371m³/s for 10% AEP rain events and the flow rates are 0.202m³/s, 2.58m³/s and 0.798m³/s for 100% AEP rain events respectively.

In post development scenario, all impervious areas runoffs from Reservoirs 1 & 2 sites, will be collected and piped into the existing dry pond. Furthermore the existing overland flows paths will also be intercepted by the existing dry pond. The anticipated storage volume for the existing dry pond is between 3,490m³. To mitigate the peak flow rate for 1% AEP rain events, approximately 1,619m³ peak storage volume will be required and the existing dry pond can sufficiently provide the required volume. With the level of mitigation, by existing dry pond, the 1% AEP runoff in post development scenario can be limited to 2.33m³/s for Armstrong Gully.

Similar approach has been undertaken for the new treatment plant site. A new dry pond will be constructed to receive all impervious area runoffs from the contributing catchment, which will be collected and detained within the new dry pond prior to discharging into the Yorke Gully.

The peak runoff will be maintained to 0.777m³/s in post development scenario as compared to 0.797m³/s flow rate in pre-development stage for 1% AEP rain events.

Furthermore, the proposal includes redirecting part of the roof runoff, collected during rain events back into the treatment facility and using this volume for water supply after treating it for potable usage. This approach will in fact reduce the overall volume discharge into the downstream stream environment, which will help in reducing adverse flooding effects on downstream properties. This approach will comply in terms of the General Standards E8.6.1.(3).

Addition to the 1% AEP, further volume and flow rate reduction will be undertaken to comply with SMAF requirement under E10 chapter of AUP. However, SMAF assessment is undertaken by council stormwater specialist and therefore, development engineer will limit assessment in this area.

Overall, the proposal of providing dry ponds for peak flow rate attenuation can be considered as acceptable. However, as mentioned under geotechnical section, with the dry pond base and sides infiltration, the geotechnical engineer will need to undertake assessment in terms of the stability of the pond embankments, especially for the new pond, since seepage of water into the ground or embankment could potentially lead to stability concerns. This assessment will need to be included in OPW application.

Signed *Irshaad Chawdhary*

Date 15th November 2019

Memo

24 October 2019

To: Tracey Grant, Principal Project Lead, Premium Resource Consents
Cc: Richard Blakey, Consultant Planner, Blakey Planning

From: Sharon Tang, Senior Specialist Environmental Health, Specialist Unit, Resource Consents
Peer reviewed by Ruben Naidoo, Specialist, Resource Consents

Subject: Woodlands Park Road, Waima – Replacement of Huia Water Treatment Plant
Soil contamination assessment - BUN60339273 /LUC60339274 /DIS60339275

I have reviewed the below documents in the context of the *National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health* (NESCS), and Chapter E30 of the Auckland Unitary Plan (Operative in Part) (AUP OP) –Contaminated land:

- Application for Resource Consent – Huia Replacement Water Treatment Plant (WTP) Project, Woodlands Park Road, Waima (Tonkin& Taylor, May 2019) (AEE)
- Preliminary Site Investigation - Replacement Huia Water Treatment Plant and Reservoirs (Tonkin&Taylor, May 2019) (PSI)
- Site Management Plan for Ground Contamination (Tonkin&Taylor, May 2019) (SMP)

Following s92 request, the below documents were provided for review:

- Huia Replacement WTP – BUN60339273, Response to Section 92 Request for Further Information (GHD,13 August 2019)
- Preliminary Site Investigation - Replacement Huia Water Treatment Plant and Reservoirs (Tonkin&Taylor, July 2019) (updated PSI)

Proposal

The details of the proposal are contained in *Application for Resource Consent – Huia Replacement Water Treatment Plant (WTP) Project, Woodlands Park Road, Waima (Tonkin& Taylor, May 2019)*.

In brief, Watercare proposes to construct a Water Treatment Plant (WTP) on the corner of Manuka Road and Woodlands Park Road to replace the existing Huia WTP and two new treated water reservoirs (50ML) on designated land for water supply purpose.

- Reservoir 1 and NH2 watermain valve chamber and tunnelling reception shaft - located on the northern side of Woodlands Park Road and completely buried / below ground level except for its eastern extent;
- Reservoir 2 - located on the existing Huia WTP site following decommissioning of the existing plant

The earthworks are associated with site establishment, erosion and sediment control, construction of retaining walls, the new water treatment plant, reservoirs, pipework, ancillary utilities, stream works, and groundwater diversion and dewatering on the reservoir site. Bulk earthworks involve the following:

- The WTP site: estimated 41,500 m³ of cut for offside disposal and 30,400 m³ of imported fill; typically excavation less than 4 m depth and up to 11 m bgl; All earthworks at the WTP site will be undertaken at or above the groundwater table, and therefore no groundwater dewatering is anticipated to be required.
- Reservoir 1: involving a total of 41,200m³ of cut and 2,000m³ of fill;
- Reservoir 2: involving a total of 4,000m³ of cut and 2,500m³ of fill
- Offsite disposal may reduce if cut material is suitable for reuse onsite.

The site and surrounding environment

The project works area is approximately 4.3 ha for the replacement WTP and two new reservoirs across three sites within a total combined site area of 15 ha. It is located within the Rural Urban Boundary (RUB)

predominately surrounded by residential (large lot) zones. A popular walking track runs along the northern side of the proposed reservoir site.

The replacement WTP is situated at the head of the Little Muddy Creek catchment within the wider Manukau Harbour catchment and approximately 1.5 km to the Manukau Harbour. There are numerous surface water channels on the replacement WTP site discharge into the Warituna Stream and Armstrong Stream runs through the Reservoir 1 site. In addition, there are two groundwater systems within the Project Site: one at approximately 6 metres below ground level (mbgl) and a deeper groundwater system at approximately 9 mbgl.

The NESCS and BRANZ guidelines

The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011 (NESCS) sets up standards and management controls to prevent or mitigate any adverse effects of certain activities proposed on a piece of land which has been (potentially) impacted by previous and/or current activities identified on the Ministry for the Environment's *Hazardous Activities and Industries List (HAIL)*.

Small volumes of soil disturbance (<25 m³ per 500 m² of land) requiring less than 5 m³ of soil per 500 m² of land to be removed from a site is a Permitted Activity under Regulation 8(3) of the NESCS, provided that the activity duration is less than 2 months and other provisions of Regulation 8(3) are also met. Disturbance or removal of greater volumes of soil requires consent if a detailed site investigation shows that contamination levels are above background concentrations.

The BRANZ guidelines provide a process of identifying, assessing and managing asbestos in soil aligning with asbestos regulations, the NESCS and the MfE's Contaminated Land Management Guidelines. The document adopts a Tier 1 soil guideline value for human health protection at 0.001% w/w (FA/AF). It provides a summary on the trigger levels and associated levels of controls for four types of earthwork involving asbestos/ACM contamination to manage and mitigate any health effects: Class A, Class B, Asbestos-Related Work or Unlicensed Asbestos Work.

AUP OP E30 Contaminated Land

The AUP OP E 30 addresses the effects of the discharge of contaminants from land containing elevated levels of contaminants into air, or into water or onto or into land to protect the environment and human health. The contaminated land rules of the AUP OP apply when the land contains contaminants above those levels specified in Table E30.6.1.4.1 or E30.6.1.4.2 of Chapter E30 of the AUP OP.

When contaminants levels exceed the levels specified in Table E30.6.1.4.1 or E30.6.1.4.2, disturbance of soil not more than 200m³ per site or per project is permitted provided that any discharge from land does not contain separate phase liquid contaminants including separate phase hydrocarbons and other rules in E30.6.1.2 are also met.

Site contamination assessment (AEE, PSI) and s92 request and response:

The PSI included a desktop review of historical aerial photographs, Council's property files and district planning maps, certificates of title, a walkover inspection, geological and hydrogeology information, limited testing of soil samples recovered during concurrent geotechnical investigations at the site.

The key findings of the PSI include:

- Historical two dwellings on the Reservoir 1 site and five dwellings/structures on the replacement WTP site constructed around the 1940s and demolished in the 1990s.
- A maintenance workshop and chemical storeroom presumed associated with the current Huia WTP
- Uncertified fill

The PSI stated that the buildings were constructed when using asbestos containing material (ACM) and lead based paint were common. It considered that it could be a potential HAIL (I) activity occurred in Reservoir 1 and the replacement WTP if the buildings or structures were not maintained or demolished or removed appropriately. The PSI considered that the ground contamination (if any) is likely to be limited to the building footprint plus a buffer and to the near surface, dependent on the deep of filling activities have occurred.

Further information was requested as part of a s92 request to clarify the location of the unauthorised fill and the reason for not considering the maintenance workshop and chemical store located within the Reservoir 2

area as a potential HAIL activity. The s92 response letter has clarified that the uncertified fill is located outside the project area. The information has been included in an updated PSI. The response has also confirmed there will be no earthwork in the vicinity of the chlorine building, which replaced the former workshop and chemical store in 2008.

The response letter states that there is no intention to demolish the existing WTP on the site. However, the Huia WTP site layout included in *Huia Replacement Water Treatment Plant Consenting Phase Site Layout Development Report (GHD, May 2019)* as shown below indicates that the proposed reservoir 2 is partially located within the footprint of the existing WTP. Therefore, demolition of at least part of the building is anticipated. Although the building demolition work is not part of the application, poor practice in maintenance/demolishment of old buildings may result in soil contamination by potential lead and/or asbestos if the buildings contain lead-based paint and/or ACM. Buildings containing asbestos products known to be in a deteriorated condition is identified on the Ministry for the Environment's HAIL list.

Figure 3 Proposed Huia WTP Site Layout



Figure 4 Proposed Huia Reservoir Site Layout (now revised - Refer Reservoir Site Layout Development Report, Beca, May 2019)

The PSI assessed the proposal as discretionary activity under both the NESCS for soil disturbance (regulation 8 (3)) and E30 AUP OP since a detailed site investigation has not been undertaken and the proposed earthworks do not meet the permitted activity criteria.

Contamination management (SMP)

A Site Management Plan (SMP) has been provided with detail controls to minimise potential discharge to the environment and inform health and safety measures.

The SMP has summarised the PSI findings and site conditions. It states that a contaminated land specialist will be engaged prior to earthworks to carry out a site inspection to identify any other potential contamination sources at the project site and undertake soil sampling on 20-30m spacing in areas where earthworks are proposed and intersects former building areas to the maximum depth of cut, or to 0.5m into natural soils. The samples are proposed to be tested for heavy metals, semi-quantitative asbestos analysis, and other contaminants if evidence of contamination is sighted during the inspection.

The SMP states that a letter report will be provided to Council prior to earthworks to confirm actual contamination status within the project area with an updated SMP when required based on the findings from soil testing. The SMP has set up general procedures and control measures assuming that low levels of heavy metals and asbestos are present in fill on site. It states that if soil testing demonstrates the investigated areas are not contaminated, the contamination-related earthworks controls in the SMP will not apply and the standard earthworks controls will be in place.

The SMP states that it is unlikely that groundwater will be encountered within fill and groundwater removed from excavations can be discharged to stormwater or sewer, if necessary, after removal of suspended solid.

The plan shows that surface water accumulated within the excavation and has been in contact with fill material will be drained to ground.

The key control measures proposed in the SMP include:

- site establishment including site hazard board, decontamination facilities (if required), PPE;
- staff induction of contamination and health and safety;
- erosion and sediment control;
- avoiding/minimising stockpiling, stockpiles placed on hard standing or polythene or alternatively, validation following stockpile removal; stockpiles damped and covered overnight/at weekends;
- carrying out earthworks involving asbestos contamination according to regulations and code of practice with detailed asbestos management procedures provided, e.g. prevent cross-contamination, avoid stockpiling, stockpiles covered, vehicle decontamination before leaving site or moving to another area, dust control, possible air monitoring during asbestos-removal works;
- trucks to be lined and covered when transporting asbestos-contaminated material off site;
- all fill/contaminated material to be disposed of to appropriately licenced landfill facility;
- other natural soils only suitable for disposal to cleanfill if earthworks methods allow clear separation of natural soils from fill;
- groundwater/surface water management & detailed testing procedures prior to disposal: e.g. water in contact with fill material to be tested prior to be disposed to stormwater or sewer;
- encapsulation procedure provided in case containment of contaminated soil is proposed;
- importing soil to meet 'cleanfill' criteria
- response procedures for unexpected discharges/complaints and other contamination such as discoloured soil, odour, potential asbestos containing material (ACM);
- health and safety procedures
- validation and reporting procedures

The SMP also includes response procedures to complaints and emergencies relating to unauthorised discharges of vapour, odour, water, soil or separate phase hydrocarbon etc. This includes the first response specified in Table 7.1 as well as provisions for notifying and managing neighbouring site users if sustained and uncontrollable discharges occur from the site.

Submissions relevant to soil contamination

Three submissions relevant to soil contamination oppose the application either in its entirety or in part (submission No. 5206 from Manuka Road Residents Society, No. 4865 and 5082 from individual submitters from Manukau Road and Huia Road). They have raised the following key concerns relevant to this memo:

- the extent of effects of discharges of airborne particles/airborne hazards (dust, or other possible contaminants found in soil such as asbestos/ lead on the adjacent properties. (submission 5206) (submission 5082)
- whether it is appropriate to dispose potential contaminated soil to Parau Landfill site rather than a special contaminated soil site. (submission 4865); particularly with respect to the appropriate management of spread of Kauri Dieback Disease. (submission 5206)

The submitters seek that the application is declined in its entirety or in part. Two of the submitters accept alternative conditions if the application is granted to appropriately remedy or mitigate the adverse effects on the environment including the adjacent residents.

Specialist review comments:

- The PSI and subsequent s92 response have appropriately identified the potential HAIL activity at the replacement WTP site and the proposed reservoir 1 site that may have caused soil contamination with lead and/or asbestos/ACM due to potentially inappropriate maintenance/demolishing/disposal of these historical buildings. However, the PSI and s92 response have not assessed the existing WTP, which will be decommissioned for the proposed reservoir 2. It is uncertain whether the building contains lead-based paint and/or ACM. Poor practice in maintenance/demolishment of old buildings may result in soil contamination if the buildings contain lead-based paint and/or ACM.
- Therefore, the WTP building should be surveyed for potential lead-based paint and ACM prior to the building being demolished. If the survey demonstrates there is the potential for soil contamination from lead and/or asbestos, the SMP sampling plan should be revised and extended to this area. The results of the survey and soil testing (if required) need to be included in a detailed site investigation

report (DSI), which should be provided to Council prior to any other earthworks to commence. This is recommended as a condition.

- Based on the HAIL activity identified on the site, I concur with the AEE that soil contamination, if present, is likely to be in isolated areas relating to historical buildings as well as the existing WTP. The extent of soil contamination is likely to be small as compared to the proposed large volume of earthworks at the site.
- The key concerns raised from the submissions relating to soil contamination are airborne discharge of hazard dust and asbestos on adjacent properties on Manuka Road and Huia Road and the spread of soil contamination to other clean areas. In consideration of the likely isolated soil contamination if it is present, I consider that the SMP has provided appropriate mitigation measures such as the below for dust control and prevention of cross-contamination.
 - erosion and sediment control
 - minimising stockpiles
 - stockpiles to be damped, covered overnight and at weekends
 - asbestos air monitoring (if required)
 - decontamination of vehicles prior to leaving the site or traveling from a contaminated area to another clean area to avoid cross contamination
 - trucks to be lined and covered when transporting asbestos-contaminated material off the site
- The AEE proposes to use the existing Watercare Parau Landfill site (3km to the southwest of the proposed WTP) as a possible alternative landfill site for partial disposal of the cut material. One of the submissions has raised the concern with the appropriateness of disposal of contaminated soil to Parau landfill site. Available Council data shows that Parau Landfill holds a permit No. 37113 (variation to permit No. 26980) granted by the former Auckland Regional Council to receive discharge of 120m³ of water treatment sludge per week and an additional 300m³ of earth slip material per year to land at 421 Huia Road Parau. The consent expires on 31 December 2030. Considering a different nature and source of the material consented to be deposited at the site back then from the currently large volume of soil intended to be placed within the site, I am of the view that a new consent (Cleanfill or Managed Fill consent) is likely required for such activity.

The SMP states that contaminated soil including asbestos contaminated soil will be disposed to an appropriate licensed landfill facility. The location of the landfill is not specified. If Parau Landfill is chosen as an alternative landfill site, confirmation with Auckland Council on consenting requirement is required. This can be addressed by consent conditions.

- In general, I consider that the SMP has been prepared in accordance with the *Ministry for the Environment's with the requirements of Contaminated Land Management Guidelines No. 1 and 5 (revised 2011)*. Although the plan states it is prepared based on the assumption of low levels of contamination present at the site, the plan in general includes sufficient details and appropriate control measures to manage/mitigate effects of the proposed earthworks from potentially contaminated soil, stormwater runoff and unexpected discovery of contamination. The SMP will be updated by a condition should significant contamination is identified from the proposed further site investigation.
- I therefore consider that the site can be made safe and any potential adverse effects of the earthworks on human health and the environment can be mitigated/ managed provided that the recommended conditions are implemented.

NESCS Consent status

I concur with the PSI and the AEE that the proposal is a discretionary under the NESCS (Regulation 11) since a DSI is not prepared and the earthwork is unlikely to meet the permitted activity criteria of the NESCS and a site management plan is required.

E30 of AUP OP consent

I concur with the applicant that the proposal is a discretionary activity under rule E30.4.1 (A7) of the AUP OP since a detailed site investigation (DSI) is not provided and the applicant has not justified that earthwork is likely to meet the permitted volume of 200m³ specified in rule E30.6.1.2(1) (a) of the AUP OP.

Recommended conditions

1. The consent holder shall engage a suitably qualified and experienced practitioner to undertake soil investigation in accordance with Section 4 of the *Site Management Plan for Ground Contamination (Tonkin&Taylor, May 2019) (SMP)* and at least 10 working days prior to commencement of earthworks, provide to the acceptance of the Team Leader Compliance Monitoring North-West, Licensing & Regulatory Compliance, Auckland Council, a detailed site investigation report (DSI) confirming the site soil contamination status.
2. The consent holder shall engage an asbestos surveyor to carry out inspection of the building and confirm and identify the presence of lead-based paint and any (potential) asbestos containing material (ACM) within the building structures prior to demolition of the building to commence, and include the survey results into the DSI required by condition 1 (XXX).
3. If the survey required by condition 2 (XXX) demonstrates there is the potential of soil contamination from lead-based paint and/asbestos/ACM, the consent holder shall include the soil investigation of the existing WTP site into the sampling plan proposed in SMP, and include the test results in the DSI required by condition 1 (XXX);
4. If the DSI required by condition 1 (XXX) shows significant soil contamination present at the site, the consent holder shall provide an updated SMP to the acceptance of the Team Leader Compliance Monitoring North-West, Licensing & Regulatory Compliance, Auckland Council.
5. The consent holder shall carry out earthworks and implement the control measures in accordance with an approved SMP; and changes to the plan shall be approved in writing by the Team Leader Compliance Monitoring North-West, Licensing & Regulatory Compliance, Auckland Council;
6. Excavated soil or waste exposed during earthworks shall be disposed of at a disposal site, which is authorised by Council to accept the relevant levels of contamination. If Parau Landfill is chosen as an alternative disposal site, a written confirmation from Auckland Council shall be provided to the Team Leader Compliance Monitoring North-West, Licensing & Regulatory Compliance, Auckland Council to confirm that Parau Landfill has appropriate consent, 5 working days prior to the disposal commencing. Copies of the disposal dockets for the material removed from the sites shall be retained;
7. The consent holder shall not result in any airborne and deposited dust beyond the property boundary of the site that is determined to be noxious, objectionable or offensive. Good practice measures, such as those described in the Good Practice Guide for Assessing and Managing Dust, Ministry for the Environment (2016) shall be adopted at all times;
8. If evidence of contamination, which has not been previously identified is discovered during any excavation at the site, the consent holder shall immediately cease the works and notify the Team Leader Compliance Monitoring Central, Licensing & Regulatory Compliance, Auckland Council and agree on appropriate remediation and validation actions;
9. The consent holder shall ensure that the contamination level of any imported soil complies with the definition of 'Cleanfill material', as per the Auckland Unitary Plan (Operative in Part). Any imported material shall be solid material of an inert nature and must not contain hazardous substances or contaminants above natural background levels of the receiving site. Imported soils shall be tested at a rate of 1 per 500m³ of material imported to site.
10. All land disturbance works shall be managed to minimise any discharge of debris, soil, silt, sediment or sediment-laden water from beyond the subject site to either land, stormwater drainage systems, watercourses or receiving waters.
11. Any perched groundwater, or surface water encountered within the excavation area requiring removal shall be considered potentially contaminated, and shall either be:
 - a. disposed of by a licenced liquid waste contractor; or
 - b. pumped to sewer, providing the relevant permits are obtained; or

- c. discharged to the site's stormwater system or surface waters provided testing demonstrates compliance with the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000)* for the protection of 80 percent of species, except for benzene where 95 percent of species shall apply, and
- d. water is free from petroleum hydrocarbons.

All testing and analysis should be undertaken in a laboratory with suitable experience and ability to carry out the analysis. For more details on how to confirm the suitability of the laboratory please refer to Part 4: Laboratory Analysis, of Contaminated Land Management Guidelines No.5

- 12. The consent holder shall, within three months following the completion of the earthworks, provide to the acceptance of the Team Leader Compliance Monitoring North-West, Licensing & Regulatory Compliance, Auckland Council a Site Validation Report.

The Site Validation Report shall include, but not be limited to:

- a) confirmation of performance of earthworks, remediation (if required) conducted in accordance with approved plans and consent conditions
- b) details and tabulated results of testing undertaken including testing of soil, water, vapour, and interpretation of the results in the context of the NESCS and the E30 of the AUP OP
- c) any unexpected contamination identified during excavation on the site and response actions
- d) volume of soil excavated from the site, disposed off-site and landfill receipts
- e) any complaints received and response during remediation works

Regards

Sharon Tang

Technical memo - Specialist Unit

To:	Richard Blakey, Planning Consultant – Blakey Planning Ltd
CC:	Andrew Benson, Manager - Coastal & Water Allocation, Resource Consents, Specialist Input Tracey Grant, Principal Project Lead – Premium Resource Consents
From:	Sian France, Beca Ltd
Date:	14 th November 2019

1.0 APPLICATION DESCRIPTION

Application and property details

Applicant's Name:	Watercare Services Ltd
Service Centre Application Number & Water Allocation Consent Number:	BUN60339273 WAT60339409
Activity type:	Temporary take and diversion of groundwater associated with excavations for a replacement water treatment plant, reservoirs and a tunnel shaft.
Site address:	Lot 6 DP 156565 / NA 94A/356 Lot 2 DP 484666 / 701575 Lot 5 DP 156565 / NA 94A/355

1.1 Application Documents

The key application and s92 documents are as follows:

- Application for Resource Consent entitled “*Huia Replacement Water Treatment Plant (WTP) Project, Woodlands Park Road*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, dated May 2019
- Report entitled “*Huia WTP Replacement & Woodlands Park Road Reservoir Project – Indicative Construction Methodology*” prepared by Alta for Watercare Services Ltd, rev 5 dated 23/05/2019

- Report entitled “*Huia Replacement Water Treatment Plant Project Preliminary Land Stability Assessment*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated May 2019
- Report entitled “*Huia Water Water Treatment Plant Replacement Project Groundwater and Settlement Effects*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated May 2019
- Drawing set included as Appendix E of the AEE and entitled “*Huia Replacement Water Treatment Plant*” prepared for Watercare Services Ltd by GHD, 26 No. A3 sheets, drawing numbers 51-3357505-G001 to 51-3357505-C016 (dated 11/18) and 3255336 K110 to 3255336 K116 (dated 21/05/2019);
- Letter entitled “*Huia Water Treatment Plant Replacement Project. Response to s92 request for further information - groundwater effects*” prepared by Tonkin & Taylor Limited, dated 15 July 2019;
- Report entitled “*Huia Water Treatment Plant Replacement Project: Addendum to the Groundwater and Settlement Report*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated July 2019;
- Letter entitled “*Huia Water Treatment Plant Replacement Project Response to draft request for further information - Land Stability*” prepared by Tonkin & Taylor Limited, dated 15 July 2019; and
- Report entitled “*Huia Water Treatment Plant Replacement Project Addendum to the Preliminary Land Stability Assessment Report*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated July 2019.

2.0 PROPOSAL, SITE AND LOCALITY DESCRIPTION

2.1 Proposal relevant to this permit/consent only

Watercare proposes to construct a new water treatment plant (WTP) to replace the aging Huia WTP, along with two new treated water reservoirs (50 ML total capacity) to provide additional treated water storage within the western supply zone.

The replacement WTP will be located in close proximity to the existing Huia WTP, on the corner of Manuka Road and Woodlands Park Road (Figure 1) on land owned by Watercare and designated for Water Supply Purposes.

Reservoir 1 is located across from the replacement WTP, on the northern side of Woodlands Park Road. A tunnelling reception shaft for NH2 will also be located within this site and will eventually form a permanent valve chamber for the water line. We note that the tunnelling of this line is outside the scope of this consent.

Reservoir 2 will be constructed on the current WTP site, once the existing plant is decommissioned.



Figure 1: Location Plan (excerpt from drawing 51-3357505-G001) showing indicative project layout.

With regards to potential for groundwater effects, the Project will include:

- Bulk earthworks including excavations of typically 4 m, but in places up to 11 m depth, and filling of up to 9 m to form construction platforms;
- Bulk earthworks including excavations of up to 15 m depth to partially bury the proposed Reservoir 1;
- Construction of retaining walls and slope stabilisation to support excavations and filling;
- Excavation to 13 m depth to allow construction of the NH2 watermain tunnel shaft and valve chamber on the Reservoir 1 site;
- Excavation to allow construction of the reception shaft for new raw water intake tunnel on the replacement WTP site;
- Creation of a stream diversion channel around the perimeter of the WTP works; and
- Installation of underground pipework between the replacement WTP site, the reservoir site and the existing Huia WTP site.

The above works will require some dewatering and associated groundwater take and diversion, though this is generally expected to occur during construction only. Due to the early stage of design, the details of proposed retaining systems have not yet been determined.

Permanent subsoil drains may be required (at a shallow depth) near surface for the replacement WTP finished building platform level, though these are considered to be primarily to manage surface infiltration and to limit the presence of water immediately below pavement surfaces. These drains are expected to be above the groundwater level and hence no long-term diversion of groundwater is anticipated. Likewise, any drainage behind retaining walls is expected to be near surface and will affect surficial soil infiltration only and is not expected to affect regional (or perched) groundwater systems.

The project sites are located within the Waitakere Ranges Heritage Area and within a known, very large ancient block slide resulting in some marked variability in topography over short distances (see Section 4 for further details and a description of site topography).

To the south-east of the project sites, the adjoining land is zoned Open Space. Elsewhere the site is surrounded predominantly by large residential lots (Figure 2) as follows:

- Five (5) residential sites (12 to 20 Manuka Road) adjoining the proposed WTP at the southern boundary;
- Eleven (11) properties (64, 94, 96 to 100 and 110 to 120 Scenic Drive) adjoining the Reservoir 1 site at the northern boundary, though these are located at a much greater elevation on the ridge above the site; and
- Twelve (12) residential properties (11 to 17 Taraire Road, 4 to 16 Ngaio Road and 80 Woodlands Park Road) at the southern boundary of the existing WTP site.

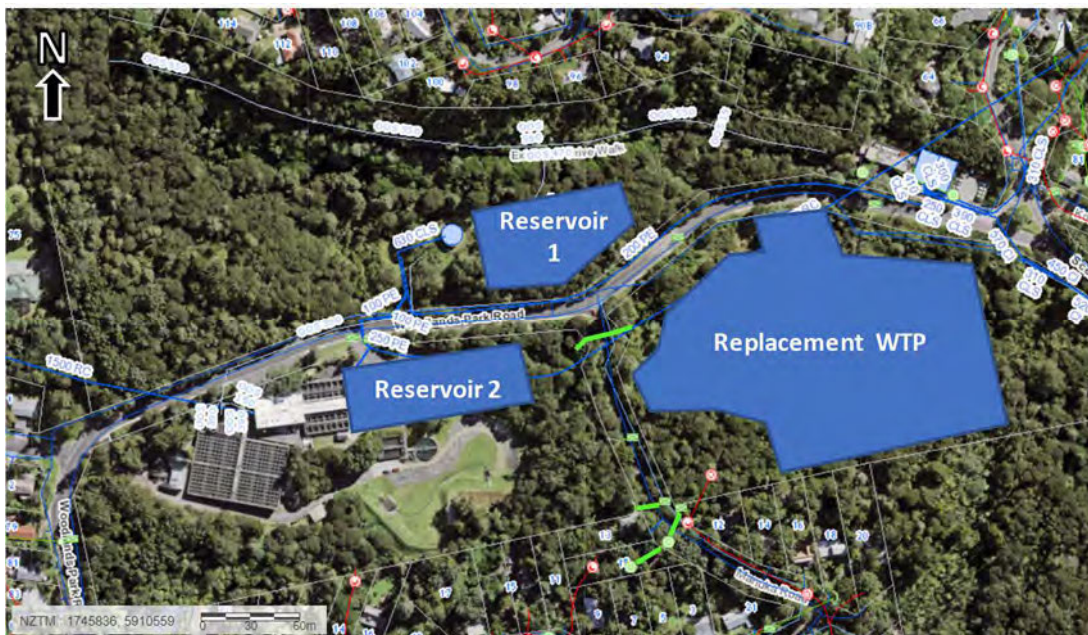


Figure 2: Indicative site layout overlain on Auckland Council GeoMaps showing location of existing Council owned services in adjacent roads (blue = water, red = wastewater and green = stormwater).

The proposed sites are also adjacent to the road reserves of Woodlands Park Road and Manuka Road. The Groundwater and Settlement Report notes that “*The only buried services within the Woodlands Park Road corridor belong to Watercare*”. However, review of Auckland Council GIS maps does indicate that there is a 375 mm diameter concrete culvert passing beneath Manuka Road between the replacement WTP site and Reservoir 2. There are also stormwater lines further south along Manuka Road (Figure 2).

The key matters relating to the actual and potential effects are as follows:

- A site-specific investigation for the current proposed works has not been undertaken, however the assessment has relied on earlier geotechnical investigations carried out on the site to develop a conceptual ground model.
- The geological profile comprises 10 m to 20 m of colluvium, overlying residually weathered (to soils) to slightly weathered rock of the Cornwallis Formation.
- Piezometers were installed in some selected boreholes as part of the historical site investigations north of Woodlands Park Road. There is also a limited number of groundwater measurements within some of the historical data.
- The available data is indicative of two distinct groundwater levels:
 - a shallow groundwater level ranging between 3.9 m to 6.6 m below ground level (m bgl), likely perched in the colluvium; and
 - a deeper groundwater level ranging from ~8 m to 15 m bgl for piezometers screened deeper in the Cornwallis Formation.
- The assessment of drawdown effects is conservatively based on an assumed single, shallow hydrostatic groundwater level for all excavations.
- On the basis of the reported groundwater levels, the deepest reservoir excavation will be up to 10 m below the groundwater level. Hence some dewatering during construction can be expected.
- Subject to final design, the retaining walls for the excavation may provide some groundwater cut-off to help control inflows and reduce the potential for drawdown and associated consolidation settlement. As this is not yet confirmed the assessment of effects has considered a fully drained excavation during construction, with the potential for associated consolidation settlement.
- Consolidation settlement could also occur as a result of the proposed filling; though would be expected to be largely limited to within the site boundaries based on the currently proposed plant layout.
- Excavation for the reservoirs and other smaller excavations will result in some mechanical settlement of the immediate surrounds.
- For the long-term, the reservoirs and other smaller excavations will be tanked and so any groundwater take or diversion is expected to be short term only.
- An indicative Geotechnical Investigation Plan has been prepared setting out the proposed locations of future investigations which will be required to confirm the ground model presented here. The adequacy of these geotechnical investigations has been reviewed and are addressed in section 4.6 below. These investigations will form a consent condition and will be required to be completed **prior** to submission of the final Groundwater and Settlement Management and Contingency Plan (GSMCP).
- An indicative Monitoring (location) Plan has been prepared setting out the proposed locations of monitoring. The proposed monitoring is commensurate with the scale of works, and, with the assessed risk of adverse effects.

However, this plan will need to be confirmed (and if necessary revised) following completion of additional investigations and analysis.

2.2 Background and site history relevant to this permit/consent only

No groundwater takes or diversion consents are currently held for the site.

3.0 REASON FOR CONSENT – GROUND DEWATERING AND DIVERSION

3.1 Reasons for consent

AUP Standards E7.6.1.6 and E.7.6.1.10 provide details of Permitted Activities. The proposal has been assessed against these standards and does not comply for the following reasons:

- The works are not for network utility diversions that are progressively open and closed, or for other very short-term diversions and hence do not meet the requirements of AUP Standard E7.6.1.10 (1) that would limit further scrutiny under E7.6.1.10 (2) to (6);
- The excavations that extend below natural groundwater level will exceed a total area of 1 ha and are more than 6 m below natural ground level and hence cannot meet Standard E7.6.1.10 (2);
- There may, in some places, be more than 2 m drawdown at the site boundary and hence cannot meet Standard E7.6.1.10 (2);
- The reservoir retaining wall(s) and final structural forms will be greater than 20 m in length and extend more than 2 m below the natural groundwater level and hence cannot meet Standard E7.6.1.10 (4);
- The distance to existing structures (roads and services) on adjoining sites are, in some cases, less than the depth of excavation and hence cannot meet AUP Standard E7.6.1.10 (5); and
- The water takes for construction dewatering is likely to be for a period greater than 30 days and hence cannot meet E7.6.1.6 (2).

In terms of dewatering associated with groundwater take and diversion the proposal is a **Restricted Discretionary Activity** and a consent is required under AUP E7.4.1 (A20 & A28).

For the purpose of the groundwater review, the effects of both consolidation and mechanical settlement arising from the project are considered to be cumulative and hence have both been considered in this technical memo.

Land Disturbance associated with earthworks is a Restricted Discretionary activity, and the matters for discretion under E12.8.2 (1) includes for the consideration of the effects of “...the stability and safety of surrounding land and, buildings, and structures”.

Whilst a review of the assessment related to Land Disturbance is not within the scope of

this memo, we note the potential for some overlap with the consideration of mechanical settlement presented here, and potentially also in the conditions of consent which we recommend are reviewed by the Processing Planner.

4.0 EXISTING GROUND CONDITIONS

4.1 Site Topography

The project sites are located within the Waitakere Ranges and within a known, very large ancient block slide resulting in some marked variability in topography over short distances.

The replacement WTP site is located at an elevation of between 120 m to 135 m RL and slopes gently from Woodlands Park Road (at the northern site boundary) towards the south. The eastern and north-eastern boundary of the site has steep slopes up towards Scenic Drive at an elevation of 140 to 145 m RL.

The proposed Reservoir 1 site is at an elevation of 125 m to 135 m RL and is described as “relatively hummocky”. The Armstrong Gully runs north to south through the middle of the site. Immediately north of the proposed reservoir, the slope rises rapidly towards Scenic Drive at an elevation of more than 180 m RL.

The proposed Reservoir 2 (existing WTP) site is at an elevation of ~100 m to 120 m RL. The site has steep slopes around the northern, eastern and southern boundaries. The Armstrong Gully watercourse is piped beneath the centre of the site and discharges into an open channel near the southern boundary.

4.1 Site Topography Existing Slope Stability

There is some conjecture as to the broader nature of instability in this area. Some geotechnical consultants have interpreted the steep escarpment to north of Reservoir 1, part of a large (1.4 km wide) arcuate / curved landform, to be the head-scarp of the Muddy Creek Landslide and the hummocky bench below the escarpment, a large-block of land that has undergone mass movement. Other geotechnical consultants consider that there is no large-scale landslide encompassing the Little Muddy Creek catchment and the subject site.

Regardless of the nature and magnitude of previous large-scale land sliding on the site, the Applicant’s engineer Tonkin & Taylor Ltd (T&T) considers that the steep escarpment to north of Reservoir 1 is a head scarp feature, and, that the bench upon which the site will be developed has a significant thickness of colluvium/landslide debris. This debris is considered to have accumulated on the bench from higher up on the escarpment and that the mounds represent the “*eroded remnants of debris piles from large scale landslip failures from higher up...*”.

From this description and provided ground model cross sections, we understand that T&T consider that the underlying residually weathered Cornwallis Formation is in-situ and the slip surface is at top of the completely weathered rock and there is no deeper-

seated failure plane. In our experience, we consider it likely that there are deeper seated failure planes.

We understand from discussions with T&T that the escarpment as well as the wider WTP area has been examined by a Senior Engineering Geologist, which confirmed that the escarpment is formed from rock, except below Exhibition Drive where the slope comprises a talus slope. Historic site visits are reported to have shown that above Exhibition Drive the escarpment is formed from a series of steep rock faces of height ranging from 1 to 3 m with flatter interconnecting slopes with a thin soil cover. In effect the escarpment can *“be considered to be rock up to and including the edge of the escarpment near Scenic Drive.”* The nature of the escarpment is discussed in detail in the Addendum to the Preliminary Land Stability Report.

Given the lack of site-specific geotechnical investigation, we consider that there is some risk that the thickness of colluvium is underestimated, and/or that the shear surface is deeper than that assumed and/or that the assumed soil or shear surface parameters differ from that modelled. However, we consider that this is a risk that should be appropriately addressed at the detailed design stage, and that the proposed further site investigation will validate and if necessary, update the ground model in subsequent design phases. Further, we agree with T&T that any changes in the model would not materially impact the assessment of risk to or effects on third parties, and, that there are sufficient design solutions available which could be employed to mitigate any residual risk should this occur.

4.2 Geological Profile

All historic investigations have identified a thick upper layer of colluvium across the proposed sites. The colluvium is typically 10 m, but in places up to 20 m thick and is comprised of predominantly sandy silt to clayey silt, with a variable component of angular gravels and occasional cobbles or boulders.

The colluvium/landslide debris is interpreted to be underlain by residually weathered rock of the Cornwallis Formation. Two ‘in-situ’ geotechnical materials have been identified within the Cornwallis Formation:

- Completely weathered to highly weathered rock recovered primarily as silts and sands; and
- Moderately to slightly weathered, extremely to very weak volcanic rich sandstones.

The published geological map for the site area (Kermode, 1992) indicates that the steep escarpment to the north of the Reservoir 1 site may be Nihotupu Formation. This unit is considered to unconformably overlie the Cornwallis Formation, however as the units were deposited contemporaneously in some locations, they are known to interbed.

The Groundwater and Settlement Report does note the potential for the site to be underlain by Nihotupu Formation instead of, or as well as the Cornwallis Formation and whilst site specific investigations would assist in confirming this, we concur with T&T’s

assessment that given excavations do not extend into rock, that this would be unlikely to materially impact the assessment of groundwater effects.

4.3 Groundwater Conditions

The available data is indicative of two distinct groundwater levels: a shallow groundwater level ranging between 3.9 m to 6.6 m below ground level (m bgl), likely perched in the colluvium, and, a deeper groundwater level ranging from ~8 m to 15 m bgl for piezometers screened deeper in the Cornwallis Formation. However, it is noted that the regional groundwater level may be deeper still.

A single design groundwater level of 5 m bgl has been adopted. However, T+T have also undertaken a sensitivity check using an upper bound groundwater level of 3 m bgl, which accounts for all but one isolated, shallower measurement.

4.4 Availability of Site Investigations

No site-specific geotechnical investigations for the replacement WTP project have been undertaken. The Applicant has instead relied on a number of historical geotechnical investigations. The historical investigations have been largely focused on the land immediately north of the existing WTP site with limited investigations elsewhere. There is good borehole coverage around the NH2 reception shaft / valve chamber; however, coverage for the remaining sites is sparse.

Whilst there is a lack of site-specific data in the footprint of some structures, overall there is general consistency across the available borehole data, in terms of thickness of colluvium, depth to rock and measured groundwater levels. The Applicant has therefore interpolated these levels to be consistent across the wider site also. Overall, we consider that the interpolations that have been made are reasonable given the historic data available.

However, we note that consideration of deeper-seated slope movement(s), that are plausible given the size of this landslide scarp and previous postulated extent of the debris lobe, have not specifically been investigated and the thickness of the landslide debris may be considerably deeper than currently assessed. In addition, it is also likely that there will be localised, site-specific variation in the nature (and behaviour) of the colluvium/landslide debris and / or the depth to rock at discrete locations.

Those qualifications notwithstanding, we consider that any residual risk arising from this can be appropriately addressed through further site investigation to support detailed design and through the implementation of appropriate groundwater consent conditions. It is common for projects of this scale to be refined at design phase in light of additional information obtained at that stage. These refinements would not be expected to change the envelope of effects but if they did, then that would trigger an application for change of conditions.

4.5 Groundwater / Surface Water Interaction

There are several overland flow paths through the site(s) all of which are reported to be the headwaters of the Armstrong Gully stream; one such headwater originates on the Reservoir 1 site.

Historical investigation data, which includes shallow piezometers screened in the near surface materials near this headwater, suggests that the perched groundwater level at 5 m to 6 m bgl, is much deeper than the invert level of the nearest (ephemeral) channel. On this basis it is likely that the stream is independent of the perched groundwater system and is fed directly by overland flows and shallow infiltration.

The replacement WTP site is also mapped as a “gully” however it is reported to have no permanent surface water flows but rather is comprised of poorly defined drainage channels that carry short-term surface flows from higher rainfall events.

4.6 Proposed Further Site Investigations

T&T has identified an outline investigation plan for future design stages which includes up to 16 machine boreholes, drilled within the footprint of each major structure and extending into un-weathered to slightly weathered rock. It is proposed that at least one borehole be drilled to a minimum of 50 m depth to investigate the potential ancient landslide. We concur that the proposed methods and scope of investigation is generally appropriate.

We suggest that at least two boreholes should be drilled deeply (min. 50 m) to investigate the potential ancient landslide, as shear surfaces within the rock mass are often thin and difficult to recover. Interpretation of the data is to identify any residual geotechnical risks and any additional investigations that may be required to address these risks, if any.

Piezometers will be installed in at least eight boreholes. In-situ permeability tests and a short (24-hour) pumping test will be undertaken to investigate aquifer parameters. It is expected that some piezometers will remain as observation wells during construction.

The investigation will also include Cone Penetration Tests (CPTs) to be undertaken between boreholes and at the locations of shallow founded structures, test pits to assist with earthworks planning and a standard suite of geotechnical laboratory tests to characterise strength, compressibility and earth working characteristics.

As noted earlier the lack of existing site-specific information has necessitated a series of assumptions with regards to ground profile, groundwater levels and hydrogeological parameters upon which the subsequent assessment of effects is based.

Whilst overall these assumptions appear reasonable, we recommend that the groundwater consent condition set include a specific requirement for the minimum level of investigation (described above) to be undertaken and reported *prior* to submission of the final GSMCP. The intent of this investigation would be to confirm that the

assumptions presented here remain valid and that there is no material change in the assessment of effects. Further investigations may be required if these assumptions are not fully validated.

5.0 TECHNICAL ASSESSMENT OF EFFECTS

5.1 Effects for Consideration

The headwaters of two streams, Yorke Stream and Armstrong Stream, are located on the proposed development site. An assessment of the potential for adverse groundwater effects on surface water bodies, and any dependent ecosystems is therefore required.

An assessment of the potential for groundwater drawdown and any associated consolidation settlement resulting from dewatering of the deep excavations is required.

For this site, the assessment of ground and building movement will also need to consider the cumulative movement from:

- Consolidation settlement due to groundwater drawdown;
- Consolidation settlement due to fill placement,
- Mechanical movement due to lateral deflection of excavation retaining walls; and
- Any ground movement that could arise due to slope instability caused or exacerbated by the site works.

Table 1 provides a summary of excavation depths and invert levels for key structures and identifies the separation distance to nearest third party assets.

It can be seen from the table that the nearest assets are generally located at a distance that is at least twice the depth of excavation / filling, and in most cases closer to three to four times the depth of excavation / filling. The notable exception being the excavation for Reservoir 1 which comes within 13 m of Woodlands Park Road.

Table 1: Summary of key structures and separation distances to adjacent 3rd party assets

Proposed Structure / Excavation		Excavation Depth (m)	Fill Height (m)	Distance to 3 rd Party Asset	
				Asset / Structure	Distance (m)
WTP	WTP platform	6	-	Woodlands Park Rd	22
	Raw water PS	4	-	Manuka Rd	23
	DAF	2 to 5	-	Woodlands Park Rd	36
	BAC	5 to 13	-	Woodlands Park Rd	53
	Washout tank	13	-	Boundary with Manuka Rd properties	29
	WTP platform	-	5		13
-		-	7	Open space / forest	10

Reservoir 1	Reservoir 1 platform	7	-	Woodlands Park Rd	36
		-	2	Woodlands Park Rd	5
	Reservoir 1	15	-	Woodlands Park Rd	13
				Boundary with Scenic Drive properties*	70
	NH2 reception shaft	10	-	Woodlands Park Rd	30
Reservoir 2	Reservoir 2 platform	2	-	375 concrete stormwater culvert	15
		3	-	Woodlands Park Rd	13
		-	6	Manuka Rd	30
		-	9	Boundary with Taraire Rd properties	90

5.2 Potential for Groundwater Drawdown

Approach / Methodology

An estimate of groundwater drawdown has been undertaken using the methodology suggested in CIRIA (Construction Industry Research and Information Association) (2016) which is based on the empirical formula of Sichardt. Use of the Sichardt equation to derive extent of drawdown may not be appropriate for a number of reasons which were discussed in a review meeting with T&T.

Whilst T+T consider that it is appropriate for use, in our experience of excavations in low permeability soils and rock in Auckland, Sichardt underestimates the extent of drawdown. However, a series of sensitivity checks have been undertaken by T+T to better constrain a maximum extent of drawdown and we agree that where secant pile (or other wall types that achieve a groundwater cut off) are used, that the extent of drawdown would be reduced comparable with the estimates provided by T+T. Given the separation distances to potentially affected third parties, we agree that in this instance, significant groundwater drawdown is unlikely to extend into third party properties. The only notable exception being the road reserve.

WTP Site

For the WTP site, although some deep excavations are required for specific structures (e.g. between 9 to 13 m bgl for the Biologically Activated Carbon Filter (BAC)), typically excavations for the wider platform are less than 4 m. Approximately half of the site will be subject to filling rather than excavation.

Based on an assumed groundwater level of 5 m bgl, T&T considers that the majority of excavations will be above the groundwater level with no resultant drawdown. Given that the BAC structure is within the middle of the WTP site and relatively small in extent, T&T considers that any groundwater drawdown will be localised and unlikely to extend

beyond the WTP site. We concur that these are reasonable assumptions if the depth to groundwater level is 5 m or greater.

For an upper bound groundwater level of 3 m bgl, the northern half of the BAC structure could be below the groundwater level, though the southern half and all other partially buried structures, would still be located at or above the groundwater level. However, the calculations provided by T&T indicate that measurable extent of drawdown is still calculated to be entirely within the WTP site boundary.

Reservoir 1 Site (including NH2 tunnel shaft)

The Groundwater and Settlement Report notes that the excavation will be mostly within colluvium, though the reservoir floor and the lower section of the north wall could be in weathered Cornwallis Formation. T&T consider that groundwater drawdown is expected to be strongly 3-dimensional and asymmetric due to variations in site elevation, variations in groundwater level (inferred to broadly follow topography) and variations in excavation depth. Groundwater drawdown has therefore been assessed separately for the four sides of the excavation.

Maximum groundwater drawdowns of 7 m to 10 m are calculated by T&T, with drawdown extending 47 m to 67 m from the excavation for the base case assessment.

The inferred rock level rises steeply in the vicinity of the northern boundary of the reservoir, and the groundwater report notes that “*a number of gravel-conglomerate layers were encountered within the Cornwallis Formation by T+T (2010) north of Woodlands Park Road*”. Given the lack of site-specific data at this location in my view there remains some risk that the excavation could encounter a more permeable gravelly-conglomerate layer in the colluvium, or that the base of the excavation is at least partially in rock.

The potential impact of this has been addressed by T&T through the provided sensitivity checks, which have included a scenario where the permeability is 1×10^{-5} m/s. As could be expected this does increase the extent of drawdown. However, and generally, measurable drawdown is expected to be largely confined to the applicant's site, and the adjacent road reserves.

If the groundwater level or the hydraulic conductivity is closer to the upper bound of parameters, then drawdown could extend for up to 100 m from the edge of the excavation. This could result in some drawdown extending beneath the properties in Scenic Drive. T+T consider that this drawdown is unrealistic as it doesn't consider the steep topography of the escarpment. Whilst the topography of the site would be expected to have some impact on groundwater flows, we consider that there is insufficient data to quantify exactly how the escarpment would materially impact the patterns of groundwater drawdown. However, given that the escarpment is rock and that any buildings are located at a much higher elevation than the reservoir, we do agree that it would be very unlikely that the drawdown would cause consolidation settlement.

For the tunnel shaft (13 m deep, some 8 m below groundwater level), the Groundwater and Settlement Report notes that drawdown could extend for a distance of 54 m. The report also notes that drawdown will overlap with drawdown from Reservoir 1, deepening the potential drawdown cone in the area between the two structures.

A plot of the extent of composite drawdown, including the base and sensitivity cases, has been provided and suggests that:

- *Upper bound drawdown is likely to be entirely limited to Watercare property, with the possible exception of five properties located on the southern edge of the escarpment. Whilst the limit of drawdown is estimated to approach, though not enter the property boundaries, we agree with T+T that the properties are significantly elevated at this location and drawdown would not be expected to affect surficial soils within the property (i.e. the risk of consolidation settlement is negligible).*
- *A 300 m length of Woodlands Park Road may be located within the extent of drawdown.*

The above is based on the “upper bound” permeability; if the “expected” lower permeability values are used then drawdown could be limited to the Watercare property alone.

Reservoir 2 Site

The Groundwater and Settlement Report notes that “No excavations below the groundwater level will be required for Reservoir 2 as this will be a largely above-ground structure.”. There is some limited data presented for MB01 and MB02 on the Reservoir 2 site which support a water table of 5 m depth and hence overall, we agree this is considered a reasonable assumption. We anticipate that the additional site investigation described earlier will confirm this at a later date as part of the detailed design stage.

5.3 Potential for Impacts on Groundwater Users

The Applicant has not undertaken a check for existing groundwater users in the area. However, on the basis that significant drawdown is not expected to extend beyond the property boundary and given the generally low permeability (and groundwater yield) of the ground, we agree that any impact on groundwater users would be expected to be less than minor.

5.4 Potential for Impacts on Surface Water Bodies

Streams in the area are generally reported as being above perched groundwater level (which is at 5 m depth); on this basis the Applicant considers that the streams (or at least the upper intermitted and ephemeral headwaters which pass through the site) will be largely acting as overland flow paths and are there will be no impact on surface water bodies.

We concur that this is reasonable based on the reported groundwater levels, and note that regardless, any change in the expected very small groundwater contribution to stream baseflow would likely be difficult to measure and / or detect, especially when compared to the effect of proposed stream deviations (the effects of which are addressed by others).

5.5 Adverse Effects Arising from Ground Settlement

5.5.1 Potential for Consolidation Settlement Due to Drawdown

An assessment of potential consolidation settlement due changes in groundwater level has been presented for Reservoir 1 (the only site where drawdown is calculated to extend beyond the site boundary).

Maximum settlements for Reservoir 1 will occur immediately adjacent the excavation (within the Watercare owned land) and are calculated to range from 44 mm to 83 mm. Maximum consolidation settlement adjacent the NH2 shaft could be > 90 mm. As the shaft is likely to be constructed using secant pile walls (or similar) that extend into underlying rock, the report notes that actual drawdown and settlement is expected to be smaller than presented. We agree this is a reasonable assumption where an effective groundwater cut off is employed; however, as detailed design and construction methodologies are not confirmed it is prudent to consider the upper bound magnitudes and extents for consenting as presented.

Consolidation settlements of up to 95 mm are calculated by T&T for the base case drawdown in the adjacent road reserves, with accompanying differential gradients of 1/520 to 1/6000.

The Addendum Groundwater report indicates that even where a shallower groundwater table is assumed or higher permeability values are used, that the extent of the consolidation settlement would still be limited to Watercare owned land and the adjacent local roads.

5.5.2 Potential for Consolidation Settlement Due to Fill Placement

Some consolidation settlement can also be expected as a result of fill placement, which will occur on the southern end of the replacement WTP site and the Reservoir 2 site.

The greatest filling and at the closest proximity to any neighbouring properties will occur at the replacement WTP site, where some 4 m of fill will be formed at a distance of approximately 12 m from the property boundary. T+T considers that settlement can be expected to occur within the immediate vicinity of the platform but would not cross over the property boundary. Accordingly, the Applicant does not consider settlement induced damage to adjacent properties or structures to be “*a realistic hazard*”.

Due to the distance away from filling, we concur that the risk of consolidation settlement (due to filling) having an adverse effect across the property boundary is relatively low. However, consolidation settlements should be assessed and confirmed at detailed design.

5.5.3 Potential for Mechanical Settlement Due to Excavation

Mechanical settlement from the project works could occur due to:

- Deflection of retaining walls supporting deep excavations;
- Deflection of retaining walls supporting the NH2 shaft; and
- Movement around unsupported shallow excavations.

Reservoir 1

The 15 m deep excavation for Reservoir 1 is ~4 m from the property boundary with Woodlands Park Road and 10 m from the road itself. It is expected that the excavation will be retained with secant pile walls. Based on the empirical relationships in CIRIA 580, the Applicant has estimated maximum horizontal deflections of 20 to 40 mm could occur, with associated vertical settlements of 10 to 20 mm.

Based on Peck (1969), T+T has estimated that mechanical effects could extend for a distance that is 2.5x the excavation depth, i.e. some 38 m distance from the excavation. As the top of the excavation is expected to be anchored, T+T has assumed that the maximum vertical settlement will occur at some distance back from the wall. The presented analysis has thus assumed that the maximum mechanical settlement could occur within Woodlands Park Road.

NH2 Shaft

The tunnel shaft will have a maximum excavation depth of 13 m and hence T+T has conservatively assumed settlements that are the same as for Reservoir 1, i.e. maximum vertical settlement of 10 mm to 20 mm but expected to be wholly within the applicant's site.

WTP Site

Excavations for the Dissolved Air Flotation (DAF) and BAC structures will extend 4 m and 9 m bgl, respectively. The retention form is not yet determined, so T+T has assumed a "flexible" wall type within soft soils. The Applicant has estimated:

- *For the DAF, maximum vertical settlements could be 80 mm and are expected to extend for ~10 m.*
- *For the BAC, maximum vertical settlements could be 180 mm and are expected to extend for ~23 m.*

T+T notes that these settlements are much greater than would generally be acceptable for achieving construction tolerances, and so they anticipate that the final design would limit wall deflections and settlements to a fraction of these values. However, these upper bound values have been used to conservatively estimate settlement at distance. We agree that this is a reasonable approach.

Unretained small WTP excavations

These would be necessarily shallow and are a significant distance from the property boundary and hence we agree with T+T that it is reasonable to assume that any settlement will be wholly within the WTP site.

5.5.4 Total Settlement Resulting from All Sources

T&T has provided a plan showing total cumulative settlement. Given the extents of settlement described above, this is expected to be limited to Woodlands Park and Manuka Roads.

For Woodlands Park Road, T&T has estimated that the total cumulative settlement is calculated to range from 0 to 95 mm, with associated differential settlement gradients of 1/720 to flatter than 1/2000.

For Manuka Road, the total cumulative settlement is calculated to range from 0 to 65 mm, with associated differential settlement gradients of 1/520 to flatter than 1/800.

Settlements are not expected to extend to private properties.

5.5.5 Effects on Third Party Buildings, Structures and Services

Neighbouring Buildings and Structures

T&T considers that settlements are not expected to extend to private properties and accordingly there is considered to be negligible risk of settlement related damage to buildings.

Services

T&T has identified a number of underground gravity services which are present on Woodlands Park Road and Manuka Road, and within the zone of expected settlement. All but a single 375 mm stormwater pipe crossing Manuka Road are identified as Watercare-owned pipes.

The stormwater pipe (culvert) is outside the expected influence of mechanical settlement but is within the zone of expected consolidation settlement. T&T has estimated that the total cumulative settlement at the location of the stormwater pipe is 50 to 65 mm. However, the stormwater pipe is aligned parallel to the settlement contours, meaning that there is negligible differential settlement expected.

T&T considers that if the full 65 mm of settlement did occur, that the stormwater pipe would move near uniformly with the surrounding land such that the “net settlement” would be closer to 0 mm. Accordingly they expect that there would be no damage or impact on operation of the pipeline.

We agree in principle that where settlement gradients are flatter than 1/500 and the services have not been subjected to any historical differential settlements, that impacts are generally expected to be “less than minor”. However, given the magnitude of potential settlement and expected variations in ground conditions, it is still possible that some differential settlement will occur.

Accordingly, a condition survey should be undertaken prior to construction, to confirm the condition of the service and its ability to tolerate the levels of settlement presented here. A pre- and post-construction condition survey will provide a clear baseline against which any damage that does occur, can be assessed.

Transport Infrastructure

Although the absolute settlements are large, the differential settlement gradients in the road are flatter than 1:500 and commonly much flatter. T&T considers that the flexible nature of the road construction and the small differential settlements means that road damage is not expected, and no significant effects on either road shape or drainage are expected.

We agree in principle that where settlement gradients are flatter than 1/500, and noting the existing gradient of the road, that any adverse effects on pavements or drainage would be expected to be “less than minor”.

However, as with the services, given the magnitude of potential settlement and expected variations in ground conditions, it is still possible that some greater differential settlement will occur. Visual condition surveys of the pavement should also be undertaken prior to, during and after construction, to provide a clear baseline against which any damage can be assessed.

5.1 Global Stability

5.1.1 Potential Mechanisms for Instability

A Preliminary Land Stability Assessment has been prepared which provides a qualitative assessment of potential mechanisms (and impacts) of instability on the site. These are:

- Instability of an open excavation:
- Excessive deflection of excavation retention systems resulting in lateral and vertical ground movements (as described above as part of the ground settlement considerations);
- The removal of soil or rock from the toe of a slope resulting in upslope displacement and / or global instability; and
- The placement of fill on a slope resulting in downslope displacement and / or global instability.

Excavation Instability

T+T consider that effects from excavation stability could potentially extend out a distance of 3 times the excavation depth for unretained excavations, though a distance approximately equivalent to the excavation depth is more likely.

For the WTP, NH2 reception shaft and Reservoir 2 sites, whilst construction methodologies are only indicative, we concur that where these excavations are actively retained, that engineering design should allow standard levels of stability to be

achieved and any instability associated with the WTP excavations would be limited to the immediate vicinity and unlikely to affect surrounding areas.

With regards to excavations at Reservoir 1 site, the Stability Assessment report notes that even if no support of the excavation was provided (which the Applicant's engineer considers unlikely), that any failure into the excavation could only extend as far back as the base of rock escarpment and that private dwellings located on the escarpment are unlikely to be affected.

We concur that it is reasonable to assume properties on Scenic Drive would not be affected where the escarpment is assumed to be competent rock. We do note that should subsequent detailed design or temporary works access etc require any cutting into this slope, then specific consideration of rock slope stability would be required.

Removal of Buttreassing Material / Toe Support

The Land Stability assessment concludes that there is a "*significant quantity of slope colluvium and landslide debris*" accumulated at the base of the rock escarpment. As the escarpment is formed from rock, it is considered that it does not rely on the accumulated soil to buttress or support it.

Therefore T+T consider that if this accumulated material slumped into the reservoir excavation (due to a failure in the retention system) that it would not impact the global stability of the escarpment.

We concur that this is a reasonable assumption, but as noted above should subsequent detailed design or temporary works access etc require any cutting back into the escarpment slope, then specific consideration of rock slope stability would be required to confirm that global stability is not impacted.

We note that properties on Scenic Drive may be subject to instability that are not attributable to any works associated with this proposal. In particular rock fall from the steep escarpment, which is likely to periodically occur. Likewise, there may be properties downslope of the site which experience instability due to slope movement. Whilst the Applicant does not expect the proposed project works to exacerbate these movements (see Section 6.0 of this technical memo), there is still some uncertainties in the ground model and it would be prudent to undertake pre-, during and post-construction condition surveys of adjacent residential land and structures. The pre-construction surveys would provide a clear baseline against which any change in condition can be assessed and would provide information regarding existing instability to inform the broader ground model.

Fill Placement

The Land Stability assessment notes that for the WTP site that re-profiling is "unlikely to induce slope instability" given the low existing slope angle and lack of any evidence of existing or historical instability.

For the Reservoir 2 site, fill of up to 9 m height is required and the Addendum Land Stability report includes numerical analysis of slope stability for the Reservoir 2 site. The analyses are from a 2010 report and for a previous design, however the previous design was broadly similar in that it incorporated both cutting and filling to form a building platform. The Land Stability report identifies that the additional loading is not expected to trigger any wider instability down slope.

5.1.2 General Summary

For all stability considerations and given the lack of site-specific investigation for some structures, there is still some risk that:

1. The thickness of colluvium is underestimated; and/or
2. That the shear surfaces are deeper than that assumed; and/or
3. That assumed soil or shear surface parameters differ from that assumed or modelled.

However, the proposed further site investigations will be used to validate and if necessary, update the ground model and inform detailed design, which will need to include further numerical analysis of stability and an assessment to confirm that any effects on third parties are limited to that presented here.

The additional investigations and analyses should be provided to Council **for peer review**, prior to finalising the final GSMCP.

Pre- and post-construction condition surveys of adjacent residential properties are recommended along Scenic Drive, to document existing and potential natural slope instability that may occur during the construction period.

5.2 Monitoring

The applicant has prepared a drawing showing the location of proposed monitoring (labelled “Indicative Monitoring Plan” and appended to the July 2019 s92 Groundwater response letter). The proposed monitoring includes:

- 18 No. ground monitoring pins along Woodlands Park Road, Manuka Road, on the property boundary between the replacement WTP and 12-20 Manuka Road, on Exhibition drive and on the slope supporting Reservoir No. 2.
- 6 No. piezometers at representative locations near the site boundaries; and
- 1 No. retaining wall monitoring pin on the deep excavations at Reservoir No. 1.

Overall the monitoring appears appropriate however we note that the above monitoring is the **minimum level of monitoring** required to confirm the extent of effects. In particular we would expect, subject to the final retention design, that the final monitoring plan would include additional retaining wall monitoring and potentially also pairs of ground markers in Woodlands Park and Manuka Roads to better quantify any differential settlement that does occur in these areas.

As described above we also recommend that pre- and post-construction condition surveys are undertaken for any third party gravity services and for the road / pavement surfaces within the zone of expected settlement. Pre- and post-construction condition surveys are also recommended for residential structures and land adjacent the site boundaries (i.e. Scenic Drive, Taraire Road and Ngaio Road). Whilst ground movement is not calculated at those locations, these are the buildings most likely to be affected in the event that movement does occur. These buildings are specifically scheduled in Condition 12.

Alert and alarm trigger levels have been proposed for the recommended survey markers and are generally commensurate with the levels of movement calculated.

Specific monitoring conditions are recommended to be included in the conditions of consent and are appended to this technical memo.

The final location of instruments and trigger levels are expected to be confirmed through submission of a final GSMCP. This will require Council approval prior to any excavation or dewatering occurring on the site.

We understand that a draft GSMCP will be prepared and submitted before the hearing but was not available for review at the time this memo was completed.

The final GSMCP must be accompanied or preceded by a separate interpretive and design report that presents the results of the additional site investigations and analyses described in earlier sections of this technical memo, and which confirms that the expected effects are within the magnitude and extent of that agreed at the time of this application. We recommend that this be specifically required within the conditions. This is reflected in the draft groundwater condition set appended to this technical memo.

5.3 Proposed Conditions

The draft conditions set provided by the Applicant includes four conditions for groundwater which broadly cover the need for a final GSMCP to be submitted to Council for approval and some minimum information requirements for the GMSCP.

Given the scale and duration of excavations and associated dewatering, and the lack of site-specific investigation at the time of assessment, it is considered that a more comprehensive set of groundwater conditions are required.

We understand that an updated condition set is being prepared by the Applicant and will be provided before the hearing but was not available for review at the time that this memo was completed. However, our recommended conditions are appended to this memo. There are drafted to align potential construction effects with the assessment provided here and include conditions to:

- Put limits on the depth of bulk excavation in line with the conceptual design reviewed;

- Nominate preliminary trigger levels for groundwater drawdown, ground settlement and retaining wall / slope movement based on the agreed envelope of effects;
- Identify contingency measures to be undertaken in the event that the ground model does differ, or performance varies from that presented and trigger levels are reached or exceeded, or complaints from potentially affected parties received;
- Note specific requirements for the final GSMCP, including the additional site investigation and assessment detailed below;
- Note specific requirements (location, duration and frequency) for monitoring of groundwater, settlement, retaining wall and / or slope movements, and impacts on potentially affected 3rd party assets to provide confidence that any differences in ground model or effects can be managed and responded to throughout the construction period; and
- Note specific requirements for reporting of data throughout the construction period and at completion.

5.4 Conclusions

An initial ground model has been developed from the information that is available and provides a sufficient basis on which to assess the effects. Further investigations are proposed as part of subsequent design phases. We concur with the Applicant that these additional investigations should be used to validate and if necessary, update the model discussed in this review.

The technical information provided in support of the resource consent application, including in response to s92 questions, indicates that:

- There will be dewatering and groundwater drawdown during construction, which is likely to result in some consolidation settlement within the road reserves of Woodlands Park Road and Manuka Road.
- There is also the potential for some mechanical settlement in the road reserves of Woodlands Park Road and Manuka Road.
- Settlement is not expected to extend into any private third party properties.
- The risk of adverse effects on services and transport infrastructure is expected to be less than minor.
- The risk of adverse effects on any third party owned assets due to stability issues triggered by the proposed works is likely to be very low.

Overall, any adverse effects on the environment are likely to be less than minor.

Given the scale and duration of excavations and associated dewatering, some

monitoring will be required to allow confirmation of effects, and where necessary trigger remedial measures.

The final GSMCP to be prepared by the applicant and referenced in the consent conditions will enable any settlement that does occur to be checked against the envelope of effects considered here. The monitoring will provide an early warning of any groundwater or ground movements that are approaching or exceed the envelope presented here and will be used trigger re-evaluation of effects and if necessary, implement remedial measures.

6.0 REVIEW OF SUBMISSIONS

A number of submitters raised matters that relate to potential groundwater and ground movement including submissions numbered: 4827, 5020, 5206, 5110, 5141, 5168, 5213, 5230, 5236, 5252, 5261 and 9002, which contain objections that relate to potential groundwater and ground movement.

We understand that the Applicant will be responding directly to the received submissions within their technical evidence. However, I have also reviewed those submissions note above and make the following general observations:

- Several submitters have noted concerns regarding the lack of site investigations. As described earlier, the Applicant has relied on historical investigations to develop the ground model discussed in this review, and which is consistent with the broader geological understanding of the area. Additional investigations will need to be undertaken and should be used to inform updated slope stability analyses taking into consideration site specific conditions and detailed design of structures. These analyses will be required to be peer reviewed as a condition of the groundwater consent.
- Most of the submissions noted above have raised concerns with regards to matters of global slope stability. As noted earlier, there does remain some risk that the presented ground model differs from that assumed or modelled. However, the proposed further site investigation (which will be a condition of consent) can be used to validate and if necessary, update the model and analyses. It is likely that any changes in the model would not materially impact the assessment of effects on third parties, and, that there are sufficient design solutions which can be employed to mitigate the risk to the level presented in the AEE.
- submission #5252 includes a desk-top geological assessment report from Riddols Consultants Ltd. This report notes:
 - That there is a risk of low-angle shear defects which could adversely affect stability of placed fill. We agree that this remains a risk and expect that the additional investigations and analyses described above would quantify that risk and allow for design of required engineering solutions, sufficient to mitigate the risk to the level presented in the AEE.

- That uncertainties in the model “*could cause difficulties for objective assessment of environmental effects ... For example ... might result in a larger earthworks footprint than proposed, with potentially greater adverse ecological consequences.*” We consider that the uncertainties in the model can be addressed through additional site investigations and analyses.

We also note that the report appendices (which we understand to be geological cross sections) were not included within the submission. The submitter may wish to provide these details at the hearing.

- Several submissions have requested either a legal contract (for repair of any damage to any property caused by any part of the works) and / or independent geotechnical / structural assessment of properties. Where buildings are within the calculated zone of ground movement (either due to settlement or potential slope instability caused by the project) it would be normal for these to be subject to an independent Building Condition Survey, as a requirement of the consent conditions. However, in this case no buildings are located within the expected zone of settlement and the project is not expected to exacerbate existing instability of adjacent properties.

As described above additional investigations and analyses are required to be undertaken and should these indicate that any buildings are within the zone of settlement, then an independent Building Condition Survey would be required. Additionally, it would in our view be prudent to undertake condition surveys for properties directly adjacent the project boundaries. Whilst the Applicant does not expect these properties to be directly impacted by the project, the surveys would help assess any **existing** ground instability due to natural triggers, which would inform the global stability assessment. The surveys would also provide a clear baseline against which any change in condition can be assessed.

- Several submissions appear to relate to works in Shetland Street which I understand relate to a different consent application. I have therefore not responded to those submissions.

7.0 STATUTORY CONSIDERATIONS

7.1 Objectives and policies of the Auckland Unitary Plan (AUP– Operative in Part)

The Auckland Unitary Plan objectives and policies are provided in Chapter B section 7.3 and Chapter E sections 1 and 2.

7.2 Other relevant matters

There are no other matters considered relevant and reasonably necessary to consider with respect to the proposed groundwater take and diversion during dewatering.

7.3 Duration of consent: Section 123

The AEE notes that construction would commence within 18 months of the necessary consents being approved. As any dewatering will be temporary (during construction only) it is considered appropriate to set a term of ten (10) years for the Restricted Discretionary Activity of dewatering and diversion.

8.0 RECOMMENDATION AND CONDITIONS

8.1 Recommendation

The assessment in this memo does not identify any reason to withhold consent and the aspect of the proposal considered by this memo could be granted consent subject to recommended conditions.

8.2 Consent Conditions

Definitions

Words in the ground dewatering (take) and groundwater diversion consent conditions have specific meanings as outlined in the table below.

Alarm Level	Specific levels at which actions are required as described in the relevant conditions.
Alert Level	Specific levels at which actions are required as described in the relevant conditions.
Completion of Dewatering	Means, in the case of a tanked building or structure construction, the stage when all the external base slab and walls are essentially watertight, the structures internal support mechanisms, including basement floors have been completed any temporary retention removed and no further groundwater is being taken for the construction of the basement.
Commencement of Excavation	Means commencement of Bulk Excavation or excavation to create perimeter walls.
Completion of Construction	Means when the Code Compliance Certificate (CCC) is issued by Auckland Council
Completion of Excavation	Means the stage when all Bulk Excavation has been completed and all foundation/footing excavations within 10 meters of the perimeter retaining wall have been completed.
Condition Survey	Means an external visual inspection or a detailed condition survey (as defined in the relevant conditions).

Damage	Includes Aesthetic, Serviceability, Stability, but does not include Negligible Damage. Damage as described in the table below.
External visual inspection	A condition survey undertaken for the purpose of detecting any new external Damage or deterioration of existing external Damage. Includes as a minimum a visual inspection of the exterior and a dated photographic record of all observable exterior Damage.
GSMCP	Means Groundwater and Settlement Monitoring and Contingency Plan
Monitoring Station	Means any monitoring instrument including a ground or building deformation station, inclinometer, groundwater monitoring bore, retaining wall deflection station, or other monitoring device required by this consent.
RL	Means Reduced Level.
Seasonal Low Groundwater Level	Means the annual lowest groundwater level – which typically occurs in summer.
Services	Include fibre optic cables, sanitary drainage, stormwater drainage, gas and water mains, power and telephone installations and infrastructure, road infrastructure assets such as footpaths, kerbs, catch-pits, pavements and street furniture.
SQEP	Means Suitably Qualified Engineering Professional
SQBS	Means Suitably Qualified Building Surveyor

Category of Damage	Normal Degree of Severity	Description of Typical Damage <i>(Building Damage Classification after Burland (1995), and Mair et al (1996))</i>	General Category <i>(after Burland – 1995)</i>
0	Negligible	Hairline cracks.	Aesthetic Damage
1	Very Slight	Fine cracks easily treated during normal redecoration. Perhaps isolated slight fracture in building. Cracks in exterior visible upon close inspection. Typical crack widths up to 1mm.	
2	Slight	Cracks easily filled. Redecoration probably required. Several slight fractures inside building. Exterior cracks visible, some repainting may be required for weather-tightness. Doors and windows may stick slightly. Typically crack widths up to 5mm.	
3	Moderate	Cracks may require cutting out and patching. Recurrent cracks can be masked by suitable linings. Brick pointing and possible replacement of a small amount of exterior brickwork may be required. Doors and windows sticking. Utility services may be interrupted. Weather tightness often impaired. Typical crack widths are 5mm to 15mm or several greater than 3mm.	Serviceability Damage
4	Severe	Extensive repair involving removal and replacement of walls especially over door and windows required. Window and door frames distorted. Floor slopes noticeably. Walls lean or bulge noticeably. Some loss of bearing in beams. Utility services disrupted. Typical crack widths are 15mm to 25mm but also depend on the number of cracks.	Stability Damage
5	Very Severe	Major repair required involving partial or complete reconstruction. Beams lose bearing, walls lean badly and require shoring. Windows broken by distortion. Danger of instability. Typical crack widths are greater than 25mm but depend on the number of cracks.	

Table 1: Building Damage Classification

Note: In the table above the column headed “Description of Typical Damage” applies to masonry buildings only and the column headed “General Category” applies to all buildings.

Standard Conditions

Activity in accordance with plans

Condition 1: The take (dewatering) and diversion of groundwater associated with the construction of the replacement Huia Water Treatment Plant shall be carried out in accordance with the plans and all information submitted with the application, detailed below, and all referenced by the council as consent number WAT60339409 including:

- Application for Resource Consent entitled “*Huia Replacement Water Treatment Plant (WTP) Project, Woodlands Park Road*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, dated May 2019
- Report entitled “*Huia WTP Replacement & Woodlands Park Road Reservoir Project – Indicative Construction Methodology*” prepared by Alta for Watercare Services Ltd, rev 5 dated 23/05/2019
- Report entitled “*Huia Replacement Water Treatment Plant Project Preliminary Land Stability Assessment*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated May 2019
- Report entitled “*Huia Water Treatment Plant Replacement Project Groundwater and Settlement Effects*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated May 2019
- Drawing set included as Appendix E of the AEE and entitled “*Huia Replacement Water Treatment Plant*” prepared for Watercare Services Ltd by GHD, 26 No. A3 sheets, drawing numbers 51-3357505-G001 to 51-3357505-C016 (dated 11/18) and 3255336 K110 to 3255336 K116 (dated 21/05/2019);
- Letter entitled “*Huia Water Treatment Plant Replacement Project. Response to s92 request for further information - groundwater effects*” prepared by Tonkin & Taylor Limited, dated 15 July 2019;
- Report entitled “*Huia Water Treatment Plant Replacement Project: Addendum to the Groundwater and Settlement Report*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated July 2019;
- Letter entitled “*Huia Water Treatment Plant Replacement Project Response to draft request for further information - Land Stability*” prepared by Tonkin & Taylor Limited,

dated 15 July 2019; and

- Report entitled “*Huia Water Treatment Plant Replacement Project Addendum to the Preliminary Land Stability Assessment Report*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated July 2019.

Duration of the consent

Condition 2: The take (dewatering) and groundwater diversion consent WAT60341640 shall expire ten (10) years from the granting of this consent unless it has lapsed, been surrendered or been cancelled at an earlier date pursuant to the RMA.

Provide for a review under section 128

Condition 3: Under section 128 of the RMA the conditions of this consent may be reviewed by the Manager Resource Consents at the consent holder’s cost, at intervals of not less than one year following Commencement of Dewatering in order

- To deal with any adverse effects on the environment which may arise or potentially arise from the exercise of this consent and which it is appropriate to deal with at a later stage
- To vary the monitoring and reporting requirements, and performance standards, in order to take account of information, including the results of previous monitoring and changed environmental knowledge on:
 - a) ground conditions
 - b) aquifer parameters
 - c) groundwater levels; and
 - d) ground surface movement.

Ground Dewatering (Take) and Groundwater Diversion Conditions

Notice of Commencement of Dewatering

Condition 1: The Team Leader West Compliance Monitoring shall be advised in writing at least 10 working days prior to the date of the Commencement of Dewatering.

Design of Excavations and Retaining Systems

Condition 2: The design and construction of the excavations, shafts, fill platform, retaining walls and permanent drainage system shall be undertaken in accordance with the specifications contained in the reports titled:

- “*Huia Water Treatment Plant Replacement Project Groundwater and Settlement Effects*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated May 2019
- “*Huia Water Treatment Plant Replacement Project. Response to s92 request for further information - groundwater effects*” prepared by Tonkin & Taylor Limited, dated 15 July 2019;
- “*Huia Water Treatment Plant Replacement Project: Addendum to the Groundwater and Settlement Report*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated July 2019;
- “*Huia Water Treatment Plant Replacement Project Response to draft request for further information - Land Stability*” prepared by Tonkin & Taylor Limited, dated 15 July 2019; and
- “*Huia Water Treatment Plant Replacement Project Addendum to the Preliminary Land Stability Assessment Report*” prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated July 2019

Excavation Limit

Condition 3: The Bulk Excavation shall not extend below:

- 15 m bgl **for Reservoir 1**;
- The cut / fill depths shown on the drawing entitled “*RESERVOIR CONCEPT EARTHWORKS PLAN*” drawing no. 3255336-K116, rev OB dated 05/19, **for Reservoir 2**; and
- The cut / fill depths shown on the drawing entitled “*EARTHWORKS CUT/FILL DEPTHS WATER TREATMENT PLANT SITE*” drawing no. 51-3357505-C006, rev 1 dated 11/18, **for the WTP**.

Performance Standards

Damage Avoidance

Condition 4: All excavation, dewatering systems, retaining structures and works associated with the diversion or taking of groundwater, shall be designed, constructed and maintained so as to avoid Damage to buildings, structures and Services on the site or adjacent properties, outside that considered as part of the application process unless otherwise agreed in writing with the asset owner.

Alert and Alarm Levels

Condition 5: The activity shall not cause any settlement or movement greater than the Alarm Level thresholds specified in Schedule A below. Alert and Alarm Levels are triggered when the following Alert and Alarm Trigger thresholds are exceeded:

Schedule A: Alarm and Alert Levels			
Movement		Trigger Thresholds (+/-)	
		Alarm	Alert
a)	Differential vertical settlement between any two Ground Surface Deformation Stations (the Differential Ground Surface Settlement Alarm or Alert Level): <ul style="list-style-type: none"> GS1 to GS18 	1:500	1:750
b)	Total vertical settlement from the pre-excavation baseline level at any Ground Surface Deformation Station (the Total Ground Surface Settlement Alarm or Alert Level): <ul style="list-style-type: none"> G1, G2, G10, G11, G12, G14, G15, G16, G17 and G18 G13 G3, G4, G8 and G9 G5, G6 and G7 	7 mm 20 mm 40 mm 80 mm	10 mm 25 mm 50 mm 95 mm
c)	Total lateral deflection from the pre-excavation baseline level at any retaining wall deflection station (the Retaining Wall Deflection Alarm or Alert Level): <ul style="list-style-type: none"> RW1 to RW5 	32 mm	40 mm
d)	Distance below the pre-dewatering Seasonal Low Groundwater Level and any subsequent groundwater reading at any groundwater monitoring bore (the Groundwater Alert Levels 1 & 2):	n/a	(1) 80% of calculated (2) 100% of calculated

Note: The locations of the Monitoring Stations listed in Schedule A are shown on the drawing entitled “*Proposed monitoring points*” prepared by Tonkin & Taylor Ltd, Figure No. A3, and appended to the s92 response dated 13 August 19.

These levels may be amended subject to approval by the Team Leader West Compliance Monitoring as part of the Groundwater Settlement Monitoring and Contingency Plan (GSMCP) approval process, and, after the receipt of pre-dewatering monitoring data, condition surveys and recommendations from a suitably qualified engineering professional (SQEP), but only to the extent that avoidance of Damage to building, structures and Services can still be achieved.

There are conditions below that must be complied with when the Alert and Alarm Level triggers are exceeded. These include actions that must be taken immediately including seeking the advice of a SQEP.

Alert Level Actions

Condition 6: In the event of any Alert Level being exceeded the Consent Holder shall:

- (a) Notify the Team Leader West Compliance Monitoring within 24 hours.
- (b) Re-measure all Monitoring Stations within 50 metres of the affected monitoring location(s) to confirm the extent of apparent movement
- (c) Ensure the data is reviewed, and advice provided, by a SQEP on the need for mitigation measures or other actions necessary to avoid further deformation. Where mitigation measures or other actions are recommended those measures shall be implemented.
- (d) Submit a written report, prepared by the SQEP responsible for overseeing the monitoring, to the Team Leader West Compliance Monitoring within five working days of Alert Level exceedance. The report shall provide an analysis of all monitoring data (including wall deflection) relating to the exceedance, actions taken to date to address the issue, recommendations for additional monitoring (i.e. the need for increased frequency or repeat condition survey(s) of building or structures) and recommendations for future remedial actions necessary to prevent Alarm Levels being exceeded.

- (e) Measure and record all Monitoring Stations within 50 metres of the location of any Alert Level exceedance every two days until such time the written report referred to above has been submitted to the Team Leader West Compliance Monitoring.

Alarm Level Actions

Condition 7: In the event of any Alarm Level being exceeded at any ground deformation pin, building deformation pin, retaining wall deflection pin or inclinometer Monitoring Station required by this consent, the Consent Holder shall:

- a) Immediately halt construction activity, including excavation, dewatering or any other works that may result in increased deformation, unless halting the activity is considered by a SQEP to be likely to be more harmful (in terms of effects on the environment) than continuing to carry out the activity.
- b) Notify the Team Leader West Compliance Monitoring within 24 hours of the Alarm Level exceedance being detected and provide details of the measurements taken.
- c) Undertake a condition survey (this could comprise either a detailed condition survey or an external visual inspection at the discretion of the SQEP responsible for overseeing the monitoring) by a SQEP or suitably qualified building surveyor (SQBS) of any building or structure located adjacent to any Monitoring Station where the Alarm Level has been exceeded.
- d) Take advice from the author of the Alert Level exceedance report (if there was one) on actions required to avoid, remedy or mitigate adverse effects on ground, buildings or structures that may occur as a result of the exceedance.
- e) Not resume construction activities (or any associated activities), halted in accordance with paragraph (a) above, until any mitigation measures (recommended in accordance with paragraphs (d) above) have been implemented to the satisfaction of a SQEP.
- f) Submit a written report, prepared by the SQEP responsible for overseeing the monitoring, to the Team Leader West Compliance Monitoring, on the results of the condition survey(s), the mitigation measures implemented and any remedial works and/or agreements with affected parties within five working days of recommencement of works.

Groundwater and Settlement Monitoring and Contingency Plan (GSMCP)

Condition 8: At least 20 working days prior to the Commencement of Dewatering, a final Groundwater and Settlement Monitoring and Contingency Plan (GSMCP) prepared by a SQEP, shall be submitted to the Team Leader West Compliance Monitoring for written approval. No activities shall commence on site until written confirmation is provided from the Team Leader West Compliance Monitoring that the GSMCP meets the conditions of consent.

The overall objective of the GSMCP shall be to set out the practices and procedures to be adopted to ensure compliance with the consent conditions and shall include, at a minimum, the following information:

- (a) A monitoring location plan, showing the location and type of all Monitoring Stations including groundwater monitoring bores, ground and building deformation pins and retaining wall deflection pins. The monitoring plan should be based on the drawing entitled “*Proposed monitoring points*” prepared by Tonkin & Taylor Ltd, Figure No. A3, and appended to the s92 response dated 13 August 19. In any case where the location of a Monitoring Station differs substantively from that shown on the drawing entitled “*Proposed monitoring points*” prepared by Tonkin & Taylor Ltd, Figure No. A3, and appended to the s92 response dated 13 August 19, a written explanation for the difference shall be provided at the same time that the final GSMCP is provided.
- (b) Final completed schedules B to E (as per the conditions below) for monitoring of groundwater drawdown, and, ground surface, building and retaining wall deformation (including any proposed changes to the monitoring frequency) as required by conditions below.
- (c) All monitoring data, the identification of Services susceptible to Damage and all building/Service condition surveys undertaken to date and required by conditions below.
- (d) A bar chart or a schedule, showing the timing and frequency of condition surveys, visual inspections and all other monitoring required by this consent, and a sample report template for the required two monthly monitoring.

- (e) All Alert and Alarm Level Triggers (including reasons if changes to such are proposed, for example as a result of recommendations in the building condition surveys or data obtained from pre-dewatering monitoring).
- (f) Details of the contingency actions to be implemented if Alert or Alarm Levels are exceeded.

The consent holder may request amendments to the GSMCP by requesting amendments in writing to the Team Leader West Compliance Monitoring for approval at least 10 working days prior to any changes taking effect. Any changes to the GSMCP shall remain consistent with the overall intent of the GSMCP and shall be consistent with the requirements of the relevant conditions of these consents. No changes shall take effect without the prior written approval of the Team Leader West Compliance Monitoring.

Condition 9: All construction, dewatering, monitoring and contingency actions shall be carried out in accordance with the approved GSMCP. No Bulk Excavation (that may affect groundwater levels) or other dewatering activities shall commence until the GSMCP is approved in writing by the Team Leader West Compliance Monitoring.

Additional Geotechnical Investigations

Condition 10: Prior to the submission of the GSMCP, additional investigations as shown on the drawing titled "*Indicative Geotechnical Investigation Plan*" appended to the s92 response letter dated 15 July 2019 are to be undertaken. A minimum of two boreholes shall be drilled to 50 m depth to investigate large-scale instability within the rock mass. The results of the investigation are to be summarised in a Geotechnical Interpretive / Design report and reporting shall include: confirmation sufficient investigation has been undertaken to address uncertainties and confirm the ground model (including deep-seated instability, geotechnical and hydrogeological parameters), confirmation of groundwater levels across the site(s), updated assessments of global stability, a summary of detailed design analyses undertaken and an updated assessment of environmental effects where different to that presented at the time of consenting, and detail any residual geotechnical risks that may not be fully addressed by the design.

Pre-Dewatering Building and Structure Survey

Condition 11: The Consent Holder shall undertake a risk assessment to identify existing buildings and structures at risk of damage due to settlement caused by the project. The risk assessment process shall be set out in the GSMCP required by Condition 8 and shall be based upon the additional site investigation and analyses, and final design and construction methodology. The risk assessment shall include:

- (a) identification of the zone of settlement or ground movement influence;
- (b) identification of the building types in this zone, and their susceptibility to ground movement induced damage;
- (c) identification of the buildings and structures at risk of damage due to the project works and requirements for monitoring; and
- (d) The schedule of existing buildings and structures identified as being potentially at risk of damage (Schedule B of this condition set) shall be updated through the building risk assessment process shall be included in the GSMCP.

Condition 12: Prior to the Commencement of Dewatering, a detailed condition survey of buildings and structures, identified as being at risk of damage due to settlement caused by the project, as specified in Schedule B below and as updated by the risk assessment required by condition 11, shall be undertaken by a SQEP or SQBS and a written report shall be prepared and reviewed by the SQEP responsible for overseeing the monitoring. The report shall be submitted for certification by the Team Leader West Compliance Monitoring.

This condition does not apply where written evidence is provided to the Team Leader West Compliance Monitoring that the owner of a property has confirmed they do not require a detailed condition survey.

The detailed condition survey shall include:

- (a) Confirmation of the installation of any required building deformation stations.
- (b) A description of the type of foundations.

- (c) A description of existing levels of Damage considered to be of an aesthetic or superficial nature.
- (d) A description of existing levels of Damage considered to affect the serviceability of the building where visually apparent without recourse to intrusive or destructive investigation.
- (e) An assessment as to whether existing Damage may or may not be associated with actual structural Damage and an assessment of the susceptibility of buildings/structures to further movement and Damage.
- (f) Photographic evidence of existing observable Damage.
- (g) A review of proposed Alarm and Alert Levels to confirm they are appropriately set and confirmation that any ground settlement less than the Alarm Level will not cause Damage.
- (h) An assessment of whether the monitoring frequency is appropriate.
- (i) An assessment of whether the locations and density of existing ground and building deformation stations are adequate and appropriate for the effective detection of change to building and structure condition.

Schedule B: Buildings/Structures that require Detailed Condition Survey and Installation of Deformation Stations		
Number	Address	Number of building deformation stations required
1	94 Scenic Drive, Titirangi	not required
2	96 Scenic Drive, Titirangi	not required
2	98 Scenic Drive, Titirangi	not required
3	100 Scenic Drive, Titirangi	not required
4	12 Manuka Road, Titirangi	not required
5	13 Manuka Road, Titirangi	not required
6	14 Manuka Road, Titirangi	not required
7	16 Manuka Road, Titirangi	not required
8	18 Manuka Road, Titirangi	not required
9	20 Manuka Road, Titirangi	not required

10	11 Taraire Road, Titirangi	not required
11	15 Taraire Road, Titirangi	not required
12	17 Taraire Road, Titirangi	not required
13	12 Ngaio Road, Titirangi	not required
14	14 Ngaio Road, Titirangi	not required
15	16 Ngaio Road, Titirangi	not required

Pre-Dewatering Services Condition Survey

Condition 13: Prior to the Commencement of Dewatering, a condition survey of potentially affected stormwater services shall be undertaken in consultation with the relevant service provider.

This condition does not apply to any service where written evidence is provided to the Team Leader West Compliance Monitoring that the owner of that service has confirmed they do not require a condition survey.

External Visual Inspections during Dewatering

Condition 14: External visual inspections of the surrounding ground (including Scenic Drive, Woodlands Park Road and Manuka Road) and any neighbouring buildings and structures identified through the risk assessment required by condition 11 and 12, shall be undertaken for the purpose of detecting any new external Damage or deterioration of existing external Damage.

Inspections are to be carried weekly from the Commencement to Completion of Dewatering. A photographic record is to be kept, including time and date, of each inspection and all observations made during the inspection, and should be of a quality that is fit for purpose.

The results of the external visual inspections and an assessment of the results are to be reviewed by the SQEP responsible for overseeing the monitoring and included in the bimonthly monitoring report for the relevant monitoring period.

This condition does not apply to any land, building or structure where written evidence is provided to the Team Leader West Compliance Monitoring confirming that the owner of the land, building or structure does not require visual inspections to be carried out.

Completion of Dewatering - Building, Structure and Service Condition Surveys

Condition 15: Between six and twelve months after Completion of Dewatering a detailed condition survey of all previously surveyed buildings, structures and stormwater Services, shall be undertaken by a SQEP or SQBS and a written report shall be prepared. The report is to be reviewed by the SQEP responsible for overseeing the monitoring and then submitted to the Team Leader West Compliance Monitoring, within one month of completion of the survey.

The condition survey report shall make specific comment on those matters identified in the pre-dewatering condition survey. It shall also identify any new Damage that has occurred since the pre-dewatering condition survey was undertaken and provide an assessment of the likely cause of any such Damage.

This condition does not apply to any building, structure or Service where written evidence is provided to the Team Leader West Compliance Monitoring confirming that the owner of that building, structure, or Service does not require a condition survey to be undertaken.

Additional Surveys

Condition 16: Additional condition surveys of any building, structure, or Service within the area defined by the extent of groundwater drawdown or ground movement (as defined in the reports titled "*Huia Water Treatment Plant Replacement Project: Addendum to the Groundwater and Settlement Report*" prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated July 2019) shall be undertaken, if requested by the Team Leader Compliance Monitoring NW2, for the purpose of investigating any Damage potentially caused by ground movement resulting from dewatering or retaining wall deflection. A written report of the results of the survey shall be prepared and/or reviewed by the SQEP responsible for overseeing the monitoring. The report shall be submitted to the Team Leader West Compliance Monitoring

The requirement for any such additional condition survey will cease six months after the Completion of Dewatering unless ground settlement or building deformation monitoring

indicates movement is still occurring at a level that may result in Damage to buildings, structures, or Services. In such circumstances the period where additional condition surveys may be required will be extended until monitoring shows that movement has stabilised and the risk of Damage to buildings, structures and Services as a result of the dewatering is no longer present.

Groundwater Monitoring

Condition 17: Groundwater monitoring is to be undertaken at the groundwater monitoring bore locations shown on the drawing entitled “*Proposed monitoring points*” prepared by Tonkin & Taylor Ltd, Figure No. A3, and appended to the s92 response dated 13 August 19, or in the approved GSMCP. Groundwater level monitoring is to be undertaken in accordance with Schedule C below:

Schedule C: Groundwater Monitoring Frequency					
Bore Name	Location		Groundwater level monitoring frequency (to an accuracy of 10mm)		
	Easting (m E)	Northing (m N)	From bore construction until one month before Commencement of Dewatering	One month before Commencement of Dewatering to Completion of Dewatering	From Completion of Dewatering until 3 months later
PZ1	tbc	tbc	Monthly (with a minimum of three (3) monthly readings)	Twice-weekly	Monthly
PZ2	tbc	tbc			
PZ3	tbc	tbc			
PZ4	tbc	tbc			
PZ5	tbc	tbc			
PZ6	tbc	tbc			

The monitoring frequency may be changed if approved by the Team Leader West Compliance Monitoring. Any change shall be specified in the GSMCP. In addition, the three-month monitoring period post Completion of Dewatering may be extended by the Team Leader Compliance Monitoring NW2, if measured groundwater levels are not consistent with inferred seasonal trends or predicted groundwater movement.

Advice Note: *If groundwater level measurements show an inconsistent pattern immediately prior to the Commencement of Dewatering (for example varying more than +/-200mm during a month), then further readings may be required to ensure that an accurate groundwater level baseline is established before dewatering commences.*

Ground Surface and Building Deformation Monitoring

Condition 18: Ground Surface Deformation Monitoring Stations (and Building Deformation Monitoring Stations, if required) shall be established and maintained at the approximate locations shown on the drawing entitled “*Proposed monitoring points*” prepared by Tonkin & Taylor Ltd, Figure No. A3, and appended to the s92 response dated 13 August 19, or in the approved GSMCP. The Monitoring Stations will be monitored at the frequency set out in Schedule D. The purpose of the Monitoring Stations is to record any vertical or horizontal movement. Benchmark positions shall be established no less than 50 away from the excavated area.

Schedule D: Ground Surface and Building Monitoring			
Monitoring Station and type	Frequency		
	Pre-Commencement of Dewatering	Commencement to Completion of Dewatering	Post- Completion of Dewatering
Ground markers G1 to G18	Twice to a vertical accuracy of +/-2mm (achieved by precise levelling)	Weekly	Monthly for 6 months
Building markers <i>(if identified as required by the risk assessment in condition 11)</i>	Twice to a vertical accuracy of +/-2mm (achieved by precise levelling)	Weekly	Monthly for 6 months

The monitoring frequency may be changed, if approved by the Team Leader Compliance Monitoring NW2.

Retaining Wall Monitoring

Condition 19: Five (5 no.) retaining wall deflection stations (RW1 to RW5), for the measurement of lateral wall movement shall be installed along the top of the southern reservoir

1 retaining wall. Monitoring of the retaining wall deflection stations shall be undertaken and recorded in accordance with Schedule E below and shall be carried out using precise levelling.

Schedule E: Retaining Wall Monitoring		
Frequency		
Pre-Commencement of Dewatering	Commencement of Dewatering to one month after Completion of Excavation	One month after Completion of Excavation to Completion of Dewatering
Twice to a horizontal and vertical accuracy of +/-2mm	Once for every 2 metres depth (on average) of excavation, and, in any case, at a minimum of once weekly.	Fortnightly

The monitoring frequency may be changed, if approved by the Team Leader West Compliance Monitoring, through the GSMCP.

Access to Third Party Property

Condition 20: Where any monitoring, inspection or condition survey in this consent requires access to property/ies owned by a third party, and access is declined or subject to what the consent holder considers to be unreasonable terms, the Consent Holder shall provide a report to the Team Leader Compliance Monitoring NW2 prepared by a SQEP identifying an alternative monitoring programme. The report shall describe how the monitoring will provide sufficient early detection of deformation to enable measures to be implemented to prevent Damage to buildings, structures or Services. Written approval from the Team Leader West Compliance Monitoring shall be obtained before an alternative monitoring option is implemented.

Contingency Actions

Condition 21: If the consent holder becomes aware of any Damage to buildings, structures or Services potentially caused wholly, or in part, by the exercise of this consent, the Consent Holder shall:

- (a) Notify the Team Leader West Compliance Monitoring and the asset owner within two working days of the consent holder becoming aware of the Damage.

- (b) Provide a report prepared by a SQEP (engaged by the Consent Holder at their cost) that describes the Damage; identifies the cause of the Damage; identifies methods to remedy and/or mitigate the Damage that has been caused; identifies the potential for further Damage to occur, and, describes actions that will be taken to avoid further Damage.
- (c) Provide a copy of the report prepared under (b) above, to the Team Leader Compliance Monitoring NW2 and the asset owner within 10 working days of notification under (a) above.

Advice Note: *It is anticipated the Consent Holder will seek the permission of the damaged asset to access the property and asset to enable the inspection/investigation. It is understood that if access is denied the report will be of limited extent.*

Building, Structure, and Services Surveys and Inspections

Condition 22: A copy of all pre-dewatering building, structure condition surveys, and Service condition surveys and photographic records of external visual inspections required by this consent shall be submitted to the Team Leader West Compliance Monitoring with the GSMCP. All other condition surveys and photographic records required by this consent shall be provided to the Team Leader West Compliance Monitoring upon request.

Reporting of Monitoring Data

Condition 23: At two monthly intervals, a report containing all monitoring data required by conditions of this consent shall be submitted to the Team Leader West Compliance Monitoring. This report shall include a construction progress timeline, the monitoring data (including the results of condition surveys) recorded in that period, and, a comparison of that data with previously recorded data and with the Alert and Alarm Levels for each Monitoring Station.

Upon Completion of Construction, one electronic data file (excel workbook) containing digital data for all groundwater monitoring bores shall be provided to the Team Leader West Compliance Monitoring. Data should include the monitoring bore name, type, location (NZTM easting / northing and elevation), screened depth for groundwater monitoring bores, absolute and relative readings (and their units of measure) and the date / time of each reading. The worksheets should contain data values only (no formulas, circular references or links to other

sheets)

The final post-construction report shall constitute a close-out report and present a summary of overall trends observed on the project and confirmation that monitored readings post-construction (groundwater level, and / or ground and building movement) have reached steady state conditions (accounting for seasonal variation).

Requirement for Close-out Report

Condition 24: The final post-construction report shall constitute a close-out report and present a summary of overall trends observed on the project and confirmation that monitored readings post-construction (groundwater level, and / or ground and building movement) have reached steady state conditions (accounting for seasonal variation).

Notice of Completion

Condition 25: The Team Leader West Compliance Monitoring shall be advised in writing within 10 working days of when excavation and dewatering has been completed.

Permanent Drainage

Condition 26: After Completion of Construction, any permanent backfill or drainage systems installed behind retaining walls or below base slabs shall not cause groundwater levels adjacent to the site to be reduced below pre-existing seasonal low levels, or, to rise above seasonal high levels, (as measured during pre-construction monitoring) or in accordance with any subsequent monitoring.

Advice Note: *The Consent Holder is advised that the discharge of pumped groundwater to a stormwater system or waterbody will need to comply with any other regulations, bylaws or discharge rules that may apply.*

9.0 REVIEW

Memo prepared by:

Sian France



Technical Director – Hydrogeology, Beca Ltd

Date:

14th November 2019

Reviewed and approved for release by:

Andrew Benson



Team Leader, Coastal & Water Allocation, Resource Consents

Date:

28 November 2019

Technical memo – Specialist Input Unit

To:	Richard Blakey, Consultant Planner – North West Resource Consents Tracey Grant, Principal Project Lead – Premium Resource Consents
From:	Hillary Johnston and Jack Turner, Consultant Specialists – Stormwater, Wastewater and Industrial Trade Activities, Specialist Input Unit
Date:	29 November 2019

1.0 APPLICATION DESCRIPTION

Application and property details

Applicant's name:	Watercare Services Limited
Application number:	BUN60339273 – <i>bundled consent reference</i> LUC60339274 – <i>regional land use consent</i> DIS60339441 – <i>water and discharge permit (stormwater)</i>
Activity type:	Diversion and Discharge of Stormwater Stormwater Management – Flow
Purpose description:	To divert and discharge stormwater from new impervious areas greater than 5,000m ² associated with the construction of a replacement water treatment plant and two reservoirs. To construct more than 50m ² of new impervious area within a Stormwater management area control – Flow 1 (SMAF 1) area.
Site address:	Woodlands Park Road, Waima

2.0 BACKGROUND, PROPOSAL, SITE AND LOCALITY DESCRIPTION

2.1 Background

Watercare Services Limited (WSL) currently operates a water treatment plant on Woodlands Park Road, Waima. Water from the Upper and Lower Huia Dams and the Upper and Lower Nihotupu Dams is treated through the plant before being distributed through the water supply network around Auckland. The existing plant is more than 90 years old and is nearing the end of its operational life. The existing plant treats approximately 20% of Auckland's water supply.

A new water treatment plant is proposed to replace the existing plant and to provide increased efficiencies in production capacity. The volume proposed to be treated from the dams is not able to be increased and therefore the production capacity is not

proposed to be increased.

The land on which the new water treatment plant (WTP) is proposed is subject to an existing designation by WSL – being Designation 9324 for Water Supply Purposes. WSL now seek regional-level resource consents under the Auckland Unitary Plan: Operative in Part (AUP) to accompany and enable the construction and operation of the proposed replacement WTP. Resource consents sought include earthworks and vegetation removal within a significant ecological area, reclamation and diversion of a watercourse, dewatering and diversion of groundwater and disturbance of contaminated land. The focus of this memo and assessment is the stormwater-related consents being the diversion and discharge of stormwater and the development of new, or redevelopment of existing impervious area within a SMAF-1 area.

2.2 Proposal relevant to this permit/consent only

The proposal includes a new replacement water treatment plant located in an area between Manuka Road, Woodlands Park Road and Scenic Drive, two new 25 mega-litre (ML) treated water reservoirs on either side of Woodlands Park Road, and ancillary structures across these areas.

Reservoir 1 is proposed to be mostly buried and will be located on the northern side of Woodlands Park Road. Reservoir 2 will be constructed on the existing water treatment plant site once the existing plant has been decommissioned.

The application is based on an indicative plant layout which allows for the maximum extent of impervious areas that may be required – refer to Figure 1. The intent is to provide flexibility and opportunities for innovation through a future detailed plant and reservoir design process, and the proposed indicative layout represents a theoretical worst-case scenario, at least in respect of stormwater management outcomes.



Figure 1. General Overview Plan – GHD (October 2018)

Stormwater runoff from the development will discharge through one of two catchments. The York Gully Stream catchment is located towards the south-east of the proposed WTP, on the east side of Manuka Road. The Armstrong Gully Stream Catchment is located towards the south-west, adjacent to the existing plant and on the west side of Manuka Road. A permanent section of the Armstrong Gully Stream is located west of the proposed Reservoir 1 site on the north side of Woodlands Park Road, and is piped beneath the road and the existing WTP, before discharging to an open section of the stream to the south of the existing WTP site.

A full description of the proposal is provided in Section 4.0 of '*Application for Resource Consent, Huia Replacement Water Treatment Plant (WTP) Project, Woodlands Park Road, Waima*' dated May 2019 and prepared by Tonkin and Taylor, hereby referred to as the Application Report or AEE.

A full description of the proposed stormwater management for the site is included within Section 5 of '*Huia Replacement Water Treatment Plant and Reservoirs, Woodlands Park Road Stormwater and Erosion and Sediment Control Report*' dated July 2019 and prepared by Cook Costello hereby referred to as the Stormwater Report.

The total new impervious area associated with the project has been estimated at approximately 3.758 hectares (ha) – or 37,580m². Of this, approximately 2.25ha would be on the proposed WTP site (east of Manuka Road), 0.88ha on the Reservoir 1 site (north of Woodlands Park Road), and 0.62ha on the Reservoir 2 site (adjacent to the existing WTP site).

In brief, the proposed stormwater management approach for the project includes:

- A standard reticulated/piped stormwater network within the development to collect and convey flows up to the 10-year ARI event to the York and Armstrong Stream catchments.
- Stormwater runoff from the roofs of the proposed water treatment (indicatively including Dissolved Air Flotation (DAF) and Biologically Activated Carbon Filter (BAC) systems) and administration buildings will be collected and recycled into the proposed WTP, for reuse and contributing to the water supply network.
- Peak flow attenuation of post-development stormwater flows to match pre-development levels for up to the 100-year ARI storm event to mitigate any potential change in flood effects or hazards downstream of the site.
- The existing off-stream dry pond within the existing WTP site would continue to be utilised to provide peak flow attenuation of large storm events. In addition, the pond will be modified to achieve hydrology mitigation in-line with AUP SMAF-1 requirements and in the form of detention and retention (via infiltration to ground through the base of the pond).

- A new off-stream dry pond is proposed on the eastern side of the proposed WTP site. The new dry pond will mimic the existing and proposed functionality of the existing/modified dry pond and would achieve peak flow attenuation and hydrology mitigation outcomes.
- All trafficked impervious areas are proposed to be treated by Stormwater360 StormFilter or similar proprietary devices.
- The proposed development would rely on two stormwater outfalls and discharge points; one to the York Gully and one to the Armstrong Gully. The Armstrong Gully outfall to the Armstrong Stream is existing, and a new outfall to the York Stream would be constructed.
- The applicant's engineer has also considered the use of living roofs for Reservoir 1 and Reservoir 2, although this is yet to be formally included as part of the proposal.
- Existing overland flow paths are proposed to be diverted around the development where required and would follow proposed accessways before discharging into the proposed and existing dry ponds.
- Maintenance of the proposed stormwater devices for the project will be undertaken by WSL as the Consent Holder, and once detailed design of the devices has been confirmed, a specific operation and maintenance plan will be developed.

2.3 Site description

The development is proposed across three sites which are designated for Water Supply Purposes and are owned by WSL, as indicated on [Figure 2](#).

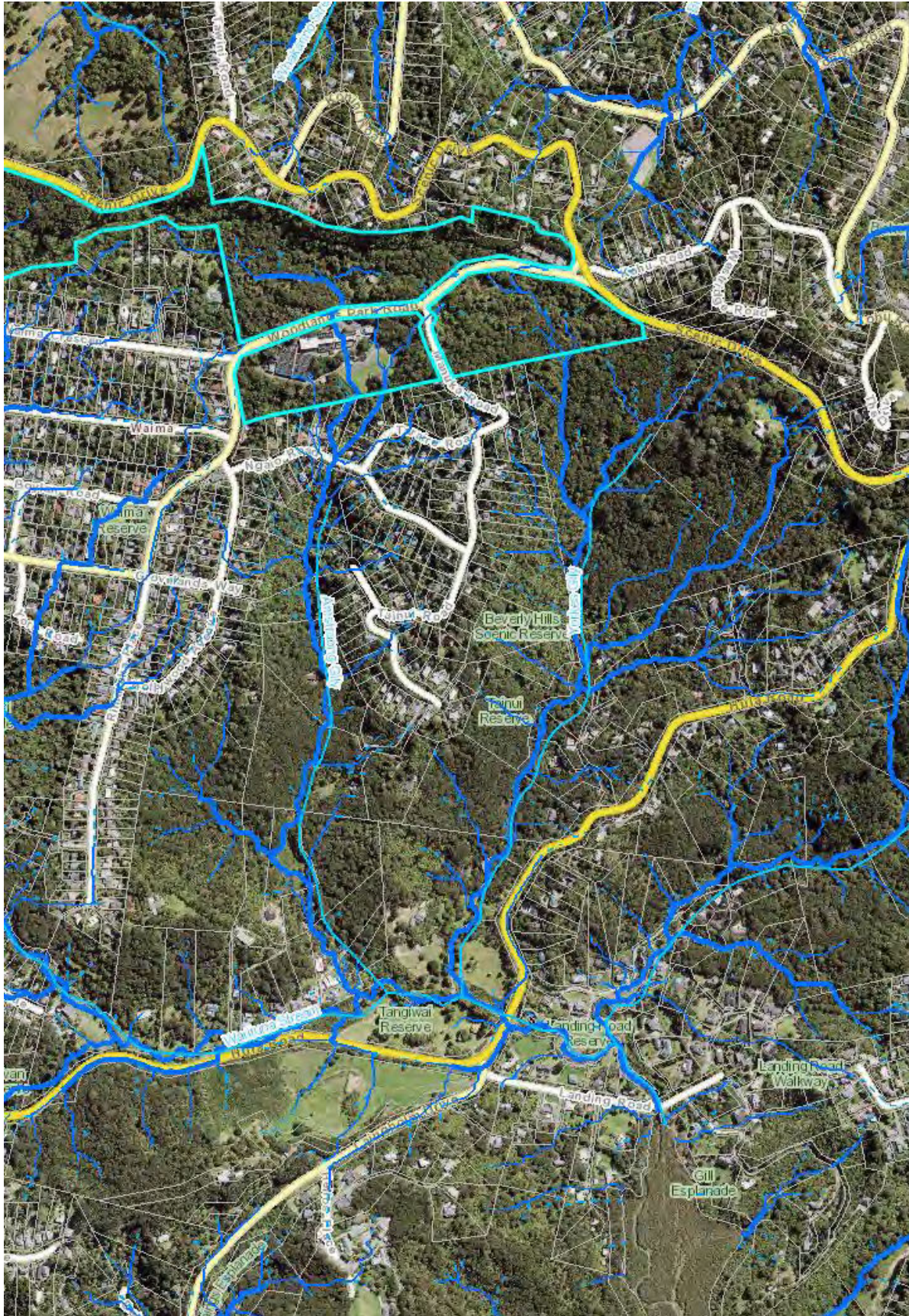


Figure 2. Site location (Auckland Council GeoMaps)

The Applicant's Agent has provided a description of the site and associated receiving environment in Section 3.0 of the Application Report and has provided a description of the existing stormwater management in Section 4.0 of the Stormwater Report. In brief:

- The total combined site area is 15ha, and of this the total development site area is 4.3ha.
- The immediate surrounding area includes native bush and existing large lot residential development. Woodlands Park Road divides the existing WTP from the Reservoir 1 site. Manuka Road is located between the proposed WTP and the existing WTP/Reservoir 2 site.
- The development is within the *Open Space – Conservation Zone* and is within a 'SMAF 1' overlay under the Auckland Unitary Plan: Operative in Part (AUP).
- As discussed in Section 2.2 above, stormwater runoff from the development would discharge to one of two catchments – the York Gully or the Armstrong Gully. These catchments are representative of those within the urban extents of the Waitakere Ranges, with moderate to steep topography dominated by regenerating native bush and low overall impervious area coverages.
- The streams within these catchments flow to the south before connecting into the Warituna Stream within Tangiwai Reserve. The Warituna Stream meanders approximately 500m to the south and east before discharging to Little Muddy Creek and the Manukau Harbour.

2.4 Existing consents

WSL holds an existing consent to discharge stormwater runoff from the existing WTP site to the Armstrong Gully (Permit no. 26979). The existing consent limits stormwater discharges from the site to 0.25m³/s in the 1 in 20-year event. WSL are seeking to replace this permit as part of this application but seek to maintain compliance with the identified limits of this consent.

3.0 REASON FOR CONSENT

3.1 Reasons for consent

Auckland Unitary Plan – Operative in Part

Section E8 – Diversion and discharge (water and discharge permits)

Consent is sought for the diversion and discharge of stormwater as a **Discretionary Activity** under rule E8.4.1.(A10). The proposal includes the creation of more than 5,000m² of impervious area and is not otherwise provided for by other rules in E8 of the activity table.

Section E10 – Stormwater management area - flow (regional land use consent)

Consent is required under Section E10 for the development of impervious areas within a SMAF 1 area. Whilst not specifically included in the reasons for consent listed within the AEE, ongoing discussions with the Applicant's Agent has established that this omission was in error, and that consent is indeed sought under this Section of the AUP. For the avoidance of doubt, WSL has sought consent within the AEE under any rules which may be applicable even if not specifically noted.

Consent is required under rule E10.4.1.(A3) of this Section as a **Restricted Discretionary Activity** for the development of new or redevelopment of existing impervious area greater than 50m² within a SMAF area which complies with the relevant standard E10.6.4.1.

3.2 Other activities considered

Section E7 – Taking, using, damming and diversion of water and drilling
(various regional-level provisions)

The embankment of the proposed dry pond (as conceptually designed at this point) would have a height of 3.5m. The dry pond is a structure which would impound surface water and is therefore considered to meet the definition of a *Dam* under Chapter J the AUP. An assessment of the dry pond against the relevant damming provisions of Section E7 for off-stream dams has been provided within Appendix O of the Application Report.

The proposed dry pond is a **Permitted Activity** under rule E7.4.1.(A29) for off-stream dams. This remains subject to detailed design, but the primary design parameters such as catchment area, maximum storage volume and dam embankment height have been demonstrated to comply with the relevant permitted activity standards.

Section E9 – High contaminant generating activities (regional land use controls)

The proposal does not include a *High contaminant generating carpark* or a *High use road* by definition under Chapter J of the AUP. Consent is hence not required under E9 as the proposal does not include the development of new, or redevelopment of existing impervious area associated with a *High use road* or a *High contaminant generating carpark*.

Section E36 – Natural hazards and flooding (district land use controls)

This section of the AUP includes a framework of district-level land use provisions to control the risks of natural hazards (including flooding and overland flows) on development. However, in this case the existing WSL designation for the land precludes these district-level controls. A future Outline Plan of Works would need to address the risks of natural hazards in detail. For completeness, we have addressed overland flow paths where these relate to on-site stormwater management.

4.0 TECHNICAL ASSESSMENT OF EFFECTS

4.1 Assessment of effects on the environment

The assessment summarised through this report focusses on matters relevant to the regional stormwater framework under the Auckland Unitary Plan and should be read in conjunction with separate Development Engineering reporting, which addresses other detailed matters including pipe and culvert capacities, and downstream network availability. In summary, the following effects and proposed measures have been identified relative to the proposed stormwater management regime. The proposal is summarised on drawing reference C400 - Rev C – *Drainage Plan Overall* and C455 – Rev D *Water Quality and Overland Flow Paths* appended to the Stormwater Report, highlighting the existing and proposed dry ponds and their respective catchment areas.

Stormwater Quality

Runoff from the new trafficked impervious areas has potential to contain vehicle-derived contaminants (e.g. zinc and copper from tyre and break wear). Impervious areas also have the potential to increase water temperature of the downstream receiving environment.

In this case, the potential for high-contaminant loads is limited by the low traffic numbers and limited vehicle movements around the facilities, together with the low speed environment required on site. Nevertheless, the Applicant's Agent has proposed to mitigate this by providing water quality treatment through the use of proprietary filtration devices, namely the Stormwater360 StormFilter device.

Due to restricted space available to accommodate stormwater quality treatment devices (without further vegetation removal), and lower expected intensity of vehicle movements around the plant, stormwater quality treatment by means of a Stormwater360 StormFilter is proposed. The StormFilter device is recognised by Auckland Council to provide contaminant removal in accordance with the objectives of GD01 Auckland Council's latest best practice guideline for stormwater management – Guideline Document 2017/001 Version 1, *Stormwater Management Devices in the Auckland Region*, December 2017.

The Stormwater360 StormFilter device is considered appropriate for managing the contaminant load and character commonly associated with runoff from trafficked impervious areas – principally higher sediment loads, heavy metals, and traces of hydrocarbon contaminants. Further, the below-ground and covered nature of StormFilter devices ensures that the device themselves do not contribute to increased water temperatures (in contrast with wetlands and wet ponds). This covered environment would also mitigate increased temperatures as a result of the impervious areas; although not to the same degree as a bioretention system. The proposed dry ponds (as opposed to wet ponds) and in particular the retention function will also

provide mitigation of increased water temperatures.

Two Stormwater360 StormFilters devices have been proposed to treat stormwater runoff from the trafficked impervious area within the new WTP site. A preliminary device cross section was provided with the Stormwater Report. Proprietary filter devices require peak flow diversion to ensure that the device provides 'offline' stormwater quality treatment to reduce the potential for resuspension. A peak flow diversion weir has been proposed to ensure high flow bypasses the StormFilter and that it is 'offline' as required by the Auckland Council Proprietary Device Approval Report for the device.

The reservoir sites will include access tracks however these will be used infrequently and as such, treatment of the access tracks has not been proposed. Due to the low expected intensity and negligible level of contaminants from the access tracks, the omission of stormwater treatment from these areas is considered appropriate.

The Stormwater Report submitted in support of the application and further information provided as part of the s92 process includes an analysis of alternative options of the different management devices considered for the project and identifies that proprietary devices are the best overall solution. The analysis provided is considered reasonable in the context of the site restrictions and sensitivity of the surrounding environment.

The proposed approach to stormwater quality treatment is appropriate in the site and project context, and the water quality-related effects of stormwater discharging to the receiving environments are likely to be adequately mitigated.

Stormwater Quantity

Increased runoff and hydrological changes from development or redevelopment of impervious areas can have an impact on the morphology and aquatic habitat in downstream freshwater environments, as well as have an impact on existing and future flood hazards. This is acknowledged through the AUP, and Section E8 and E10 include measures to address these impacts.

Discharges of stormwater from the proposed development will be directed to stream receiving environments within a SMAF area which is managed under the AUP Section E10 rule framework. Hydrology mitigation in accordance with Table E10.6.3.1.1 is required under standard E10.6.4.1.(1), which specifies the following mitigation for a SMAF 1 area – targeting smaller and high frequency rainfall events:

- *Provide retention (volume reduction) of at least 5mm runoff depth for the impervious area for which hydrology mitigation is required; and*
- *Provide detention (temporary storage) and a drain down period of 24 hours for the difference between the predevelopment and post-development runoff volumes from the 95th percentile, 24 hour rainfall event minus the 5 mm*

retention volume or any greater retention volume that is achieved, over the impervious area for which hydrology mitigation is required.

Standard E10.6.4.1.(1)(a) clarifies that where new or redeveloped impervious area is less than 50 per cent of the total site area, stormwater runoff from only the new or redeveloped impervious area must be managed to achieve the required hydrology mitigation. As the total proposed impervious area is approximately 3.758ha and the total site area is 15ha (approximately 25%), hydrology mitigation is required for only the new or redeveloped impervious areas.

The applicant has proposed to achieve the required retention and detention within the existing and proposed dry ponds. The dry ponds will achieve hydrology mitigation outcomes in line with the specified requirements of the AUP – i.e. to achieve the equivalent of ‘SMAF-1’ requirements under Table E10.6.3.1.1.

Retention

The total required retention volume across the three sites is detailed within Table 11 of the Stormwater Report as 188m³.

The Applicant’s Agent has proposed to achieve 29m³ of the required retention volume via water reuse and recycling of stormwater runoff from the roofs of the treatment systems and administration building back into the WTP.

Through the further information process (RMA Section 92), clarification was sought regarding how much of the required retention volume could be achieved as infiltration to ground through the base of the existing and proposed dry pond. The Applicant’s Agent has clarified that the existing pond, with a base area of 1,633m² would be able to achieve the required retention volume associated with the new/redeveloped impervious areas within the pond’s contributing catchment via infiltration to ground (conservatively assuming an infiltration rate of 60mm/day). Conversely, the Applicant’s Agent has predicted that the new pond, with a base area of 64.8m² would not be able to achieve the required retention volume (again, associated with this pond’s contributing catchment). The Applicant’s Agent has further clarified that only 4m³ of the required retention volume would be achieved via infiltration to ground through the base of the new dry pond (being 113m³ for the pond’s contributing catchment).

Noting the requirements of Table E10.6.3.1.1(2)(a) and (b), the remaining retention volume of 66m³ cannot be redirected to the WTP for reuse as a portion of this comprises of runoff from trafficked impervious area which is unsuitable for recycling back into the WTP. Further, the Applicant’s Agent has explained that there is unlikely to be any areas on the site of sufficient size to accommodate all required infiltration to ground that is free of other constraints. In accordance with E10.6.3.1.1.(2)(c) the remaining retention volume is instead proposed to be substituted as additional detention within the new dry pond. This approach is appropriate in the circumstances.

Although not formally included as part of the application, should the reservoir roofs be designed to include 'living roofs', the Applicant's Agent has estimated that up to a further 73m³ of retention for each reservoir would be achieved. This approach is strongly encouraged and may provide dual-purposed mitigation for the project – not only providing hydrology mitigation, but also providing habitat and mitigation of aesthetic or amenity effects.

GD01 considers both living roofs and dry ponds as effective mitigation devices for reducing the effects of an increase in water temperature of stormwater runoff, particularly as they achieve a retention function as part of the design. Auckland Council's current best practice guideline on stormwater contaminant and volume management – TR2013/035 (*Auckland Unitary Plan stormwater management provisions: Technical basis of contaminant and volume management requirements*) further describes that infiltration of runoff to underlying soil allows the temperature to balance with lower groundwater temperatures and highlights the loss of heat achieved by evapotranspiration due to the energy required to transfer water from a liquid form to a gas form. Whilst the proposed dry pond would not achieve the total required retention volume, it is considered that both the existing and proposed dry ponds will achieve positive effects on water temperature prior to the discharge of stormwater runoff to the stream receiving environments.

Detention

The Applicant's Agent has clarified that the existing dry pond has a storage volume of 4,500m³. The new dry pond would have a total storage volume of 426m³. The existing dry pond would receive stormwater runoff from both of the reservoir sites as well as a portion of the proposed WTP site. The proposed dry pond will receive stormwater runoff from the new WTP site only.

The outlet of the existing pond has sufficient control to attenuate larger / lower frequency storm events; however it has not currently been designed to provide detention of smaller events, such as the 95th percentile storm event. As such, the outlet of the existing pond would be retrofitted to achieve the required detention hydrology mitigation. In tandem, the outlet of the proposed pond will be designed with a low flow orifice to achieve the required detention hydrology mitigation.

It is intended that the overall hydrology mitigation approach will comply with Table E10.6.3.1.1 (noting the exclusions under E10.6.3.1.1.(2) as described above). Whilst preliminary design details have demonstrated this is feasible at the site, the proposed conditions will ensure that this designed standard is realised through a future detailed design phase.

Overall, the approach to managing stormwater quantity effects in respect of hydrology mitigation is appropriate in the site and project context. Any potential effects in this regard will likely be appropriately mitigated.

Natural Hazards and Flooding

Overland flow paths

The existing indicative overland flow paths are shown within [Figure 2](#) above. An overland flow path is identified through the middle of the proposed WTP site discharging to a tributary of the York Gully to the south. Existing overland flow paths are also indicated in the general location of the proposed Reservoir 1 and as crossing through the existing WTP. Overland flow through the existing WTP is conveyed to the existing dry pond by the site accessways before discharging to the Armstrong Gully Stream via the existing outfall.

The Auckland Council Stormwater Code of Practice requires overland flow paths to be managed up to the 100-year ARI storm event. It is proposed to divert overland flow paths to the existing and proposed dry ponds, which are intended to provide attenuation of up to the 100-year ARI storm event. The applicant's agent has proposed to divert the overland flow paths to the ponds through the proposed accessways.

The entry and exit points of the overland flow paths would remain largely unchanged and will be attenuated via the proposed and existing dry ponds. Any effects resulting from the diversion of the existing overland flow paths within the site can be adequately mitigated.

Flooding

Attenuation of larger and less frequent storm events (including, 10-year and 100-year ARI events) to pre-development levels has also been proposed through the existing and proposed dry ponds. This approach balances the post-development flow rates associated with the contributing catchments to each dry pond back to the pre-development levels experienced at the discharge points from the ponds. These measures would mitigate the potential for increases in existing flood hazards and associated risks in the Armstrong Gully and York Gully catchments. This approach is in-line with the recommendations within GD01.

In the context of the Huia WTP project, the existing and proposed dry ponds discharge to tributaries of the Warituna Stream which flow to Little Muddy Creek, both of which are widely recognised as unique and sensitive receiving environments.

Auckland Council GeoMaps identifies that there are indicative existing flood hazards downstream of the site, at the bottom of the wider Warituna Catchment near the Landing Road Reserve, associated with existing residential properties and an existing road bridge over the Warituna Stream channel on Landing Road (Figure 3). The proposed approach for large storm peak flow attenuation within the existing and proposed dry ponds is hence an appropriate response for discharges to the York Gully and Armstrong Gully sub-catchments, mitigating the potential for increased flood-related hazards downstream. The location of the site in the upper-most reaches of these catchments further ensures the effectiveness of this approach (avoiding the potential for timing issues with the attenuation and longer-duration of pre-

development discharge flow rates).

Overall, the approach to managing stormwater effects in respect of natural hazards and downstream flood-related risk is appropriate in the site and project context. Any potential effects in this regard can be appropriately mitigated.



Figure 3. Existing Flood Hazards (Auckland Council GeoMaps)

Outfalls

The outfall system from the existing dry pond on the existing WTP site discharges stormwater to Armstrong Gully. This system restricts the pond and site discharges to 0.25m³/s in the 1 in 20-year event. The existing outfall from the pond is regularly monitored and maintained as necessary, and it remains in sound condition without causing any existing point-source erosion issues. This outfall is not proposed to be altered as part of the development and would continue to be monitored.

The outfall proposed from the new dry pond to York Gully is conceptually based on a standard wingwall outlet with rock riprap erosion protection. Preliminary design

details have been provided, with the outfall design and sizing to be confirmed following the finalisation of the layout of the replacement WTP. Conditions that have been proposed will require the new outfall to be designed in accordance with Auckland Council's current best practice outfall design guideline – TR2013/018 (*Hydraulic Energy Management: Inlet and Outlet Design for Treatment Devices*). This would minimise erosion potential at the discharge point.

There is also potential for 'green' outfall designs to be considered during detailed design phase to reduce the impact of engineered structures within a sensitive receiving environment. The Applicant's Agent has clarified through the s92 process that the potential for an improved, more ecologically sympathetic outfall design could be considered at detailed design stage and that comments to this effect from an ecologist could also be provided at this stage. Consideration should be given to 'green' outfall designs as opposed to the standard wingwall outfall currently proposed. A condition to this effect including a supporting ecological impact assessment regarding the new outfall and including an investigation of alternative design solutions has been recommended.

Operation and Maintenance

Maintenance of the proposed stormwater devices for the project will be undertaken by WSL as the Consent Holder, and once detailed design of the devices has been confirmed, a specific operation and maintenance plan will be developed.

Several proprietary treatment devices have been implemented in similar areas of the Waitakere Ranges, and the natural debris loads from bush catchments can lead to higher than expected maintenance frequencies. The functionality of such devices can be maintained long-term, but this is dependent on a regular and often high-frequency maintenance regime.

Consent conditions to address the above matters have been recommended.

Conclusion

Overall, the conclusions reached through the application documents and summarised in the Stormwater Report (dated 15 July 2019) are generally agreed with and supported:

“Stormwater flows from the development enter either the Armstrong Gully catchment or the Yorke Gully catchment. To manage the increase in flow from the proposed development, stormwater runoff volumes will be managed and maintained at predevelopment levels in all assessed storm events up to a 1 in 100 year event. The attenuation of flows shall be achieved by controlling the discharge from two online stormwater management structures; one within each catchment. Both catchments will utilise a dry pond to attenuate the required discharge volume in order to maintain predevelopment flows.

Water quality shall be provided to catchments that require treatment through the

installation of appropriately sized proprietary devices, which through our assessment of treatment options provides the best practicable option in achieving water quality objectives.

In conclusion having assessed the existing site and the proposed development, we consider the construction and ongoing effects resulting from the earthworks operations and stormwater management, can be avoided or mitigated through the appropriate use of site management and physical controls.”

As outlined above, potential effects resulting from the diversion and discharge of stormwater from new and redeveloped impervious area within a SMAF area will be suitably mitigated. The current (conceptual) proposal is generally appropriate in respect of stormwater outcomes and in the context of this site, receiving environments and existing infrastructure and site constraints.

4.2 Submissions

Submissions were received in respect of stormwater matters associated with the project. These are summarised and commented on as follows:

General

- A number of submissions raised issues with increased flooding or flood risk within the catchment as a result of the proposed development (4868, 4871, 5020, 5206, 5242). In order to mitigate any potential impacts of impacts on flooding or flood risk, the Applicant’s Agent has proposed to attenuate the larger and less frequent storm events (including, 10-year and 100-year ARI events) to pre-development levels. It is proposed to achieve this through the use of the existing and proposed dry ponds. The approach to managing downstream flood-related risk is appropriate in the site and project context, and in-line with Council’s best practice guidelines (including GD01). Any potential effects in this regard will likely be appropriately mitigated.
- Submissions 4868, 4871, 5004, 5020, 5206, 5242 raised concerns around potential impacts on in-stream ecology and riparian habitat as a result of the changes in hydrology of the downstream environment as a result of the proposed associated increase in impervious area. Section E10 of the AUP seeks to protect and enhance stream and aquatic biodiversity by minimising or mitigating the effects of increases in flow rate and volume may have on receiving waters. This section of the AUP recognises the above and seeks to manage stormwater runoff to minimise potential adverse effects through hydrology mitigation. The Applicant’s Agent has proposed to achieve hydrology mitigation in accordance with the relevant standards within this section. The Applicant’s Agent has demonstrated that the proposed methods of achieving hydrology mitigation will be achievable at the site however this is subject to detailed design. Conditions recommended will ensure the objectives of the design to achieve these standards is realised.

- Submissions 5020 and 5032 raise concerns regarding the quality of stormwater runoff from the proposed development. The Applicant's Agent has proposed to mitigate this by providing water quality treatment of all trafficked impervious area through the use of proprietary filtration devices, namely the Stormwater360 StormFilter device. The proposed approach to stormwater quality treatment is appropriate in the site and project context, and the water quality-related effects of stormwater discharging to the receiving environments will be adequately mitigated.

Specific

- **Forest and Bird** (Nick Beveridge - 5032) – The Organisation has raised specific concerns about two stormwater conditions proposed by the Applicant's Agent being Condition 39 and Condition 40 (now recommended Condition 41). With respect to proposed Condition 39, the Organisation have raised that the Condition lacks certainty for requiring additional stormwater treatment measures and onsite retention. The Organisation also highlights that additional requirements which achieve stormwater quality benefits for the project should be set out as an enforceable condition of consent. Regarding the comments around provision for retention, it is agreed that the proposed conditions of consent should seek to ensure this as proposed by the Applicant's Agent. Amendments to the proposed Condition 39 in this regard have been recommended. Additionally, with reference to 'additional requirements', the proposed approach to stormwater management is considered appropriate in the site and project context, and any potential effects will be adequately avoided and suitably mitigated. Further mitigation, additional to what has been proposed, is not considered necessary in determining this conclusion and therefore may not require further attention via a specific condition of consent. With respect to proposed Condition 40 (now recommended Condition 41), this Condition is a standard condition imposed by Council on most diversion and discharge consents. The intent of this Condition is to allow for minor modifications to the stormwater management system. Amendments to this Condition, including an advice note which clarifies the intention of the Condition have been recommended.
- **Waima and Woodlands Park Residents & Ratepayers Association** (Steven Westwood - 5242) – The Community Group has raised specific concerns regarding hydrological changes and impacts associated with the diversion of stormwater away from watercourses and other related matters. During the s92 process, clarification was sought regarding whether the proposal included any post-development catchment diversions. Catchment boundaries are shown on drawings C450, C451, C452, which confirm that the proposed boundaries are largely consistent with the existing. The Applicant's Agent has also clarified that the existing catchment flows are replicated post development for events up to the 100-year ARI storm. Together with water quality and hydrological mitigation, the overall proposed stormwater regime is representative of current best practice to mitigate the impacts of new and

redeveloped impervious surfaces.

- Little Muddy Creek Estuary Rehabilitation Project** (Megan Fritter - 5261) - The Organisation has sought clarification on the methodology used to determine climate change rainfall adjustments. The Applicant's Agent has adopted current best practice in this regard, as promoted by guidelines prepared by the Ministry for the Environment (MfE), and as adopted by relevant Auckland Council guidelines (including the Stormwater Code of Practice). At present, account for climate change in respect of stormwater management is primarily managed through a percentage-based increase of rainfall intensities relative to different event frequencies; and the Applicant's Agent has adopted this approach (in accordance with the guidelines) for the conceptual design of their stormwater management devices. The submitter has also requested that permeable paving is used through the development. The options analysis provided within the Stormwater Report, and built on within the s92 response information, has assessed alternative device options against the Best Practicable Option criteria outline within the RMA and has concluded that treatment by means of proprietary filtration is the preferred option. Permeable paving was specifically ruled out as a viable option for the proposed WTP due to the long-term, high frequency of inspections required to prevent clogging and maintain permeability and due to its limited water quality treatment performance. These device limitations are further recognised within GD01. The submitter has requested that the length of the maintenance contract is extended to a minimum of 50 years. The maximum term of consent under the RMA for the diversion and discharge of stormwater is 35 years; hence providing an upper-limit constraint for any associated consent conditions.

4.3 Conditions

Stormwater works

The stormwater works proposed in this application to avoid, remedy or mitigate the identified actual or potential adverse effects associated with the diversion and discharge of stormwater from the activity, have been designed to minimise the impact of increased impervious areas. These works are outlined in the proposed conditions of consent. Modifications have been suggested to the proposed design objectives to better reflect the proposed outcomes of the stormwater management proposed.

Minor modifications to any part of the stormwater management system (assessed as part of this application) which do not alter the capacity or performance of the stormwater management system, may be undertaken without requiring a full variation to the consent. A proposed condition of consent provides for minor modifications when information confirming the extent of the changes is also provided at the time of the request. The modification must be verified by Council.

Operation and maintenance

Ongoing maintenance of the proposed devices is crucial to ensuring that the effects continue to be mitigated. An Operation and Maintenance Plan was not included in the application. Conditions requiring an Operation and Maintenance Plan to be provided and adhered to have been suggested, and a monitoring report condition is suggested, detailing maintenance and inspections undertaken in a given period.

Construction meetings and plans

Conditions are suggested requiring pre and post construction meetings as well as as-built plans to be submitted. This will ensure that the works are carried out in accordance with the plans and allows the opportunity for Council Officers to discuss any changes on site and have them documented.

5.0 STATUTORY CONSIDERATIONS

5.1 Objectives and policies

The following provisions of the AUP relate to the management of stormwater.

- Objectives - E1.2.(1)-(3), E10.2.(1)
- Policies - E1.3.(1)-(6), E1.3.(8)-(11), E1.3.(13)-(14), E2.3.(22), E10.3.(1)-(3)

In general terms, the proposal will achieve the above objectives and policies through the proposed stormwater management systems which can be considered to be representative of the Best Practicable Option for the development. Policies E1.3.(8) and E1.3.(9) are of particular relevance for this application – policies which promote development and redevelopment to include measures to reduce and minimise contaminants and to minimise or mitigate changes in hydrology including loss of infiltration. The proposed stormwater management includes stormwater quality treatment for all trafficked impervious areas noting that these are not considered high contaminant generating car parks or high use roads, whilst also recognising the sensitivity of the receiving environment. Further, the proposal includes infiltration of stormwater runoff to ground through the base of the proposed dry ponds.

The following general objectives and policies of the plan may also be relevant to the planner's assessment of the application:

- Chapter B7 Natural Resources – Auckland Regional Policy Statement

The proposal addresses the matters set out within the relevant policies and objectives of the AUP. Further, the proposed stormwater management regime addresses the potential effects of the development on the receiving environments as directed within the objectives and is generally consistent in this regard.

5.2 Other statutory documents

The following statutory documents are considered relevant to the planner's assessment of the application:

- National Policy Statement: Freshwater Management 2014
- New Zealand Coastal Policy Statement 2010
- Waitakere Ranges Heritage Area Act 2008

5.3 Matters relevant to discharge or coastal permits (Section 105) and restrictions on certain permits (Section 107)

The provisions of Section 105 have been met as it has been determined that there are no significant effects on the receiving environment as concluded in Section 4 of this memo. It has been assessed that the applicant's reasons for the proposed choice of stormwater management are appropriate in the circumstances and regard has been had to alternative methods of discharge applicable in this case.

Section 107(1) of the RMA places restrictions on the granting of certain discharge permits that would contravene Sections 15 or 15A of the RMA. The proposal will not give rise to any of the effects listed in Section 107(1).

5.4 Duration of consent: Section 123

Stormwater diversion and discharge

It is appropriate to set a term of **35 years** because the nature of the proposed activity is unlikely to alter during this period (as has been experienced through the existing WTP facility and associated stormwater consents), and the ongoing maintenance of the stormwater management systems as required by the recommended conditions of consent will ensure that the required standards continue to be met.

Stormwater management area - flow

Although it is usual practice to set a term of 35 years for stormwater diversion and discharge permits, regional land use consents for the development of new or redevelopment of existing impervious area, within a SMAF area, issued under s9(2) of the RMA and do not have a maximum term of consent.

6.0 CONDITIONS

The conditions proposed by the applicant are generally appropriate and are outlined in within both Appendix Q of the AEE and in Section 6.2 of the Stormwater Report. We have outlined several suggestions, including those to reflect current standard practice within a separate document.

7.0 REVIEW

Memo prepared by:

Hillary Johnston



Consultant Specialist - Stormwater, Wastewater and Industrial Trade Activities
Specialist Input, Resource Consents

Date:

29.11.2019

Jack Turner



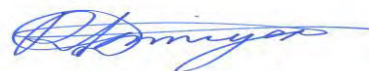
Consultant Specialist - Stormwater, Wastewater and Industrial Trade Activities
Specialist Input, Resource Consents

Date:

29.11.2019

Memo and technical review reviewed and approved for release by:

Rod Dissmeyer



Team Leader – Stormwater, Wastewater and Industrial Trade Activities
Specialist Input, Resource Consents

Date:

29th November 2019

8.0 DEFINITIONS

ARI	Average recurrence interval
AUP	Auckland Unitary Plan – Operative in Part
GD01	Auckland Council Guideline Document 2017/001, Version 1 – Stormwater Management Devices in the Auckland Region
RMA	Resource Management Act. 1991
SMAF	Stormwater Management Area Flow (as defined by the AUP)
TR2013/018	Auckland Council Technical Report 2013/018 – Hydraulic Energy Management: Inlet and Outlet Design for Treatment Devices
TR2013/035	Auckland Council Technical Report 2013/035 – Auckland Unitary Plan Stormwater Management Provisions: Technical Basis of Contaminant and Volume Management Requirements
WSL	Watercare Services Limited
WTP	Water treatment plant

BUN60339273 – *bundled consent reference*
 LUC60339274 – *regional land use consent*
 DIS60339441 – *water and discharge permit (stormwater)*

Attachment Q - Proposed Conditions

Deletions – ~~striketrough~~

Additions and amendments – underlined

Stormwater

X.37 The detailed design, including drawings, specification, design report and calculations for the stormwater management devices for each stage of the Project shall be submitted to Council for certification and at least 30 working days prior to initiation of construction of the devices for that stage. ~~Council should respond within 20 working days.~~

X.38 The Consent Holder shall ensure (through detailed design) that stormwater management devices are designed in accordance with ~~the~~ GD01: Stormwater Management Devices in the Auckland Region. The detailed design shall be constructed for the following catchment areas and design requirements, and shall be completed prior to discharges commencing from the site:

Works to be undertaken	Catchment area (ha)	Design requirements
Existing Dry Detention Pond	3.139	<p><u>Retention of at least 5mm runoff depth from impervious area.</u></p> <p>Detention of the 95th percentile storm (SMAF1) and slow release over a 24-hour period <u>minus the 5mm retention volume or any greater retention volume that is achieved from impervious area.</u></p> <p>Peak flow attenuation of the 10 year ARI storm event to predevelopment levels.</p> <p>Peak Flow discharge of the 100 year event to be attenuated or shown to only increase nominally from the predevelopment discharge.</p>
Proposed Dry Pond	1.224	<p><u>Retention of at least 5mm runoff depth from impervious area to the greatest extent practicable.</u></p> <p>Detention of the 95th percentile storm</p>

		<p>(SMAF1) and slow release over a 24-hour period <u>minus any retention volume that is achieved from impervious area, with remaining required retention volume substituted as additional detention.</u></p> <p>Peak flow attenuation of the 10 year ARI storm event to predevelopment levels.</p> <p>Flow discharge of the 100 year event to be attenuated or shown to only increase nominally from the predevelopment discharge.</p>
Roof material	All	Inert materials only and no exposed unpainted metal surfaces.
Stormwater outfalls	Varies	Erosion protection measures in accordance with TR2013/018 or higher standard
Proprietary Devices	Varies	Water Quality treatment to all Heavy Contaminant Generating Activity (HCGA) areas <u>of all trafficked impervious area</u> in accordance with GD01 or higher standard.

X.39 A final site plan with stormwater management features and supporting calculations shall be provided to the Council for certification prior to the commencement of works. The final site plan must give due consideration to additional stormwater treatment measures that achieve stormwater quality benefits for the Project Site. Consideration shall be given to providing living roofs on one or both of the reservoirs in accordance with Auckland Council's GD01.

X.40 During detailed design, potential for design improvements for the proposed York Gully Outfall shall be considered. An assessment of potential design improvements including a supporting ecological impact assessment regarding the new outfall, and including an investigation of alternative design solutions shall be provided to the Council prior to lodgement of Building Consent.

X.41 In the event that any modifications to the stormwater management system are required, that will not result in an application pursuant to Section 127 of the RMA the following information shall be provided:

- (a) Plans and drawings outlining the details of the modifications; and
- (b) Supporting information that details how the proposal does not affect the capacity or performance of the stormwater management system.

All information shall be submitted to and approved by the Council prior to implementation.

Advice Note:

All proposed changes must be discussed with the Council, prior to implementation. Any changes to the proposal which will affect the capacity or performance of the stormwater management system will require an application to Council pursuant to Section 127 of the RMA. An example of a minor modification can be a change to the location of a pipe or slight changes to the site layout. If there is a change of device type, the consent will have to be varied under s127 of the RMA.

Construction meetings

X.42 A pre-construction meeting shall be held by the consent holder, prior to commencement of the construction of any stormwater devices onsite, that:

- a) Is arranged five working days prior to initiation of the construction of any stormwater devices on the site;
- b) Is located on the subject area;
- c) Includes representation from the Council; and includes representation from the site stormwater engineer, contractors who will undertake the works and any other relevant parties.

X.43 The following information shall be made available prior to, or at the pre-construction meeting:

- a) Timeframes for key stages of the works authorised under this consent;
- b) Contact details of the site contractor and site stormwater engineer; and
- c) Construction plans, including design details of the stormwater tanks, approved (signed/stamped) by an Auckland Council Development Engineer

X.44 A post-construction meeting shall be held by the consent holder, within 20 working days of completion of the stormwater management works, that:

- a) Is located on the subject area;
- b) Includes representation from the Council; and
- c) Includes representation from the site stormwater engineer, contractors who have undertaken the works and any other relevant parties.

Advice note:

To arrange the construction meetings required by this consent, please contact the Council on 09 301 0101 or monitoring@aucklandcouncil.govt.nz

Certification of stormwater management works (As-Built Plans)

- X.45** As-Built certification and plans of the stormwater management works, which are certified (signed) by a suitably qualified registered surveyor as a true record of the stormwater management system, shall be provided to the ~~Team Leader West Monitoring, Licensing & Regulatory Compliance, Auckland~~ Council for approval 5 days prior to the post-construction meeting required by this consent.
- X.46** The As-Built plans shall display the entirety of the stormwater management system, and shall include:
- a) The surveyed location (to the nearest 0.1m) and level (to the nearest 0.01m) of the stormwater management devices, with co-ordinates expressed in terms of NZTM and LINZ datum;
 - b) Plans and cross sections of all stormwater management devices, including confirmation of any storage volumes and levels of any outflow control structure;
 - c) Documentation of any discrepancies between the design plans and the As-Built plans approved by the Modifications Approval condition.

Operation and Maintenance Plan

- X.47** An Operation and Maintenance Plan shall be submitted to the ~~Team Leader West Monitoring, Licensing & Regulatory Compliance, Auckland~~ Council for approval 5 days prior to the post-construction meeting required by this consent.
- X.48** The Operation and Maintenance Plan shall set out how the stormwater management system is to be operated and maintained to ensure that adverse environmental effects are minimised. The plan shall include:
- a) Details of who will hold responsibility for long-term maintenance of the stormwater management system and the organisational structure which will support this process;
 - b) A programme for regular maintenance and inspection of the stormwater management system;
 - c) A programme for the collection and disposal of debris and sediment collected by the stormwater management devices or practices;
 - d) A programme for post storm inspection and maintenance;
 - e) General inspection checklists for all aspects of the stormwater management system, including visual checks; and
 - f) A copy of any current maintenance contract.

X.49 The stormwater management system shall be managed in accordance with the approved Operation and Maintenance Plan.

X.50 Any amendments or alterations to the Operation and Maintenance Plan shall be submitted to, and approved by the ~~Team Leader West Monitoring, Licensing &~~

~~Regulatory Compliance, Auckland Council~~ in writing prior to implementation.

X.51 The Operation and Maintenance Plan shall be updated and submitted to the ~~Team Leader West Monitoring, Licensing & Regulatory Compliance, Auckland Council~~ for approval, on request.

Specialist Maintenance Contract

X.52 A written maintenance contract for the on-going maintenance of the proprietary device(s) shall be entered into with an appropriate stormwater management system operator, prior to the operation of the proprietary stormwater management device(s). A written maintenance contract shall be in place and maintained for the duration of the consent.

Advice Note:

Due to the nature of the surrounding contributing area, being a dense bush catchment, a higher than typically anticipated maintenance frequency is expected. The maintenance frequency of the propriety devices shall be determined by the device loading and as recommended by the specialist maintenance provider.

X.53 A signed copy of the maintenance contract for the first three (3) years of operation shall be forwarded to the ~~Team Leader West Monitoring, Licensing & Regulatory Compliance, Auckland Council~~ 5 days prior to the post-construction meeting required by this consent.

X.54 A copy of the current maintenance contract shall be provided to the ~~Auckland Council~~ upon request throughout the duration of the consent.

Maintenance Report

X.55 Details of all inspections and maintenance for the stormwater management system, for the preceding three (3) years, shall be retained.

X.56 A maintenance report shall be provided to the ~~Team Leader West Monitoring, Licensing & Regulatory Compliance, Auckland Council~~ on request.

X.57 The maintenance report shall include the following information:

- a) Details of who is responsible for maintenance of the stormwater management system and the organisational structure supporting this process;
- b) Details of any maintenance undertaken; and
- c) Details of any inspections completed.

X.58 For stormwater flows in excess of the capacity of the primary drainage systems, overland flow paths shall be provided and maintained to allow surplus stormwater from critical storms (up to the 100 year ARI event), to discharge with the minimum of nuisance and damage to properties. Overland flow paths shall be kept free of all obstructions.



Huia Water Treatment Plan

Resource consent review

December 2019

flow

TRANSPORTATION SPECIALISTS

891

Project: Huia Water Treatment Plan
Title: Resource consent review
Document Reference: P:\ATSP Auckland Strategy and Policy\067 Resource Consent Reviews\068_Huia WTP, Woodlands Park Road\Reporting\R1A191209_Hearing report.docx
Prepared by: Mat Collins
Reviewed by: Lachlan Beban

Revisions:

Date	Status	Reference	Approved by	Initials
09 December 2019	ISSUED TO COUNCIL	R1A191209	L Beban	

The drawings, information and data recorded in this document (the information) are the property of Flow Transportation Specialists Ltd. This document and the information are solely for the use of the authorised recipient and this document may not be used, copied or reproduced in whole or part for any purpose other than that for which it was supplied by Flow Transportation Specialists Ltd. Flow Transportation Specialists Ltd makes no representation, undertakes no duty and accepts no responsibility to any third party who may use or rely upon this document or the information.

EXECUTIVE SUMMARY

Auckland Transport (AT) has requested Flow Transportation Specialists (Flow) to review the transportation matters associated with the resource consent application by Watercare Services Ltd (applicant) for the enabling works for the replacement of Huia Water Treatment Plant at Woodlands Park Drive, Waima.

Watercare proposes to construct a new Water Treatment Plant (WTP) to replace the aging Huia WTP, along with two treated water reservoirs (50ML total capacity) to provide additional treated water storage within the western supply zone. The site for the replacement WTP is located in close proximity to the existing Huia WTP, on the corner of Manuka Road and Woodlands Park Road on land owned by Watercare and designated for Water Supply Purposes (Designation 9324). One 25 ML treated water reservoir is to be located across from the replacement WTP on the northern side of Woodlands Park Road. Other than the most eastern extent of this reservoir, it will be entirely buried / below ground level. The NH2 valve chamber and tunnelling reception shaft will also be located within this site. The second 25 ML reservoir is to be constructed on the existing Huia WTP site once this plant is decommissioned. All of the structures are located on land designated for water supply purposes.

The proposal involves earthworks and vegetation removal, including in an SEA overlay, and stream works including the diversion and reclamation of a small length of intermittent stream. Resource consents are also sought for the diversion and discharge of groundwater and stormwater, and the disturbance of potentially contaminated land.

Land use activities, including the construction of the replacement WTP and reservoirs and associated traffic and noise effects do not form part of this application, and instead will be addressed through an outline plan of works (OPW) that Watercare will submit to Auckland Council as required under section 176A of the RMA in relation to its designation.

Flow and AT specialists raised the following transport matters as part of Section 92 information requests

- ◆ Restricting heavy vehicle movements around schools during peak pick up/drop off periods
- ◆ Compatibility of surrounding land uses on the proposed haulage routes
- ◆ The ability of the proposed haulage routes to accommodate heavy vehicle tracking
- ◆ Driver sight lines at the site access and the Woodlands Park Road/Scenic Drive intersection
- ◆ Control of spill over parking onto surrounding roads during the construction period
- ◆ Potential impacts on AT assets including pavements and slope stability on Scenic Drive

Over 500 submissions were received, many of which included transport matters. I have reviewed the submissions related to transport matters. A summary of key themes of the submissions is included in Section 5 of Auckland Council's transport review (prepared by Anatole Sergejew, dated 29 November 2019, attached as Appendix A to this report).

I consider that the matters raised in Section 92 queries and public submissions have been appropriately addressed by the applicant or can be addressed through the consent conditions and advice notes included in this report.

As part of my review I have worked closely with Anatole Sergejew (Auckland Council's transport expert) and support the content and conclusions of his summary report (attached as Appendix A), other than minor amendments as detailed in my report.

Should my recommended conditions of consent and advice notes be accepted, I would be satisfied that the proposed enabling works for the Huia Water Treatment Plan can be safely and efficiently provided for from a transportation perspective.

CONTENTS

1	SUMMARY OF THE PROPOSAL	4
2	PEER REVIEW OF TRANSPORT MATTERS	6
3	PUBLIC SUBMISSIONS.....	7
4	RECOMMENDATIONS.....	7
5	SUMMARY AND CONCLUSION	12

APPENDICES

APPENDIX A AUCKLAND COUNCIL TRANSPORT REPORT

APPENDIX B FLOW SECTION 92 REVIEW

1 SUMMARY OF THE PROPOSAL

Auckland Transport (AT) has requested Flow Transportation Specialists Limited (Flow) to review transportation matters regarding the resource consent application by Watercare Services Ltd (WSL) for the enabling works for the replacement of Huia Water Treatment Plant (WTP).

A summary of the site is provided in Table 1.

Table 1: Site summary

Site Address	Woodlands Park Road/Manuka Road, Waima (Titirangi)
Unitary Plan Zoning	Open Space – Conservation Zone, Designation 9324
Activity Proposed	Earthworks
Road Classification	Neither Woodlands Park Road nor Manuka Road are classified in the AUP-OIP.

Watercare proposes to construct a new WTP to replace the aging Huia WTP, along with two treated water reservoirs (50ML total capacity) to provide additional treated water storage within the western supply zone. The site for the replacement WTP is located in close proximity to the existing Huia WTP, on the corner of Manuka Road and Woodlands Park Road on land owned by Watercare and designated for Water Supply Purposes (Designation 9324). One 25 ML treated water reservoir is to be located across from the replacement WTP on the northern side of Woodlands Park Road. Other than the most eastern extent of this reservoir, it will be entirely buried / below ground level. The NH2 valve chamber and tunnelling reception shaft will also be located within this site. The second 25 ML reservoir is to be constructed on the existing Huia WTP site once this plant is decommissioned. All of the structures are located on land designated for water supply purposes.

The proposal involves earthworks and vegetation removal, including in an SEA overlay, and stream works including the diversion and reclamation of a small length of intermittent stream. Resource consents are also sought for the diversion and discharge of groundwater and stormwater, and the disturbance of potentially contaminated land.

Land use activities, including the construction of the replacement WTP and reservoirs and associated traffic and noise effects do not form part of this application, and instead will be addressed through an outline plan of works (OPW) that Watercare will submit to Auckland Council as required under section 176A of the RMA in relation to its designation.

The regional consent application seeks to authorise the following activities

- ◆ Earthworks and vegetation removal, including in a Significant Ecological Area (SEA) overlay, which are required to enable the construction of the replacement WTP and reservoirs, and to allow for the NH2 valve chamber and tunnelling reception shaft within the Reservoir 1 site;
- ◆ Discharge of contaminants associated with the disturbance of potentially contaminated land;
- ◆ Stream works including diversion and reclamation;
- ◆ Dewatering, and groundwater diversion and discharge; and

- ◆ Diversion and discharge of stormwater.

Land use activities under section 9(3) of the RMA are not part of this application. Watercare will submit an outline plan of works (OPW) to the Council as required under section 176A of the RMA in relation to the proposed construction of the WTP and reservoirs within designation 9324. This will address district land use matters including

- ◆ Traffic effects and proposed management and mitigation measures associated with the construction and operation of the WTP and reservoirs (note: traffic effects related to vegetation removal and bulk earthworks are addressed in this application);
- ◆ Construction and operational noise effects and proposed measures to manage and mitigate these effects (note: noise effects related to vegetation removal and bulk earthworks are addressed in this application);
- ◆ Landscape and visual effects, including the height, shape and bulk of the replacement WTP and reservoirs, along with proposed landscape mitigation measures; and
- ◆ Any effects on heritage values or archaeology.

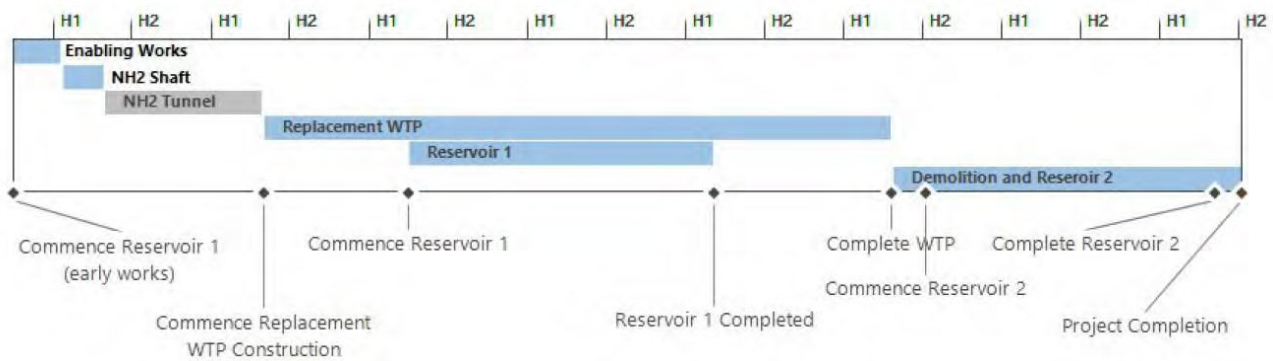
Figure 1 - Construction footprints (solid black outline) and indicative layouts of the proposed replacement WTP and reservoirs



Construction of the project is expected to take between 7 and 8 years. At a conceptual level the programme is broken down as follows

- ◆ 6 months early works: clearing the site and construction of the NH2 shaft
- ◆ 1 year of tunnelling for the NH2 pipeline tunnel project in advance of the WTP project works
- ◆ 1 year for enabling and earthworks on the WTP site
- ◆ 2 years for the main structures and buildings of the WTP and Woodland Park Reservoir (Reservoir 1)
- ◆ 1 year for finishing, commissioning and programme contingency of the WTP
- ◆ 2 years for existing plant decommissioning, demolition and construction of the Reservoir 2.

Figure 2 – Indicative construction programme



2 PEER REVIEW OF TRANSPORT MATTERS

Flow has reviewed all the traffic and transportation information provided to support the resource consent application, including

- ◆ Resource Consent application documents including
 - Assessment of Environmental Effects (AEE), prepared by Tonkin and Taylor, dated May 2019
 - Appendix E Indicative Design Drawings, prepared by GHD, dated October 2018
 - Appendix F Indicative Construction Methodology Report, prepared by Alta, dated May 2019
 - Appendix M Transport Assessment Report (TAR), prepared Beca, dated May 2019
 - Appendix Q Proposed Conditions
- ◆ Section 92 responses including
 - Draft Construction Traffic Management Plan, prepared by Beca, dated 11 July 2019
 - Updated Transport Assessment Report, prepared by Beca, dated 10 July 2019
 - Section 92 Response Letter – Transportation Matters, prepared by Beca, dated 9 August 2019
 - Huia Replacement WTP: Rigid Heavy Vehicle Demonstration letter, prepared by Beca, dated 26 September 2019
 - Huia Replacement Water Treatment Plant – Section 92 Request for Further Information Response to Transport Assessment Report, prepared by Beca, dated 4 November 2019
 - Huia WTP Replacement Project - Response to Section 92 request for further information: Road Stability letter, prepared by Tonkin and Taylor, dated 8 November 2019

Flow and AT specialists raised the following transport matters as part of Section 92 information requests

- ◆ Restricting heavy vehicle movements around schools during peak pick up/drop off periods

- ◆ Compatibility of surrounding land uses on the proposed haulage routes
- ◆ The ability of the proposed haulage routes to accommodate heavy vehicle tracking
- ◆ Driver sight lines at the site access and the Woodlands Park Road/Scenic Drive intersection
- ◆ Control of spill over parking onto surrounding roads during the construction period
- ◆ Potential impacts on AT assets including pavements and slope stability on Scenic Drive

The correspondence between Flow and the applicant on these matters is detailed in Appendix B. Further discussion of these matters is included in Auckland Council's transport report.

I consider that the matters raised by Flow and AT technical specialists have been appropriately addressed by the applicant or can be addressed through the consent conditions and advice notes included in this report.

3 PUBLIC SUBMISSIONS

Over 500 submissions were received, many of which included transport matters. I have reviewed the submissions related to transport matters. A summary of key themes of the submissions is included in Section 5 of Auckland Council's transport review (prepared by Anatole Sergejew, dated 29 November 2019, attached as Appendix 1 to this report). I agree with Mr Sergejew's summary of the key themes of public submissions.

4 RECOMMENDATIONS

As part of my review I have worked closely with Anatole Sergejew (Auckland Council's transport expert) and support the content and conclusions of his review (attached as Appendix A). Following further input from AT asset and corridor access specialists after Mr Sergejew had finalised his report, I request amendments to his proposed conditions of consent, as outlined below

44. Objective to manage the condition of public road condition to link to the requested changes to condition 46.
45. j. allows AT to manage traffic effects in the instance that the Atkinson Rd route is more appropriate than the Titirangi Rd route (e.g. due to road works)
k/l/m. allows the restriction of movement during school pick up/drop off times to be adapted in the CTMP to individual school schedules if needed
n. following further consultation with AT I've defined the scope of "haulage route", as detailed in condition YY
o. I suggest that reference is made in the condition to parking removal on Titirangi Rd, to reduce the chance that this aspect is relitigated once earthworks activity starts
v/w. I've added this to allow AT to alter corridor access in the instance that pavement damage or slips on Scenic Drive result in truck access needing to be updated (e.g. a restriction on movements or alternative haulage route until damage is repaired)
46. Advice note to reference parking removal to reduce the chance that this issue is relitigated once earthworks activity starts

XX. Updated to reference the condition which identifies the haulage routes (YY)

YY. Following further consultation with AT I've defined the scope of "haulage route"

ZZ. Added monitoring and inspection conditions for Scenic Drive slope stability, based on the recommendations of the applicant's report (produced by T&T)

The consent conditions included in Mr Sergejew's report are reproduced below. The ~~strickethrough~~ and **red** text relate to amendments recommended by Mr Sergejew in his report. I have marked my recommended amendments in **green**.

42. The Consent Holder shall prepare a Construction Traffic Management Plan (CTMP) in accordance with the Council's requirements for CTMPs and the New Zealand Transport Authority's Code of Practice for Temporary Traffic Management for each stage of the Project. The CTMP shall be in general accordance with the Draft CTMP provided as part of the application documents and shall address the management of construction traffic from the site enabling works.
43. The Consent holder shall submit the CTMP for each stage of construction to the Team Leader Compliance and Monitoring – West at least twenty (20) working days prior to the Commencement of Construction for each stage ~~for certification~~. **The purpose of the CTMP is to provide a comprehensive document that sets out the management procedures and construction methods to be implemented to avoid, remedy or mitigate potential adverse effects on the environment arising from construction activities and shall be consistent with the information provided in the Assessment of Environmental Effects and further information provided as part of the application. No construction activity shall commence until confirmation is provided from the Council that the CTMP satisfactorily gives effect to the objectives in Condition 44 and complies with the requirements in Conditions 45 and 46, as applicable to the particular stage of construction, the Council's requirements for CTMPs and New Zealand Transport Authority's Code of Practice for Temporary Traffic Management, and all measures identified in that plan as needing to be put in place prior to commencement of works have been put in place.**
44. The objectives of the CTMP are to:
 - a. Limit and manage the number of construction traffic movements on the transport network;
 - b. Provide for the safety of everyone at all times;
 - c. ~~Ensure maintenance of~~ **Maintain pedestrian and vehicle** access at all times to / from properties;
 - d. Minimise disruption from construction traffic on the travelling public and road users along the identified sections of the construction routes;
 - e. Seek to avoid full road closures and minimise any partial or managed closures;
 - f. Manage integration with other construction projects and Auckland Transport projects;
 - g. **Manage the condition of roading assets to ensure road user safety and accessibility is maintained**
 - h. Provide for prior engagement with relevant stakeholders, including:
 - when public access, particularly to properties, will be affected by construction traffic; and
 - with the **Boards of S**schools located along identified heavy vehicle routes (Titirangi Primary School, Kaurilands School, Woodlands Park School and Glen Eden Intermediate School).
 - i. Provide a mechanism for addressing queries and responding to complaints (including through the Community Liaison Group (CLG) or similar).
45. The CTMP shall include:
 - a. The traffic management measures that will be required to be implemented, including in the vicinity of the site access points and at the Woodlands Park Road / Scenic Drive intersection;
 - b. A mechanism and nominated stakeholder manager responsible for receiving, addressing and monitoring queries and responding to complaints in relation to the construction works;

- c. Provision of appropriate ingress and egress routes to/from the sites for the construction vehicles, including confirmation of appropriate heavy vehicle layover areas and over dimensional vehicle routes;
- d. For each Project stage, confirmation of typical numbers of heavy vehicle movements throughout the day for heavy vehicle access routes;
- e. Coordination with Auckland Transport regarding other construction sites and streetworks;
- f. Restricted parking for workers on construction sites, with parking prioritised for minor trades (i.e. those needing to bring tools for specialist activities), car / van pooling, staff working outside standard hours and mobility impaired staff / visitors;
- g. A site parking plan, including measures to restrict construction vehicles associated with this consent from parking on Woodlands Park Road, Manuka Road and Scenic Drive;
- h. Location of any shuttle bus interchange and operation of this (or similar) service to transport workers to and from the site;
- i. Location and operation of any works staging site;
- j. The Titirangi Road route as the preferred ingress and egress route to/from the sites for the construction vehicles, instead of the Atkinson Road (South), Kaurilands Road and, Glendale Road, **Godley Road, Golf Road and Portage Road** route, whenever possible **unless otherwise agreed with Auckland Transport**;
- k. Limitations on heavy vehicle movements to and from the construction sites on the Titirangi Road route during the following periods excluding public holidays, school holidays and vehicle movements associated with concrete pours;
 - o ~~Weekday morning and afternoon pick up / drop off periods for schools~~ **During morning and afternoon pick up / drop off periods for schools (generally being from 7:30 to 8:30 and from 14:30 to 15:30 on weekdays)**
 - o ~~Weekday commuter peak periods~~
 - o ~~Around midday~~ **after 13:00** on Saturday
- l. No heavy vehicle movements to and from construction sites on the Atkinson Road (South), Kaurilands Road and Glendale Road route shall occur ~~during the weekday morning and afternoon pick up / drop off periods for schools~~ **during morning and afternoon pick up / drop off periods for schools (generally being from 7:30 to 8:30 and from 14:30 to 15:30 on weekdays)** excluding public holidays, school holidays and vehicle movements associated with concrete pours, unless approved as part of via the CTMP **with Auckland Transport and named stakeholders (e.g. schools boards)**;
- m. No heavy vehicle movements / deliveries to and from construction sites on the Woodlands Park Road / Huia Road route (associated with any use of the Parau landfill site) **during morning and afternoon pick up / drop off periods for schools (generally being from 7:30 to 8:30 and from 14:30 to 15:30** ~~during the weekday morning and afternoon pick up / drop off periods for schools on weekdays)~~, excluding public holidays and school holidays, unless approved as part of via the CTMP **with Auckland Transport and named stakeholders (e.g. schools boards)**;
- n. Monitoring of pavements located on **construction haulage routes (the scope and extent of which is to be agreed with Auckland Transport)** and remediation of any damage resulting from Project construction traffic **in accordance with Conditions XX and YY and ZZ**;
- o. **Provision of heavy vehicle tracking on the proposed haulage route(s), and measures to address any conflicts, including potential removal of on-street parking as identified in the CH2M Beca Report dated 9 August 2019 (reference 6513515/s92/BUN60339273 NZ1-16354770-3)**;
- p. **Measures to address the restricted visibility for heavy vehicles turning right out from Woodlands Park Road into Scenic Drive, in the instance that permanent improvements have not been undertaken**;
- q. Specific measures to **ensure continuous** ~~provide for the safe movement of pedestrians, including access to bus stops, a continuous footpath and cycling network, and to minimise detours and additional crossing points for pedestrians~~ and cyclists **in the vicinity of the site access points**;

- r. The provision of construction traffic management staff to assist any construction trucks reversing into or out of the construction site;
 - s. Monitoring of and cleaning of spillage from construction trucks onto roads **or footpaths**;
 - t. Vegetation trimming or removal within the site to achieve sufficient sight lines from site accesses;
 - u. Educating construction staff of the safety needs of pedestrians and people cycling; and
 - v. **Provisions to ensure the ongoing ability of road pavements to withstand the proposed loading from heavy vehicles without affecting safety or behaviour of other road users**
 - w. Processes for monitoring, review and amendments to the CTMP, **in particular in response to changes in the roading network including any change in the condition of roading assets.**
46. The CTMP shall be prepared in consultation with the CLG in accordance with Condition 7, and in consultation with schools located along identified heavy vehicle routes (Titirangi Primary School, Kaurilands School, Woodlands Park School and Glen Eden Intermediate School).
- ~~47. There shall be no damage to public roads, footpaths, berms, kerbs, drains as a result of the earthworks and construction activities. In the event that such damage does occur, Auckland Council will be notified with 24 hours of its discovery. The costs of rectifying such damage and restoring the asset to its original condition will be met by the Consent Holder.~~
- Advice notes:*

The CTMP required by Conditions 42 to ~~47~~ 46 is required to address the management of construction traffic from the site enabling works (including earthworks and vegetation clearance). Overall traffic management, including for enabling works and construction of the WTP and reservoirs, will be addressed by the separate Outline Plan process and does not form part of this consent.

The heavy vehicle tracking assessment undertaken by CH2M Beca on 9 August 2019 (reference 6513515/s92/BUN60339273 NZ1-16354770-3) is sufficient to address Condition 45(o) unless there have been changes to the road network that affect the conclusion of that assessment.

It is the responsibility of the consent holder to seek approval for the CTMP from Auckland Transport. Contact Auckland Transport on (09) 355 3553.

*All applications for temporary use of the road reserve during construction, **including temporary removal of any on-street parking**, must be submitted to Auckland Transport as a Corridor Access Request (CAR). The CAR application should be submitted to Auckland Transport at least 12 weeks prior to the scheduled commencement of works.*

Works within the Auckland Transport road reserve will require a Works Access Permit and Engineering Plan Approval from Auckland Transport.

Public road assets condition

- XX. **Prior to the activity approved in this consent and to the satisfaction of the Team Leader Western Monitoring, the consent holder shall provide a Pavement Impact Assessment (PIA) undertaken by a suitably qualified pavement engineer to determine the current condition of the pavement on any haulage route identified in ~~the CTMP required under Condition 42~~ YY of this consent, or otherwise determined in the CTMP. The PIA shall quantify the extent of the reduced life of the pavements on the haulage route due to additional heavy vehicle movements, and shall include:**

- a. Analysis using a representative Equivalent Standard Axle (ESA) loading for the expected trucks expected to use the site and shall be in accordance with Austroads Guide to Traffic Management Part 12 Section 5.4; and
- b. Falling Weight Deflectometer (FWD) testing of haulage routes at no more than 50m intervals.

Where this assessment determines there will be a loading increase greater than 5% of the existing ESA, and a subsequent reduction in the pavement life due to activities under this consent, the consent holder will undertake any strengthening and/or rehabilitation works as identified by the independent pavement engineer and to the satisfaction of the Team Leader Western Monitoring.

Advice notes

All FWD test should be sent to Auckland Transport in RAMM format for entry into Auckland Transport's RAMM database.

Any required pavement strengthening works should be discussed with Auckland Transport to identify synergies with Auckland Transport's asset investment programme.

- YY. The PIA shall include the following sections of road, being identified as haulage routes:
- a. Woodlands Park Road, between the site access(es) and Scenic Drive
 - b. Scenic Drive, between Woodlands Park Road and Titirangi Road
 - c. Atkinson Road, for a distance of 100m from the intersection with Titirangi Road
 - d. Titirangi Road, for a distance of 100m from the intersection with Atkinson Road
 - e. Woodlands Park Road, between the site access(es) and Huia Road (in the instance of the Parau fill site being used)
 - f. Huia Road, between Woodlands Park Road and the Parau fill site (in the instance of the Parau fill site being used)
- ZZ. Prior to the commencement of construction works the consent holder shall submit a RAMM visual condition assessment, including a high definition video, of the haulage routes identified in the CTMP required by condition 43 YY, to the Team Leader Western Monitoring.

Prior to the commencement of construction works the consent holder shall undertake an assessment of Scenic Drive, between Titirangi Road and Woodlands Park Road, and submit a visual condition assessment to the Team Leader Western Monitoring. The assessment shall include:

- a. Logging of existing road and footpath deformation (on drawings and/or photographic records); and
- b. Recording of the condition of retaining walls and other structures supporting the road and footpath; and
- c. Engineering geological mapping of the slopes beneath Scenic Drive to identify existing areas of slope instability or areas where instability may potentially occur based on topography and drainage; and
- d. Establishing the existing RL (reduced level) of the footpath at locations agreed by Team Leader Western Monitoring

The consent holder shall arrange a site meeting with Council's Team Leader Western Monitoring and Auckland Transport's Asset Roading Manager to discuss the findings of the visual assessments and agree on the existing condition of Auckland Transport assets ~~within the work area~~ on the haulage routes. The consent holder's representative shall take minutes of the meeting and these minutes shall be circulated to attendees within five working days of the meeting taking place. No construction

activity shall commence until the minutes from this meeting have been confirmed as being accurate by the consent holder and the Council staff.

At no more than three monthly intervals, and one week after the earthworks activity has ceased, a RAMM Visual Condition inspection of Auckland Transport assets the haulage routes shall also be undertaken.

At no more than the following intervals an inspection of the footpath and outside traffic lane on Scenic Drive, between Titirangi Road and Woodlands Park Road, should be undertaken to identify any degradation or evidence of the on-set of slope instability:

- e. Once per two weeks whenever more than 80 heavy vehicle movements are generated within any 24-hour period
- f. Once per month whenever more than 20 heavy vehicle movements are generated within any 24-hour period

At no more than the following intervals an inspection of the slopes, retaining walls, and footpath RL on Scenic Drive, between Titirangi Road and Woodlands Park Road, shall be undertaken to identify any degradation or evidence of the on-set of slope instability:

- g. Once per three months whenever more than 80 heavy vehicle movements are generated within any 24-hour period

The outcome of these assessments shall be provided within 10 working days of the assessment to Auckland Transport's Asset Roding Manager and Council's Team Leader Western Monitoring by way of:

- h. A written report of the asset conditions; and
- i. Photographic evidence and NZTM coordinates of those assets that have experienced damage.

If in the opinion of the Council's Monitoring Officer any Auckland Transport asset has been damaged as a result of the activity undertaken as part of this consent, the consent holder shall arrange for repair of the asset to the Council's satisfaction. Such repair shall be at the expense of the consent holder and undertaken no more than five days after the damage has been indicated to the consent holder as needing repair, excepting any damage that may compromise public safety, in which case such repair shall be undertaken as soon as practicable.

Advice notes

All staff engaged in undertaking rating surveys should hold current NZIHT RAMM Road Condition Rater for Sealed Roads course accreditation at the time of undertaking the surveys.

Should any pavement deterioration or slope instability be identified, the CTMP is to be reviewed in accordance with Condition 45.(v) and 45.(w).

5 SUMMARY AND CONCLUSION

Following our review of the application, and the submissions, I have recommended consent conditions to address the potential effects on the transport network and users.

Should my recommended conditions of consent and advice notes be accepted, I would be satisfied that the proposed enabling works for the Huia Water Treatment Plan can be safely and efficiently provided for from a transportation perspective.

APPENDIX A Auckland Council transport report

29th November 2019

Tracey Grant
Principal Project Lead - Premium
Resource Consents
Auckland Council
Private Bag 92-300
Victoria Street West
Auckland 1142

Dear Tracey,

***Huia Water Treatment Plant Replacement – Woodlands Park Road, Titirangi
Review of Traffic Impacts of Earthworks and Vegetation Removal***

1. As requested, I have reviewed the traffic impacts of the earthworks and vegetation removal associated with the construction of a new Water Treatment Plant (the Proposal) to replace the aging Huia Water Treatment Plant on Woodlands Park Road, Titirangi. My review has been developed with significant input from Mat Collins, representing Auckland Transport.
2. I have reviewed the Transport Assessment Report (TAR) prepared by CH2M BECA dated 10th July 2019, the draft Construction Traffic Management Plan (CTMP) prepared by CH2M BECA dated 11th July 2019, the Assessment of Environmental Effects (AEE) prepared by Tonkin & Taylor Ltd dated 24 May 2019, the Indicative Construction Methodology report prepared by ALTA dated 23 May 2019, the Section 92 responses to transportation matters prepared by CH2M BECA dated 9 August 2019 and 4 November 2019, the Rigid Heavy Vehicle Demonstration for the Parau landfill site route prepared by CH2M BECA dated 26 September 2019, and considered the technical note prepared by FLOW for Auckland Transport dated 19 June 2019 but updated on 22 July 2019 as well as submissions on the resource consent application relating to transport effects.
3. The consent application is for earthworks and vegetation removal only, with the construction and operational effects of the WTP being part of a future Outline Plan of Works (OPW). However, for completeness the TAR considers the cumulative transport effects of both the earthworks and construction activities, as these activities are proposed to be concurrent for a portion of the Proposal.

Auckland Office:
P O Box 60-255, Titirangi, Auckland 0642
Level 1, 400 Titirangi Road, Titirangi Village
Tel: (09) 817 2500
Fax: (09) 817 2504
www.trafficplanning.co.nz

1. The Proposal

4. The proposal is to construct a replacement Water Treatment Plant (WTP), along with two treated water reservoirs on Woodlands Park Road, Titirangi. The site for the replacement WTP is located close to the existing Huia WTP, on the corner of Manuka Road and Woodlands Park Road. A 25 million litre treated water reservoir is to be constructed across from the replacement WTP on the northern side of Woodlands Park Road, and a second 25 million litre reservoir is to be constructed on the existing Huia WTP site once this plant is decommissioned.
5. The Indicative Construction Methodology report advises that construction of the replacement WTP is expected to take approximately 4 years, and that approximately two subsequent years would be required for commissioning of the new plant, demolition of the existing plant, construction of the second reservoir on the existing WTP site and commissioning of that reservoir.
6. As the proposed works are located on land designated for water supply purposes, the design, construction and operation of the WTP and reservoirs are authorised by the designation and are thus not the subject of this application or of this review. This traffic review is therefore confined to traffic effects associated with the earthworks and vegetation removal associated with the construction of the new Water Treatment Plant and reservoirs.
7. The Transport Assessment Report provided with the application assesses the cumulative effects of the enabling activities provided for under this current application, as well as construction and operational effects.
8. Further details of the proposal are given in the documentation reviewed.

2. Traffic Generation

9. Section 3.4.1 of the Transport Assessment Report advises that “the maximum on-site parking at any one time would include 50 carparks distributed between both the WTP and reservoir/s sites”, and that construction staff unable to park on site would need to be brought to the work sites by shuttle buses. On this basis Table 3-2 of the Transport Assessment Report predicts up to 130 staff vehicle movements per day could be generated by the project. With 80% staff arriving in the morning and departing in the afternoon, construction staff traffic will be up to 104 vehicle movements in the morning and again in the afternoon.
10. Section 4.4 of the draft CTMP indicates that there will be limited opportunity or need to provide on-site parking for light vehicles during the vegetation removal and enabling earthworks phases, and thus the level of light motor vehicle traffic generated in the vicinity of the site associated with the vegetation removal and enabling earthworks is anticipated to be negligible.
11. Page 42 of the AEE advises that in terms of heavy vehicle movements associated with this application for vegetation removal and enabling earthworks, approximately 13 to 36 heavy vehicle movements are anticipated each day, with a peak of around 70 heavy vehicle movements per day for a 7-month period which equates to around 2 to 5 movements per hour, and up to 10 per hour over the busiest period.
12. In their Section 92 response, dated 4 November 2019, CH2M Beca provided further detail of the number of heavy vehicle movements resulting from this consent application:
 - a. In the seven busiest months associated with the site enabling works consent activities, there would be around 66 to 71 daily heavy truck movements, equating to around nine to ten heavy truck movements per hour (both directions) across the day
 - b. The further breakdown of the predicted range of daily heavy trucks movements across the 99-month programme for the site enabling works activities is as follows:
 - i. 56 months of no site enabling works activities
 - ii. 21 months of 1 to 20 movements per day – up to three movements per hour across the day
 - iii. 14 months of 21 to 45 movements per day – up to seven movements per hour across the day
 - iv. 1 month of 46 to 60 movements per day – up to nine movements per hour across the day
 - v. 7 months of 61 to 71 movements per day – up to ten movements per hour across the day
 - c. 77 of the 99 months therefore result in 20 or less heavy truck movements per day, equating to three or less heavy truck movements per hour (both directions) across the day.

13. Figure 3-6 on Page 31 of the TAR (10 July 2019 version) estimates that the combined heavy vehicle movements from the earthworks and construction activities will peak at 118 movements per day (both directions), which occurs in Month 44 of the construction programme. As noted above, the construction activities do not form part of the current application, and will be considered as part of the future OPW.

3. Construction Truck Routes

14. From Woodlands Park Road and Scenic Drive, the following options have been identified in the AEE and Transport Assessment Report as potentially appropriate routes for heavy construction vehicles:

- Option 1: Inbound and outbound movements along Titirangi Road only to and from Great North Road. An alternative for some of the inbound and/or outbound movements to use Golf Road or possibly Godley Road and Portage Road instead of Titirangi Road.
- Option 2: One-way loop consisting of inbound from West Coast Road via Glendale Road, Kaurilands Road and Atkinson Road, then outbound via Titirangi Road (or Golf/Godley Roads and Portage Road) to Great North Road.

15. A possible alternative landfill site for partial disposal of the cut material has been identified as the existing Parau Landfill located approximately 3 km by road to the southwest of the proposed WTP. The route towards the landfill is mainly along Woodlands Park Road with a short section along Huia Road. The landfill site could potentially accommodate 66,000 to 100,000m³ of material.

16. The existing daily traffic volumes, and the percent and approximate number of heavy vehicles on these roads as given in Table 2-3 and 2-4 of the Transport Assessment Report are summarised below:

Table 1 –Traffic Counts

Road	Direction	Date	Weekday Average Volume	% Heavy Vehicles	Weekday Average Heavy Vehicles
Woodlands Park Road	Both	Feb 2018	5,135	3%	150
Scenic Drive	Both	Feb 2018	7,325	4%	290
Titirangi Road	Both	Feb 2018	18,131	5%	900
Godley Road	Both	2015	13,415	3%	400
Golf Road	Both	2015	11,735	4%	470
Portage Road	Both	2015	10,064	4%	400
Glendale Road	Both	2016	12,265	3%	370
Kaurilands Road	Both	2015	7,531	2%	150
Atkinson Road	Both	Feb 2018	7,954	5%	400
Huia Road	Both	Sep 2016	5,394	6%	320

4. Impacts of Construction Traffic

4.1. Impacts of Light Vehicle Construction Traffic

17. As discussed in Section 2, the level of light motor vehicle traffic generated in the vicinity of the site associated with the vegetation removal and enabling earthworks is anticipated to be negligible.
18. It is therefore anticipated that the effects of light motor vehicle traffic in the vicinity of the site will be negligible.

4.2. Impact of Heavy Vehicle Construction Traffic on Truck Routes

19. An increase of 70 heavy vehicles per day, while insignificant in terms of total traffic on any of the roads on the construction truck routes as listed in Table 1, represents a significant increase in the daily volume of heavy vehicles on all but one of these roads. The exception is Titirangi Road, where an increase of 70 heavy vehicles per day represents an 8% increase to the existing daily heavy traffic volume.
20. I have concerns about the use of the Atkinson Road route due to the presence of a number of schools and childcare centres, presence of traffic calming devices, and a high number of vulnerable road users. With reference to the route options detailed in paragraph 14, I consider Option 1 (inbound and outbound movements along Titirangi Road only) to be more appropriate.
21. Auckland Transport has stated that it would not want to exclusively rely on Option 1 as this would result in more heavy vehicle movements through the Titirangi village, and truck routing may be affected by other projects within the area, such as the Huia 1 Watermain replacement project or Auckland Transport maintenance and repair projects.
22. While I consider Option 1 (inbound and outbound movements along Titirangi Road only) to be more appropriate, I agree with Auckland Transport that a degree of flexibility should be preserved to allow the construction routes to be determined and adapted as part of a Construction Traffic Management Plan and Corridor Access Request.
23. In the updated transport conditions attached to their Section 92 response, dated 4 November 2019, CH2M Beca propose a condition that the CTMP prefer heavy vehicles using Titirangi Road instead of Atkinson Road (South), Kaurilands Road and Glendale Road. I support this, but suggest that use of Titirangi Road also be favoured over Godley Road, Golf Road and Portage Road.
24. Construction traffic could potentially impact on the road operation, congestion and safety of the construction truck routes. These three effects are inter-related.

4.3. Reported Truck Crashes

25. A review of reported road crashes relating to trucks on the proposed heavy vehicle routes over a 10-year period is included in Section 2.4.2 of the Transport Assessment Report, and did not identify any specific locations with truck crash issues or any recurring truck crash causation patterns along the routes.

4.4. “Pinch Points” on Truck Routes

26. A concern with road operation and safety is that the increase in truck traffic may result in increased conflict between trucks and between trucks and other traffic at locations on the truck routes that are narrow, on curves, or where the width is restricted by on-street parking. In response to a Section 92 request, CH2M BECA was commissioned by the applicant to undertake heavy vehicle demonstration surveys on the proposed truck routes. The demonstration involved driving the routes with heavy vehicle similar to the vehicles anticipated for earthworks transport to and from the project sites. The demonstration heavy vehicle was a truck and trailer for the Woodlands Park Road-Scenic Drive-Atkinson Road-Kaurilands Road-Glendale Road and Titirangi Road routes, and a six-wheel heavy rigid truck for the Parau landfill route. Vehicles in front and behind the survey truck videotaped the ability of the demonstration heavy vehicles to negotiate the truck routes within their traffic lane.
27. The demonstration indicated that truck and trailer units could generally stay within their traffic lane on Woodlands Park Road, Scenic Drive, Atkinson Road, Kaurilands Road, Glendale Road and Titirangi Road, except for two “pinch points”:
- a) A 200-metre section of Titirangi Road north of the Titirangi Village, from a point some 70 metres north of Rangiwai Road to a point some 90 metres south of Park Road
 - b) Intermittent locations on Atkinson Road and Kaurilands Road where the truck and trailer (and any other traffic) needed to cross the centreline to pass a parked vehicle.
28. Large rigid trucks could generally stay within the traffic lane on the Parau landfill route, except where parked vehicles encroached across the edge line into the traffic lane, in which case the truck (and any other traffic) needed to cross the centreline to pass the parked vehicle.
29. For routes other than Titirangi Road north of the village, CH2M BECA note that parking requiring vehicles to cross the centreline is intermittent, except in the vicinity of schools at the start and end of school. I propose conditions to prohibit heavy vehicle movements at the start and end of school, unless otherwise agreed via the CTMP with Auckland Transport and named stakeholders (e.g. schools boards). With such conditions in place, I consider

that the truck routes are adequate to accommodate the expected levels of construction truck traffic.

30. In the case of the section of Titirangi Road north of Titirangi Village (between Rangiwai Road and Park Road), CH2M BECA suggest that to mitigate the effects of construction trucks it may be necessary to remove some on-street parking on the western side of the road, especially on the winding sections, which currently have no time restriction (parking is already prohibited on the eastern side of this section of Titirangi Road).
31. A parking survey undertaken by CH2M BECA indicates that this section of on-street parking is lightly used on weekends, with a maximum of 5 spaces occupied. On weekdays between 10am and 3:30pm demand highest, with over 50% of spaces occupied (peak of 15 spaces occupied).
32. My measurements indicate that this section of Titirangi Road could accommodate 25 parking spaces, but that with the lack of marking of individual parking spaces the space available is not always used efficiently.
33. To mitigate conflict between heavy vehicles and between heavy vehicles and other traffic, some of the unrestricted parking on the eastern side of Titirangi Road should be removed, particularly at the bend some 170 metres north of Rangiwai Road. The remaining unrestricted parking should be marked, so that it is more efficiently used.
34. Provided that at least 15 unrestricted parking spaces on the western side of Titirangi Road, between Rangiwai Road and Park Road remain, there would still be sufficient parking on this section of Titirangi Road to accommodate current parking demand.
35. Auckland Transport has confirmed that it is comfortable with the temporary removal of some parking on the western side of Titirangi Road, and that the extent of parking removal can be confirmed as part of a future Corridor Access Request. While it is acknowledged that if parking spaces closer to the Titirangi village are lost some parkers might seek to park elsewhere rather than park further down the hill, overall there should be minimal displacement of demand for on-street parking and thus minimal parking impact.
36. Auckland Transport recommends a requirement that the condition specifying what the CTMP must include, provision of heavy vehicle tracking on the proposed heavy construction vehicle routes, and measures to address any conflicts. While heavy vehicle tracking has been provided as part of the application, changes to the existing road environment prior to activities in this consent commencing may introduce new constraint points. I support such an addition.

4.5. Schools on Truck Routes

37. A particular safety concern arises because there are a number of schools along Atkinson Road South, Kaurilands Road, Glendale Road, Golf Road and the Woodlands Park Road route to the Parau landfill. Safety concerns arise in connection with the effects of construction traffic on parking activity when children are dropped off and collected from school, and with school children walking to and from school.
38. In their Section 92 response letter dated 4 November 2019, CH2M BECA suggest that the objectives of the CTMP include providing for prior engagement with relevant stakeholders, including schools located on truck routes (Titirangi Primary School, Kaurilands School, Woodlands Park School and Glen Eden Intermediate). I suggest instead that a condition require these schools to have representation on the Community Liaison Group proposed by the applicant, and be invited as stakeholders to have involvement in the preparation of the CTMP.
39. The application included a draft consent condition to “restrict” heavy vehicle movements on these roads at the morning and evening drop off/pick up periods for kindergartens and schools. Initially Auckland Transport supported this condition, with minor amendments, however following a review of submissions it considered that heavy vehicle movements on these roads should be “prohibited” during drop off/pick up periods.
40. In their Section 92 response letter dated 4 November 2019, CH2M BECA argue that prohibiting truck movements during drop off/pick up periods is too restrictive. They propose that no construction trucks be allowed on these roads at the morning and evening drop off/pick up periods for schools unless approved as part of the CTMP. Further, they consider that if a prohibition on heavy truck movements was still considered necessary at the time of the activity, then their proposed amended conditions enable this to be reflected in the CTMP.
41. Generally, school peak times are 0800 – 0900 and 1430 – 1530 on weekdays, with site by site variations. I suggest that consent conditions are specific about time restrictions on each haulage route, and that construction truck movements are “prohibited” during school pick up / drop off periods, particularly on the Woodlands Park Road, Atkinson Road and Golf Road routes, unless otherwise agreed via the CTMP with Auckland Transport and named stakeholders (e.g. schools boards).

4.6. Truck Route Capacity and Congestion

42. The Transport Assessment Report has undertaken a residual road capacity analysis in an attempt to demonstrate that there is adequate capacity on the proposed truck routes to accommodate construction traffic. However the report acknowledges that this method does not take into account the reduced capacity (and existing congestion) that occurs in the Titirangi Village in busy times due to the signalised pedestrian crossing, or the reduced

capacity (and congestion) that occurs in the vicinity of schools at the morning and evening drop off/pick up periods.

43. An appropriate condition prohibiting heavy vehicle movements at the start and end of school unless otherwise agreed via the CTMP with Auckland Transport and named stakeholders (e.g. schools boards) would ensure construction traffic does not cause congestion at these times.
44. While a limitation on heavy vehicle movements is also proposed by CH2M BECA for Titirangi Road at school drop off/pick up and commuter peaks, in their Section 92 response letter dated 4 November 2019, they note that activities under this consent application (earthworks) are not expected to generate more than 10 vehicle movements per hour on Titirangi Road. I suggest that a cap on heavy vehicle movements on Titirangi Road during peak hours is not necessary as a condition, but can be addressed as part of the CTMP, when the cumulative effects of earthworks and construction of the WTP can be considered.
45. I have been advised that a separate project, the Huia 1 watermain replacement project, will require some road closures on Atkinson Road and Titirangi Road. Once the indicative programme has been determined, AT will need to be consulted to identify any potential conflicts with this and any other roading works or projects being undertaken. I therefore support the consent condition proposed by the applicant that the CTMP include a requirement to coordinate with Auckland Transport regarding other construction sites and streetworks.
46. Page 42 of the Transport Assessment Report notes that if construction trucks operate from 7am to 6pm excluding school peak periods, this equates to an effective truck operational period of 7 hours per day. Page 42 of the AEE advises that approximately 13 to 36 heavy vehicle movements associated with vegetation removal and enabling earthworks are anticipated each day, with a peak of around 70 heavy vehicle movements per day for a 7-month period. The peak equates to 10 heavy vehicle movements per hour, or one vehicle movement every 6 minutes on average. The number of construction trucks will be relatively low compared to existing vehicle numbers and in this respect the congestion impact will be minor.

4.7. Local Impacts at Site Accesses

47. Auckland Transport has suggested a condition that the CTMP include measures to address restricted visibility at site construction access points, minimising inconvenience to pedestrians and cyclists and maintaining access to bus stops near construction sites, and the monitoring and cleaning of any spillage onto the road during construction. I support this condition, but suggest for the removal of doubt it also include spillage onto footpaths.

4.8. Parking Impacts near Construction Sites

48. As indicated in Section 2 above, there will be limited opportunity or need to provide on-site parking for light vehicles during the vegetation removal and enabling earthworks phases.
49. The applicant has proposed a condition that the CTMP include restricting parking for workers on construction sites, and details of the operation of shuttle services to transport workers to and from the site. Auckland Transport propose adding a requirement that the CTMP include a site parking plan, including measures to restrict construction traffic parking on Woodland Park Road, Manuka Road and Scenic Drive, and this is now included in the updated transport conditions attached to CH2M BECA's Section 92 response letter dated 4 November 2019.
50. I support these conditions. Provided they are implemented, I anticipate that the impacts of construction vehicle parking during the vegetation removal and enabling earthworks phases will be minor.

4.9. Construction Impacts on Public Road Assets

51. Auckland Transport has proposed a condition that the CTMP include measuring the condition of public road assets prior to construction and requiring the applicant to repair any such asset damaged by construction works within 5 days, unless the damage raises safety issues in which case it should be repaired as soon as practicable. I support this condition.

5. Issues Raised in Submissions

52. Many submissions raise concerns regarding the traffic effects of construction traffic. The traffic issues raised in submissions are discussed below:

5.1. Existing Heavy Traffic Volumes on Proposed Construction Traffic Routes

53. Some submitters question the existing volume of heavy traffic on the proposed truck routes quoted in Table 2-3 and 2-4 of the Transport Assessment Report, suggesting that utility vehicles and campervans may have been included as heavy commercial vehicles.

54. In their Section 92 response letter dated 4 November 2019, CH2M BECA advise that, consistent with the NZTA vehicle classification system and Auckland Transport practise, “heavy vehicles” includes single unit rigid vehicles with an axle spacing of 3.2 metres or more, on their own or towing a trailer. This would exclude utility vehicles, and only include the larger campervans that are effectively heavy vehicles. Thus, the existing volume of heavy traffic on the proposed truck routes quoted in Table 2-3 and 2-4 of the Transport Assessment Report are considered to be appropriate.

5.2. Heavy Vehicle Traffic Generation

55. Section 3.4.6 of the Transport Assessment Report advises that the highest total construction truck movements will be generated over 11 months and total 88 to 118 heavy vehicle movements per day. Some submitters suggest that this figure only relates to the earthworks component of the project.

56. This is incorrect. The predicted traffic generation outlined in section 3.4 of the Transport Assessment Report is for the project as a whole including earthworks, construction of the replacement WTP, demolition of the existing plant, and construction of the second reservoir.

57. Page 42 of the AEE advises that approximately 13 to 36 heavy vehicle movements associated with vegetation removal and enabling earthworks are anticipated each day, with a peak of around 70 heavy vehicles per day for a 7-month period. More details are given by CH2M BECA in their Section 92 response letter dated 4 November 2019 (refer to paragraph 12 of this review).

58. One submitter notes that as only trucks were proposed to use the route to the Parau landfill, not truck and trailer units as proposed for the other routes, this would double the number of truck routes on the Parau landfill route. This is accepted, however as discussed in Section 4.1.6 of the Transport Assessment Report, the geometry of the Parau landfill site is such that it is not suitable for use by truck and trailer units.

5.3. Impact on Schools on Heavy Vehicle Traffic Routes

59. Many submissions express safety concerns in connection with the various schools located on proposed construction truck routes, and the effects of construction traffic on parking activity when children are dropped off and collected from school, and with school children walking to and from school.
60. In their Section 92 response letter dated 4 November 2019, CH2M BECA, has proposed a consent condition that no heavy vehicle movements be permitted the Atkinson Road and Parau Road routes at the morning and evening drop off/pick up periods for kindergartens and schools unless approved as part of the CTMP.
61. They further recommend that the CTMP prefer heavy vehicles using Titirangi Road instead of Atkinson Road (South), Kaurilands Road and Glendale Road.
62. I also recommend a condition that schools on truck routes (Titirangi Primary School, Kaurilands School, Woodlands Park School and Glen Eden Intermediate), be invited as stakeholders to have involvement in the preparation of the CTMP and be a member of a Community Liaison Group.
63. I consider that these proposed conditions of consent should ensure that safety concerns regarding the impact of construction trucks on school traffic and pedestrians are adequately addressed.

5.4. Pedestrians on Heavy Vehicle Traffic Routes

64. Several submitters express concern for the safety of pedestrians on construction traffic routes, especially where there are no footpaths or where trucks might encroach onto shoulders used as footpaths.
65. My observation is that every proposed construction truck route has a footpath on at least one side of the road.
66. The heavy vehicle demonstration surveys undertaken by CH2M BECA on the proposed truck routes indicate that construction trucks could generally stay within the traffic lane on the truck routes, except some locations where parked vehicles require trucks (and any other traffic) to cross the centreline to pass the parked vehicle. At no point would a truck be required to encroach onto the footpath.
67. Overall it is considered that, beyond the construction site access points, construction traffic should not have an appreciable effect on pedestrian safety provided heavy vehicle movements are prohibited during school drop off/pick up times on all haulage routes other than Titirangi Road. As discussed in paragraphs 87 to 88 of this traffic review, specific

construction traffic management will be required to ensure pedestrian safety at the construction site access points on Woodlands Park Road.

5.5. Heavy Vehicle Passing on Traffic Routes

68. A concern of submitters is that there were locations on some truck routes where there was insufficient room for one heavy vehicle to pass another.
69. In response to a Section 92 request, CH2M BECA Ltd was commissioned by the applicant to undertake heavy vehicle demonstration surveys on the proposed truck routes. The demonstration involved driving the routes with heavy vehicle similar to the vehicles anticipated for earthworks transport to and from the project sites.
70. The demonstration indicated that construction trucks could generally stay within their traffic lane on the proposed truck routes, except for some locations where a truck (and any other traffic) needed to cross the centreline to pass a parked vehicle.
71. For routes other than Titirangi Road north of the village, CH2M BECA note that parking requiring vehicles to cross the centreline is intermittent, except in the vicinity of schools at the start and end of school. Provided that appropriate conditions prohibit heavy vehicle movements at the start and end of school, unless otherwise agreed via the CTMP with Auckland Transport and named stakeholders (e.g. schools boards), it is considered that the truck routes are adequate to accommodate the expected levels of construction truck traffic.
72. In the case of the section of Titirangi Road north of Titirangi Village, CH2M BECA suggest that to mitigate the effects of construction trucks it may be necessary to restrict parking on the western side of the road, especially on the winding sections (parking is already prohibited on the eastern side of this section of Titirangi Road). This matter has been discussed further in paragraphs 30 to 35 of my traffic review.
73. A few submitters suggest that the portion of Huia Road proposed as part of the Parau landfill route had not been adequately assessed. The assessment of this route is contained in Section 4.1.6 of the Transport Assessment Report and in the rigid heavy vehicle demonstration report undertaken by CH2M BECA dated 26 September 2019 (which was provided after notification and therefore not available to submitters). As discussed in paragraphs 28 and 29 of my review, the Parau route is generally appropriate for rigid heavy vehicle movements.

5.6. Heavy Vehicle Impact on Proposed Truck Routes

74. A number of submitters are concerned that the proposed construction routes were not built for the expected volume and weight of heavy construction traffic, and feared that this

heavy traffic could cause pavement damage and potentially slips and road closures (particularly on Scenic Drive).

75. Auckland Transport have requested road inspection, monitoring and remediation conditions of consent.
76. In Section 6.0 of Attachment D to their Section 92 response letter dated 4 November 2019, CH2M BECA advise that *“the simplest method to demonstrate and ensure the ongoing stability of Scenic Drive is to undertake a pre-construction condition survey of the route and to undertake regular inspections to identify potential changes. We understand that this is already addressed through the requirement for a Pavement Impact Assessment (PIA) along with the requirement that any damage to roads be rectified”*.
77. Auckland Transport commissioned WSP to review the response from CH2M BECA on this issue. WSP advised that *“T&T have compiled an excellent report on the nature of the stability, the effects of traffic, and that of additional construction traffic on the road. Also included is a section on monitoring of the road and structures including engineering geological mapping. What is missing is the datum for this monitoring. It is considered that engineering geology mapping is required at this stage, to assess the existing condition of the road. Only after this is undertaken a datum would be available”*.
78. I have been advised that Auckland Transport are comfortable that this can be addressed in an inspection and monitoring condition, and that further information will be provided in a separate letter from Auckland Transport.

5.7. Congestion Effects of Construction Traffic

79. Several submitters are concerned about the congestion effects of construction traffic, particularly construction trucks. Mostly these concerns relate to times when children are dropped off and picked up from school, and during peak commuter periods.
80. Some submitters also suggested that construction activity on Woodlands Park Road and Scenic Drive might congest or even block these roads and thus divert traffic to Huia Road, and that the effects of such a diversion should be assessed.
81. It is possible that traffic on Woodland Park Road at the construction site access points may be temporarily stopped or limited to one lane as larger trucks access or egress the site, but this will be for limited duration. Apart from that, Woodlands Park Road and Scenic Drive will still be open for two-way traffic movement.
82. I support the condition proposed by the applicant and modified by Auckland Transport that construction heavy vehicle movements are “prohibited” particularly on the Woodlands Park Road, Atkinson Road and Golf Road routes, at the morning and evening drop off/pick

up periods for schools unless otherwise agreed via the CTMP with Auckland Transport and named stakeholders (e.g. schools boards).

83. As discussed in paragraph 46 of this traffic review, the peak of heavy vehicle movements associated with vegetation removal and enabling earthworks equates to 10 heavy vehicle movements per hour, or one vehicle movement every 6 minutes on average. This number of construction trucks is relatively low compared to existing vehicle numbers and in this respect the congestion impact will be minor.
84. A related concern is the lower speed of trucks and the lack of safe passing opportunities, with the concern that frustrated motorists held up by trucks may try to overtake where visibility is limited. In this regard, I note that earthworks laden trucks will be departing the site and mostly going downhill, and may thus not be as slow as feared, while trucks laden with construction materials will mostly use Titirangi Road which has room to pass trucks on the uphill gradient.

5.8. Speed Cushions on Atkinson Road

85. Some submitters are concerned about the effect when construction trucks drive over the speed cushions on Atkinson Road. These concerns relate to safety, but also the effect on trucks themselves and the vibration effects on neighbouring properties.
86. While speed cushions are designed to minimise the effect on wider vehicles, they will still have some effect. Auckland Transport raised this concern during a pre-application discussion as a reason for limiting truck movements on Atkinson Road. The revised CTMP objectives in the proposed conditions of consent require construction traffic to favour using Titirangi Road over Atkinson Road.

5.9. Traffic Safety on Woodlands Park Road and Scenic Drive Intersection

87. Concern was raised in submissions about traffic safety at the construction site accesses on Woodlands Park Road and at the Woodlands Park Road / Scenic Drive intersection.
88. I consider that such concerns are adequately addressed on page 50 of the Transport Assessment Report, which advises as follows:

“To minimise and manage any adverse effects this may have on the safety of road users on the surrounding road network the following mitigation measures are recommended for the CTMP:

- *Site-Specific Temporary Traffic Management Plan/s (SSTMP) for Woodlands Park Road and the intersection with Scenic Drive, including signage and speed reduction along Woodlands Park Road*

- *Localised road widening and kerb / channel on the north side of Woodlands Park Road to assist in reducing potential conflict between oncoming vehicles with the additional and more regular turning movements at the site accesses."*

5.10. Construction Vehicles Parking on Main Roads and Side Roads

89. Some submitters are concerned about the effects of construction trucks and tradesmen parking on main road and side roads in the vicinity of the site. Many surrounding roads are too narrow for on-street parking, or require passing traffic to cross the centreline to pass parked vehicles. I agree that if construction traffic were to park on such roads this could have a significant effect on traffic safety and capacity.
90. As noted in Section 4.4 of this traffic review, Auckland Transport propose a requirement that the CTMP include a site parking plan, including measures to restrict construction traffic parking on Woodland Park Road, Manuka Road and Scenic Drive. Such a provision has been included in the updated transport conditions attached to the CH2M BECA Section 92 response letter dated 4 November 2019.
91. I support such a condition. Provided it is implemented, I anticipate that the impacts of construction traffic parking will be minor.

5.11. Loss of Parking on Titirangi Road During Construction

92. CH2M BECA suggest that to mitigate the effects of construction trucks on a narrow section of Titirangi Road north of Titirangi Village, it may be necessary to restrict parking on the western side of the road, especially on the winding sections between Rangiwai Road and Park Road (parking is already prohibited on the eastern side of this section of Titirangi Road). Some submissions express concern about the effects of this loss of parking on the Titirangi village.
93. This matter is discussed further in paragraphs 30 to 35 of this traffic review. Provided that at least 15 unrestricted parking spaces on Titirangi Road, between Rangiwai Road and Park Road remain, there should be minimal displacement of demand for on-street parking.
94. One submitter suggested that the consented commercial development at 490 South Titirangi Road and 408-416 Titirangi Road would increase parking demand and exacerbate the effects of restricting parking on the narrow section of Titirangi Road. I have reviewed the consent decision report (LUC60316216) and note that the development will provide 40 parking spaces of which 18 will be general public parking spaces and the balance will be for the development. The development will have a parking shortfall of one space for retail activity, when compared with the minimum parking rates specified in the Auckland Unitary Plan. I note that as part of their review of LUC60316216, Auckland Council's Traffic

Engineer had no concerns regarding the proposed parking shortfall of one space and the consent decision report notes that “there is sufficient public and private car parking provided on site to adequately serve the proposed retail activities.”

6. Conclusions and Recommendations

95. As the proposed works are located on land designated for water supply purposes, the design, construction and operation of the WTP and reservoirs are authorised by the designation and are thus not the subject of this application or this review. This traffic review is therefore confined to traffic effects associated with the earthworks and vegetation removal associated with the construction of a new Water Treatment Plant and reservoirs.
96. Having said this, my review has given consideration to the cumulative effects of both earthworks and construction traffic effects, as these activities will overlap.
97. The applicant has suggested various conditions of consent to avoid, remedy or mitigate adverse traffic effects during earthworks and vegetation removal, and I have suggested some additions and modifications.
98. The updated transport conditions proposed by the applicant and attached to the CH2M BECA Section 92 response letter dated 4 November 2019 are included in Appendix 1, with the modifications I propose in ~~striketrough~~ or highlighted in **red**.
99. It is proposed that most of the measures to avoid, remedy or mitigate adverse traffic effects will be detailed in the CTMP, which must be prepared by the applicant and approved by Council prior to works commencing.
100. Overall, I consider that, provided the consent includes the attached conditions, the proposal is acceptable from a transport perspective.

Yours faithfully

TRAFFIC PLANNING CONSULTANTS LTD



Anatole Sergejew
Senior Associate

APPENDIX 1 – PROPOSED TRANSPORT-RELATED CONDITIONS

42. The Consent Holder shall prepare a Construction Traffic Management Plan (CTMP) in accordance with the Council's requirements for CTMPs and the New Zealand Transport Authority's Code of Practice for Temporary Traffic Management for each stage of the Project.
The CTMP shall be in general accordance with the Draft CTMP provided as part of the application documents and shall address the management of construction traffic from the site enabling works.
43. The Consent holder shall submit the CTMP for each stage of construction to the Team Leader Compliance and Monitoring – West at least twenty (20) working days prior to the Commencement of Construction for each stage ~~for certification~~. **The purpose of the CTMP is to provide a comprehensive document that sets out the management procedures and construction methods to be implemented to avoid, remedy or mitigate potential adverse effects on the environment arising from construction activities and shall be consistent with the information provided in the Assessment of Environmental Effects and further information provided as part of the application. No construction activity shall commence until confirmation is provided from the Council that the CTMP satisfactorily gives effect to the objectives in Condition 44 and complies with the requirements in Conditions 45 and 46, as applicable to the particular stage of construction, the Council's requirements for CTMPs and New Zealand Transport Authority's Code of Practice for Temporary Traffic Management, and all measures identified in that plan as needing to be put in place prior to commencement of works have been put in place.**
44. The objectives of the CTMP are to:
- Limit and manage the number of construction traffic movements on the transport network;
 - Provide for the safety of everyone at all times;
 - ~~Ensure maintenance of~~ **Maintain pedestrian and vehicle** access at all times to / from properties;
 - Minimise disruption from construction traffic on the travelling public and road users along the identified sections of the construction routes;
 - Seek to avoid full road closures and minimise any partial or managed closures;
 - Manage integration with other construction projects and Auckland Transport projects;
 - Provide for prior engagement with relevant stakeholders, including:
 - when public access, particularly to properties, will be affected by construction traffic; and
 - with **the Boards of S**schools located along identified heavy vehicle routes (Titirangi Primary School, Kaurilands School, Woodlands Park School and Glen Eden Intermediate School).
 - Provide a mechanism for addressing queries and responding to complaints (including through the Community Liaison Group (CLG) or similar).
45. The CTMP shall include:
- The traffic management measures that will be required to be implemented, including in the vicinity of the site access points and at the Woodlands Park Road / Scenic Drive intersection;
 - A mechanism and nominated stakeholder manager responsible for receiving, addressing and monitoring queries and responding to complaints in relation to the construction works;
 - Provision of appropriate ingress and egress routes to/from the sites for the construction vehicles, including confirmation of appropriate heavy vehicles layover areas and over dimensional vehicle routes;
 - For each Project stage, confirmation of typical numbers of heavy vehicle movements throughout the day for heavy vehicle access routes;

- e. Coordination with Auckland Transport regarding other construction sites and streetworks;
- f. Restricted parking for workers on construction sites, with parking prioritised for minor trades (i.e. those needing to bring tools for specialist activities), car / van pooling, staff working outside standard hours and mobility impaired staff / visitors;
- g. A site parking plan, including measures to restrict construction vehicles associated with this consent from parking on Woodlands Park Road, Manuka Road and Scenic Drive;
- h. Location of any shuttle bus interchange and operation of this (or similar) service to transport workers to and from the site;
- i. Location and operation of any works staging site;
- j. The Titirangi Road route as the preferred ingress and egress route to/from the sites for the construction vehicles, instead of the Atkinson Road (South), Kaurilands Road and, Glendale Road, **Godley Road, Golf Road and Portage Road** route, whenever possible;
- k. Limitations on heavy vehicle movements to and from the construction sites on the Titirangi Road route during the following periods excluding public holidays, school holidays and vehicle movements associated with concrete pours;
 - o ~~Weekday morning and afternoon pick up / drop off periods for schools~~ **from 7:30 to 8:30 and from 14:30 to 15:30 on weekdays**
 - o ~~Weekday commuter peak periods~~
 - o ~~Around midday~~ **after 13:00** on Saturdays
- l. No heavy vehicle movements to and from construction sites on the Atkinson Road (South), Kaurilands Road and Glendale Road route shall occur ~~during the weekday morning and afternoon pick up / drop off periods for schools,~~ **from 7:30 to 8:30 and from 14:30 to 15:30** on weekdays excluding public holidays, school holidays and vehicle movements associated with concrete pours, unless approved as part of **via the CTMP with Auckland Transport and named stakeholders (e.g. schools boards);**
- m. No heavy vehicle movements / deliveries to and from construction sites on the Woodlands Park Road / Huia Road route (associated with any use of the Parau landfill site) **from 7:30 to 8:30 and from 14:30 to 15:30** ~~during the weekday morning and afternoon pick up / drop off periods for schools,~~ on weekdays, excluding public holidays and school holidays, unless approved as part of **via the CTMP with Auckland Transport and named stakeholders (e.g. schools boards);**
- n. Monitoring of pavements located on construction routes (the scope and extent of which is to be agreed with Auckland Transport) and remediation of any damage resulting from Project construction traffic **in accordance with Conditions XX and YY;**
- o. Provision of heavy vehicle tracking on the proposed haulage route(s), and measures to address any conflicts;**
- p. Measures to address the restricted visibility for heavy vehicles turning right out from Woodlands Park Road into Scenic Drive, in the instance that permanent improvements have not been undertaken;**
- q. Specific measures to **ensure continuous** ~~provide for the safe movement of pedestrians, including access to bus stops,~~ **a continuous footpath and cycling network, and to minimise detours and additional crossing points for pedestrians** and cyclists ~~in the vicinity of the site access points;~~
- r. The provision of construction traffic management staff to assist any construction trucks reversing into or out of the construction site;
- s. Monitoring of and cleaning of spillage from construction trucks onto roads **or footpaths;**
- t. Vegetation trimming or removal within the site to achieve sufficient sight lines from site accesses;
- u. Educating construction staff of the safety needs of pedestrians and people cycling; and
- v. Processes for monitoring, review and amendments to the CTMP.

46. The CTMP shall be prepared in consultation with the CLG in accordance with Condition 7, and in consultation with schools located along identified heavy vehicle routes (Titirangi Primary School, Kaurilands School, Woodlands Park School and Glen Eden Intermediate School).

~~47. There shall be no damage to public roads, footpaths, berms, kerbs, drains as a result of the earthworks and construction activities. In the event that such damage does occur, Auckland Council will be notified within 24 hours of its discovery. The costs of rectifying such damage and restoring the asset to its original condition will be met by the Consent Holder.~~

Advice notes:

The CTMP required by Conditions 42 to ~~47~~**46** is required to address the management of construction traffic from the site enabling works (including earthworks and vegetation clearance). Overall traffic management, including for enabling works and construction of the WTP and reservoirs, will be addressed by the separate Outline Plan process and does not form part of this consent.

The heavy vehicle tracking assessment undertaken by CH2M Beca on 9 August 2019 (reference 6513515/s92/BUN60339273 NZ1-16354770-3) is sufficient to address Condition 45(o) unless there have been changes to the road network that affect the conclusion of that assessment.

It is the responsibility of the consent holder to seek approval for the TMP from Auckland Transport. Contact Auckland Transport on (09) 355 3553.

All applications for temporary use of the road reserve during construction must be submitted to Auckland Transport as a Corridor Access Request (CAR). The CAR application should be submitted to Auckland Transport at least 12 weeks prior to the scheduled commencement of works.

Works within the Auckland Transport road reserve will require a Works Access Permit and Engineering Plan Approval from Auckland Transport.

Public road assets condition

XX. Prior to the activity approved in this consent and to the satisfaction of the Team Leader Western Monitoring, the consent holder shall provide a Pavement Impact Assessment (PIA) undertaken by a suitably qualified pavement engineer to determine the current condition of the pavement on any haulage route identified in the CTMP required under Condition 42 of this consent. The PIA shall quantify the extent of the reduced life of the pavements on the haulage route due to additional heavy vehicle movements, and shall include:

- a. Analysis using a representative Equivalent Standard Axle (ESA) loading for the expected trucks expected to use the site and shall be in accordance with Austroads Guide to Traffic Management Part 12 Section 5.4; and**
- b. Falling Weight Deflectometer (FWD) testing of haulage routes at no more than 50m intervals.**

Where this assessment determines there will be a loading increase greater than 5% of the existing ESA, and a subsequent reduction in the pavement life due to activities under this consent, the consent holder will undertake any strengthening and/or rehabilitation works as identified by the independent pavement engineer and to the satisfaction of the Team Leader Western Monitoring.

Advice note: All FWD test should be sent to Auckland Transport in RAMM format for entry into Auckland Transport's RAMM database.

YY. Prior to the commencement of construction works the consent holder shall submit a RAMM visual condition assessment, including a high definition video, of the haulage route identified in the CTMP required by condition 43, to the Team Leader Monitoring.

The consent holder shall arrange a site meeting with Council's Team Leader Monitoring and Auckland Transport's Asset Roading Manager to discuss the findings of the visual assessment agree on the existing condition of Auckland Transport assets within the work area. The consent holder's representative shall take minutes of the meeting and these minutes shall be circulated to attendees within five working days of the meeting taking place. No construction activity shall commence until the minutes from this meeting have been confirmed as being accurate by the consent holder and the Council staff.

At no more than three monthly intervals, and one week after the earthworks activity has ceased, a RAMM Visual Condition inspection of Auckland Transport assets shall also be undertaken. The outcome of the visual assessment shall be provided within 10 working days of the assessment to Auckland Transport's Asset Roading Manager and Council's Team Leader Monitoring by way of:

- a. A written report of the asset conditions; and
- b. Photographic evidence and NZTM coordinates of those assets that have experienced damage.

If in the opinion of the Council's Monitoring Officer any Auckland Transport asset has been damaged as a result of the activity undertaken as part of this consent, the consent holder shall arrange for repair of the asset to the Council's satisfaction. Such repair shall be at the expense of the consent holder and undertaken no more than five days after the damage has been indicated to the consent holder as needing repair, excepting any damage that may compromise public safety, in which case such repair shall be undertaken as soon as practicable.

Advice note: All staff engaged in undertaking rating surveys should hold current NZIHT RAMM Road Condition Rater for Sealed Roads course accreditation at the time of undertaking the surveys.

APPENDIX B

Flow Section 92 review

Item	Status	Specialist	AT comment 23/05/19	Applicant response 09/07/2019	AT response 19/07/19
1	Closed - no further action	Flow Transport	Please confirm that all structures needed to support final site levels, such as MSE walls and retaining walls, are located outside of the legal road.	All structures located outside of legal roads.	Noted.
2	Closed - Condition requested	Flow Transport	The Transport Assessment provided by Beca identifies a need for kerb and channel on the northern side of Woodlands Park Drive to assist in reducing potential conflict between oncoming vehicles with the additional and more regular turning movements at the site accesses, however this is not reflected in the AEE or the Engineering Drawings. Please confirm inclusion of the kerb and channel into the design	It is considered that this level of design detail can be satisfactorily addressed through the later design development, in parallel with the preparation of the CTMP. This is more clearly identified in Section 4.3 of the Draft CTMP. The design would need to be developed with consideration to the current road reserve available.	Accepted. Request that this is included as part of the consent condition for the CTMP, refer condition 43(s)
3	Closed - Condition requested	Flow Transport	During pre-app engagement Auckland Transport requested that the application included heavy vehicle tracking for Scenic Drive, due to the existing narrow carriageway and potential for increased frequency of conflicts between trucks and oncoming vehicles. Please provide tracking for horizontal curves on Scenic Drive along the proposed haulage route, for the largest vehicle expected to access the site as part of earthworks activity	This section of Scenic Drive has limited useful aerial imagery due to existing tree canopies obstructing a clear view of the road kerblines and centreline. There has also been recent localised widening as part of the recent AT works, not reflected in the aerial imagery. This would make it very difficult to provide conclusive vehicle tracking. Instead a vehicle demonstration is being arranged and the outcomes will be to AC/AT. The demonstration will also cover other relevant sections of the recommended truck routes.	Flow suggest that the results of the tracking assessment can be provided with the TMP/ Corridor Access Request, and that a condition of consent covering this would be acceptable. Refer Condition 43(m)
4	Closed - Condition requested	Flow Transport	The Transport Assessment provided by Beca identifies the need to undertake vegetation trimming within private property to provide sufficient sight lines from the vehicle crossing to the WTP. Flow request that a condition is included, refer condition 46(r). Additionally the OPW should address how it will be managed on an ongoing basis once construction is complete to ensure the sightlines are not compromised	Text has been updated in the Transport Assessment, Section 4.2.2. From a transport perspective, the condition is agreed in principle. However, the final wording of the condition needs to be reviewed by Watercare and the planning/legal teams.	Accepted. CTMP can address sight line during construction. Flow suggest that the OPW consider how the visibility will be maintained once the WTP is in operation.
5	Closed - Condition requested	Flow Transport	During pre-app engagement Auckland Transport identified a preference for using Titirangi Road over Atkinson Road route. This was due to the location of schools and childcares, residential nature, presence of traffic calming devices, and high risk rating for vulnerable road users. Flow request a consent condition that identifies Titirangi Road as a preferred haulage route over Atkinson Road. Refer condition 42(c)	The TAR and Draft CTMP discuss that Titirangi route should be used as the first choice, however, the additional routes are identified as possible alternatives. This would particularly be during the busier period of construction (with the exception of the start and end of the school day) the use of the Atkinson Road route (one-way) will help alleviate the impacts of two-way movements on Titirangi Road. It is considered this is better identified as a 'measure' in conditions, rather than an 'objective'. Consistent with a similar approach of the 36th Americas Cup Base Infrastructure consents. From a transport perspective, the condition is agreed in principle. However, the final wording of the condition needs to be reviewed by Watercare and the planning/legal teams.	Accepted. Requested condition has been reworded identifying a preference for Titirangi Road "as far as practicable".
6	Closed - Condition requested	Flow Transport	Consistent with the Transport assessment provided by Beca, Flow request a condition restricting heavy vehicle movements on Atkinson Road and Woodland Road (for the Parua route) during school pick up and drop off time. Refer to Condition 42(b) and 46(j) and 46(k).	As identified in the TAR and Draft CTMP, the management measures associated with Atkinson Road route involve preventing heavy trucks using this route during the periods around the start and end of the school day. As such, bringing this forward into a condition would be consistent with the Draft CTMP. However, given heavy vehicles may be delayed arriving at the site due to wider network influences, then it is considered that this should prevent, 'as far as practicable', heavy vehicles using the Atkinson Road route at those times. It is also considered this is better identified as a 'measure' in conditions, rather than an 'objective'. Consistent with a similar approach of the 36th Americas Cup Base Infrastructure consents. From a transport perspective, the condition is agreed in principle. However, the final wording of the condition needs to be reviewed by Watercare and the planning/legal teams.	Accepted. Requested condition has been reworded requiring HCV to avoid Atkinson Road "as far as practicable".
7	Closed - Condition requested	Flow Transport	As identified in the Transport Assessment by Beca, the existing Woodlands Park Road / Scenic Drive intersection has restricted visibility for HCV turning right into Scenic Drive. Noting that this is an existing, and that AT and Watercare are currently discussing potential works to improve this, Flow request that temporary improvements considered as part of the CTMP. Refer Condition 46(m)	It is considered that the Site Specific Traffic Management Plans (SSTMPs) will deal with this. The Transport Assessment Report (Section 4.1.5) and draft CTMP include reference to this matter. From a transport perspective, the condition is agreed in principle. However, the final wording of the condition needs to be reviewed by Watercare and the planning/legal teams.	Accepted.
8	Closed - Condition requested	Flow Transport	Consistent with the Transport Assessment provided by Beca, we request a condition restricting construction parking on surrounding streets. Refer Condition 46(g).	The site parking plan has been referenced in the Transport Assessment Report (Section 4.1.8) and the draft CTMP. From a transport perspective, the condition is agreed in principle. However, the final wording of the condition needs to be reviewed by Watercare and the planning/legal teams.	Accepted.
9	Closed - Condition requested	Flow Transport	Flow recommend replacing proposed condition 46 with more robust consent conditions relating to damage to AT assets. We have included 3 conditions relating to a pre-start meeting, pre-start inspection, progress inspections, and remedial works.	From a transport perspective, the condition is agreed in principle. However, the final wording of the condition needs to be reviewed by Watercare and the planning/legal teams.	Accepted.
10	Closed - Condition requested	Flow Transport	Consistent with AT's pre-app feedback, and Beca's Transport Assessment, a pavement impact assessment should be undertaken prior to works commencing. Flow have provided a draft consent condition.	T&T to discuss with Bruce Chappel (Beca)	Noted. Flow request a consent condition requiring a pavement impact assessment prior to works commencing. Refer condition XX and 46.

Item	Status	Specialist	AT comment 23/05/19	Applicant response 09/07/2019	AT response 19/07/19
11	Condition requested	Flow Transport	As identified in the Transport Assessment provided by Beca some intersections (such as the Kaurilands/Atkinson Road intersection) may require minor works to accommodate truck and trailer movements. Flow request that vehicle tracking assessments and any mitigation works are assessed as part of the CTMP. Refer condition 46(m)	As per Item 3, a vehicle demonstration is being arranged.	Noted, see our response to Item 3.
12	Suggestion / FYI	Flow Transport	Any utilities located within the legal road shall be designed in accordance with the National Code of Practice for Utility Operators' Access to Transport Corridors (November 2011). This should be addressed as part of the OPW.	Agreed will be addressed as part of OPW stage.	Accepted.
13	Suggestion / FYI	Flow Transport	The vehicle tracking assessment provided by Beca in their transport assessment shows vehicle crossings wider than permitted by the Auckland Unitary Plan. Flow accept that wider vehicle crossings are needed during the construction phase to provide for the high number of heavy vehicles that will be accessing the site. However, once construction is complete the vehicle crossing widths should be reduced on the southern side of Woodland Park Road to prevent negative impacts on pedestrian amenity and safety. This comment should be addressed within the OPW.	It is considered that the SSTMPs will deal with the construction phase and the comments from AT are agreed. For the operational phase, the WTP vehicle crossing design is based on vehicle tracking (Appendix D of the Transport Assessment Report) and operational considerations, as advised by Watercare. This includes providing a crossing width that allows for operational heavy vehicles to enter and exit without conflict. However, it is recognised that the vehicle tracking in the TAR indicates there is the potential for further design to allow for a pedestrian refuge between the entering and exiting vehicle swept paths. This would reduce the width pedestrians would need to cross in a single stage. It is considered that this can be addressed as part of the OPW conditions for later design development.	Accepted.
14	Closed - no further action	Road Safety	<p>Visibility at accessways</p> <p>1. Section 4.2 of the Beca Transport Assessment (TA) covers visibility from the accessways serving the site. They have used Austroads approach sight distance (ASD) and stopping sight distance (SSD) to assess the visibility. They should be using Austroads safe intersection sight distance (SISD) which is a greater distance.</p> <p>2. For a 55 km/h 85th percentile operating speed road SISD should be around 109 m (2 s reaction time, 0.36 deceleration co-efficient), not allowing for the effect of longitudinal grade which is typically minor.</p> <p>3. Table 4-29 in the TA shows this distance will not be achieved looking west from the new water treatment plant (WTP) accessway. Only 80 m is available. This will effect drivers turning right out of the site, which will be the predominate movement.</p> <p>4. During construction I would be happy for them to use temporary traffic management to slow traffic on Woodlands Park Rd and thereby reduce the SISD required, but once the construction works are done and the site is operational it needs to be provided. I suggest this be done by removing vegetation from the applicants site and road reserve on the inside of the corner. A consent notice requiring them to keep this part of their site clear of tall vegetation should also be included.</p> <p>5. Section 4.2.3 of the TA says that there is 105 and 150+ metres of visibility for the east and west of the reservoir 1 accessway respectively. I would be prepared to accept that this accessway will meet SISD on this basis.</p> <p>6. The accessway for reservoir 2 needs to be assessed for visibility, even if there will only be a small number of vehicle movements post-construction.</p> <p>7. They can use a deceleration co-efficient for a car rather than a truck for this post-construction period as heavy vehicle traffic will be much reduced.</p>	<p>1 to 3. It is recognised that SISD is preferable for assessing visibility at intersections. However, due the constraints of the site frontage, we note that this cannot be achieved for this driveway. As stated in the Transport Assesment Report, the proposed WTP site access driveway is located in the best possible location to provide the optimal sight distance on either approach, given the road environment and site constraints. It is also noted the assessment has used the higher requirements for a truck not a car. This will be enhanced by the trimming of low level vegetation along the site frontage, as per Item 4. It has, however, been demonstrated that the driveway (not an intersection) complies with both the ASD and SSD. This is considered appropriate given the low number of movements associated with the operational phase, similar to the existing WTP site.</p> <p>4. It is agreed that, once construction starts and the SSTMPs are in place, the speed past the site will be reduced, thus reducing the SISD, ASD and SSD requirements. In this context, it is considered that appropriate SISD, ASD and SSD can be achieved.</p> <p>5. SISD is not achievable for both approaches. We consider that ASD and SSD is achievable for the access and is appropriate, given the low number of movements.</p> <p>6. There is no change to the current operation of the existing access. Indeed, with the WTP relocating, operational vehicle movements to and from the existing access (when Reservoir 2 is operational) will be reduced. It is not considered further analysis is needed. During the construction phase, as per Item 14.4, it is considered that appropriate sightlines can be achieved with the SSTMPs in place.</p> <p>7. Even if the car deceleration coefficient is used, the accesses still will not comply fully with SISD. It is considered that ASD and SSD is achievable for the access and is appropriate, given the low number of movements.</p>	<p>Not accepted. It is within their power to provide SISD by clearing vegetation within their site on the inside of the curve. Recommend we ask for a condition around this.</p> <p>[Flow comment: Refer to Flow response to Item 4. A consent condition is requested to address visibility during the construction phase. The future permanent vehicle crossing will be outside of Watercare's designation, and therefore subject to Engineering Plan Approval rather than OPW. Visibility will be futher assessed at that Stage]</p>

Item	Status	Specialist	AT comment 23/05/19	Applicant response 09/07/2019	AT response 19/07/19
15	Closed - no further action	Road Safety	<p>Accessway Design</p> <p>8. There are drawings in the appendices to the TA showing the design of the WTP. It has been designed to allow B-train vehicles to enter and leave simultaneously and is very wide. Wide crossings allow light vehicles (cars, etc) to turn in and out at high speed and also increase the distance for crossing pedestrians. It also appears that it has been designed to look like an intersection where vehicles have right of way over pedestrians rather than as a conventional industrial vehicle crossing.</p> <p>9. No scale is shown on the tracking drawing, but based on the vehicles shown it appears to be greater than 15 m wide. The width of the crossing from reservoir 2 appears to be much less and is more reasonable.</p> <p>10. I would like the applicant to reconsider whether they will need to allow for simultaneous entry / exit by vehicles of this size in the post-construction period. If they don't I would like them to amend the design to reduce the width of the crossing and if they do I would like them to include more justification for this in the TA. I am happy for a wider temporary access to be provided during construction if appropriate temporary traffic management is provided.</p> <p>11. I also request that the accessway be designed as a standard industrial vehicle crossing which gives clear priority to pedestrians.</p>	<p>The Transport Assessment Report has included high level assessment of District Plan Requirements and proposed design. Similarly to the access design, it is considered that this can be developed and refined through later design processes required by conditions of the OPW application for the project.</p>	<p>Recommend we ask for a condition to be put on the width of this accessway to ensure it is not forgotten at the next stage and has an acceptable width and form.</p> <p>[Flow comment: A condition of consent cannot be requested as consent is not being sought for the design of the permanent vehicle crossing. The vehicle crossing will be outside of Watercare's designation and therefore not part of the future OPW, Engineering Plan Approval will be required, at which point AT can ensure the design is consistent with AT standards]</p>
16	Closed - no further action	Road Safety	<p>Heavy vehicle safety on routes to site</p> <p>12. At their peak works will generate a lot of heavy traffic. The TA has provided a reasonably good analysis of the options regarding heavy vehicle routes, but doesn't include any crash history analysis to identify any locations with existing safety problems which might be exacerbated by the works and could need remedial work before the project gets underway. I request that the applicant update the TA to include CAS analysis of the routes. They only need to focus on the routes already deemed to be viable. Routes which are not considered suitable (for instance Scenic Dr west of Woodlands Park Rd) do not need to be re-examined.</p>	<p>Additional information has been provided in the Transport Assessment Report, Section 2.4.2. The assessment has found no specific location or recurring crash causations in the recorded crash data for heavy vehicle movements on the identified heavy vehicle routes to/from the main regional freight network.</p>	<p>Ok. The crash analysis in the report showed there were many recorded crashes in West Coast Rd near the Glen Eden Town Centre, however the AT Road Safety Team were already aware of this and have a project underway to improve safety in this location. Comment closed.</p>
17	Condition requested	Assets	<p>1. Falling Weight Deflectometer (FWD) test should be undertaken prior to construction traffic commenced for all the heavy truck Haul routes to assess the pavement condition. Then undertake the same test annually until construction traffic is ceased. All the test results in RAMM format should be sent to Auckland Transport to enter in RAMM database</p> <p>2. RAMM Visual Condition Rating assessment should be undertaken prior to construction traffic commenced for all the heavy truck Haul routes to assess the surface condition and then monitor these routes by undertaking RAMM Visual Condition rating assessment at three monthly interval until the construction traffic is ceased. All staff engaged in undertaking rating surveys should hold current NZIHT RAMM Road Condition Rater for Sealed Roads course accreditation at the time of undertaking the surveys. All the condition rating data should be sent to Auckland Transport to enter in RAMM database</p> <p>3. Any damaged carriageway, footpath, kerb, crossings, or other Auckland Transport assets as result of the construction or earthworks shall be repaired, reinstated or reconstructed in accordance with Auckland Transport Code of Practice at no cost to Auckland Transport</p>	<p>T&T to discuss with Bruce Chappel (Beca)</p>	<p>Noted. Flow request a consent condition requiring a pavement impact assessment prior to works commencing. Refer condition XX and 46.</p>

MEMO

TO: Richard Blakey – Consultant planner to council

FROM: Andrew Gordon – Specialist

DATE: 29 November 2019 (Revision 1)

SUBJECT: Huia Replacement Water Treatment Plant Project - Peer review of noise and vibration effects

Introduction

I refer to the brief dated 25 May 2019 and a request for comments regarding potential noise and vibration effects for application BUN60339273 to construct and operate the proposed Huia replacement water treatment plant and two associated reservoirs.

I've reviewed sections of the AEE prepared by Tonkin & Taylor Ltd dated July 2019 and the acoustic report prepared by Marshall Day Acoustics (MDA) dated 20 May 2019 regarding an assessment of potential noise and vibration effects.

I visited the subject site and surrounds on the 11 June 2019.

Proposal

The proposal is described in detail in section 4 of the T&T report and briefly summarised in section 2.0 of the MDA report. In regard to noise effects it is important to note: -

Construction

The proposed construction stage duration is eight years.

Noisy construction will generally be programmed to occur between 7:30 am and 6:00 pm, with no significant construction occurring outside these hours Monday to Saturday and no construction on Sundays or Public Holidays.

All works will be subject to a Construction Noise and Vibration Management Plan (CNVMP).

Any noisy construction works outside the normal hours or works predicted to infringe permitted standards will be supported by an Activity Specific CNVMP.

Operation

The replacement water treatment plant will incorporate acoustic design and mitigation measures to ensure compliance is achieved with reasonable noise levels.

There will be no truck movements onsite outside of "daytime" hours (Monday to Saturday, 7am – 10pm and Sunday, 9am – 6pm).

AUP (OP) E25.2 Objectives

- (1) People are protected from unreasonable levels of noise and vibration.
- (2) The amenity values of residential zones are protected from unreasonable noise and vibration, particularly at night.
- (4) Construction activities that cannot meet noise and vibration standards are enabled while controlling duration, frequency and timing to manage adverse effects.

AUP (OP) E25.3 Policies

(2) Minimise, where practicable, noise and vibration at its source or on the site from which it is generated to mitigate adverse effects on adjacent sites.

(10) Avoid, remedy or mitigate the adverse effects of noise and vibration from construction, maintenance and demolition activities while having regard to:

- (a) the sensitivity of the receiving environment; and
- (b) the proposed duration and hours of operation of the activity; and
- (c) the practicability of complying with permitted noise and vibration standards.

AUP (OP) E25.6 Noise standards

The subject sites are designated (9324) for water supply purposes, but the designation does not include any conditions for construction noise or operational noise (and vibration).

As the underlying zoning is Open Space – Conservation, the relevant E25 zone standard is used for assessment purposes.

Permitted noise (and vibration) standards are correctly referenced in the report:

- E25.6.27 Construction noise
- E25.6.30 (1) Construction vibration
- E25.6.30 (2) Vibration levels for stationary machinery
- E25.6.18 Operational noise as reproduced below: -

E25.6.18. Open Space – Conservation Zone, Open Space – Informal Recreation Zone, Open Space – Civic Spaces Zone or Open Space – Community Zone interface

(1) The noise (rating) level and maximum noise level from any activity in the Open Space – Conservation Zone, Open Space – Informal Recreation Zone,

Unitary Plan Operative in part

16

E25 Noise and vibration

Open Space – Civic Spaces Zone or Open Space – Community Zone when measured within the boundary of a site in a residential zone or notional boundary of a site in a rural zone must not exceed the levels in Table E25.6.18.1 Noise levels at the Open Space – Conservation Zone, Open Space – Informal Recreation Zone, Open Space – Civic Spaces Zone or Open Space – Community Zone interface below:

Table E25.6.18.1 Noise limits at the Open Space – Conservation Zone, Open Space – Informal Recreation Zone, Open Space – Civic Spaces Zone or Open Space – Community Zone interface

Time	Noise level
Monday to Saturday 7am-10pm	50dB LAeq
Sunday 9am-6pm	
All other times	40dB LAeq 75dB LAFmax

As the proposal will operate 24 hours, seven days a week, the design standard to be met is 40 dB LAeq and 75 dB LAFmax measured within the boundary of any site zoned residential.

Discussion

I consider the proposal has been accurately described to ensure assumptions used in the calculation of predicted noise and vibration levels, are representative of the proposal.

Operational noise from reservoirs is typically negligible (as for this proposal) given any items of machinery are located underground or fully enclosed. Operational noise effects are therefore focused on the replacement WTP.

I've reviewed the MDA report and generally agree with the assessment, methodology and conclusions in the report.

The following comments are specific to sections in the MDA report.

Section 2.3 Closest Potentially Sensitive Receivers

Affected receivers are correctly identified in Table 1 and include the setback distances from the dwellings to the closest point of the proposed works. A total of 25 individual receiver sites are identified.

Given the geographical distribution, affected receivers have been grouped into 5 separate areas surrounding the subject sites as reproduced in Figure 2 of the MDA report below:



Compliance within the above sites will ensure compliance is achieved within all other sites zoned residential not specifically included in Table 1.

Section 3.0 Existing Acoustic Baseline

As shown above, a noise logger was installed within the proposed WTP site to measure existing background and ambient noise levels over seven days. The logger results are reproduced below: -

Period	Measured Levels (dB)	
	LAeq	L _{A50}
Daytime (7.00am-10.00pm)	45-49	37-43
Daytime Average	46	40
Night-time (10.00pm-7.00am)	39-41	32-35
Night-time Average	40	34

The low levels are typical of an environment remote from busy roads and intensive farming (rural), residential or business activities.

It is noted the night-time background (LA90) average is 34 dB and 6 dB below the design noise limit of 40 dB LAeq, but the night-time ambient (LAeq or average noise level) level is at the design noise limit of 40 dB LAeq.

Attended measurements were also taken during the evening adjacent to 17 Taraire Rd and 13 Manuka Rd. Results are slightly lower than logger results with ambient levels ranging from 32 – 44 dB LAeq and background levels ranging from 28 dB – 37 dB LA90. This is expected due to increased setback distances from Woodlands Park Rd and therefore less traffic noise effects.

I agree the monitoring indicates that the existing WTP was creating noise compliant with the lowest permitted noise standard of 40 dB LAeq when the monitoring was carried out.

Section 4.0 Acoustic Performance Standards and Legislation

As mentioned above, correct noise and vibration standards have been referenced for assessment purposes.

Section 5.1 Replacement WTP Operational Noise

Predicted noise levels have been prepared using recognised noise modelling software. Modelling of predicted noise levels typically gives conservative results.

Sound power data used in the modelling is presented in Appendix E and includes noise levels across the frequency spectrum and the A weighted levels.

It is noted that operation of the plant is not expected to generate any tonal issues. If this effect did occur (e.g. worn bearings) there are engineering solutions readily available to avoid, remedy or mitigate any tonal noise effects. However, it is recommended that tonal reverse alarms are not permitted on the site.

As shown in Table 7, noise levels have been predicted from operation of the proposed WTP immediately inside the legal boundary of the affected sites. Noise levels from the existing WTP are also provided and the difference in noise levels and subjective effect from the change in noise levels have been described.

The highest predicted noise level is at the permitted noise standard of 40 dB LAeq within the boundary of 20 Manuka Rd and 78 Kohu Rd, these sites are shown below: -



The above two receivers and receivers at 16 Manuka and 18 Manuka Rd are predicted to notice an increase in noise which is described as “very noticeable” but at a reasonable level at night (at or below 40 dB LAeq immediately within the site boundary).

Overall, given the measured existing noise environment, I agree with the effects assessment that although 4 receivers (12 and 14 Manuka Rd, 94 and 96 Scenic Drive) may experience a noticeable increase in noise and an additional 4 receivers (16, 18 and 20 Manuka Rd and 78 Kohu Rd) may experience a very noticeable increase, noise from the replacement WTP will comply with the lowest permitted noise standard adopted for the project (40 dB LAeq).

It is noted that New Zealand Standard NZS 6802:2008 Acoustics - Environmental noise refers to appropriate noise standards to protect the health and amenity of residential land use. The following is reproduced from NZS 6802:2008: -

C8.6.2 *The recommended daytime limit of 55 dB $L_{Aeq(15\ min)}$ is consistent with the guideline values for community noise in specific environments published by the World Health Organization. The World Health Organization identifies that during the daytime, few people are seriously annoyed by activities with levels below 55 dB L_{Aeq} . The night-time limit recommended should not exceed 45 dB $L_{Aeq(15\ min)}$ outside dwellings so that people can sleep with windows open for ventilation and achieve the desirable indoor 30 to 35 dB $L_{Aeq(15\ min)}$ level as a design level to protect against sleep disturbance.*

Predicted noise levels meet the recommended guideline limit at night with a 5 dB safety allowance.

Although not mentioned in the MDA report, compliance with the maximum noise limit of 75 dB LAFmax is expected given there are no proposed night time activities which could potentially create loud impact type noise.

As the noisiest plant identified in Appendix E (e.g. Sludge Dewatering Building, Lime Silo Cyclone and Blower Building) are expected to operate for up to 24 hours per day (although some plant may have on and off cycles), the noise emissions are not expected to change significantly between day time and night time except it is proposed that at night there will be no truck movements onsite.

Therefore, designing the replacement WTP to comply with 40 dB LAeq at night will result in noise levels significantly below the 50 dB LAeq daytime noise limit.

Table 8 provides predicted cumulative noise levels from the existing WTP and the new WTP as there is likely to be a period of crossover. I agree with the assessment that any cumulative noise effects will be imperceptible for most receivers with the potential for a perceivable cumulative effect (+3 dB) within one site at 100 Scenic Drive. More importantly, cumulative noise levels are predicted to comply with the project noise standard of 40 dB LAeq at night.

Section 5.2 Construction Noise

I agree a preliminary assessment is appropriate until such time the construction methodology, machinery and contractor details are finalised.

Construction noise is predicted in general accordance with the method detailed in Annex D of NZS6803:1999 Acoustics – Construction noise. The method considers the sound power level, periods of operation, distance from source to receiver and screening of each source, as well as façade reflection and the degree of soft ground attenuation.

Sound power levels and various setback distances including the setback distance to achieve compliance are provided in Table 9 (WTP) and Table 10 (reservoir 1 and 2) for typical plant and machinery expected to be utilised for a project of this scale and nature.

The sound data looks representative of the proposal based on reviews of the same or similar machinery proposed on other sites subject to resource consent applications. It is noted onsite truck movements are included with a sound power level of 105 dBA.

I agree noise from works carried at the replacement WTP site is predicted to generally comply with the permitted noise standards except where vegetation is removed/processed at 55m from Manuka Road receivers. A +4dB infringement is predicted.

I agree noise from works carried at the reservoir site is predicted to generally comply with the permitted noise standards except where vegetation is removed/processed at 65m from Scenic Drive receivers. A +3dB infringement is predicted.

I agree predicted infringements of 3-4 dB are not significant when works are carried out during reasonable day time hours and affected neighbours have been notified in advance of the works.

The duration of the infringement is not reported and should be provided by the applicant (at the public hearing).

MDA has also assessed the potential for cumulative noise effects if periods of work on the replacement WTP and the Reservoir 1 site were carried out concurrently. Given the sites' separation distances as well as the distances to the nearest common receivers, MDA predicts that the cumulative effect of parallel construction works would be up to +3dB - which is a just perceptible change in noise level. However, I agree that parallel works would decrease the total construction period duration which most receivers would welcome despite a slightly increased noise level.

Predicted infringement of E25.6.27 Construction noise is a reason for resource consent.

Section 5.2.5 Construction Traffic Noise on Public Roads

I agree noise from trucks/vehicles driving on the public road network (to and from the construction site) is outside the scope of the AUP (OP) as there are no specific noise standards.

However, an assessment has been completed based on the average number of vehicle movements over the total construction programme and, the peak number of vehicle movements expected over a period of seven months (months 29 to 35) when the highest number of vehicle movements are expected to occur.

Vehicle noise associated with construction has been predicted and compared to existing vehicle noise levels based on existing traffic volumes provided by the applicants traffic engineer. Results are shown in Table 11 and demonstrate that overall traffic noise levels will increase by 1 dB for receivers setback a nominal 15 m from Woodlands Park Rd and Atkinson Rd.

This result is expected as traffic volumes need to generally double to result in a +3dB increase.

Although there will be an increase in the percentage of trucks in the traffic flow (e.g. on Woodlands Park Rd the percentage of trucks will increase from 3% to 6.3%), the resulting total traffic noise level will increase from 62 dB LAeq(1-hour) to 63 dB LAeq(1-hour).

For some residents truck noise will become more noticeable as trucks will pass their property more frequently. However, in regard to the recognised method used to assess traffic noise, the change in total traffic noise levels will be imperceptible.

Section 6.1 Operational Vibration Assessment.

A brief statement is made that with good design, vibration levels from operation of the replacement WTP and reservoir will easily comply with permitted vibration standards in Table E25.6.30.2 reproduced below: -

(2) Permanently installed stationary vibrating, reciprocating and rotating machinery and all piping, ducting and other equipment attached to such machinery must be installed and maintained so that any resulting vibration does not exceed the limits of Table E25.6.30.2 Vibration levels for stationary machinery when measured in any occupied room of any building on another site or in any occupied unit under different ownership from the source of the vibration. Vibration must be measured in accordance with ISO 2631-2:2003 Mechanical vibration and shock – Evaluation of human exposure to whole-body vibration – Part 2: Vibration in buildings (1Hz to 80Hz):

Table E25.6.30.2 Vibration levels for stationary machinery

Affected occupied building or area	Time of day	Maximum vibration level in root mean square velocity (mm/s) between 8 and 80Hz
Noise sensitive spaces	7am-10pm	0.20
Bedrooms and sleeping areas only within activities sensitive to noise	10pm-7am	0.14

Given the setback distances from the closest plant to neighbouring dwellings, I agree that vibration standards will be met without any practical difficulties providing an acoustic specialist is involved during the detailed design stage. Furthermore, compliance with the above permitted standards indicates vibration will not be perceivable in any occupied room outside the designated site boundaries.

Section 6.2 Construction Vibration

A brief statement is made that due to the setback distances from the reservoirs to the closest dwellings, vibration levels are expected to be negligible and compliant with permitted vibration standards.

Given the highest vibrating activities mentioned (excavator movement, sheet piling and use of vibratory rollers), I agree compliance will be achieved based on reviews of assessments for the same or similar machinery on other sites.

As the setback distances from the replacement WTP and neighbouring dwellings is shorter, more information is provided to demonstrate effects.

Indicative vibration levels from the above machinery/works are estimated using regression curves based on published vibration data and field monitoring results. Use of regression curves is a common assessment method.

The largest setback distance to ensure compliance with the most stringent limit (human comfort/amenity limit of 2mm/s PPV) specified in Table E25.6.30.1 is 43m. As works will occur at a minimum setback distance of 50m from the closest dwellings in Manuka Road, compliance is expected with all permitted vibration standards.

However, I agree that occupiers of buildings in Manuka Rd may potentially perceive short term vibration effects because the human threshold for perception is very low at 0.15 mm/s PPV when vibration may be just perceivable.

The following table reproduced from BS 5228-2:2009 Part 2: Vibration provides comments on vibration effects on humans:-

Vibration level mm/s PPV	Effect
0.10	Not felt
0.15	Maybe just perceptible depending on frequency, threshold of perception
0.35	Maybe just perceptible
1.0	Noticeable and may cause complaint in sensitive environments but may be tolerable if receivers informed of the works
10	Strongly noticeable and likely to be intolerable for any more than a very brief exposure

Regarding vibration effects (construction and operation), the proposal is a permitted activity.

Section 7.0 Mitigation and Management of Construction Noise and Vibration

Infringement of the construction noise limits are common and typically unavoidable for construction activities if adjacent houses are located close to the construction site boundary. Such infringements are often considered reasonable if they are of a limited duration and the best practicable options are implemented to avoid, remedy and/or mitigate construction noise effects.

To mitigate noise and vibration effects a Construction Noise and Vibration Management Plan (CNVMP) will be prepared and implemented. A CNVMP must include specific mitigation measures which will be implemented to demonstrate that the best practicable option will be adopted to minimise noise and vibration as far as practicable.

I consider the extent of noise infringements to be reliable but can be re-checked once the contractor, equipment, and methodology is confirmed in a CNVMP and, validated by onsite monitoring when the works are carried out.

A CNVMP is the most appropriate method for managing temporary construction noise and vibration. I concur with this approach and the submission of a CNVMP to council for certification prior to commencement of any works on the site and should be conditioned accordingly.

Furthermore, if works are required outside of normal construction hours, or expected to infringe the permitted noise standards (e.g. vegetation clearance), an Activity Specific Construction Noise and Vibration Management Plan (ASCNVMP) will be prepared to mitigate and manage effects associated with the specific works. This is an additional and separate activity specific management plan under the umbrella CNVMP.

Noise and vibration monitoring should be carried out at commencement of noisy and high vibrating creating activities so that works can be managed accordingly to ensure noise and vibration effects are minimised as far as practicable.

Provision of a draft CNVMP for the hearing is recommended providing the assumptions used to prepare the CNVMP are clearly stated. Providing a draft CNVMP will be helpful for decision makers (and submitters) to see how noisy construction works and in particular noisy works predicted to infringe the noise limits, will be mitigated and managed. The estimated duration of the noise infringement mentioned earlier can be included.

Section 8 Recommended conditions of consent

I generally support recommended conditions (i) to (vii) to manage noise and vibration effects during the construction stage.

I suggest operational noise limits, prohibiting tonal reverse alarms and a requirement to carry out compliance monitoring within 3 months of commissioning the replacement WTP and reservoirs to demonstrate compliance with consented noise limits.

Suggested conditions are: -

CXX

The noise rating level and maximum noise level arising from any activity subject to this consent on sites designated XX when measured within the boundary of a site in a residential zone must not exceed the levels below: -

Time	Noise Level
Monday to Saturday 7am – 10pm Sunday 9am – 6pm	50 dB LAeq
All other times	40 dB LAeq 75 dB LAFmax

Noise levels shall be measured in accordance with the provisions of NZS 6801:2008 Acoustics – Measurement of environmental sound and shall be assessed in accordance with NZS 6802:2008 Acoustics – Environmental noise.

Advice Note:

- i. The consent holder is reminded of their general obligation under section 16 of the Resource Management Act 1991 to adopt the best practicable option to ensure that the emission of noise does not exceed a reasonable level.*

CXX

The consent holder shall provide to the Team Leader Compliance Monitoring NW a report that: -

- a) Measures and assesses noise emitted from the replacement water treatment plant and reservoirs within 3 months of commissioning and, when weather conditions are suitable for noise measurements;
- b) Measures noise at representative positions at the designated site boundaries and/or within adjacent site boundaries of sites zoned residential (if access is made available) and/or suitable proxy locations that are most exposed to noise from the water treatment plant and reservoirs;
- c) Determines the extent of any compliance or infringement of the noise limits specified in **condition XX**; and
- d) Recommends specific actions, in the event of an infringement, that will ensure compliance with the noise limits specified in **condition XX**.

The above report shall be prepared by a suitably qualified and experienced acoustic specialist and submitted to the Team Leader Compliance Monitoring NW within 14 working days from completion of the monitoring.

In the event of an infringement the consent holder shall ensure all remedial actions recommended by the acoustic specialist are implemented, to the satisfaction of the Team Leader Compliance Monitoring NW, immediately or as soon as practicable.

CXX

Tonal reverse alarms vehicles are prohibited on the site. Broadband reverse alarms are permitted.

Submissions

Noise and vibration effects were raised by a number of submissions including submitters 4900, 5230, 5243, 5166, 5215, 5234 and 9002.

In my opinion noise effects have been adequately assessed by Marshall Day Acoustics in their report dated 20 May 2019. The submissions generally do not raise any issues that have not been addressed with the acoustic information provided.

Some submissions identify concerns with vibration created by trucks driving on the local road network. This is outside the scope of the AUP (OP) and there are no specific vibration standards that apply to trucks driven on public roads (same as for noise). Vibration levels from passing trucks associated with this proposal will be the same or similar for any truck passing by an individual property. Vibration levels from passing trucks are expected to be negligible for a truck travelling along a road which is maintained, in good condition and free of any imperfections (e.g. potholes). Neighbours who observe potholes outside their properties should contact Auckland Transport to have them repaired.

Vibration received within a building is dependent, amongst other variables, on the type and condition of building foundations and setback distance of the building from the road. A detailed vibration assessment is not practicable or necessary.

A section 92 request was made to provide comments on vibration effects from truck movements however a response was not provided prior to this memo. Information on this potential effect at the hearing might be helpful to address the concerns of the submitters.

Conclusion/Recommendation

1. The acoustic report has satisfactorily assessed noise and vibration effects from the proposal with appropriate AUP (OP) E25 permitted noise and vibration standards.
2. Resource consent is required as construction noise is predicted to infringe the noise standard in E25.6.27 during vegetation clearance works only. All other construction works can be managed to ensure compliance.
3. Construction vibration will comply with permitted standards in E25.6.30 (1) and operational vibration will comply with permitted standards in E25.6.30 (2)
4. I support the approach that as compliance with construction noise standards will not be achieved at all times, infringements must be managed by a CNVMP/ASCNVMP to be submitted to council for certification prior to works commencing.
5. Neighbours usually tolerate high construction noise levels provided noise is no louder than necessary, noisy works occur within appropriate hours of the day and/or at times likely to cause the least disturbance, adequate consultation is completed before and during the works and, best practice is adopted to minimise effects as far as practicable.
6. Construction noise and vibration effects at affected receivers are acceptable providing works are managed in accordance with a certified CNVMP/ASCNVMP.
7. As the setback distance from the replacement WTP to the closest dwellings is shorter than the existing WTP, four receivers may experience a noticeable increase in noise and four receivers may experience a very noticeable increase in noise resulting from the proposal.
8. The replacement WTP plant will incorporate acoustic mitigation in the design and therefore operational noise from the replacement WTP will comply with reasonable noise levels during the daytime and at night.
9. Operational noise is predicted to not exceed permitted noise standards in E25.6.18 within all sites zoned residential.
10. If consent is granted noise effects can be managed by conditions of consent.

Please do not hesitate to contact me if you require any further information

Yours sincerely

Andrew Gordon
Specialist

Technical Memo – Ecological Compensation Review

To:	Richard Blakey, Consultant Planner	Job No:	1904
From:	Graham Ussher, RMA Ecology Ltd	Date:	12 December 2019
cc:	Carol Bergquist & Carl Tutt, Auckland Council		
Applicant:	Watercare Services Limited		
Applicant No:	BUN60339273: Water Treatment Plant Replacement		
Application type:	Vegetation clearance from a Significant Ecological Area		
Site address:	Woodlands Park Road, Waima		

1 Scope of this review

Watercare Services Limited ('Watercare') proposes to construct and operate a new Water Treatment Plant and two new reservoirs at the junction of Woodlands Park and Manuka Roads in the Waitakere Ranges. The Huia Water Treatment Plant Replacement project ('WTP') has a development footprint of 4.3 ha and will require the removal of 3.5 ha of indigenous vegetation.

This review has been undertaken for Auckland Council¹ to provide an assessment of the package of ecological enhancements and protections offered up by Watercare to address adverse effects on terrestrial ecology values that are not avoided, remedied or otherwise mitigated within or close to the project site.

This review compliments, and should be read in conjunction with, the review of terrestrial ecology values and on-site effects management undertaken by Dr Carol Bergquist (Auckland Council). Matters regarding adverse effects on aquatic ecology values, and the management of those (including mitigation and offsetting) are addressed in the separate technical report by Mr Carl Tutt (Auckland Council).

The documents that I have reviewed in the preparation of this report include:

- Huia Water Treatment Plant Replacement. Assessment of Ecological Effects. Boffa Miskell. 21 May 2019.
- Huia Replacement Water Treatment Plant (WTP) Project, Final AEE. Tonkin & Taylor Limited. July 2019.
- Consenting Phase Site Layout Development Report. GHD. May 2019.

¹ In accordance with our scope of engagement dated 1 July 2019.

- North-western water supply; storage requirements. Assessment of storage required and site selection assessment. Beca Ltd. 22 May 2019
- Reservoir Site Layout Development Report, Beca Limited. 22 May 2019.
- Indicative Construction Methodology, Alta. 23 May 2019.
- Proposed Conditions, May 2019.
- Huia Replacement WTP – BUN60339273; Response to Section 92 Request for further information. Tonkin & Taylor Ltd. 13 August 2019.
- Huia Replacement WTP – BUN60339273; Response to second Section 92 Request for further information. Tonkin & Taylor Ltd. 8 November 2019.
- As well as documents prepared by Auckland Council, including Section 92 requests and technical memos prepared by Dr Carol Bergquist and Mr Carl Tutt.

2 Summary of Proposal

The proposed project spans three sites owned by Watercare which have a total area of 15 hectares. Infrastructure comprising the project includes a new WTP to replace the aging Huia WTP, and two treated water reservoirs (50 million litres total capacity) to provide additional treated water storage. The new WTP will occur, in part, across some of the area currently occupied by the existing Water Treatment Plant, which will be decommissioned during the construction of the replacement plant.

As described in the Applicant's AEE:

The site for the replacement WTP is located in close proximity to the existing Huia WTP, on the corner of Manuka Road and Woodlands Park Road on land owned by Watercare and designated for Water Supply Purposes (Designation 9324). One 25 ML treated water reservoir is to be located across from the replacement WTP on the northern side of Woodlands Park Road. Other than the most eastern extent of this reservoir, it will be entirely buried / below ground level. The NH2 valve chamber and tunnelling reception shaft will also be located within this site. The second 25 ML reservoir is to be constructed on the existing Huia WTP site once this plant is decommissioned.

The design of the new plant requires that areas currently supporting vegetation, including grassland, exotic weedland and indigenous vegetation, are cleared and built on.

Land use consent for vegetation removal from a SEA requires consent as it is a Restricted Discretionary Activity under E26.3.3.1 (A77) and does not meet Standard E26.3.5.2 on account of:

- (1) The proposal involves vegetation removal on both the reservoir site and the replacement WTP site that will include trees over 6 m in height and 600 mm in girth, and
- (2) Vegetation removal will also result in the removal of more than 20 m² of vegetation within a SEA.

3 Site description and ecological effects

The site is located wholly within the peri-urban foothills of the Waitakere Ranges and is part of Significant Ecological Area (SEA)_T_5539 which encompasses some 24,000 ha of the wider Waitakere Ranges Regional Parklands.

The site occupies part of a relatively contiguous band of indigenous vegetation at the head of the Little Muddy Creek catchment and provides a corridor of forest and shrubland, broken only by roads, which connects forest in the Lower Nihotupu Reservoir and Little Muddy Creek catchments.

Vegetation within the broader site includes kauri- podocarp forest, broadleaved forest, and swamp and floodplain forest, as well as early and mid-regenerating examples of each, within which kanuka and mahoe are two of the dominant forest trees. Exotic grass and weedland comprise a relatively small component of the vegetation.

Wildlife detected during surveys by Watercare, or which may be present based on nearby records, includes a full suite of forest and shrubland native birds, up to five native lizard species, a relatively intact community of invertebrates, and the possibility of native bats and the native Hostetter's frog being present at the site.

Overall, the terrestrial ecological values within the wider (ca. 15 ha) project area are assessed as being Very High by the Applicant's ecology advisor, and as Very High by Dr Bergquist in her review.

The effects of the proposed development on the site's ecology values are describe in the Applicant's ecology report, and are generally supported by Dr Bergquist. I accept the assessment of Dr Bergquist as representing the range of ecology values that will be adversely affected by the proposed works.

These include (for terrestrial values):

- Removal of 3.5ha of indigenous forest and scrub (some aged at 80-120 years) for the three footprints of the WTP, Reservoir 1 and Reservoir 2 within the centre of the 15 ha site. The loss of vegetation types within the footprint includes the following:
 - WTP footprint – 1.2 ha kanuka - mamangi forest; 0.7 ha kanuka -mahoe forest and scrub; and 0.6 ha mahoe scrub
 - Reservoir 1 – 0.6 ha of kanuka forest, and patches of kahikatea-kanuka forest
 - Reservoir 2 – 0.4 ha of predominantly kanuka-mamangi forest
- Loss of threatened/at risk flora – with the proposed forest clearance of kanuka-dominated forest, manuka and climbing rata species, which are species that have been recently listed as threatened or at risk of extinction from the effects of myrtle rust
- Disturbance to or loss of fauna species, particularly herpetofauna, native birds, bats and invertebrates
- Catchment scale effects, as the proposed clearance and development introduces localised fragmentation into the vegetated corridor across the top of the Little Muddy Creek catchment, and the gap created will further reduce connectivity across the local landscape and between mature and regenerating forest patches in the Project Site.

Age of forest within the development site appears to be ca. 70 years based on aerial photos of the site, although, as noted in the Applicant's ecology report, there are mature kahikatea scattered across parts of the footprint with trunk diameters that equate to trees aged 80 -120 years old. Other large specimen trees of broadleaved and podocarp species also occur through areas of regenerating forest and may be of similar age (100+ years).

Matters relating to kauri dieback, stream effects, and tree protection are not included in this review as management plans or protocols have been proposed by the Applicant to address ecological risk, and these are assessed in the other relevant specialist reports commissioned by Council.

4 Residual effects management

The residual adverse effects of the proposed development, after on-site avoidance, remedy and mitigation are applied, are stated by Watercare to be:

- (1) The permanent loss of 3.5 ha of indigenous forest cover, including mature secondary forest and modified broadleaved scrub communities, within the Project Site, which will constitute a reduction in extent of the significant ecological area within the Little Muddy Creek catchment; and
- (2) Loss of ecosystem functions, including partial loss of connectivity within the forested corridor below Scenic Drive, on the northern boundary of Little Muddy Creek catchment; disruption of ecological sequences in the Project Site and immediate surrounds; and a potential reduction in the quality of forest habitat on the perimeter of the Project Site.

These residual effects are also supported by Dr Bergquist in her review. Dr Bergquist regards the loss of these values to be ecologically significant.

To address the residual adverse effects on ecological values of the site Watercare proposes to undertake a comprehensive programme of weed and animal pest control, and public engagement for conservation purposes within a substantial area of the Waima catchment. The enhancement programme is proposed throughout a spatial area which includes 990 ha of the suburbs of Waima, Woodlands Park and Laingholm (essentially most of the Little Muddy Creek catchment) and is referred to by the Applicant as the Waima Biodiversity Management Area (WBMA).

The WBMA has subsequently been increased to include an area of parkland to the east of the proposed eastern boundary of the WBMA – so that the whole of the Little Muddy Creek catchment is encompassed by the WBMA².

Management within the WBMA will be guided by a Waimea Biodiversity Management Plan (WBMP), which is to be developed in conjunction with Council.

The key elements of the ecological enhancement work proposed within the WBMP are:

1. Establish an administrative structure that coordinates and implements conservation work.
 - A draft Trust Deed has been provided as part of the Application materials
 - Watercare proposes establishing a \$5 million fund in the Trust to fund conservation works across the area for a minimum of 10 years
 - Engagement with landowners and residents to enable access to facilitate weed and pest animal control
2. Undertake multi-species vertebrate pest management throughout the WBMA
 - Target is to recruit at least 400 owners of properties within 2 years of Trust's establishment, and to secure access for vertebrate pest control
 - Suppression of pest below thresholds values to deliver biodiversity gains
3. Weed management
 - Progressive recruitment of landowners to secure access for weed control
 - Suppression of target species to control infestations
4. 'Kauri rescue'
 - Identify properties with kauri and seek access to assess kauri tree health, and develop site-specific management to alleviate kauri dieback risk

² As confirmed by the Applicant's ecologist in the memo from Boffa Miskell dated 5 July 2019. The additional area is to the east of the proposed area and includes the land between the existing eastern boundary of the WBMA and a line originating from the intersection of Kohu Rd, Atkinson Rd, Scenic Drive, and Titirangi Road, along the eastern side of the Titirangi War Memorial Reserve, across to Titirangi Beach Road, and along the eastern edge of the Parkland to the coast.

5. Argentine ant control
 - Develop surveillance framework
 - Effective eradication of localised populations
6. Biodiversity monitoring
 - Implement monitoring plan and framework for indicator species
 - Regular reporting & recommendations to drive improved allocation and delivery
7. WBMP review and update
 - Annual reporting & recommendations regarding management actions or monitoring methods as required.

Additional detail has been provided by Watercare as part of the Section 92 process by which Council can seek further information. Information relevant to this assessment includes:

- Clarifications by the Applicant's legal advisors regarding the way in which the Trustees of the Trust will be elected, how they will be financially compensated for their involvement on the Trust, and the way in which the Trust Deed will ensure that the \$5 million is spent wisely.
- Clarification around the portion of the Trust's funding that is anticipated to be spent on the control of possums, rats and stoats (30 % of the overall budget).
- Clarification over the role of the Trust Board in administering the funds. The Trust Board will have the discretion to allocate funding to work that requires resourcing, and conserve funds where voluntary effort or regulatory enforcement is available. In this way the Trust can adaptively reprioritise funds to areas that may have been under-budgeted for, or may be able to expand the operational life of the fund.
- Provision of a breakdown of the proposed expenditure of the Fund on various activities over a 10-year period (see table below taken from the s92 reply dated 13 August 2019; page 13 of the Boffa Miskell ecology memo).

Table 2 Indicative Trust fund budget allocation.

Component	Total cost	Rate (approx.)	Factors
Annual vertebrate pest control (including monitoring)	\$1,590,000	~\$200/ha p/a	Rate varies depending on pest densities, accessibility and need to supplement control on public land. Costed for SEA (including public land). + buffer. Budget assumes no volunteer support.
Staged weed control across WBMA over 10 years.	\$2,300,000	~\$5,575 /ha	Rate varies depending on difficulty. Costed for SEA on private land only (~400 ha). Budget assumes no volunteer support or control by landowners under RPMP.
Other initiatives (kauri dieback, Argentine ant and other pest management)	\$275,000	\$27,500 p/a	Discretionary sum to allocate these initiatives as required.
Biodiversity monitoring	\$185,000	\$18,500 p/a	Allowance for technical assistance and equipment hire.
Project coordinator	\$650,000	\$65,000 p/a	Contract salary
Total Budget (excl. GST)	\$5,000,000		

- Part of the WBMA that was originally available for weed control has been retracted – that of the portion of the Nihotupu Reservoir catchment – due to constraints placed by Watercare on the uses of herbicides within water supply catchments.

The Applicant's ecology report states that several alternative initiatives to address residual adverse effects of the WTP proposal were considered, however the WBMP and its catchment-scale approach to enhancing vegetation and wildlife, and engaging with local communities, was favoured.

The Applicant considers the WBMP and actions within it constitute an ecological compensation package, although it notes that it could be considered to be a biodiversity offset if the AUP Appendix 8 criterion of no-net-loss (NNL) enabled inferred assessments of NNL, rather than only clearly quantifiable estimates.

The Applicant presents an analysis to support its assessment that the proposed WBMP is the best option for addressing residual adverse ecological effects, because it will be adequately resourced, is located locally, is of sufficiently large scale to generate landscape-level ecological benefits, and is likely to produce immediate enhancements across a full spectrum of biota and ecological communities that are potentially impacted within the proposed development footprint.

5 Main Issues and discussion

The starting point for this assessment is that the losses of ecological values are unavoidable. The reviews by several of the other specialists on behalf of Council have dealt with the issues of engineering design, site selection, and site-specific initiatives to locate the development footprint away from places of higher ecological values, where practicably feasible.

I do not dwell on those matters, except to note that the Applicant presents a case that a reasonable effort has been expended to avoid adverse effects on ecological values at this site, and that the residual effects represent the end of an iterative design process where ecological matters have been a central focus.

While I may agree that pacing the WTP in another location may generate less impacts on ecological values, it is the effects on values associated with this Huia WTP application site that I have been asked to assess.

The AUP:OP requires that effects that cannot be avoided, remedied or mitigated and which are significant, should be offset. The Applicant's ecologist considers that the residual effects are significant and this is supported by Dr Bergquist. All residual effects on terrestrial ecology values have been brought forward for consideration as part of the WBMP programme, so whether or not residual effects are or are not ecologically significant is a moot point. I will simply note that the proposal by the Applicant to address all residual effects accords with recent good practice guidance prepared for Local Government New Zealand on biodiversity offsetting and ecological compensation under the RMA³. In that document, the authors promote the need to address all residual adverse effects, not just those that are considered to be significant, if a site is a Significant Natural Area or meets agreed criteria as one. That is certainly the case for the replacement Huia WTP site.

The AUP:OP provides guidance on the application of biodiversity offsetting, (Appendix 8), but is silent on ecological compensation. Others have interpreted this as leaving open the potential to consider a proposal from an Applicant that does not meet all of the guidance criteria for qualifying as biodiversity offset, but nonetheless provides for a package of ecological enhancements and protections.

In this assessment, I have taken the approach that a package such as that proffered by the Applicant should be assessed on its merits, and that good practice guidance should be used to assess how it

³ Maseyk F, Ussher GT, Kessels G, Christensen M, and Brown M. 2018. Biodiversity offsetting under the Resource Management Act: a guidance document. Contract number TCG 2017/076. Unpublished report prepared for the Regional Council Biodiversity Working Group, Wellington. September 2018. 80 pp

stacks up against accepted good design principles. I have relied upon the LGNZ 2018 guidance which states that ecological compensation can deliver good benefits for biodiversity, and that such compensation should seek to satisfy as many of the key principles of good biodiversity offset design, where practicably feasible. That approach is also given support by s104(1)(ab) of the RMA which requires that Councils have regard to measures proposed to ensure positive environmental effects that offset or compensate for adverse effects (as introduced by the Resource Legislation Amendment Act 2017).

The key issue at stake for this Application and the assessment of the positive effects package proposed by the Applicant, is not whether there is merit in the proposed package (WBMP), but whether it can be achieved given the constraints that Watercare has placed around the project.

The other key issue is whether the exchange of biodiversity that will be lost within the development footprint if consents are granted is adequately balanced by the potential gains within the WBMA.

The focus of my assessment in this regard has been on the following aspects, each of which provides a test for the Applicant's package against good practice that has been applied for other projects, or which is stated as a key factor in Council's Appendix 8 guidelines, or the guidelines of others (e.g. LGNZ 2018), or from my experience with the design and implementation of biodiversity offset and compensation packages under the RMA.

Limits to offsetting & compensation

There are limits to the application of offsetting and ecological compensation. Adverse effects that result in the loss of the last individual of a species or area of an ecosystem in a local area (e.g. at an Ecological Region level), or such that their overall threat classification is raised markedly, are inappropriate and should be avoided.

There are no species or ecosystem types listed by the Applicant, or identified in the review by Dr Bergquist, that exhibit those qualities of irreplaceability or vulnerability within the proposed development footprint. The Applicant provides adequate information regarding the location and type of ecological resources across the Watercare site, and evidence that the most special of those have been avoided as part of the development footprint design process.

The exception to this is kauri, the risks to which have been described in the technical review by Dr Murray Fea (Auckland Council). Dr Fea identifies significant risk to kauri not proposed to be directly impacted at the site, as well as consequential risk to old-aged kauri specimens downslope of the site, as well as risks associated with possible importation of the kauri dieback pathogen into the site. Dr Fea concludes his report by stating that adverse effects on kauri cannot be avoided or remedied and are extremely difficult to mitigate. Loss of old-age kauri from the site or outside of the site as a consequence of this project would constitute an effect that is not possible to offset, and may not be socially or politically acceptable to attempt compensation. In any case, the issues identified in the report by Dr Fea, in my opinion, constitute potential risks to kauri, and the conditions propose mitigations of that risk (whether in full or not). If the consent conditions provide the means to alleviate risk, and if the potential for loss of kauri as a result of the proposed WTP is not certain, then there is no potential loss that needs to be addressed. If loss occurs or is certain, offsetting is not a viable avenue to alleviate that loss.

Proximity to development losses

A key principle of ecological enhancement works is that proximity to the impact is advantageous, not only for maintaining ecological links and benefiting elements of the same ecological communities, but also for ensuring that the resulting benefits are retained within the same human communities exposed to the losses.

For the Huia WTP project, the proposed WBMA is within and surrounds the site of the ecological losses (the WTP development area), and the ecological benefits resulting from the proposed enhancement works will be within the same local area.

Would all of this good work have been done anyway by others (additionality)

The WBMA is large and the potential benefits from improved control of weeds and animal pests is potentially great. However, it is important that only those benefits that arise from the work undertaken by Watercare (as the potential consent holder) are counted towards an assessment of 'ecological worth' of the WBMA.

I am aware of work already being undertaken by Auckland Council across nine of the local area Reserves within the proposed WBMA; those works include control of weeds listed in the Regional Pest Management Plan (RPMP) at all of those sites, and control of animal vertebrate pests to low levels at six of those sites. There is also at least one community group operating in the area that controls (in particular) animal pests, albeit over a small part of the proposed WBMA.

Watercare provides a breakdown of the area of the WBMA that is in various forms of land ownership, and a brief review of the work being undertaken by the local community to control animal pests. Even when community-run initiatives and work being undertaken by Council on high priority local parks is taken into account, the majority of the proposed WBMA would clearly benefit from having an improved level of weed and animal pest management, or benefit from greater coordination to align resourcing to achieve greater efficiencies and provide assistance to programmes already in place.

In terms of requirements of landowners or Council to undertake some or all of the activities proposed by Watercare within the WBMA area, I make the following comments:

1. I have been informed by Council's technical support staff that there are no requirements on landowners to control any pest animal identified in the proposed WBMA. Landowners could be required to control pest animals listed in the RPMP if they have a QEII or other Council-issued covenant on their property, however there are only 5 listed within the proposed WBMA area. Even then, the ability for Auckland Council to enforce these requirements is unknown as the conditions of these covenants have changed over the years of issue, and new landowners may not even know covenants exist on their property if it was set up by a previous landowner. Furthermore, the totality of the covenanted area is very small, so even if it could be enforced, the overall benefit to the whole WBMA compensation area would be minor.

Therefore, weed and animal pest control works proposed as part of the WBMA would constitute activities over most of the area that are additional to the requirements expected by the AUP:OP of landowners.

2. The new Natural Environment Targeted Rate (NETR) in the Auckland Region will provide a substantial boost to the resources available to Council to undertake weed and animal pest control (amongst other activities). There is currently discussion within Council over how that money will be spent, including within Significant Ecological Areas (SEAs) on Parklands and private land. Separate to that discussion is consideration of requirements on landowners adjoining SEAs to manage some weed issues as part of a buffer initiative. Neither the NETR funding allocation nor SEA buffer weed control initiatives have been confirmed by Council for the WBMA area, and there is no commitment, or robust plans, or guarantees of such funding or regulatory requirement on landowners at this time.

Therefore, for the purposes of this assessment, I consider that the contribution made by existing programmes is small in comparison to the overall land area within the WBMA requiring weed and pest animal control and that ecological benefits that are outcomes of the control programme proposed by the Applicant, will be additional.

Priorities for funding

The WBMA is proposed in concept by Watercare, with the intention that detailed information will be provided by way of the WBMP if the concept forms part of a granted consent.

Information provided by the Applicant with regard to how the WBMP funding will be split has been brief and general, and I accept the reasons for that. The indicative funding split put forward by the Applicant's ecologist shows that most of the proposed \$5 million funding (ca. \$3.9 million) is proposed to be allocated to animal pest and weed control, with the balance split between kauri and Argentine ant initiatives, and programme administration.

The indicative funding split accords with my general view on how effort arising from the WBMP should be allocated – a clear focus should be on control of pest vertebrate animals, followed by weeds, followed by, to a much lesser extent, initiatives that involve other biosecurity issues, community engagement and administration.

In my opinion, a clear focus on pest vertebrate control and weed control is necessary as those two activities form the entire basis for generating benefits that are most likely to directly replace or compensate for the loss of values within the construction footprint (as discussed below).

Equivalence

Indigenous vegetation proposed for removal within the development footprint is mostly mid or late successional forest dominated by kanuka, with some older elements of individual podocarp and broadleaved trees.

The WBMA area includes substantial areas of these same vegetation types, as well as patches of mature secondary forest.

Anticipated improvements to wildlife and vegetation within the WBMA area will be to the same suite of species and broad vegetation types that are present within the development footprint, particularly for wildlife and for fruiting plant species within the development footprint.

For kanuka, the programme of weed and pest animal control is less likely to deliver benefits to tree health or to seed dispersal, simply because the suite of weeds and animal pests proposed to be controlled are unlikely to be having a significant adverse effect on kanuka health. Instead, the BWMA programme is likely to have disproportionately greater benefit on mature forest trees, such as puriri, karaka, taraire, pigeonwood, rimu, totara, kahikatea and other long-lived canopy species that are targeted by rats and possums.

I consider that the anticipated improvement to mature forest areas within the WBMA represents a form of 'trading-up' offset⁴, which adds to the value of WBMA programme, and that equivalence is maintained between the values proposed to be removed at the WTP site, and the values proposed to be enhanced at the WBMA area.

⁴ As defined in the LGNZ 2018 as a loss of biodiversity that is common in exchange for improvements to biodiversity that is of a higher conservation threat status or of a greater conservation need.

Assessing no-net-loss

Guidelines on the application of offsetting and ecological compensation provide for trades that involve loss of extent (area) for improvements in condition (of existing values), although replacement of physical area of habitat or vegetation is often the preferred approach.

For this project, the Applicant is proposing a trade between loss of area (3.5 ha) and enhancement to an existing area of habitat (the WMBA).

If the trade proposed was area for area, the resulting offset planting area that would be required to create forest is approximately 55 ha⁵ and would be a relatively straight-forward calculation. However, trades between area and condition (as is proposed for this project) are fraught, especially so in this case as the timeframe for maintaining the enhancements is relatively short (10 years or so).

More importantly, the range of assumptions that would need to be made when populating a forecast improvement model for vegetation types within the WBMA would be great and undermine any purported rigour in such an assessment. For fauna, forecast of potential gain could be made, particularly since there is a range of information from other projects that could inform assumptions of relative gain over time. However, given the large size of the WBMA area proposed for pest control, and the magnitude of change to bird populations recorded from other studies, it is apparent that any estimates of loss:gain balance would return considerable net-benefit.

For vegetation, the question becomes whether the potential benefits that might accrue to native plants and forest types within the WBMA area are of a sufficient nature and scale that they would compare favourably against approximately 55 ha of planted kanuka-dominated forest (setting aside the fact that an area this large is not available in the local area for conversion back to native forest).

The level of improvement to the forest area within the WBMA that is additional to that being already managed by Council or the community would need to be a relatively small level of improvement to achieve this (perhaps 10 % improvement in ecological condition). The improvements to fauna communities are likely to be great based on information from published studies elsewhere. The possible improvement to seeding of key canopy podocarps and broadleaved trees is also likely to be considerable, based on studies of rat and possum damage to canopy tree fruit within coastal forest in Auckland. However, I am unaware of information from elsewhere that could be used to help inform the quantitative benefit of animal pest control to improved seed dispersal, seedling establishment and plant recruitment in a situation such as for this project.

In the absence of information from elsewhere, I can only state that I concur with the Applicant's ecologist that those benefits will be expressed throughout the WBMA area, and probably in adjoining areas due to bird-assisted seed dispersal, and that those benefits will be long-lasting.

An assessment of whether NNL could be achieved is not possible, and is not necessary given that the Applicant has proposed a package of measures that it has collectively referred to as compensation.

In my opinion, when considering the potential ecological benefits of undertaking the proposed weed and animal pest control programme as described in the Applicant's ecology report, I consider that the likely ecological benefits that are generated will be at least commensurate with the type and scale of biodiversity losses at the development site (taking into account benefits that might otherwise accrue if offset revegetation planting were instead proposed).

⁵ Based on a simplified accounting model of Offset Area Required = Present Value (1+i)ⁿ; where Present Value is the area of habitat to be removed in Year 1, 'i' is the discount rate (3.5 % in this case) and 'n' is the number of habitat function years lost (i.e. time to replacement; taken as 80 years given presence of older canopy trees within clearance area). Usage follows accepted application of applying time preference discounting in NZ.

The inclusion of additional aspects of the WBMA programme – kauri dieback prevention, Argentine ant eradication and community engagement – the overall WBMA package could be considered to include additional positive actions such that broader issues of environmental sustainability are also included.

Role of funding in determining project duration

The Applicant's AEE, supporting ecology report and the draft Trust Deed refer to a programme of WBMP funding that will continue 'for a minimum of 10 years'.

The funding breakdown provided in the first Section 92 reply confirms that the programme is intended to last a minimum of 10 years, and the \$5 million budget appears to have been developed on a 10-year basis. The Trust Deed includes Clause E, which enables the Trust Board to receive or acquire additional funding, should it be required.

I have queried the level of funding and whether it may be sufficient to adequately resource the WBMP to the level of pest and weed control (and other objectives) set as targets. The Applicant has provided reassurance that the \$5 million funding proposed is an appropriate sum.

I have made enquiries from other sources regarding the cost of undertaking animal and weed pest control over the areas proposed in the WBMA and for the periods of time proposed as a minimum by the Applicant. My analysis suggests that a greater level of funding will be required to achieve the stated targets.

The purpose of the WBMA programme is to provide assurance that ecological values will be replaced, even if NNL cannot be quantitatively demonstrated. As such, the estimated cost and initial funding proposed for the Trust are less relevant, as it is the achievement of the weed and pest animal control targets (and the sustaining of those level of successful control) that is key to demonstrating that the offset/ compensation has been achieved.

It is reassuring to see in the Trust Deed that the Board may receive and acquire further funds or other property from time to time from other sources for the purposes of the Trust. I interpret this to mean that the Consent Holder will provide more funds if the initial sum of \$5 million is found to be insufficient to sustain the WBMP programme such that targets are being met.

In that regard, I consider that the only determinant of the WBMP success should be that the objectives and targets are met, rather than the budget proposed by the Applicant is shown to be spent.

Duration of enhancement project and permanence of benefits

Biodiversity offsets should be designed to deliver ecological enhancements that endure in perpetuity or for as long as the impacts of the development persist. The same yardstick should be applied to ecological compensation projects – and should be a criterion for acceptance for the WBMA project as well.

The WBMA project is proposed to operate for 'a minimum of 10 years'. In my opinion, the WBMP should operate for as long as is necessary to achieve and maintain low animal pest and weed control targets that form the basis of the agreed WBMP plan.

However, at some stage, pest control targets are likely to be met and the consent holder will be able to cease or scale down its direct involvement in managing a WBMA programme.

The issue of funding and management ceasing after a period of time, and that of permanence on the ecological benefits that will arise from that programme are, in my mind, two separate matters.

There is no consented offset or ecological compensation programme that I know of in New Zealand – amongst the many hundreds that have been consented – that has a requirement to be funded, to be monitored and to ensure that biodiversity gains are maintained in perpetuity. For all of those projects, there is a reasonable expectation that the biodiversity enhancements generated will be managed to a point of self-sufficiency, or to a level where significant, ongoing, management intervention is not required.

A key issue for the WBMA programme is that the management activities at the site are likely to be reliant on ongoing funding – as ceasing management after 10 or more years will most likely result in a progressive return of animal pests and weeds over time.

Without relying on the above, and assuming that weeds and pest animals are allowed to proliferate within the WBMA once Watercare's involvement ceases, in my opinion the biodiversity benefits will nonetheless persist. In that regard, I consider that a 10+ year programme of animal and weed pest control as proposed by the Applicant can feasibly be considered to deliver biodiversity benefits that will persist for a long time, even if the proposed weed and animal pest control cease after 10 years.

My reasoning is based on:

1. For vegetation, a key focus of the pest animal control programme is on seed predators, and predators of seed dispersers. There is robust evidence from published studies in New Zealand which show that the control of seed and bird predators results in a greater seed set, greater fruit availability and an increase in the populations of key seed dispersers (e.g. kereru), which is of particular benefit to large-fruited, long-lived native canopy trees.

The creation of a ca. 1,000 ha of intensive pest-control area (the WBMA) will ensure that key canopy and understory trees and shrubs of podocarp and broadleaved forest types that exist in pockets throughout the proposed WBMA will fruit more successfully and have a much greater chance of seed being dispersed across the local landscape.

Assuming that the full WBMA programme will take 2 years to establish (as estimated by the Applicant), that will ensure that, at a minimum, 8 years of catchment-wide flowering, fruiting and seed dispersal will take place that is relatively unhindered by predators of seeds and fruits, or of the birds (and perhaps lizards) that disperse them.

Weed control and control of seed predators will ensure that dispersed seed has a greater opportunity to establish. Results from studies elsewhere record a very large increase in germination and seedling establishment of native trees when seed predators (particularly rodents) are removed. Key plant species that will establish are podocarp and broadleaved canopy species. This is likely to accelerate a transition to secondary mature forest, compared to the rate and state of natural transition without comprehensive pest control.

Seed fall and seedling establishment will be into areas where key plant herbivores are absent – there are no goats or deer within the Waitakere Ranges or its adjoining areas, and the localised areas that support pigs are the subject of ongoing control by Council.

2. For fauna, the considerations are similar. Control of wildlife predators to low levels has been shown elsewhere to result in increased breeding success and population abundance of native birds and will result in the 'halo' effect seen in other mainland pest control projects. Animal populations will expand and numbers disperse into adjoining areas, providing a boost to numbers, breeding populations and overall persistence in adjoining areas where pests may be not controlled to the same level.

A 10-year programme will provide ca. 8 years of low pest numbers. Results from studies elsewhere (including from bird count records in the Waitakere Ranges and Hunua Ranges undertaken by Auckland Council) record increased nesting and fledging success and increases in population abundance for most native birds. Some studies record substantial increases over only several years of pest control. Maintaining control over 8 years or longer will provide considerable gains for native birds. Information on the benefits of pest animal control for invertebrates and lizards is less well established, however follows similar patterns of improvement recorded for birds.

The magnitude of potential gains within the WBMA over 10 years is discussed by the Applicant's ecologist in the first Section 92 reply. I agree with the general rationale put forward – that populations of wildlife in the WBMA are likely to benefit and generate considerable increases in abundance over time. If pest control is ceased after 10 years of the WBMA programme, pest numbers will increase and their impacts on wildlife populations will result in a decline over time. However, that decline is not likely to be immediate, and it is most likely that some wildlife (especially mobile species) will have contributed to enhancements in adjoining areas, thereby contributing to landscape-level benefits.

While the loss of 3.5 ha of indigenous forest within the development footprint will result in the loss of habitat, controls around the removal of the vegetation mean that not all wildlife within that area will be killed. Salvage of native lizards (and frogs, if necessary) will reduce losses. Birds will likely move to adjoining habitat, and have a greater chance of establishing successfully if pest control programmes are already operating in those areas. Direct mortality of birds is likely to be low; it is loss of potential breeding contribution to the surrounding landscape that is the key issue.

I have only considered the potential benefits of a 10 year programme, and then the gradual return of weeds and animal pests once a Watercare-funded programme is ceased.

Although not part of the above assessment, it may be relevant to consider whether Council or the local community would allow pests and weeds to proliferate once the funding and programme managed by the consent holder ceases? My experience is that once a programme of this sort of scale and level of community involvement is established and is delivering tangible benefits, it is unlikely that the local community will allow it to decline in its entirety.

There are a number of sources of funding and resources that other community-led conservation projects access to sustain projects, and all of those would be available to the WBMA post-Watercare involvement. The model adopted by the NZ Government under the Tomorrow Accord (2014⁶) is relevant.

Although the WBMA programme duration could be as short as 10 years, in my opinion the large scale of the programme and sustained control of weeds and animal pests to low numbers over that period will result in a surge in seedling establishment of trees of long-lived canopy species within the WBMA and surrounding areas, and an increase to local populations of birds, reptiles and invertebrates. The increases are likely to contribute to enhancements in populations in adjoining areas. Improvements to plant recruitment will persist even if pest and weed control cease. Improvements to fauna population will be eroded over time if pest animal control ceases, although

⁶ The Tomorrow Accord is an agreement between the NEXT Foundation and the New Zealand Government to maintain the outcomes of Foundation-funded conservation projects where the agreed biodiversity outcomes are achieved, but are not able to be funded through continuing contributions by NEXT Foundation.

it is likely that benefits that result to wildlife populations over a broader area will persist for longer and/or have secondary benefits for populations outside of the immediate WMBA area.

6 Consideration of Submitters

The ecological matters raised in submissions are considered below. Note that not all submissions on each topic are necessarily listed individually. Where relevant, cross references are made to the assessment of effects within section 5.

A number of submitters have made comments with respect to conditions of consent. Watercare has advised that an amended and updated list of conditions will be provided to respond to the points raised in submissions, and also to reflect updates following matters raised in the most recent Section 92 further information request.

Ecological compensation is inappropriate

Submissions including 4878 – Anne Taylor, 4975 – Brent Courtney, 5029 – Lisa Prager, 5172 – Justine Cormack, 5206 – Manuka Road Resident's Society, 5273 – Cyril Hamiaux, 9005 – Tom Ang, 9006 – Wendy Gray oppose the Application and submit that the ecological compensation package is inappropriate for one or more of the following reasons:

- No amount of compensation can replace the loss of native bush or endangered kahikatea wetland.
- The concept of compensation is incompatible with aims to restore and protect a fragile environment.
- Humans cannot restore nature back its original state – only leaving nature for long periods of time can restore nature.
- The compensation package relies upon claiming ecological gains through animal pest and weed control that residents should be, or already are, doing or which is required by Council to be undertaken as part of buffer pest management to the Regional Parklands.
- The proposed offsetting does not achieve a like-for-like replacement.
- The proposed compensation focusses on weed and animal pest control, not replacing biodiversity values that will be destroyed.

The submitters are seeking the following relief: That the application is declined.

Officer comment:

Activities that provide for positive benefits to the environment are recognised forms of replacing or balancing adverse effects that cannot be avoided, remedied or mitigated – where the loss of such values is regarded as appropriate. The AUP provides for the consideration of offsetting and compensation.

The package of ecological enhancements put forward by the Applicant is referred to as compensation, not a biodiversity offset, although the Applicant has attempted to take into account good practice guidance on offsetting in the design of the package. By its nature, ecological compensation is not required to adhere to good practice offset design principles – including retaining a like-for-like replace, although by doing so it would align more with standard practice and have a greater likelihood of replacing the values associated with species and ecological communities that are impacted upon.

The areas proposed for management (the WBMA area) and the methods proposed for management (weed and animal pest control) are well recognised means of providing enhancements to indigenous biodiversity, although not all native species will respond equally (i.e. some species are likely to benefit more than others). In my opinion, the proposed weed and animal pest control programme will provide benefits to indigenous biodiversity, will assist with restoring and protecting indigenous

vegetation types within the same local area, and will benefit the same types of ecological communities (in addition to others) that are proposed to be impacted within the WTP footprint.

The issue of additionality is important. I have discussed with Council's Biosecurity and Community Engagement teams the level of work being undertaken by Council or community groups within the proposed WBMA area. I understand that community-led initiatives to control biosecurity threats include control of some key weeds, and some control of animal pests on private and public land. The areas covered are small in comparison to the size of the WBMA area. I also understand that biosecurity works on Local Area Reserves being undertaken by Council either does not include all Reserves or is at an irregular frequency which is unlikely to provide the level of ecological benefit compared to the Applicant's proposed programme.

Council requires that some weeds within the proposed WBMA must be controlled by private landowners, however for most weeds, there is no mandatory requirement to undertake control. While Council is currently considering a proposal to describe a buffer around regional parklands in which landowners or Council must control a range of weeds and pests, a decision on that proposal has yet to be made, and therefore cannot be taken into account against the Applicant's biodiversity enhancement package.

As discussed in Sections 5, 7 and 8 of this report, I consider that the proposed compensation package is appropriate and that it provides for additional, substantial, ecological enhancements.

Ecological compensation is inadequate

Submissions including 4865 – Olaf Klesse, 5028 – Waitakere Ranges Protection Society, 5133 – Tree Council, 5146 - Titirangi Residents & Ratepayers Association, 5171 – Valera Koltsov, 5230 – Titirangi Protection Group Incorporated, 5287 – Department of Conservation, 5297 – Waitakere Ranges Local Board, 9002 – Dave and Julie Hutchings oppose the Application and submit that the ecological compensation package is inadequate. Several submitters comment that the compensation package 'is miniscule' or 'does not address the scale of the adverse effects'.

A key concern of submitters is that the enhancement package will not provide a like-for-like replacement of ecological values, that the duration of the weed and animal pest control is short duration (10 years) and any gains would therefore be temporary, and that the area over which enhancement is proposed (the WBMA) is too small.

Resolutions variously proposed by the submitters in this regard include:

- No alternative proposal provided by the submitter;
- Increase the level of funding for the compensation package to \$10 million or \$20 million, with additional funding made available at the end of the initial period.
- Increase the duration of the programme to 15 years or up to 100 years.
- Extend the boundaries of the enhancement management area to include the whole of the Waitakere Ranges as a possible recipient for funding;
- (an alternative view put forward by other submitters is to ensure that funding is only spent within the Little Muddy Creek catchment, and not outside of that immediate area).

Several submitters echo the view of 5133 – Tree Council, which states that 'the compensation package included in the application is totally inadequate, lacking any equivalency to the scale of the negative impacts, lacking critical details that would enable an evaluation of the practicality and achievability of the stated objectives'.

The submitters are seeking the following relief:

- That the application is declined (4865, 5133, 5146, 5230, 5287, 5297)
- That the Applicant's compensation package is revised (5028, 5171)

Officer comment:

The Applicant provides a breakdown of how the funding amount will be divided between various activities as part of the WBMP programme. The basis for this appears to be assumptions made over the extent and cost of activities over a 10-year period.

I agree that there is no information provided by the Applicant with regard to the anticipated scale of benefit arising from each of the enhancement activities and how this has been used to justify equivalence of biodiversity gains, or used to justify the duration of the compensation programme.

Given that the package proposed is ecological compensation, there is less onus on the Applicant providing such justifications, however for the purposes of clarity I agree that a rationalisation of how the area, benefits and sum has been arrived at would assist submitters with understanding how the Applicant has arrived at the proposed package.

In my opinion – and as outlined in Section 5 of this report – I regard the proposed extent of activities within the proposed WBMA area to be adequate, so long as a high standard of weed and animal pest control is achieved and maintained for a minimum period. I do not think that cost should be the key determinant in deciding the extent, duration or quality of enhancement work undertaken. Rather, there should be a commitment by the Applicant to a standard of enhancement work known to provide beneficial biodiversity outcomes, with a requirement that the commitment endure until that standard is achieved.

In my opinion, while an increase in funding to \$10 million or \$20 million will provide a larger 'pot' from which to fund a wider range of activities, or over a larger area, or for a longer time period, it does not in itself guarantee that meaningful control of threats to biodiversity will be achieved. That, in my mind, is central to assessment of whether the proposed compensation package is adequate, or not.

7 Conclusions

The proposed Huia WTP project will have significant residual adverse effects on terrestrial ecology values by removing 3.5 ha of indigenous vegetation that is mostly mid to late-successional stage kanuka forest with some older canopy trees. The loss of that forest will have effects on the connectivity of indigenous vegetation cover of the local catchment.

The package of enhancements offered by the Applicant includes a programme of at least 10 years of weed and animal pest control, as well as other conservation initiatives, within a proposed Waima Biodiversity Management Area, which covers at least 990 ha of the surrounding area and includes most of Little Muddy Creek catchment.

The scale of proposed weed and pest control is great; however, the duration of the programme is short and if the programme ceases, biodiversity gains for some species will erode over time. Some potential gains – especially to forest health and recruitment of long-lived forest trees - are likely to persist however and will accelerate a transition to mature forest throughout the management area (and in nearby areas).

The WBMA programme meets many of the key criteria by which a well-designed biodiversity offset is developed – in particular, proximity to impact area, work proposed is not being undertaken by others and is not required by law, and parts, but not all, of the enhancements to ecology values will

persist. The package cannot be assessed against the no-net-loss principle because of difficulty accounting for exchanges of loss of area against improvements to condition for such a complex proposed management area.

On the balance, I consider that the proposed WBMA compensation package will provide enhancements that are at least commensurate to the values proposed to be removed from within the project footprint.

A key component underlying my assessment of 'commensurate benefit' is the duration and effectiveness of weed and animal pest control within the WBMA area.

In this regard, there are several changes that I have suggested to the set of proposed resource consent conditions to ensure that weed and animal pest control will be undertaken to a high standard. My assessment of 'commensurate benefit' is contingent upon these changes to the set of consent conditions being adopted; if the changes are not adopted, I would consider that residual adverse effects on terrestrial ecology values will not have been adequately addressed, and that a significant residual adverse effect on ecology values will result from the Huia WTP project.

8 Conditions

The Applicant has submitted a set of draft conditions for comment. Should the hearing panel be of a mind to grant consent, I recommend that the following changes to the condition set should be included.

New Condition xxx

Waima Biodiversity Management Plan

xxx.1

Prior to the commencement of any vegetation removal works the Consent Holder shall submit and have certified by Auckland Council, a Waima Biodiversity Management Plan (WBMP) prepared by a suitably qualified and experienced ecologist.

xxx.2

The WBMP shall be in general accordance with the following document:

1. Huia Water Treatment Plan Replacement: Assessment of Ecological Effects, prepared by Boffa Miskell Ltd for Watercare Services, dated 21 May 2019.

xxx.3

The WBMP shall include as a minimum:

- a. Ecological enhancement works carried out within the area described by the Little Muddy Creek catchment; and
- b. Control of weeds consistent with Auckland Council weed priorities; and
- c. Control of vertebrate animal pests; and
- d. Undertaking of other activities that contribute to an improvement in ecological health or management of ecological risk (e.g. identification of kauri dieback disease areas, eradication of localised Argentine ant infestations, public education and advocacy as

- may be needed to achieve the stated goals of the WBMP project); and
- e. Monitoring and reporting on the results and outcomes of the WBMP project to Auckland Council.

xxx.4

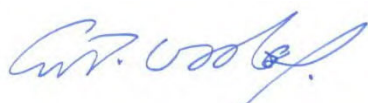
The requirements for the WBMP programme shall include, but not be limited to achieving:

- a. Agreement of the owners of at least 400 private properties, appropriately dispersed across the whole of the catchment, to secure access for vertebrate pest control; and
- b. Control of rats, possums and mustelids over the 400 private properties to the target control levels stated in the WBMP (averaged over 400 properties, on an annual basis), for a period of no less than 8 consecutive years; and
- c. Progressive recruitment of the owners of private properties containing native forest to secure access for weed control; and
- d. Suppression of target weed species to the extent that no mature plants exist.

xxx.5

No vegetation clearance within the Huia WTP area may commence until written certification from Auckland Council is obtained that a WBMA Plan has been prepared to the satisfaction of Auckland Council.

Signature:



Graham Ussher
Principal Ecologist⁷
RMA Ecology Ltd

g:\my drive\rma ecology ltd\active projects\1904 ac wtp
review\working\ak_council_huiawtp_ecologyoffsetcomp_review_12dec2019_issued.docx

⁷ This report has been prepared for the benefit of our Client with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement. Any use or reliance by a third party is at that party's own risk. Where information has been supplied by the Client or obtained from other external sources, it has been assumed that it is accurate, without independent verification, unless otherwise indicated. No liability or responsibility is accepted by RMA Ecology Limited for any errors or omissions to the extent that they arise from inaccurate information provided by the Client or any external source.

ATTACHMENT FIVE

DESIGNATION 9324

	headworks areas	
9322	Water supply purposes - headworks services land	Waitakere Ranges
9323	Water supply purposes - water treatment plant and associated structures	105-121 Christian Road, Swanson and 21 Long Road, Bethells
9324	Water supply purposes - water treatment plants and associated structures	Woodlands Park Road, Manuka Road and Exhibition Drive, Titirangi
9325	Water supply purposes - reservoir and associated structures	88 Sunhill Road, Glen Eden
9326	Water supply purposes - reservoir and associated structures	166-176 Konini Road, Titirangi
9327	Wastewater purposes - storage tanks and associated structures	56 The Concourse, Henderson
9328	Water supply purposes - pump station and associated structures	143 Flanshaw Road, Te Atatu
9329	Water supply purposes - pump station and associated structures	Road Reserve on Pleasant Road / Titirangi Road Corner
9330	Water supply purposes - pump station and associated structures	Totara Road Esplanade Reserve, 9 Kelvin Crescent, Te Atatu Peninsula
9331	Water supply purposes - water treatment plant and associated structures	415A Te Atatu Road, Te Atatu
9332	Water supply purposes - water treatment plant and associated structures	Wood Bay Beach Reserve in the vicinity of 81 Wood Bay Road, Titirangi
9333	Water supply purposes - pump station and associated structures	Road Reserve, adjoining 172A Laingholm Drive, Laingholm
9334	Water supply purposes - pump station and associated structures	97B Fred Taylor Drive, Whenuapai
9335	Water supply purposes - water treatment plant	362 Wayby Valley Road, Wellsford
9336	Water supply purposes - reservoir and associated structures	Worthington Road (Lot 1 DP 57349), Wellsford
9337	Wastewater purposes - wastewater treatment plant	Between State Highway 1 and Rustbrook Road (Lot 3 DP 64870), Wellsford
9338	Water supply purposes - reservoir and associated structures	31 Omaha Drive, Omaha
9340	Wastewater purposes - wastewater treatment plant	64 Jones Road, Omaha Flats
9341	Water supply purposes - reservoir and associated structures	20 View Road, Warkworth
9342	Wastewater purposes - wastewater treatment plant	6 Brown Road, Warkworth
9343	Wastewater purposes - wastewater treatment plant	55 Alnwick Street and Part Allot 68, SO 64916 Warkworth
9344	Water supply purposes - reservoir and associated structures	James Street, Snells Beach, and adjoining properties (Lots 1 and 2 DP 205704)
9345	Water supply purposes - reservoir and associated structures	32 Tudor Collins Drive, Warkworth
9346	Wastewater purposes - wastewater treatment plant	114 and 118 Hamilton Road, Warkworth

9324 Huia and Nihotupu Water Treatment Plants

Designation Number	9324
Requiring Authority	Watercare Services Ltd
Location	Woodlands Park Road, Manuka Road and Exhibition Drive, Titirangi
Rollover Designation	Yes
Legacy Reference	Designation WSL4, Auckland Council District Plan (Waitakere Section) 2003
Lapse Date	Given effect to (i.e. no lapse date)

Purpose

Water supply purposes - Huia and Nihotupu water treatment plants and associated structures.

Conditions

1. To ensure that section 176A 3(f) of the Act has been adequately addressed, an outline plan shall include, as appropriate:
 - a. a statement on the relevant Plan objectives, policies and rules; and
 - b. a statement on any adverse effects the works will have on the environment and the mitigation measures to be carried out.

Explanation:

While it is accepted that the project or works will be (or should be) in accordance with the designated purpose, the Council wishes to be reasonably assured that the specific works to be carried out will not unnecessarily compromise the objectives, policies and rules of the Plan or adversely affect the environment. The Council's principal opportunity to influence the works to assist the requiring authority to meet its environmental responsibilities is through the outline plan, and the assessment of compliance and effects will assist it in determining whether to request changes.

2. Appropriate sedimentation and erosion control measures shall be employed for any earthworks on the designated site.

Explanation:

This Plan outlines erosion and sediment control measures for earthworks which are above a certain threshold, with that threshold varying according to the particular environment. Compliance with these measures would generally satisfy condition 2. Note that major earthworks may require consent from the Council.

- 3a. Works shall not adversely affect those elements of the Huia Filter Station (Designation 9324), the Nihotupu Filter Station (Designation 9324) or the Waitakere Filter Station (Designation 9323) which are identified in the Appendix 9.1 - Schedule of Significant Historic Heritage Places of the Unitary Plan as 77 Huia Filter Station, 86 Nihotupu Filter Station, 90 Waitakere Filter Station.
- b. Works shall not adversely affect the stringer dam in Designation 9322, the sawpit in Designation 9322 or the mill and holding dam in Designation 9321, as described in the Appendix 9.1 - Schedule of Significant Historic Heritage Places of the Unitary Plan as 158 Whatipu Stream Stringer Dam Site, 12 Cowans Mill Saw Pit Site and 8 Gibbons Huia Mill (timber mill site with earth holding dam).

Explanation:

Works otherwise in accordance with the designation but which adversely affect the items or elements of items identified as being of heritage significance may only be carried out if the designation is altered to specifically alter (or remove) the condition. As part of the requirement to alter the designation, the requiring authority would be expected to carry out a form of heritage assessment.

ATTACHMENT SIX

SUBMISSIONS AND LOCAL BOARD COMMENTS

These have been reproduced separately and are available at this link:

<https://www.aucklandcouncil.govt.nz/have-your-say/hearings/find-hearing/Pages/resource-consent-hearing-documents.aspx?HearingId=251>

ATTACHMENT SEVEN
SUBMISSION SUMMARY TABLE

2019 Site Address	NRC Applicant Name	F of A Applicants	Applicants Full Name	Organisation	Contact Ph	Email Address	Postal Address	Submission Options	Question 1	Question 2	Question 3	Question 4	Attend Hearing	Joint Submission	Submission Business E	Attacher Modified	Item Type	Path
4764	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Simon Kison	022126046:skapool@gmail.com	022126046:skapool@gmail.com	68 Waimea CrescentAucklandAuckland 0604	Vegetation Removal, Traffic, multiple issues	I believe, I am not a trade comp	Yes	Yes	Yes	Yes	Joint Submission	b1e43fca1 CentralCSubmissions	43682.92	Item	Lists/ResourceConsentSubmission
4767	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Jessica Wilson	022917117:spjalina@hotmail.com	022917117:spjalina@hotmail.com	20 Amber AveGlenn EdenAuckland 0602	Deconstruction It's a residential area that is home to native Reserve. I am not a trade comp	No	No	No	No	No	Yes	15934949 CentralCSubmissions	43683.37	Item	Lists/ResourceConsentSubmission
4769	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Mike Clarke	027524250:michaialclarke@yahoo.co.nz	027524250:michaialclarke@yahoo.co.nz	34 Onedin PlaceTirirangiAuckland 0604	The overhanging of the local natural environment (I just scribble I am not a trade comp	No	No	No	No	No	Yes	eae70dad CentralCSubmissions	43683.5	Item	Lists/ResourceConsentSubmission
4770	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Matthew Borsos	021152469:matborsos@gmail.com	021152469:matborsos@gmail.com	13 Valley View RdTirirangiAuckland 0604	The destruction of vegetation	I find alterer I am not a trade comp	No	No	No	No	Yes	714842e43 CentralCSubmissions	43683.55	Item	Lists/ResourceConsentSubmission
4771	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Nathan May	021292358:nathanmay@gmail.com	021292358:nathanmay@gmail.com	43 Rimutaka PlaceWaikanaeAuckland 0604	I am concerned about the amount of traffic. The amount I am not a trade comp	No	No	No	No	No	Yes	c31c12741 CentralCSubmissions	43683.57	Item	Lists/ResourceConsentSubmission
4772	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Gonzalez Enrique De Santiago	027329291:gonzalez@xtra.co.nz	027329291:gonzalez@xtra.co.nz	26 Manuka RoadTirirangiAuckland 0604	All of it	I would like I am not a trade comp	No	No	No	No	Yes	a2734414 CentralCSubmissions	43683.57	Item	Lists/ResourceConsentSubmission
4773	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Katja Jacobs	022431412:katja.jacobs@gmail.com	022431412:katja.jacobs@gmail.com	111 Laingholm DriveAucklandAuckland 0604	The scale of the scale of this development at Adhere to I am not a trade comp	No	No	No	No	Yes	63aff6be CentralCSubmissions	43683.58	Item	Lists/ResourceConsentSubmission	
4774	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Mariano Fernandez	021023571:marianofernandezjanezic@gmail.com	021023571:marianofernandezjanezic@gmail.com	74/1 Ambrico PlaceNew LynnAuckland 0600	Location of Cutting down forest, volume of truck movement Different I am not a trade comp	No	No	No	No	Yes	00721297 CentralCSubmissions	43683.58	Item	Lists/ResourceConsentSubmission	
4775	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Matthew Judd	021557424:matthew_judd@hotmail.com	021557424:matthew_judd@hotmail.com	6/16 Waimea CrescentTirirangiAuckland 0600	The impact of the proposed to build a huge industrial cor Refuse con I am not a trade comp	No	No	No	No	Yes	37835644 CentralCSubmissions	43683.58	Item	Lists/ResourceConsentSubmission	
4777	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Stuart Robertson	021485008:stuart@meanbusiness.co.nz	021485008:stuart@meanbusiness.co.nz	87 Garden RdPihaiAuckland 0772	Environmental and their are better options than destroy to stop an I am not a trade comp	No	No	No	No	Yes	6045706a CentralCSubmissions	43683.59	Item	Lists/ResourceConsentSubmission	
4778	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Gary Martin	021191791:judyte@xtra.co.nz	021191791:judyte@xtra.co.nz	2079 Great North RoadAuroraAuckland 0604	Building a 'There are ecologically and socially much to Revisit the I am not a trade comp	No	No	No	No	Yes	75171cfc CentralCSubmissions	43683.96	Item	Lists/ResourceConsentSubmission	
4779	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Mark Atkinson	021836226:enhancedlandscapes@gmail.com	021836226:enhancedlandscapes@gmail.com	10 Warwick AveTirirangiAuckland 0604	In respons Traffic and the impact of up to 90 heavy tru Use smart's I am not a trade comp	No	No	No	No	Yes	d1f453316 CentralCSubmissions	43683.97	Item	Lists/ResourceConsentSubmission	
4780	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Berthine Brunisma	021214933:lgreen@ownworld.com	021214933:lgreen@ownworld.com	6 Jays Rd, TirirangiWoodlands ParkAuckland 0604	Deconstruction of Heritage forest and subsequent damage Improve it I am not a trade comp	No	No	No	No	Yes	10886d1b CentralCSubmissions	43684.38	Item	Lists/ResourceConsentSubmission	
4781	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Aaron Bessem	021163334:aaronbessem@hotmail.com	021163334:aaronbessem@hotmail.com	24 Mahoe RoadTirirangiWaikare 0604	In respons Traffic and the impact of up to 90 heavy tru Use smart's I am not a trade comp	No	No	No	No	Yes	5811812f CentralCSubmissions	43684.4	Item	Lists/ResourceConsentSubmission	
4782	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Mr Scott Allan	021403030:scottjverry@gmail.com	021403030:scottjverry@gmail.com	6 Jays RoadWoodlands park, TirirangiAuckland 0604	No Construct I live near the proposed plant and pass it e Stop the p I am not a trade comp	No	No	No	No	Yes	82b8b77c CentralCSubmissions	43684.69	Item	Lists/ResourceConsentSubmission	
4783	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Serena Scott	021134214:serena_l_scott@hotmail.com	021134214:serena_l_scott@hotmail.com	42 Tawini RdTirirangiAuckland 0604	Construct I live near the proposed plant and pass it e Stop the p I am not a trade comp	No	No	No	No	Yes	1465408f3 CentralCSubmissions	43684.73	Item	Lists/ResourceConsentSubmission	
4784	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Gabrielle MacDonald	021555433:gmacd@rocon.net.nz	021555433:gmacd@rocon.net.nz	42 Tawini RdTirirangiTirirangi 0604	Construct I live near the proposed plant and pass it e Stop the p I am not a trade comp	No	No	No	No	Yes	34118e49 CentralCSubmissions	43684.73	Item	Lists/ResourceConsentSubmission	
4786	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Anita Kirker	021260974:anitakirker@gmail.com	021260974:anitakirker@gmail.com	205 Woodlands Park RoadTirirangiWaikare 0604	Location of Cutting down forest, volume of truck movement Different I am not a trade comp	No	No	No	No	Yes	3a9f8086 CentralCSubmissions	43684.87	Item	Lists/ResourceConsentSubmission	
4787	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Maia Greig	021260974:maiaivgreig@gmail.com	021260974:maiaivgreig@gmail.com	57th South Tiritangi RdTirirangiTirirangi 0604	I am subject I am concerned about the amount of traffic. The amount I am not a trade comp	No	No	No	No	Yes	6529e102 CentralCSubmissions	43684.92	Item	Lists/ResourceConsentSubmission	
4788	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Marjke Hansford	021188749:marjkehansford@hotmail.com	021188749:marjkehansford@hotmail.com	11311 Huia RoadHuaAuckland 0604	Watercare Traffic and the impact of up to 90 heavy tru I would like I am not a trade comp	No	No	No	No	Yes	e60490ab CentralCSubmissions	43684.94	Item	Lists/ResourceConsentSubmission	
4790	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Lisa Rainger	02185699:lrainger@hotmail.com	02185699:lrainger@hotmail.com	88 Huia RoadTirirangiAuckland 0604	I Oppose Living in the area the destruction of native I would like I am not a trade comp	No	No	No	No	Yes	076503e5 CentralCSubmissions	43685.41	Item	Lists/ResourceConsentSubmission	
4791	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Eunice Ann Stott	02179810:eunicestott@icloud.com	02179810:eunicestott@icloud.com	124 Laingholm DriveLaingholmAuckland 0604	The reason I oppose the location. It is a r Choose an I am not a trade comp	No	No	No	No	Yes	6c886f03 CentralCSubmissions	43685.69	Item	Lists/ResourceConsentSubmission	
4792	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Craig Donaghey	02221100:craig.r.donaghey@gmail.com	02221100:craig.r.donaghey@gmail.com	163 Scenic DriveTirirangiAuckland 0604	In Protecting Destroying the gate way to the Waitakere I think I be I am not a trade comp	No	No	No	No	Yes	03d513a0 CentralCSubmissions	43685.81	Item	Lists/ResourceConsentSubmission	
4793	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Karyn Elizabeth Honey	021951433:kabretta@yahoo.com	021951433:kabretta@yahoo.com	163 Scenic DriveTirirangiAuckland 0604	The impact of the proposed to build a huge industrial cor Refuse con I am not a trade comp	No	No	No	No	Yes	21512613 CentralCSubmissions	43686.35	Item	Lists/ResourceConsentSubmission	
4794	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Nathan May	021292358:nathanmay@gmail.com	021292358:nathanmay@gmail.com	5 Kaitiaki SHOnimutuRotorua 3010	All of it	I would like I am not a trade comp	No	No	No	No	Yes	be9313205 CentralCSubmissions	43686.36	Item	Lists/ResourceConsentSubmission
4796	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Lani Kerecapa	02182080:lani.kerecapa@gmail.com	02182080:lani.kerecapa@gmail.com	516 Te Atatu RoadTe atatu peninsulaAuckland 0610	The scale of the scale of this development at Adhere to I am not a trade comp	No	No	No	No	Yes	962fd957 CentralCSubmissions	43686.76	Item	Lists/ResourceConsentSubmission	
4797	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Hayley Smith	021729863:hayley.jean.smith@hotmail.com	021729863:hayley.jean.smith@hotmail.com	387 Tirirangi RdAucklandAuckland 0604	The scale of the scale of this development at Adhere to I am not a trade comp	No	No	No	No	Yes	82e46bf5 CentralCSubmissions	43688.82	Item	Lists/ResourceConsentSubmission	
4801	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Martin John Vink	022140240:mahrvhar@xtra.co.nz	022140240:mahrvhar@xtra.co.nz	387 Tirirangi RdAucklandAuckland 0604	Opposing it I am absolutely outraged that Watercare: Not to build I am not a trade comp	No	No	No	No	Yes	a3720da4 CentralCSubmissions	43688.88	Item	Lists/ResourceConsentSubmission	
4802	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	shamus jenner	021088484:shamusjenner@gmail.com	021088484:shamusjenner@gmail.com	27 Hollywood AveTirirangiAuckland 0604	Earthwork I am a resident of Waimea in close proximity As a resident I am not a trade comp	No	No	No	No	Yes	70251d4d CentralCSubmissions	43690.47	Item	Lists/ResourceConsentSubmission	
4804	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Nasha Sidhu	021079888:nasha_a@outlook.co.nz	021079888:nasha_a@outlook.co.nz	8 York RoadTirirangiAuckland 0605	The destruct As above Please con I am not a trade comp	No	No	No	No	Yes	53fae6d7 CentralCSubmissions	43690.76	Item	Lists/ResourceConsentSubmission	
4808	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Anna Swann	021917533:annaswam@hotmail.com	021917533:annaswam@hotmail.com	30 Shyln Valley AvenuTirirangiAuckland 0604	Traffic issue I think the decision to build a water treatment Consul I am not a trade comp	No	No	No	No	Yes	38bd38a3 CentralCSubmissions	43690.8	Item	Lists/ResourceConsentSubmission	
4809	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Katy Atkin	021225790:katin34@gmail.com	021225790:katin34@gmail.com	22 Hollywood AveWaimeaTirirangi 0604	The water I live in a beautiful part of New Zealand, an Move the v I am not a trade comp	No	No	No	No	Yes	04442ca0 CentralCSubmissions	43691.82	Item	Lists/ResourceConsentSubmission	
4811	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Jaimee Wood	027568221:jmefortune@gmail.com	027568221:jmefortune@gmail.com	8 York roadTirirangiAuckland 0604	The applic I am a resident of Laingholm and the constri I am asking I am not a trade comp	No	No	No	No	Yes	e825496b CentralCSubmissions	43691.83	Item	Lists/ResourceConsentSubmission	
4812	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Annelise Kuegler	021306335:andyhuda@gmail.com	021306335:andyhuda@gmail.com	1751 Laingholm Drive, LaingholmLaingholmAuckland 0604	The destruct As above To find an I am not a trade comp	No	No	No	No	Yes	cc66e19b CentralCSubmissions	43691.89	Item	Lists/ResourceConsentSubmission	
4813	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Meghan Khalil	022068939:megpugh@gmail.com	022068939:megpugh@gmail.com	6214 Huia RoadParau BayWaikanaeAuckland 0604	I am subject I am concerned about the amount of traffic. The amount I am not a trade comp	No	No	No	No	Yes	6c886f03 CentralCSubmissions	43691.99	Item	Lists/ResourceConsentSubmission	
4814	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Julia Dobby	021739512:juliekidd@gmail.com	021739512:juliekidd@gmail.com	5 Victory RdLaingholmAuckland 0604	I am conc This is a long term project that will affect Rd-Consolid I am not a trade comp	No	No	No	No	Yes	a2b7a22d CentralCSubmissions	43692.31	Item	Lists/ResourceConsentSubmission	
4815	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Sharon Stobart	021056569:writesharons@gmail.com	021056569:writesharons@gmail.com	54 Ulinda RoadHuaAuckland 0604	Oppose I live in Huia. There is only one road through Mt Rangi I am not a trade comp	No	No	No	No	Yes	5a183aa2b CentralCSubmissions	43692.33	Item	Lists/ResourceConsentSubmission	
4816	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Linda Gwilliam	022091760:lindee.boval@gmail.com	022091760:lindee.boval@gmail.com	11 staley roadParauAuckland 0604	Oppose I oppose the application, the roads are atroc night I am not a trade comp	No	No	No	No	Yes	1b43ca5c5 CentralCSubmissions	43692.57	Item	Lists/ResourceConsentSubmission	
4817	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Katie Mason	022320290:katiemason18@hotmail.com	022320290:katiemason18@hotmail.com	205 Victory RdLaingholmAuckland 0604	The propo I strongly oppose the brute force of earth v We must s I am not a trade comp	No	No	No	No	Yes	033a2e8fc CentralCSubmissions	43692.59	Item	Lists/ResourceConsentSubmission	
4818	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Annelise Kuegler	021066776:askueler@gmail.com	021066776:askueler@gmail.com	377 Huia RoadTirirangiAuckland 0604	The dama It is my local community that this is affective See that th I am not a trade comp	No	No	No	No	Yes	844774667 CentralCSubmissions	43692.74	Item	Lists/ResourceConsentSubmission	
4819	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Aaron Powey	021029423:aaronpowey@gmail.com	021029423:aaronpowey@gmail.com	29 Huia RoadTirirangiAuckland 0604	The amount of traffic the proposed to build a huge industrial cor Refuse con I am not a trade comp	No	No	No	No	Yes	6529e102 CentralCSubmissions	43692.74	Item	Lists/ResourceConsentSubmission	
4822	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Melissa Williams	021040653:mellywilliams@outlook.com	021040653:mellywilliams@outlook.com	25 Waimea CrescentTirirangiAuckland 0604	The Subm 3.5ha of Significant Ecological Area (S.E.A.) The subm I am not a trade comp	No	No	No	No	Yes	7077315f CentralCSubmissions	43692.82	Item	Lists/ResourceConsentSubmission	
4823	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Charlotte Wallace	021306898:charlotte_wallace@hotmail.com	021306898:charlotte_wallace@hotmail.com	13 Rimutaka PlaceTirirangiAuckland 0604	This subm 1. Risk of spreading Kauri die back. Have W This subm I am not a trade comp	No	No	No	No	Yes	4411f00e CentralCSubmissions	43692.85	Item	Lists/ResourceConsentSubmission	
4824	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	David McLaren	021059217:David@colourspace.tv	021059217:David@colourspace.tv	68AucklandAuckland 0804	Local infra: The movements of heavy vehicles past r either an I am not a trade comp	No	No	No	No	Yes	4e2929e9 CentralCSubmissions	43693.65	Item	Lists/ResourceConsentSubmission	
4825	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Sandy Bedgood	021106773:sandybedgood@gmail.com	021106773:sandybedgood@gmail.com	3 Hellos PtTirirangiAki 0604	The total of Total disruption to the flora and fauna, the Do not app I am not a trade comp	No	No	No	No	Yes	06923af0 CentralCSubmissions	43693.85	Item	Lists/ResourceConsentSubmission	
4827	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Penny Madgwick and Caroline Pery	021617354:pennm27@gmail.com	021617354:pennm27@gmail.com	79 Shetland StreetGlenn EdenAuckland 0602	Constructs To Stop-The destruction of protected Nahts I would like I am not a trade comp	No	No	No	No	Yes	5435d126 CentralCSubmissions	43694.73	Item	Lists/ResourceConsentSubmission	
4828	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Galen Kierewich	021260748:galen.kierewich@gmail.com	021260748:galen.kierewich@gmail.com	735 Huia RoadTirirangiAuckland 0604	I oppose the application in whole or in part Please con I am not a trade comp	No	No	No	No	Yes	0584894c CentralCSubmissions	43694.78	Item	Lists/ResourceConsentSubmission	
4829	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	David Blake	021861957:davidblake3@gmail.com	021861957:davidblake3@gmail.com	36 Wood Bay RoadTirirangiAuckland 0604	This subm Please see the attached document. I would like I am not a trade comp	No	No	No	No	Yes	60ec119c4 CentralCSubmissions	43695.56	Item	Lists/ResourceConsentSubmission	
4831	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Taimi Alan	022482464:ceo@changingminds.org.nz	022482464:ceo@changingminds.org.nz	PO box 60576TirirangiAuckland 0642	I oppose t 8 years of debilitating disruption to the cor An alterna I am not a trade comp	No	No	No	No	Yes	1db1991f4 CentralCSubmissions	43695.68	Item	Lists/ResourceConsentSubmission	
4832	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Katrina Mathers	021352297:katrina.mathers@gmail.com	021352297:katrina.mathers@gmail.com	406/70 Pitt StreetAucklandAuckland 1010	The localc As a New Zealander I oppose any unnesses To revisit c I am not a trade comp	No	No	No	No	Yes	6250df38 CentralCSubmissions	43695.73	Item	Lists/ResourceConsentSubmission	
4834	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Maree Isabel Hill and Philip Edward North	021767684:northhill@xtra.co.nz	021767684:northhill@xtra.co.nz	49 Tainui RoadTirirangiTirirangi 0604	we oppose We oppose the entire applications made to That is the a I am not a trade comp	No	No	No	No	Yes	5115450d4 CentralCSubmissions	43695.81	Item	Lists/ResourceConsentSubmission	
4835	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Lily Paul Wood	09816287:lilypigwood@gmail.com	09816287:lilypigwood@gmail.com	8 York RoadTirirangiAuckland 0605	Ecologcal I am a 30 year resident of Tirirangi In 2019 Vegetator I am not a trade comp	No	No	No	No	Yes	04529561 CentralCSubmissions	43695.94	Item	Lists/ResourceConsentSubmission	
4836	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Thomas Clive Wood	021501933:tomwood.electrian@gmail.com	021501933:tomwood.electrian@gmail.com	8 York RdTirirangiAuckland 0604	Resourcal I am a 30 year resident of Tirirangi In 2019 Vegetator I am not a trade comp	No	No	No	No	Yes	43078aa0 CentralCSubmissions	43695.85	Item	Lists/ResourceConsentSubmission	
4837	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Ronja V Schipper	021164514:bavariankwin@gmx.de	021164514:bavariankwin@gmx.de	55 Victory RdLaingholmAuckland 0604	Ecologcal I strongly oppose the proposed development DO NOT gr I am not a trade comp	No	No	No	No	Yes	84269d09 CentralCSubmissions	43695.91	Item	Lists/ResourceConsentSubmission	
4840	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Joseph Lawrie	0210207575:jlawrie.mcharry@gmail.com	0210207575:jlawrie.mcharry@gmail.com	25a Landng road tirirangiTirirangiAuckland 1024	Watercare should not be allowed to destroy native bu I think an c I am not a trade comp	No	No	No	No	Yes	515a442e CentralCSubmissions	43696.82	Item	Lists/ResourceConsentSubmission	
4841	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Chris Good	096234567:coven1@protonmail.com	096234567:coven1@protonmail.com	2 / 18 herbert rdn edenaukland 1024	Huia Repla Huia Replacement Water Treatment Plant (I can an al) I am not a trade comp	No	No	No	No	Yes	1479fd08 CentralCSubmissions	43696.82	Item	Lists/ResourceConsentSubmission	
4842	Huia Repla	BUN60339	Watercare Pau.Jones Watercare	Susan Beach	0217255264:suzieb@xtra.co.nz	0217255264:suzieb@xtra.co.nz	138 Hinau RdWaikanaeAuckland 0881	The entire Even our kids can see that the numbers do Seriously c I am not a trade comp	No	No	No	No	Yes	4305501f CentralCSubmissions	43696.84	Item	Lists/ResourceConsentSubmission	

5092	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Craig Love	Child	022066833: sootyllove@actrix.co.nz	7 Staley RdParauAuckland 0604	opposes the application in whole or in part	I pray that Without the natural beauty, but to mention I pray that I am not a trade comp No	No	a6800c87 CentralCSubmissions	43709.39	Item	Lists/Resource/ConsentSubmission		
5093	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Sadie Iris Reid	Child	0221281130: trafroid.refid@greenscenenz.com	61 waimea crescenttirirangauckland 0604	opposes the application in whole or in part	My submis Because i think they should do it no mention i pray that no i vian not a trade comp No	No	1a975edc5 CentralCSubmissions	43709.42	Item	Lists/Resource/ConsentSubmission		
5094	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Jane vile		093612190: janevile@gmx.com	26 scotts tee, onetangiometangi wahekeuckland 1081	opposes the application in whole or in part	I am totally opposed to the clear felling of all of those trees in the area i am not a trade comp No	No	ead99878 CentralCSubmissions	43709.43	Item	Lists/Resource/ConsentSubmission		
5095	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Vicki Moffat		0274171931: vicandsonmoff@xtra.co.nz	84 Withers RoadGlen EdenAuckland 0604	opposes the application in whole or in part	Vegetation Concerns for the loss of vegetation and ecc More future i am not a trade comp No	No	ead99878 CentralCSubmissions	43709.43	Item	Lists/Resource/ConsentSubmission		
5096	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Kirstie Barton-O'Brien		021574833: kirstie_barton@hotmail.com	60 Warner Park AvenueLaingholmAuckland 0604	opposes the application in whole or in part	This subm i am currently facing a devastating disease To decline i am not a trade comp No	Yes	b0ffa399d CentralCSubmissions	43709.45	Item	Lists/Resource/ConsentSubmission		
5097	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Cameron Moffat	Child	027173311: tommy@b0322@gmail.com	84 Withers RoadGlen EdenAuckland 0604	opposes the application in whole or in part	I am strongly opposed to the choice of 0.15 3.5 hectare i would like i am not a trade comp No	Yes	b6f8845e5 CentralCSubmissions	43709.45	Item	Lists/Resource/ConsentSubmission		
5098	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Hazel Poppy Reid	Child	0221281130: trafroid.refid@greenscenenz.com	61 Waimea crescenttirirangauckland 0604	opposes the application in whole or in part	My submis The reasons that i am submitting is because To decline i am not a trade comp No	No	b6f8845e5 CentralCSubmissions	43709.46	Item	Lists/Resource/ConsentSubmission		
5099	Huia Repla BUN60339	Watercare Paul.Jones	Watercare A		0210244351: bery@gmail.com	8B0 0604	opposes the application in whole or in part	Enviro Go elweh i am not a trade comp No	No	7d5076261 CentralCSubmissions	43709.47	Item	Lists/Resource/ConsentSubmission		
5100	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Harish Patel		0210253131: waimesuper@gmail.com	84 Woodlands Park RoadTtirirangauckland 0604	opposes the application in whole or in part	This subm i have a Dairy business on 84 woodlands park road i am a trad i am direct No	No	2ed8ad8b1 CentralCSubmissions	43709.48	Item	Lists/Resource/ConsentSubmission		
5101	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Alexander Klesse		021106189: klesse@ymail.com	36 Rimutaka PlaceAucklandAuckland 0604	opposes the application in whole or in part	1,2,5 i am almost 5 years old. At school we learn Please do i am not a trade comp Yes	Yes	22d9f6dee CentralCSubmissions	43709.49	Item	Lists/Resource/ConsentSubmission		
5102	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Vivienne Bottani		021454604: vivcurr@hotmil.co.uk	14 Rimutaka PlaceAucklandAuckland 0604	opposes the application in whole or in part	Traffic and Effects on my children with the added traf To stop the i am not a trade comp No	Yes	b4f544ee3 CentralCSubmissions	43709.51	Item	Lists/Resource/ConsentSubmission		
5103	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Tony Philp French		022237247: tonyphilp323@gmail.com	7 Kono StreetRdLaingholmAuckland 0604	opposes the application in whole or in part	I am strongly opposed to the choice of 0.15 3.5 hectare i would like i am not a trade comp No	Yes	177a3798f CentralCSubmissions	43709.51	Item	Lists/Resource/ConsentSubmission		
5104	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Charis Boos		021877693: chngping@xtra.co.nz	42 Valley RoadTtirirangauckland 0604	opposes the application in whole or in part	I am opposed to the chosen location for the water tre: Find a diffi i am not a trade comp No	Yes	fc3af62c2 CentralCSubmissions	43709.54	Item	Lists/Resource/ConsentSubmission		
5105	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Brooke Paterson		021172131: b.paterson.rufio@live.com	338 Hillsborough RoadHillsboroughAuckland 1042	opposes the application in whole or in part	I oppose A The environment in the designated area i think this i am not a trade comp Yes	Yes	f78925cbe CentralCSubmissions	43709.55	Item	Lists/Resource/ConsentSubmission		
5106	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Awhi Ikin Oakley		021029810: awhioakley@gmail.com	18 Kauri Point RdAucklandAuckland 0604	opposes the application in whole or in part	The remove I live here and chose it specifically for the r Refuse i am not a trade comp Yes	Yes	6079c256e CentralCSubmissions	43709.58	Item	Lists/Resource/ConsentSubmission		
5107	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Belinda Jane Harvey		0212135931: marvhav@xtra.co.nz	387 Ttiriranga RoadTtirirangauckland 0604	opposes the application in whole or in part	Enviro i believe the proposed project at this site is Decline i am not a trade comp No	No	7827540f9 CentralCSubmissions	43709.6	Item	Lists/Resource/ConsentSubmission		
5108	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Diana Waipara		02796999: dianaw@corcon.net.nz	107 Hukutia RoadOpotikiOpotiki 3122	opposes the application in whole or in part	Clear felling 3.5ha of pristine regenerating forest in W: Stop clear i am not a trade comp No	No	8790326a3 CentralCSubmissions	43709.62	Item	Lists/Resource/ConsentSubmission		
5109	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Philip Charles Partridge		021245680: philpar@outlook.com	7 Waimea CrescentWaimeaAuckland 0604	opposes the application in whole or in part	No 11 Sector: Watercare and the Auckland Council should My suggest i am not a trade comp No	No	b8f80646e CentralCSubmissions	43709.62	Item	Lists/Resource/ConsentSubmission		
5110	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Kay Miller		021545820: kay_millar@hotmail.com	65 Daffodil StreetAucklandAuckland 0604	opposes the application in whole or in part	This subm This large area of heavily vegetated nature i am not a trade comp No	Yes	b829d1911 CentralCSubmissions	43709.62	Item	Lists/Resource/ConsentSubmission		
5111	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Tessa curin		0210483091: tessestess90@gmail.com	184 woodlands park rdWoodlands parkAuckland 0604	opposes the application in whole or in part	Traffic dir: Concerned about Traffic disruption/vibrat Coe a d i am not a trade comp Yes	No	c70df205f CentralCSubmissions	43709.63	Item	Lists/Resource/ConsentSubmission		
5112	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Gai Bishop	West Auckland	0981118274: info@westaucklandhistory.org.nz	P O Box 21416HendersonAuckland 0650	opposes the application in whole or in part	Application We are representing The West Auckland H Outlined in i am not a trade comp Yes	Yes	2e0f06ccc CentralCSubmissions	43709.65	Item	Lists/Resource/ConsentSubmission		
5113	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Rodney Janey Field		098173045: rd@eventbase.co.nz	3 Valley Road French BayTtirirangauckland 0604	opposes the application in whole or in part	I would like i am not a trade comp Yes	Yes	a0De4cc9 CentralCSubmissions	43709.68	Item	Lists/Resource/ConsentSubmission		
5114	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Gritzy Thomson		021307666: jae2@xtra.co.nz	173 Kiri Kiri RoadTtirirangauckland 0604	opposes the application in whole or in part	The Tirirangi is Do not gra i am not a trade comp No	Yes	030213241 CentralCSubmissions	43709.68	Item	Lists/Resource/ConsentSubmission		
5115	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Roderick Taylor		021134512: griedwardmerryweather@gmail.com	40 Minnehaha Ave., Woodlands Park, Ttiriranga Auckland NZ_E	opposes the application in whole or in part	The Loss of it WILL EFFECT A LOT MORE THAN JUST O To be	Yes	030213241 CentralCSubmissions	43709.68	Item	Lists/Resource/ConsentSubmission		
5116	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Louise Neto		021025467: louiseneto@hotmail.com	59 Rimutaka PlaceTtirirangauckland 0604	opposes the application in whole or in part	This subm Louise NetoAddress - 59 Rimutaka Place, Ti The subm i am not a trade comp No	No	6b330634e CentralCSubmissions	43709.68	Item	Lists/Resource/ConsentSubmission		
5117	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Jack Cormack-Neto		021038811: jackcormackneto@gmail.com	59 Rimutaka PlaceTtirirangauckland 0604	opposes the application in whole or in part	This subm i am not a trade comp No	No	a7e10068f CentralCSubmissions	43709.68	Item	Lists/Resource/ConsentSubmission		
5118	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Hannah Cormack-Neto		021025243: justincormack@hotmail.com	59 Rimutaka PlaceTtirirangauckland 0604	opposes the application in whole or in part	This subm Hannah Cormack- NetoAddress - 59 Rimutu The subm i am not a trade comp No	No	e3529eb8f CentralCSubmissions	43709.68	Item	Lists/Resource/ConsentSubmission		
5119	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Olivia Cormack-Neto		021025243: justincormack@hotmail.com	59 Rimutaka PlaceTtirirangauckland 0604	opposes the application in whole or in part	This subm Olivia Cormack-NetoAddress - 59 Rimutaka The subm i am not a trade comp No	No	2765884e9 CentralCSubmissions	43709.69	Item	Lists/Resource/ConsentSubmission		
5120	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Jonny McDermid Services		021061407: jonny@5454.com	3108 Kaitake Rd, Papanui, Christchurch, New Zealand	opposes the application in whole or in part	Choice of vegetation and landscaping design: Do not Decline the i am not a trade comp Yes	Yes	11e933161 CentralCSubmissions	43709.71	Item	Lists/Resource/ConsentSubmission		
5121	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Rodney Holt, Kathryn Holt Tim Holt Alexandra Holt		09817597: holt_family@xtra.co.nz	79 Waimea CrescentTtirirangauckland 0604	opposes the application in whole or in part	The entire We live in challenging times with many cr Decline i am not a trade comp Yes	Yes	2a7740bc2 CentralCSubmissions	43709.71	Item	Lists/Resource/ConsentSubmission		
5122	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Geoff and Helen Emson		021133368: helenemson@gmail.com	83 Park Road Ttiriranga AucklandAuckland 0604	opposes the application in whole or in part	Vegetation We object to the removal of significant nat Please rec i am not a trade comp No	Yes	ca72b3864 CentralCSubmissions	43709.71	Item	Lists/Resource/ConsentSubmission		
5123	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Joy Bennett		64273632: pj.bennett@xtra.co.nz	109 Daffodil SITtiriranga, Auckland, New ZealandTtiriranga, Auckland 0604	opposes the application in whole or in part	This subm Auckland Council has finally conceded that The subm i am not a trade comp Yes	Yes	17354e1b1 CentralCSubmissions	43709.73	Item	Lists/Resource/ConsentSubmission		
5124	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Cara Bennett		098177144: moomoo@outlook.com	109 Daffodil StAucklandAuckland 0604	opposes the application in whole or in part	This subm Auckland Council has finally conceded that The subm i am not a trade comp No	No	90347a86c CentralCSubmissions	43709.73	Item	Lists/Resource/ConsentSubmission		
5126	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Annika Bennett		098177144: moomoo@outlook.com	109 Daffodil SITtiriranga, Auckland, New ZealandTtiriranga, Auckland 0604	opposes the application in whole or in part	This subm Auckland Council has finally conceded that The subm i am not a trade comp No	No	38937336c CentralCSubmissions	43709.74	Item	Lists/Resource/ConsentSubmission		
5128	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Thierry Panmeller	Puna Consult	021556267: thierry.panmeller@idcloud.com	189 Atkinson RoadTtirirangauckland 0604	opposes the application in whole or in part	I'm submit to submit because i'm losing business i would like i am not a trade comp Yes	Yes	520b79a3d CentralCSubmissions	43709.74	Item	Lists/Resource/ConsentSubmission		
5128	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Janette Mary Miller		09840761: janette@janettehefferman.com	6 Clarence RoadNorthcote PointAuckland 0627	opposes the application in whole or in part	Do not wa in this day of Climate change i would not inc i am not a trade comp No	Yes	15161a620 CentralCSubmissions	43709.74	Item	Lists/Resource/ConsentSubmission		
5129	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Te Huia Claire Taylor		021023115: tehuia.taylor@gmail.com	15 Kiwi RoadWaiukuAuckland 2681	opposes the application in whole or in part	Clearing of vegetation. I would like i am not a trade comp No	Yes	567d3a2c3 CentralCSubmissions	43709.75	Item	Lists/Resource/ConsentSubmission		
5130	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Helen Rose Anderson		027473286: rstpejs@xtra.co.nz	341 Huia RdTtirirangauckland 0604	opposes the application in whole or in part	I oppose t Firstly the deforestation of this area that w DO NOT Al i am not a trade comp No	Yes	2cfd0f80c CentralCSubmissions	43709.76	Item	Lists/Resource/ConsentSubmission		
5131	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Engelleque Lau		021517451: elaw@hotmail.com	1/11 Glenorchy StreetGlen EdenAuckland 0600	opposes the application in whole or in part	The subm i grew up in the area and am moving back i The applici i am not a trade comp No	No	Vegetation RemovalEarthworksSite Selection Process To compl i am not a trade comp No	No	609016f4d CentralCSubmissions	43709.77	Item	Lists/Resource/ConsentSubmission
5132	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Helen Jansen	The Tree Group	0216981683: info@thetreegroup.org.nz	PO Box 47496PonsonbyAuckland 1144	opposes the application in whole or in part	Earthwork See attached PDF Refuse the i am not a trade comp Yes	Yes	7717de02 CentralCSubmissions	43709.77	Item	Lists/Resource/ConsentSubmission		
5133	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Sean D Freeman		021698165: rstpejs@xtra.co.nz	341 Huia RoadTtirirangauckland 0604	opposes the application in whole or in part	OPPOSE all i would feel very sad if all the trees got cho Do not allow i am not a trade comp No	Yes	7717de02 CentralCSubmissions	43709.77	Item	Lists/Resource/ConsentSubmission		
5134	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Alexandra Hedington		021666020: rolff@xtra.co.nz	PO Box 47496PonsonbyAuckland 1144	opposes the application in whole or in part	Vegetation RemovalEarthworksSite Selection process Complete i am not a trade comp No	No	7717de02 CentralCSubmissions	43709.77	Item	Lists/Resource/ConsentSubmission		
5135	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Rolf Jansen		021817013: mowbes8@hotmail.com	6 Karen RoadLaingholmAuckland 0604	opposes the application in whole or in part	Vegetation i oppose the application by Watercare for r To not issu i am not a trade comp No	Yes	8ba3d3d7c CentralCSubmissi	43709.78	Item	Lists/Resource/ConsentSubmission		
5136	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Julie Moore		021132409: jenkinhousehold@xtra.co.nz	9 Lancewood AvenueTtirirangaTtiriranga 0604	opposes the application in whole or in part	I am subm due the environmental,Traffic, ecological a i would like i am not a trade comp No	No	04c3ba3c7 CentralCSubmissions	43709.78	Item	Lists/Resource/ConsentSubmission		
5138	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Catherine Wright		021032291: cstawright@gmail.com	403/8 Hugenit StGiraruaAuckland 1023	opposes the application in whole or in part	This subm First, please note that I lived in Waimea for 1 The subm i am not a trade comp No	No	1a66b04d7 CentralCSubmissi	43709.78	Item	Lists/Resource/ConsentSubmission		
5139	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Anna Grew		027142268: annagrew@gmail.com	3 Kaitake PtTtirirangaAuckland 0604	opposes the application in whole or in part	The ecological effects of the proposal: Objections of th To reject th i am not a trade comp Yes	Yes	73617905f CentralCSubmissions	43709.81	Item	Lists/Resource/ConsentSubmission		
5141	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Simon Grant		098118978: 80manuhs@gmail.com	76 Waimea CrescentTtirirangauckland 0604	opposes the application in whole or in part	I am subm i object to deforestation of protected land, I would like i am not a trade comp No	Yes	013ab619c CentralCSubmissions	43709.81	Item	Lists/Resource/ConsentSubmission		
5142	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Stephen Olding		021112589f: stephen.olding@gmail.com	159 Atkinson RoadTtirirangaWaterkere 0604	opposes the application in whole or in part	Heavy truc Atkinson Rd is now a suburban street, pop Stop trucks i am not a trade comp No	Yes	88a0ba1e2 CentralCSubmissions	43709.81	Item	Lists/Resource/ConsentSubmission		
5143	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Scott Kelly		021167231: pohl-janet@outlook.com	16 Hollywood AveTtirirangaAuckland 0604	opposes the application in whole or in part	This Traffic This area is not designed for the volume of Please do i am not a trade comp No	No	e093f489d CentralCSubmissions	43709.83	Item	Lists/Resource/ConsentSubmission		
5144	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Phil Bennett		021770619: phil.bennett@xtra.co.nz	109 Daffodil SITtiriranga, Auckland, New ZealandTtiriranga, Auckland 0604	opposes the application in whole or in part	This subm Auckland Council has finally conceded that The subm i am not a trade comp No	No	ab6aa31c CentralCSubmissions	43709.83	Item	Lists/Resource/ConsentSubmission		
5145	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Janna Reid	Ttiriranga Resi	021591129: jannareid@gmail.com	PO Box 60023Ttirirangauckland 0642	opposes the application in whole or in part	This subm I am not a trade comp No	Yes	1a7d7735c CentralCSubmissions	43709.84	Item	Lists/Resource/ConsentSubmission		
5146	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Mels Barton		021213123: melbarton@gmail.com	PO Box 60023Ttirirangauckland 0642	opposes the application in whole or in part	See attach See attached PDF See attach i am not a trade comp Yes	Yes	ddfc11942 CentralCSubmissi	43709.84	Item	Lists/Resource/ConsentSubmission		
5147	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Paulien Vloedveld		098176681: jempbmobile@hotmail.com	73 waimea crescentWaime,TtirirangaAuckland 0604	opposes the application in whole or in part	Traffic effe I am worried about the safety of my childre i would like i am not a trade comp No	Yes	d21e8920 CentralCSubmissions	43709.84	Item	Lists/Resource/ConsentSubmission		
5148	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Paula Enderidge		021822512: lancee@theroefingstore.co.nz	13 rimutaka PtTtirirangaAuckland 0604	opposes the application in whole or in part	All aspects Against destruction of the native forest an i i am not a trade comp No	Yes	5ec8430ef CentralCSubmissions	43709.86	Item	Lists/Resource/ConsentSubmission		
5149	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Meika Etheridge		021280624: meika@malworkts.com	14 Sylvan Valley AvenueTtirirangaAuckland 0604	opposes the application in whole or in part	This subm I am a Waimea resident and have chosen to i i am not a trade comp Yes	Yes	df0Ba1a3f CentralCSubmissions	43709.87	Item	Lists/Resource/ConsentSubmission		
5150	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Thierry Panmeller		021556267: thierry.panmeller@idcloud.com	189 Atkinson RoadTtirirangauckland 0604	opposes the application in whole or in part	I'm submit to submit because i'm losing business i would like i am not a trade comp Yes	Yes	03332a2ef CentralCSubmissions	43709.86	Item	Lists/Resource/ConsentSubmission		
5151	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Merle Jordaan	Private	027229990: jordan.merle@gmail.com	30 Wood Bay roadTtirirangauckland 0604	opposes the application in whole or in part	Vegetation i oppose Watercare's application for resou Go back to i am not a trade comp No	Yes	503618a2e CentralCSubmissions	43709.87	Item	Lists/Resource/ConsentSubmission		
5152	Huia Repla BUN60339	Watercare Paul.Jones	Watercare David Little and family		021243524: nevsummer@gmail.com	36 Waimea CrescentTtirirangauckland 0604	opposes the application in whole or in part	As per atts As per attached submission. As per atts i am not a trade comp Yes	Yes	b5e0204d9 CentralCSubmissions	43709.88	Item	Lists/Resource/ConsentSubmission		
5153	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Mark Carter	Allergenic	021767945: info@markcarter.co.nz	PO Box 60281Ttirirangauckland 0642	opposes the application in whole or in part	All of it i am a third generation Waimea resident cur i amque i am not a trade comp Yes	Yes	68d4b5a4c CentralCSubmissions	43709.89	Item	Lists/Resource/ConsentSubmission		
5154	Huia Repla BUN60339	Watercare Paul.Jones	Watercare Melekhova Irina		891040057f: infoevadme@gmail.com	107241GolovynoMoscov 1072	opposes the application in whole or in part	The environmental effects of building the							

5234 Huia Repla BUN60339 Watercare Paul.Jones Watercare Jennifer Dupen	0212384781.jennifer.dupen@gmail.com	98 Atkinson RoadTitirangiAuckland 0604	opposes the application in whole or in part	I oppose th I would like a mitigation package if the proj for this no i am not a trade comp No	Yes	18856e391 CentralSubmissions	43710.56	Item	Lists/ResourceConsentSubmission	
5235 Huia Repla BUN60339 Watercare Paul.Jones Watercare Jasmine Taylor	0274051081.jasmine.taylor.email@gmail.com	83 Hillborough RdHillsboroughAuckland 1012	opposes the application in whole or in part	I am again: We have such a small proportion of Aotear I would like i am not a trade comp No	Yes	b94d5cef1 CentralSubmissions	43710.56	Item	Lists/ResourceConsentSubmission	
5236 Huia Repla BUN60339 Watercare Paul.Jones Watercare Lisa Martell	021816289_lisamartell789@hotmail.com	33 Concord AvenueMount MaunganuiTaureanga 3116	opposes the application in whole or in part	We oppose the Resource Consent for Watercare's proj do not un I am not a trade comp No	No	e9388bf09 CentralSubmissions	43710.57	Item	Lists/ResourceConsentSubmission	
5237 Huia Repla BUN60339 Watercare Paul.Jones Watercare Shelley de Graaf	0276962751shelleydegraafnz@gmail.com	20 Woodlands Park RdTitirangiAuckland 0604	opposes the application in whole or in part	Traffic Imp The opposition to this proposal is on the i I would like i am not a trade comp No	No	bdc0f05e78 CentralSubmissions	43710.57	Item	Lists/ResourceConsentSubmission	
5238 Huia Repla BUN60339 Watercare Paul.Jones Watercare Katharine Jayne Brown	027817314.kjuggard@gmail.com	555 South Titirang RoadTitirangiAuckland 0604	opposes the application in whole or in part	Vegetation On 11 June I am not a trade comp No	No	dc0896a07 CentralSubmissions	43710.57	Item	Lists/ResourceConsentSubmission	
5239 Huia Repla BUN60339 Watercare Paul.Jones Watercare Toni Reid	092924988_toni@maxvet.co.nz	46 Stinson Rd, Avaramu3 DruryAuckland 2579	opposes the application in whole or in part	The propo Conservation of flora and fauna is an issue Decline th I am not a trade comp No	No	47f4a2744 CentralSubmissions	43710.57	Item	Lists/ResourceConsentSubmission	
5240 Huia Repla BUN60339 Watercare Paul.Jones Watercare Glends Lock	021082139.kjunda_lock@hotmail.co.nz	42 Rimutaka PlaceTitirangiAuckland 0604	opposes the application in whole or in part	(1) oppose the application in whole (2) submit that t I Not build c I am not a trade comp No	No	cd7b1eab1 CentralSubmissions	43710.58	Item	Lists/ResourceConsentSubmission	
5241 Huia Repla BUN60339 Watercare Paul.Jones Watercare Kim Bowkett-Moore	098177873_kbowkettmoore@yahoo.co.nz	6 Karen RoadIngholmAuckland 0604	opposes the application in whole or in part	Environme I oppose the resource consent in its entirety for the Coi i am not a trade comp No	No	4a525580c CentralSubmissions	43710.58	Item	Lists/ResourceConsentSubmission	
5242 Huia Repla BUN60339 Watercare Paul.Jones Watercare Steven Westwood	Waima and V027425631.waimawoodlandspark@gmail.com	8514/176 BroadwayNewmarketAuckland 1023	opposes the application in whole or in part	Vegetation removal and earthworks We are ask i am not a trade comp Yes	No	e98773cd CentralSubmissions	43710.59	Item	Lists/ResourceConsentSubmission	
5243 Huia Repla BUN60339 Watercare Paul.Jones Watercare Ngaria Stephenson - Principal	Woodlands P 098175140_principal@woodlandspark.school.nz	202 Woodlands Park RoadWoodlands Park, TitirangiAuckland PO Box 60627TitirangiAuckland 0642	opposes the application in whole or in part	We have o We have outlined these in the Attachment. We have o I am not a trade comp Yes	Yes	d8f51a086 CentralSubmissions	43710.59	Item	Lists/ResourceConsentSubmission	
5244 Huia Repla BUN60339 Watercare Paul.Jones Watercare Sheila Roscoe	357 8971 howard.roscoe@gmail.com	174 Scenic DriveTitirangiAuckland 0604	opposes the application in whole or in part	The number of heavy vehicles That the p I am not a trade comp No	Yes	32980246c CentralSubmissions	43710.59	Item	Lists/ResourceConsentSubmission	
5245 Huia Repla BUN60339 Watercare Paul.Jones Watercare Tamara GEORGE	021343503_tamara.george@vocomedia.nz	12 Manuka RoadTitirangiAuckland 0604	opposes the application in whole or in part	Regional t The submitter opposes the application. The subm I am not a trade comp No	Yes	703212f0c CentralSubmissions	43710.59	Item	Lists/ResourceConsentSubmission	
5246 Huia Repla BUN60339 Watercare Paul.Jones Watercare Victoria Scott	021026114.porlypod@gmail.com	96 Scenic DriveTitirangiAuckland 0604	opposes the application in whole or in part	Traffic with he land proposed is not in a state of readin I'd like Auc I am not a trade comp No	Yes	a71143582 CentralSubmissions	43710.6	Item	Lists/ResourceConsentSubmission	
5247 Huia Repla BUN60339 Watercare Paul.Jones Watercare Jim Roskivist	0275727267.jimroskivist@hotmail.com	87 Tainui RoadTitirangiAuckland 0604	supports the application in whole or in part	Entire appl Watercare has taken adequate steps to mir Approve th I am not a trade comp No	No	32d0f76e9 CentralSubmissions	43710.6	Item	Lists/ResourceConsentSubmission	
5248 Huia Repla BUN60339 Watercare Paul.Jones Watercare Jake and Megan Fitter	021619854_hellojakeandmegan@hotmail.com	198a Huia RoadTitirangiAuckland 0604	opposes the application in whole or in part	All of them We've typed them up on the attachment. We've typ I am not a trade comp No	No	479c0f158 CentralSubmissions	43710.6	Item	Lists/ResourceConsentSubmission	
5249 Huia Repla BUN60339 Watercare Paul.Jones Watercare TRACEY PARKER	021265389:titirangiteacher@gmail.com	8 WARWICK AVENUEAucklandAuckland 0640	opposes the application in whole or in part	With the on-going sensitivity and demise of Kauri in th To not cut I am not a trade comp No	No	9e6a64e07 CentralSubmissions	43710.6	Item	Lists/ResourceConsentSubmission	
5250 Huia Repla BUN60339 Watercare Paul.Jones Watercare Mischa Charlotte Dorothy Fitter	098168528_hellojakeandmegan@hotmail.com	198a Huia RoadTitirangiAuckland 0604	opposes the application in whole or in part	The Veget I just wanted to share my poem Wednesda I do not cut. I am not a trade comp Yes	No	8c72350bc CentralSubmissions	43710.6	Item	Lists/ResourceConsentSubmission	
5251 Huia Repla BUN60339 Watercare Paul.Jones Watercare Stephanie Wickham	0272763721stephaniewh@hotmail.com	174 Scenic DriveTitirangiAuckland 0604	opposes the application in whole or in part	The possib Several reasons- Surely Watercare could c Currently, I am not a trade comp Yes	No	0f460a5a5 CentralSubmissions	43710.6	Item	Lists/ResourceConsentSubmission	
5252 Huia Repla BUN60339 Watercare Paul.Jones Watercare Chantal Bayley	021882434_chantalbayley@gmail.com	TitirangiAucklandAuckland 0604	opposes the application in whole or in part	This subm I am a local resident of the area that will be I am seeke I am not a trade comp No	No	728a97404 CentralSubmissions	43710.62	Item	Lists/ResourceConsentSubmission	
5029 Huia Repla BUN60339 Watercare Paul.Jones Watercare Lisa Prager	027900860: L.pra@xtra.co.nz	85 Garnet RdWestmereAuckland 1022	opposes the application in whole or in part	See my pr See my previous submission See my pr e I am not a trade comp Yes	Yes	ad58287c CentralSubmissions	43710.62	Item	Lists/ResourceConsentSubmission	
5253 Huia Repla BUN60339 Watercare Paul.Jones Watercare Kate Lawson	+64221001:Katlinfo.lawson@gmail.com	21 Karen RoadAucklandAuckland 0604	opposes the application in whole or in part	Vegetation See attached To recom I am not a trade comp No	No	d39790641 CentralSubmissions	43710.63	Item	Lists/ResourceConsentSubmission	
5256 Huia Repla BUN60339 Watercare Paul.Jones Watercare Yona Zhou	021 024 2772 clouy_yona@hotmail.com	41 Waihoehoe RoadDruryAuckland 2113	opposes the application in whole or in part	Vegetation This vegetation includes protected, mature Use smart I am not a trade comp No	No	70d3eeb03 CentralSubmissions	43710.62	Item	Lists/ResourceConsentSubmission	
5257 Huia Repla BUN60339 Watercare Paul.Jones Watercare Janette Liwell	021 368935_prelmans@xtra.co.nz	512 South Titirang RoadTitirangiAuckland 0604	opposes the application in whole or in part	Loss of fr The proposed site is almost completely cov Go back to I am not a trade comp No	No	c680ab0ff CentralSubmissions	43710.63	Item	Lists/ResourceConsentSubmission	
5258 Huia Repla BUN60339 Watercare Paul.Jones Watercare Annetise	027679007_judides@xtra.co.nz	173 Godley RoadAucklandAuckland 0604	opposes the application in whole or in part	Support the petition and in which I go against the propo I think about I am a trad I am direct No	No	ed77ca2e0 CentralSubmissions	43710.63	Item	Lists/ResourceConsentSubmission	
5259 Huia Repla BUN60339 Watercare Paul.Jones Watercare Ekta Kapadia	+64 210 833_ektakapadiaa@gmail.com	1/3 Barron Drive Green Bay, Auckland, New ZealandGreen Bay	supports the application in whole or in part	to stop the water, first of all, is not going to us it is no matter I am not a trade comp No	Yes	1a65de6dd CentralSubmissions	43710.63	Item	Lists/ResourceConsentSubmission	
5260 Huia Repla BUN60339 Watercare Paul.Jones Watercare Isis Lellani Fynn	Green Bay Hi +642041666_isis.fynn@xtra.co.nz	242 Scenic Dr Titirangi Auckland 0604	opposes the application in whole or in part	Watercres: *The water is for the North Shore but land for This tre i am not a trade comp No	Yes	3c69d3668 CentralSubmissions	43710.63	Item	Lists/ResourceConsentSubmission	
5261 Huia Repla BUN60339 Watercare Paul.Jones Watercare Megan Fitter	021619854_meganfitter@xtra.co.nz	198a Huia RoadTitirangiAuckland 0604	opposes the application in whole or in part	Vegetation removal including its effects and mitigation Please rej I am not a trade comp Yes	Yes	f659a1e30 CentralSubmissions	43710.64	Item	Lists/ResourceConsentSubmission	
5262 Huia Repla BUN60339 Watercare Paul.Jones Watercare Robin rawstorne	098179667_robin@rawstornestudio.com	37 landing rdauklandaukland 0604	opposes the application in whole or in part	I am a loca I feel that due process has not been follow I propose t I am not a trade comp Yes	Yes	a49c0e5a7 CentralSubmissions	43710.63	Item	Lists/ResourceConsentSubmission	
5263 Huia Repla BUN60339 Watercare Paul.Jones Watercare Vanessa Morris	021232719_vanessamorris@gmail.com	24 Hollywood AvenueTitirangiAuckland 0604	opposes the application in whole or in part	I am oppo I have lived in Waima for over 10 years and I think that t I am not a trade comp No	Yes	3a356935c CentralSubmissions	43710.64	Item	Lists/ResourceConsentSubmission	
5264 Huia Repla BUN60339 Watercare Paul.Jones Watercare Nicholas Drake	021232719_n Drake@Aut.ac.nz	21 Manuka RoadTitirangiAuckland 0604	opposes the application in whole or in part	This subm I submit that the New Watercare develop The Appli I am not a trade comp Yes	No	902c08a52 CentralSubmissions	43710.64	Item	Lists/ResourceConsentSubmission	
5265 Huia Repla BUN60339 Watercare Paul.Jones Watercare Seaton Meredith	Auckland Cus 021 748 203_seaton@sunshade.co.nz	397 Huia RoadTitirangiAuckland 0604	opposes the application in whole or in part	Transporta We have 2 businesses and 4 staff working I Road stren I am not a trade comp Yes	All of it in I My family is second generation to be living I am requ I am not a trade comp No	Yes	2077735c CentralSubmissions	43710.64	Item	Lists/ResourceConsentSubmission
5266 Huia Repla BUN60339 Watercare Paul.Jones Watercare Victoria Warne	0210309981_victoria@vevofoodstore.co.nz	VEVO FoodStore 402c Titirang RdTitirangiAuckland 0642	opposes the application in whole or in part	If it in I My family is second generation to be living I am requ I am not a trade comp No	Yes	38d99e9a0 CentralSubmissions	43710.64	Item	Lists/ResourceConsentSubmission	
5267 Huia Repla BUN60339 Watercare Paul.Jones Watercare Yiyi Li	0220761181mmhyth@hotmail.com	15 Nelson StreetAuckland CBD Auckland 1010	opposes the application in whole or in part	Vegetation *This vegetation includes protected, matur *Use smart I am not a trade comp Yes	Yes	f05c270cd CentralSubmissions	43710.64	Item	Lists/ResourceConsentSubmission	
5268 Huia Repla BUN60339 Watercare Paul.Jones Watercare Kate Wemyss	0210263121_kate@fibreplus.co.nz	104 Atkinson RoadTitirangiAuckland 0604	opposes the application in whole or in part	Oppose t I believe the site is not suitable for the plan Choose an I am not a trade comp No	No	b836e0be9 CentralSubmissions	43710.64	Item	Lists/ResourceConsentSubmission	
5269 Huia Repla BUN60339 Watercare Paul.Jones Watercare Ryan Bann	098173734_mandysevellmakin@hotmail.com	142 Woodlands Park RoadAucklandAuckland 0604	opposes the application in whole or in part	Clearance Chopping the trees and bush, I'm worried at Choos I am not a trade comp No	No	9394a4d8c CentralSubmissions	43710.65	Item	Lists/ResourceConsentSubmission	
5270 Huia Repla BUN60339 Watercare Paul.Jones Watercare Nicola Drayton	0212642562_nic.r.drayton@gmail.com	12 York RoadTitirangiAuckland 0604	opposes the application in whole or in part	This subm The roundabout at Titirangi is congested at I would like I am not a trade comp No	No	807b5f048 CentralSubmissions	43710.65	Item	Lists/ResourceConsentSubmission	
5271 Huia Repla BUN60339 Watercare Paul.Jones Watercare Jade Barnes	098177234_mandysevellmakin@hotmail.com	142 Woodlands Park RoadAucklandAuckland 0604	opposes the application in whole or in part	Earthwork Earthworks and trucks, I don't like the vibro Decline th I am not a trade comp No	No	71706f66c CentralSubmissions	43710.65	Item	Lists/ResourceConsentSubmission	
5272 Huia Repla BUN60339 Watercare Paul.Jones Watercare Megan Schussler	027411486: megan09@outlook.com	172 Woodlands Park RdTitirangiAuckland 0604	opposes the application in whole or in part	Earthwork The small trees weren't even counted. Onl Say no to t I am not a trade comp No	Yes	319eb88c5 CentralSubmissions	43710.65	Item	Lists/ResourceConsentSubmission	
5273 Huia Repla BUN60339 Watercare Paul.Jones Watercare Cyril Hamiaux	021103484_cyril@cyrilhamiaux.net	13 Manuka RoadTitirangiAuckland 0604	opposes the application in whole or in part	See attach See attached. I have lodged this submission See attach I am not a trade comp No	Yes	f3069e6da CentralSubmissions	43710.66	Item	Lists/ResourceConsentSubmission	
5274 Huia Repla BUN60339 Watercare Paul.Jones Watercare Helmi Thompson	022429905:info@woodlandenchanted.co.nz	272 Huia Road, Titirangi Auckland 0604	opposes the application in whole or in part	Destructio Very concerned about the loss of natural fr I would like I am not a trade comp No	No	720a4f902 CentralSubmissions	43710.65	Item	Lists/ResourceConsentSubmission	
5275 Huia Repla BUN60339 Watercare Paul.Jones Watercare Len Taylor	027411486: len.taylor@outlook.co.nz	142 Woodlands Park RoadAuckland 0604	opposes the application in whole or in part	Vegetation The reason for my submission is to protect Decline th I am not a trade comp No	Yes	22528bae5 CentralSubmissions	43710.66	Item	Lists/ResourceConsentSubmission	
5276 Huia Repla BUN60339 Watercare Paul.Jones Watercare Rylen Schussler	027411486: rylen@outlook.co.nz	172 Woodlands Park RdTitirangiAuckland 0604	opposes the application in whole or in part	No Destruction It is the wrong location due to ecological d I'd like els I am not a trade comp No	No	de9a09f9c CentralSubmissions	43710.66	Item	Lists/ResourceConsentSubmission	
5277 Huia Repla BUN60339 Watercare Paul.Jones Watercare Scott McKerrow	021100621_scottmckerrow@gmail.com	10 rimutaka placeTitirangiAuckland 0604	opposes the application in whole or in part	No Earthwork: I am making this submission as I live and w Decline th I am not a trade comp No	Yes	b95d0f2d2 CentralSubmissions	43710.66	Item	Lists/ResourceConsentSubmission	
5278 Huia Repla BUN60339 Watercare Paul.Jones Watercare Amanda Barnes	0210359041_mandysevellmakin@hotmail.com	142 Woodlands Park RoadAucklandAuckland 0604	opposes the application in whole or in part	No I oppose al concern for WIDER ENVIRONMENTAL [compen I am not a trade comp Yes	Yes	6239a7c22 CentralSubmissions	43710.67	Item	Lists/ResourceConsentSubmission	
5279 Huia Repla BUN60339 Watercare Paul.Jones Watercare MP Mears	098174223_idlechat@gmail.com	12 WaimaCresTitirangiAuckland 0604	opposes the application in whole or in part	*The subm I have lived in Titirang with my daughter fr The subm I am not a trade comp No	No	06791826c CentralSubmissions	43710.67	Item	Lists/ResourceConsentSubmission	
5280 Huia Repla BUN60339 Watercare Paul.Jones Watercare tara GEORGE	02110561721 tarageorge95@gmail.com	37 landing RoadTitirangiAuckland 0604	opposes the application in whole or in part	Our subm: We support and adopt the submission/peti I seek that I am not a trade comp No	No	9394a4d8c CentralSubmissions	43710.67	Item	Lists/ResourceConsentSubmission	
5281 Huia Repla BUN60339 Watercare Paul.Jones Watercare Douglas Austin Cowan	021414693_doug@cowan.net.nz	486 New North RoadAucklandAuckland 1021	opposes the application in whole or in part	Please rel Please refer to the attached submission. Please rel I am not a trade comp Yes	Yes	11b88d2fe CentralSubmissions	43710.67	Item	Lists/ResourceConsentSubmission	
5282 Huia Repla BUN60339 Watercare Paul.Jones Watercare Rita Steel	021242454:Ritasteel.nz@gmail.com	771 West Coast RdOratiaWaikare 0604	opposes the application in whole or in part	- Removal - removing healthy Kauri of any size in this To reject th I am not a trade comp Yes	Yes	11d41369f CentralSubmissions	43710.67	Item	Lists/ResourceConsentSubmission	
5283 Huia Repla BUN60339 Watercare Paul.Jones Watercare Kati Chapman	0220310691_kati_chapman@hotmail.com	69 Sheland st, AucklandGlen EdenAuckland 0602	opposes the application in whole or in part	The location of the new plant Think about I am not a trade comp Yes	Yes	3d0f136cd CentralSubmissions	43710.67	Item	Lists/ResourceConsentSubmission	
5284 Huia Repla BUN60339 Watercare Paul.Jones Watercare Eden Sofia Fitter	098168528_hellojakeandmegan@hotmail.com	198a Huia RoadTitirangiAuckland 0604	opposes the application in whole or in part	Vegetation Personally, I think all the kids walking home say NO I am not a trade comp No	No	dc03a1a60 CentralSubmissions	43710.67	Item	Lists/ResourceConsentSubmission	
5285 Huia Repla BUN60339 Watercare Paul.Jones Watercare Jim Aikman	09 817 5671_jakaikman@xtra.co.nz	35 Waima CrescentTitirangiAuckland 0604	opposes the application in whole or in part	The new p Felling of Kauri, Kahikatea, Kanuka & Rimu Consider o I am not a trade comp No	No	06791826c CentralSubmissions	43710.67	Item	Lists/ResourceConsentSubmission	
5286 Huia Repla BUN60339 Watercare Paul.Jones Watercare mark Stephen	021359385_design@markstephen.co.nz	198a Huia RoadTitirangiAuckland 0604	opposes the application in whole or in part	Our subm: We support and adopt the submission/peti I seek that I am not a trade comp No	No	9394a4d8c CentralSubmissions	43710.67	Item	Lists/ResourceConsentSubmission	
5287 Huia Repla BUN60339 Watercare Paul.Jones Watercare Maggie Burns	Department 027 632 291_mburns@doc.govt.nz	RMA Shared Services, Department of Conservation, Private B	opposes the application in whole or in part	Please rel Please refer to the attached submission. Please rel I am not a trade comp Yes	Yes	62b29a84c CentralSubmissions	43710.68	Item	Lists/ResourceConsentSubmission	
5288 Huia Repla BUN60339 Watercare Paul.Jones Watercare Arlie Hinton	0210235111_belynda_a@yahoo.com	16 Waima CrescentTitirangiAuckland 0604	opposes the application in whole or in part	I oppose th There should be a law that you can't cut d I'd like the I am not a trade comp Yes	No	ec84e18a0 CentralSubmissions	43710.68	Item	Lists/ResourceConsentSubmission	
5289 Huia Repla BUN60339 Watercare Paul.Jones Watercare Barrie-John Partridge	0212941071_bjpartridge@xtra.co.nz	15A Cajero PlaceGreen BayAuckland 0604	opposes the application in whole or in part	This subm The impact of the construction on our com I seek that I am not a trade comp No	No	e39357822 CentralSubmissions	43710.68	Item	Lists/ResourceConsentSubmission	
5290 Huia Repla BUN60339 Watercare Paul.Jones Watercare Divya Simone Karippail	027318705:divya.karipail@bghs.school.nz	11 Terracotta Drive, Blockhouse BayBlockhouse BayAuckland 0604	opposes the application in whole or in part	I disagree- I have friends and family living in Titirangi, To find can I am not a trade comp No	Yes	f5107ab03 CentralSubmissions	43710.68	Item	Lists/ResourceConsentSubmission	
5291 Huia Repla BUN60339 Watercare Paul.Jones Watercare sarah johnson	Rawstorne Li +64211429 sarah@rawstornestudio.com	37 Landing RoadTitirangi Auckland Titirangi Auckland 0604	opposes the application in whole or in part	Im local re see above cancel t - i I am not a trade comp Yes	Yes	50d9f09a0 CentralSubmissions	43710.69	Item	Lists/ResourceConsentSubmission	
5292 Huia Repla BUN60339 Watercare Paul.Jones Watercare Matthew Phang	021133050_mphang@gmail.com	16 Pilos LaneHobsonvilleAuckland 0618	opposes the application in whole or in part	Vegetation This vegetation includes protected, mature Use smart I am not a trade comp No	Yes	9d3561d41 CentralSubmissions	43710.69	Item	Lists/ResourceConsentSubmission	
5293 Huia Repla BUN60339 Watercare Paul.Jones Watercare John Bradley	021994886_whynot1@hotmail.com	P O Box 60601TitirangiWaikare 0642	opposes the application in whole or in part	The locat Concerned Auckland. To whom it I am not a trade comp No	No	0152b713 CentralSubmissions	43710.69	Item	Lists/ResourceConsentSubmission	
5294 Huia Repla BUN60339 Watercare Paul.Jones Watercare Donna Schussler	027411486: glennsdemise@hotmail.com	172 Woodlands Park Road, Titirangi Auckland Auckland 0604	opposes the application in whole or in part	vegetation I oppose the resource consent application Decline th I am not a trade comp No	Yes	65a67e778 CentralSubmissions	43710.69	Item	Lists/ResourceConsentSubmission	
5295 Huia Repla BUN60339 Watercare Paul.Jones Watercare Jennifer Joy Gibson	021814995_jenngibson@hotmail.co.nz	51 Paturoa RoadTitirangiAuckland 0604	opposes the application in whole or in part	VEGETAT I am a concerned resident and global citize I would like I am not a trade comp No	Yes	076af07d4 CentralSubmissions	43710.69	Item	Lists/ResourceConsentSubmission	
5296 Huia Repla BUN60339 Watercare Paul.Jones Watercare Sarah Fearnside	021394999_sarfearnside@gmail.com	1 Boylan RoadTitirangiAuckland 0604	opposes the application in whole or in part	I oppose th The impact on the environment, including I would like I am not a trade comp No	Yes	ba0b304f3 CentralSubmissions	43710.69	Item	Lists/ResourceConsentSubmission	
5297 Huia Repla BUN60339 Watercare Paul.Jones Watercare Greg Presland	Waitakere Ra 09 813 915f Sharon.Davies@auklandcouncil.govt.nz	Private Bag 92300AucklandAuckland 1142	opposes the application in whole or in part	See attach See attached See attach I am not a trade comp Yes	No	16c78a0d0 CentralSubmissions	43710.69	Item	Lists/ResourceConsentSubmission	
5298 Huia Repla BUN60339 Watercare Paul.Jones Watercare James William Aikman	817 5672 jakaikman@xtra.co.nz	35 Waima CrescentTitirangiAuckland 0604	opposes the application in whole or in part	The new p The loss of Clarks Track. The clearing of a la The consid I am not a trade comp No	No	bbae95fbc CentralSubmissions	43710.69	Item	Lists/ResourceConsentSubmission	
5299 Huia Repla BUN60339 Watercare Paul.Jones Watercare Donna Schussler	027411486: donna@bystyntech.co.nz	172 Woodlands Park RdTitirangiAuckland 0604	opposes the application in whole or in part	Timeframe There are over 2000 pages of information I increase th I am not a trade comp No	No	7a9c98419 CentralSubmissions	43710.69	Item	Lists/ResourceConsentSubmission	
5300 Huia Repla BUN60339 Watercare Paul.Jones Watercare Tanya Ludvigson	0212 028394_tsludvigson@slingshot.co.nz	53 Phillip AveGlen EdenAuckland 0602	opposes the application in whole or in part	I am oppo The area is well known for its rich biodiversity I find an al I am not a trade comp No	No	8a27e7233 CentralSubmissions	43710.7	Item	Lists/ResourceConsentSubmission	
5301 Huia Repla BUN60339 Watercare Paul.Jones Watercare Damien Kearney	021634256_damien_ Kearney@yahoo.co.nz	1 Boylan RoadTitirangiAuckland 0604	opposes the application in whole or in part	I oppose th The impact on the environment, including I would like I am not a trade comp No	No	a94194bec CentralSubmissions	43710.7	Item	Lists/ResourceConsentSubmission	
5302 Huia Repla BUN60339 Watercare Paul.Jones Watercare Glenn Schussler	021243825: glenn.schussler@uniliver.com	172 Woodlands Park Road, Titirangi Auckland Auckland								

ATTACHMENT EIGHT
HIGH COURT DECISION – TITIRANGI
PROTECTION GROUP

[1] This appeal follows the refusal of the Environment Court to make a declaration that a proposed water treatment plant to be constructed on land designated for water treatment purposes in West Auckland fell outside the purposes of the designation.¹

The parties

[2] The Titirangi Protection Group Incorporated is an incorporated society having the principal purpose of protecting and supporting the natural and human environment of the Titirangi area.

[3] The remaining appellants, Mr and Mrs Hutchings and Ms Berman, are residents who live near the designated area in which the new plant would be constructed.

[4] The first respondent, Watercare Services Limited (Watercare), is a company now owned and controlled by the Auckland Council (the Council). It is responsible for administering the city's water supply and wastewater assets. It is also required to meet a number of statutory obligations. These include a requirement to act consistently with any Council plan or strategy to the extent directed by the governing body of the Council.²

[5] The Council is the local authority for the Auckland region and is responsible for the development, administration and application of the Auckland Unitary Plan.

Background

[6] For many years a significant proportion of Auckland's water supply has come from dams and catchment areas within the Waitakere Ranges. Water from four dams in that area has been processed at the Nihotupu Filter Station and the Huia Water Treatment Plant. Both are located near Titirangi on land acquired by the then Auckland City Council in 1926 and now owned by Watercare.

¹ *Titirangi Protection Group Inc v Watercare Services Ltd* [2017] NZEnvC 181.

² Local Government (Auckland Council) Act 2009, s 58.

[7] The Nihotupu Filter Station was commissioned in 1928, whilst the Huia Plant was commissioned in 1929. Over the years the plants have been upgraded progressively to provide them with greater processing capacity to meet the city's increasing need for treated water for human use and consumption.

[8] During the 1990s, the Huia Plant was subject to a significant upgrade including automation. When this was completed the Nihotupu Station was decommissioned. Water formerly treated at that station was diverted to, and treated at, the Huia Plant. The Nihotupu Station is now only used for water storage. It plays no role in the water treatment process.

[9] The Huia Plant is now responsible for providing approximately 20 per cent of Auckland's water supply. It primarily services the western and northern suburbs of the city, but water from the station can also be distributed to all parts of the Auckland water network as required. It is currently the third largest water treatment plant within the Auckland region.

[10] Watercare has been planning to replace or significantly upgrade the Huia Plant since 2008. A recent independent high-level asset review has identified that it is not viable for Watercare to invest significant capital into the Huia Plant because it is nearing the end of its economic life. Even with careful ongoing maintenance it is unlikely that the Huia Plant will be able to perform its current role for more than five to ten years. Watercare has therefore concluded that traditional treatment processes used in the existing plant should be replaced by advanced processes now considered more appropriate for the treatment of water received from the dams that supply it.

[11] Watercare has also concluded that any new capital investment in this area should focus on the development of a modern water treatment plant rather than upgrading of the Huia Plant. Any new plant will not only incorporate more advanced processing systems but will also address seismic design requirements and other limitations faced by the existing facility.

[12] Watercare proposes to relocate the bulk of the water treatment processes currently carried out at the Huia Plant to a new plant to be built on a 4.2 hectare parcel

of land adjacent to the land on which the Huia Plant is now located. It intends to re-locate primary water treatment processes, chemical storage and administrative facilities to the new site. Other systems will remain on the existing Huia site. Surplus assets on the existing site that are not considered to be heritage assets will be demolished. Once the new plant has been completed, the three plants will operate together as a single water treatment facility.

Designation 9324

[13] The land on which the two existing plants are located is subject to a designation known as Designation 9324. The new plant will also be located on land having that designation. The designation is annexed to the judgment as an appendix for ease of reference.

[14] Under the heading “Purpose”, the designation states “Water supply purposes – Huia and Nihotupu water treatment plants and associated structures”.

[15] Designation 9324 is a legacy designation, having been in existence in one form or another since 1972. Prior to its incorporation in the Auckland Unitary Plan it comprised designation WSL4 under the former Waitakere District Plan. Designation 9324 is largely in the same terms as Designation WSL4, although the earlier designation did not include the words “and associated structures”.

[16] The designation applies to three parcels of land encompassing in total 57 hectares. The first is a four hectare parcel of land on which the existing Huia Station and associated pipelines are located. The second is an adjoining 4.2 hectare parcel of land that is presently covered in regenerating bush. This is the land on which the new plant is to be built. The remaining parcel of land comprises 49 hectares. The decommissioned Nihotupu Filtration Station is located on one corner of this parcel of land, as is a pipeline network.

[17] The designation was incorporated into the Auckland Unitary Plan (AUP) after Watercare gave the Council notice of its requirement that the whole of the land was to

remain subject to a designation for water treatment purposes.³ The rollover process occurred between 2013 and 2016.

[18] No submissions were received in opposition to the rollover of the designation. The appellants point out, however, that nothing in the rollover process provided any hint that Watercare proposed to construct a new plant on the designated land. By that stage the proposal must have been well advanced. The appellants say the lack of notice about the proposal meant they effectively lost the opportunity to make submissions about it at the time of the rollover.

[19] The designation is subject to three conditions. The first relates to matters that Watercare is required to address or include in any outline plan of work (OPW) it might submit to the Council. The second relates to sedimentation and erosion control measures for any earthworks to be carried out on the designated site. The third comprises a prohibition on future works that might adversely affect those elements of the Filter Stations that are identified as having heritage value.

The Environment Court's decision

[20] The appellants sought the following declarations in the Environment Court:

- (a) That “Designation 9324 Huia and Nihotupu Water Treatment Plants” at Woodlands Park Road, Manuka Road, and Exhibition Drive, Titirangi for “water supply purposes – water treatment plants and associated structures” in the partly Operative Unitary Plan of Auckland Council does not authorise the use of that property in terms of the RMA for the construction and operation of a new water treatment plant.
- (b) That the construction and operation of any new water treatment plant on the designated land would require a new or further designation.

[21] As the Environment Court noted, the question was whether the existing designation covered a new water treatment plant outside the existing footprint but within the designated area.⁴ That issue turned on the correct interpretation of the

³ The process to be used when designations are to be rolled over into subsequent district plans is prescribed by cl 4 to Schedule 1 to the Resource Management Act 1991. The public are entitled to make submissions once a designation has been incorporated in a proposed district plan: cl 5(2), Sch 1, Resource Management Act.

⁴ *Titirangi Protection Group Inc v Watercare Services Ltd*, above n 1, at [6].

purpose contained in the designation: “Water supply purposes – Huia and Nihotupu water treatment plants and associated structures”.

[22] The Environment Court noted that the wording of the designation gave rise to two possible interpretations.⁵ Which of these was correct depended on the meaning to be attributed to the hyphen between the words “water supply purposes” and “Huia and Nihotupu water treatment plants and associated structures”. The first, and that for which the appellants contended, treats the hyphen as being synonymous with the words “being the”. This would restrict the designated purpose to those water supply activities undertaken at the two named water treatment plants and their associated structures. It would not extend to an entirely new plant constructed in a new location.

[23] The second interpretation treats the hyphen as meaning “including the”. This would not exclude water supply activities undertaken at other locations within the designated land from the designated purpose.

[24] The Environment Court preferred the latter interpretation for the following reasons:

[20] I have reached the clear conclusion that the words “Huia and Nihotupu filter station” or “Huia and Nihotupu water treatment plants and associated structures” does not describe the full extent of the water supply purposes. There are several reasons for this:

- (a) major aspects of both the Huia and Nihotupu treatment stations are protected by condition 3. That is not for a water supply purpose but for a heritage purpose. At the time of the designation, Nihotupu was providing either no or limited water supply purposes. I conclude that the reservoir aspect of it would have been covered as part of the associated works in any event;
- (b) the WSL34 did not refer to associated works and structures, yet they are clearly part of the ongoing operation of this water supply purpose. Without them, the filtration plant could not operate. They have had to be upgraded and modified over the years. Accordingly, the full extent of the designation cannot simply be the water filtration plants themselves;
- (c) designation WSL4 (and in the AUP) conditions 1 and 2 make it clear that further works are anticipated on the site. If these were only minor, incremental changes within the existing footprint,

⁵ At [19].

then it would seem unusual that full outline development plans would be required, with a full assessment of adverse effects;

- (d) it appears to be contemplated that any new works required within the designation should avoid the Huia and Nihotupu heritage elements. If one looks at the explanation to condition 3, it notes:

... works otherwise in accordance with the designation, but which adversely affect the items or elements of items identified as being of heritage significance, may only be carried out if the designation is altered to specifically alter (or remove) the condition.

Given that Nihotupu is not currently used as a water treatment plant, this would suggest that any construction of a replacement water treatment plant for that or Huia would be better on a new site than affecting heritage items within the existing sites.

[25] The Environment Court then observed:

A holistic approach

[21] Looking at the designation as a whole, the question is “How would a reasonable person understand that designation?” Looking at the relevant map, it is clear that the designation does not just cover the area around Woodlands Park or Manuka Drive, but the entire 57ha. Although it clearly includes the water treatment plants, it must also include the existing reservoir, roading, parking, pipelines, dams or reservoirs situated over the land.

[22] Given the generality of the purpose, a reasonable person would understand that there may be changes to the operation and process for water treatment in the Auckland region over decades. The controls in this case are not exercised through the land use control, but through the conditions on the designation and the requirement for regional consents. In this designation there are significant constraints that would avoid the possibility of the entire site being converted to a water treatment plant, for example. Even if only aspects of the activity are non-complying, or fully discretionary, it is clear that the regional consents would require considerable attention to the details of design.

[23] I conclude that a reasonable person would expect that the water treatment plants and processes could be replaced over time and new ones constructed.

[26] In addition, the Environment Court went on to say:

[28] Given my primary conclusion it is not, strictly speaking, necessary to discuss this issue further. Nevertheless, I conclude there is a further impediment to the applicant’s position. Although it is correct that the Huia and Nihotupu treatment plants’ buildings can currently be identified, I am not satisfied that this means that the designation would be limited to those buildings.

[29] The treatment of water is, in fact, a process involving many stages and parts, as I have identified earlier in this decision. Over the years, the requirements for water quality have changed, and this has added elements such as testing laboratories, chemical additions and, more latterly, UV and microbiological treatment of waters through various means. New technology is being developed all the time, including membrane filtration and other similar methodologies.

[30] I cannot accept that the description of the two areas as Huia and Nihotupu treatment plants means that they are constrained to the existing buildings or footprints. This position is strengthened by a reference to the identifiers. Huia and Nihotupu are references, not to these particular buildings, but to areas that are the sources of the water. In both cases the water supply dams Huia and Nihotupu are not within the designation, but are in different parts of the catchment. They may refer either to particular reservoirs and dams, or to catchments.

[31] On that basis, the use of those names before the water treatment plant would simply identify the source of the water, not the footprint or structures associated with it. Thus, the Huia water treatment plant would be the treatment plant that treats the Huia water and similarly for the Nihotupu. At the current time, the so-called Huia treatment plant treats the water for both Nihotupu and Huia since the decommissioning of the Nihotupu water treatment plant.

[32] Overall, I have concluded that the reason for the identification of the water treatment plants is to be descriptive of areas from which the water is sourced and the general nature of the activity on the site. Given that the Nihotupu plant never operated during the time of either the Waitakere District Plan or the Unitary Plan, it cannot be that the descriptor words [relate] to the water supply function of those particular two structures.

The approach on appeal

[27] Appeal to this Court from a decision of the Environment Court is only permitted on questions of law.⁶ An error of law may occur in different ways. The appellants allege the Environment Court applied the wrong test, failed to take into account relevant factors and/or took into account irrelevant factors. I accept that these would constitute errors of law if established.⁷ Relief would only be granted, however, if the errors materially affected the outcome of the Environment Court's decision.⁸

⁶ Resource Management Act 1991, s 299(1).

⁷ See *Countdown Properties (Northlands) Ltd v Dunedin City Council* [1994] NZRMA 145 (HC) at 153.

⁸ *Royal Forest and Bird Protection Society Inc v W A Habgood Ltd* (1987) 12 NZTPA 76 (HC) at 81-82.

Errors of law

[28] The appellants contend the Environment Court erred in law in three respects:

1. in concluding that the words “Huia and Nihotupu water treatment plants” did not constrain the application of the designation primarily to those facilities;⁹
2. in concluding that the designation authorises a new water treatment plant, reservoirs and associated structures; and
3. in taking into account or giving undue weight to several factors that were either irrelevant or of little relevance to the issue the Environment Court was required to determine.

[29] Before considering the alleged errors in greater detail it is necessary to have regard to the statutory scheme relating to designations and to the approach the courts have taken to interpretation of designations.

The statutory scheme relating to designations

[30] Part 8 of the Resource Management Act 1991 (the RMA) provides for designations. The Act defines the term “designation” as follows:¹⁰

designation means a provision made in a district plan to give effect to a requirement made by a requiring authority under section 168 or section 168A or clause 4 of Schedule 1

[31] As will be evident from this definition, a designation gives effect to a requirement made by a requiring authority under s 168. The RMA defines “requiring authority” as follows:¹¹

requiring authority means—

- (a) a Minister of the Crown; or

⁹ Counsel for the appellants used the words “meaning of the designation” rather than “application of the designation” but I consider the latter more aptly describes the issue on appeal.

¹⁰ Section 166.

¹¹ Section 166.

- (b) a local authority; or
- (c) a network utility operator approved as a requiring authority under section 167.

[32] There is no dispute that Watercare is a network utility operator approved as a requiring authority under s 167 of the Act.

[33] Section 176 of the Act prescribes the effect of a designation as follows:

176 Effect of designation

- (1) If a designation is included in a district plan, then—
 - (a) section 9(3) does not apply to a public work or project or work undertaken by a requiring authority under the designation; and
 - (b) no person may, without the prior written consent of that requiring authority, do anything in relation to the land that is subject to the designation that would prevent or hinder a public work or project or work to which the designation relates, including—
 - (i) undertaking any use of the land; and
 - (ii) subdividing the land; and
 - (iii) changing the character, intensity, or scale of the use of the land.
- (2) The provisions of a district plan or proposed district plan shall apply in relation to any land that is subject to a designation only to the extent that the land is used for a purpose other than the designated purpose.

...

[34] As s 176(1)(a) makes clear, land that is subject to a designation will no longer be subject to the requirements of s 9(3) of the RMA. That section prohibits land being used in a manner that contravenes a district rule unless the use is expressly allowed by either a resource consent or ss 10 or 10A of the RMA. Designations have been described as “notice to the world” of the use to which the land subject to a designation may be put.¹²

¹² *Waimairi County Council v Hogan* [1978] 2 NZLR 587 (CA) at 590.

[35] Although a proposed work that is covered by a designation does not require a resource consent in the form of a land use consent, it remains subject to other requirements. First, the requiring authority must comply with s 176A of the RMA before carrying out the work. This requires the requiring authority to provide the territorial authority, in this case the Council, with an outline plan of any works (OPW) the requiring authority proposes to carry out on the land subject to the designation. Section 176A relevantly provides as follows:

176A Outline plan

- (1) Subject to subsection (2), an outline plan of the public work, project, or work to be constructed on designated land must be submitted by the requiring authority to the territorial authority to allow the territorial authority to request changes before construction is commenced.
- (2) An outline plan need not be submitted to the territorial authority if—
 - (a) the proposed public work, project, or work has been otherwise approved under this Act; or
 - (b) the details of the proposed public work, project, or work, as referred to in subsection (3), are incorporated into the designation; or
 - (c) the territorial authority waives the requirement for an outline plan.
- (3) An outline plan must show—
 - (a) the height, shape, and bulk of the public work, project, or work; and
 - (b) the location on the site of the public work, project, or work; and
 - (c) the likely finished contour of the site; and
 - (d) the vehicular access, circulation, and the provision for parking; and
 - (e) the landscaping proposed; and
 - (f) any other matters to avoid, remedy, or mitigate any adverse effects on the environment.
- (4) Within 20 working days after receiving the outline plan, the territorial authority may request the requiring authority to make changes to the outline plan.
- (5) If the requiring authority decides not to make the changes requested under subsection (4), the territorial authority may, within 15 working

days after being notified of the requiring authority's decision, appeal against the decision to the Environment Court.

- (6) In determining any such appeal, the Environment Court must consider whether the changes requested by the territorial authority will give effect to the purpose of this Act.
- (7) This section applies, with all necessary modifications, to public works, projects, or works to be constructed on designated land by a territorial authority.

[36] As the section makes clear the Council has the ability to request changes to any OPW that might be submitted by a requiring authority. The Council also has a right of appeal to the Environment Court if the requiring authority does not make the changes requested. As the appellants point out, however, no party other than the territorial authority has the ability to have any input into the OPW process.

[37] In addition, the requiring authority must also seek any necessary resource consents under the regional plan components of the AUP.

[38] Before considering the alleged errors of law it is also appropriate to consider the approach the courts have taken to the interpretation of designations.

The interpretation of designations

[39] Historically, most designations were drafted in very broad terms. Many designations of this type, commonly known as legacy designations, remain in existence because they have been “rolled over” into successive district plans with or without modification. More recently, however, the trend has been to prescribe the activity or use to which a designation relates with some precision so that all persons who have cause to consider the designation can be left in no doubt as to its potential scope.

[40] As the present case demonstrates, broadly worded designations can raise issues as to whether a current or proposed use of the land in question is covered by or included within the designation. Often the designation will have been drafted at a time when a proposed use could not have been contemplated.

[41] There is no dispute regarding the test to be applied when interpreting the purpose of a broadly worded designation. As confirmed in numerous cases, the test is what an ordinary, reasonable member of the public who is considering a district scheme or plan would have taken from the designation.¹³

[42] There are numerous examples of the courts and planning authorities applying the test. It is worth referring to some of these because they provide practical examples of the approach the courts have taken.

[43] In *Concerned Citizens Group v Wanganui District Council*, the High Court was required to consider whether the Planning Tribunal had correctly concluded that the designation “Wanganui Base Hospital” included the construction and operation of a medium secure psychiatric unit within the land subject to the designation.¹⁴ That type of facility would not have been foreseen when the designation was first included in the District Scheme. Neazor J concluded that the proposed development “should be regarded as one of the hospital services which may contribute to the totality of services provided by a base hospital”.¹⁵ This prompted his Honour to uphold the Planning Tribunal’s decision that the proposed development fell within the designation.

[44] In *Hororata Concerned Citizens v Canterbury Gliding Club Inc*, a gliding club sought a declaration that gliding activities constituted a recreational activity so that it could be accommodated on an area designated as a recreation reserve.¹⁶ The Environment Court concluded that the designated purpose of “recreation reserve” would cover all recreational activities.¹⁷ It held that gliding was clearly a recreational activity and the existing designation was therefore sufficient to cover it.

¹³ *Waimairi County Council v Hogan*, above n 12, at 590 applying *Maunsell v Olins* [1975] AC 373 (HL) at 391.

¹⁴ *Concerned Citizens Group v Wanganui District Council* HC Wellington AP19/92, 17 July 1992.

¹⁵ At 18.

¹⁶ *Hororata Concerned Citizens v Canterbury Gliding Club Inc* EnvC Christchurch C185/2004, 8 December 2004.

¹⁷ At [51].

[45] In *Ngataringa Bay 2000 Inc v Minister of Defence* the Planning Tribunal was required to decide whether the establishment of a Damage Control School fell within the purpose of the designation “defence purposes”.¹⁸ The Tribunal concluded:¹⁹

In my opinion a thoughtful member of the public, considering the designation “Defence Purposes” in the context of a document listing the range of activities given in that paragraph (including Naval training), might reasonably expect that it would include a facility for training Naval personnel in damage control on ships. I hold that the use and development of part of the site so designated for the Royal New Zealand Navy Damage Control School is in accordance with the designation.

[46] In *Waimairi County Council v Hogan*, the Court of Appeal was required to determine whether a playcentre could be erected as of right on land designated as a “public recreation (play) area”.²⁰ It held that the proposal was contrary to the designation because it would “exclude the public at large from a substantial part of the reserve”.²¹

[47] In *Olsen v Minister of Social Welfare*, the Planning Tribunal dealt with both an appeal and an application for a declaration that the designation of the “Epuni Boys Home” did not authorise the use of the designated land for purposes including the custodial detention of young persons on remand from the courts.²² The appeal was filed by persons living near the Epuni Boys Home after the Hutt City Council had accepted a requirement issued by the Minister of Education that an existing designation of “Boys Home” be altered to “Social Welfare purposes: residents (sic) for care and control (including detention) of children and young persons and related office accommodation”.

[48] The Planning Tribunal held that the requiring authority that had originally obtained the designation “was intent upon using a name [Boys Home] for the purpose of pacifying the public”.²³ It considered the Minister had adopted the same approach

¹⁸ *Ngataringa Bay 2000 Inc v Minister of Defence* (3) (1992) 2 NZRMA 318 (PT).

¹⁹ At 325.

²⁰ *Waimairi County Council v Hogan*, above n 12.

²¹ At 590.

²² *Olsen v Minister of Social Welfare* [1995] NZRMA 385 (PT).

²³ At 389.

in seeking a new designation naming the facility as a “residential centre”. The Tribunal observed:²⁴

Lastly we observe that despite the declarations the legality of the activity eventually becomes a matter of degree. A “Boys Home” may well contain one or two boys who are at the worse end of the offending scale and some type of mix is probably inevitable. The Epuni institution however was well past being accommodated by the expression “home” which is misleading to the general public. The closest description we can give to it is a young persons detention centre.

Decision

First alleged error: Did the Environment Court err in concluding that the words “Huia and Nihotupu water treatment plants” did not constrain the application of the designation primarily to those constructed facilities?

[49] I accept that the wording of the purpose of the designation can be interpreted in differing ways as identified by the Environment Court. It is common ground, however, that the purpose of the designation must be ascertained having regard to the whole of the designation and not just the words used in setting out the purpose.

[50] I agree with the Environment Court that the conditions are relevant in this context. They clearly anticipate that Watercare will carry out further works in reliance on the designation because they make provision for what will happen in that event. As I have already observed, Condition 1 prescribes matters Watercare must include or cover in any future OPW; Condition 2 deals with sedimentation and erosion control measures in relation to future works; and Condition 3 deals with future works that adversely affect elements of the treatment plants identified as having heritage values. The designation itself therefore contemplates further works within the scope of the designation being carried out in the future.

[51] The appellants do not take issue with this. They acknowledge Watercare will need to maintain and upgrade the Huia plant to ensure it maintains the ability to meet future water needs. They part company with Watercare and the Council in relation to the scope of works that may be carried out within the boundaries of the designation. The appellants acknowledge that the designation permits Watercare to maintain and if

²⁴ At 390.

necessary replace the two existing plants without a resource consent or new designation, but only if the work is carried out within the footprint of the existing sites. They say the designation does not extend to the construction of a new plant on another site. They contend Watercare is required to obtain a new designation or resource consent if it wishes to take that step.

[52] As the Environment Court correctly observed, the ultimate test in the present context is what the ordinary, reasonable person would understand the designation to mean. That hypothetical person must be taken to have the level of knowledge about the factual context likely to be possessed by any ordinary and reasonable person who takes the trouble to examine a designation.

[53] I deal first with an argument by the appellants regarding the meaning an ordinary and reasonable person would take from the words “Given effect to (i.e. no lapse date)”. These appear in the designation in response to the words “Lapse date”. The appellants argue that these words would suggest to such a person that the effect of the designation is spent because the designated works have already been constructed. As a result, no reasonable person would interpret the designation as authorising substantial works in the future.

[54] This argument has several flaws. First, a designation of this breadth does not relate solely to construction works. Rather, it relates to the purpose for which the land has been designated. The land has been designated for water supply purposes. Although the plants may have been built, the conditions clearly anticipate that further works may be carried out in the future.

[55] More importantly, the hypothetical person must be taken as having a reasonable knowledge of the manner in which designations operate. Ordinarily a designation will lapse after five years if it is not given effect.²⁵ The words in the designation are designed to alert the reader to the fact that the designation has been given effect so that it will not lapse. This argument has no merit.

²⁵ Resource Management Act 1991, s 184(1)(a).

[56] I deal next with an issue raised by the Environment Court in the passage set out above at [25]. In that passage the Environment Court noted, albeit as a subsidiary conclusion, that the two existing facilities take their names from the dams that supply them with water for processing.²⁶ The evidence from Watercare is certainly to that effect and it might also be within the knowledge of some persons who live in the area and/or who have an interest in water treatment activities. I would be surprised, however, if that fact was within the knowledge of most ordinary and reasonable persons. I suspect that few persons outside the immediate area would know the names of the dams that supply the two facilities.

[57] The hypothetical reasonable and ordinary person would, however, know that the treatment of water from its raw state to a product suitable for human use and consumption will require a number of steps to be taken. These will vary in nature and intensity as knowledge and technology advance, and as the demand for water rises with the steady increase in Auckland's population.

[58] That person would also know that, in common with plant used for most industrial and commercial purposes, the plant installed at Watercare's sites will have a finite working life. New and more advanced water treatment methods will inevitably emerge as time goes on. The hypothetical person may also know that the Nihotupu plant reached the end of its working life nearly twenty years ago, and has been decommissioned as a result. Even if the person is not aware of that fact, he or she will know that all water treatment plants eventually become obsolete or unable to process water in an appropriate or economic way. The ordinary and reasonable person would therefore anticipate the eventual construction of one or more new facilities to either replace the existing facility or, as is now proposed, to operate in conjunction with it.

[59] I do not consider the ordinary and reasonable person would conclude that any new or replacement facility would necessarily be located on the same site as the Huia or Nihotupu plants. That would be inherently unlikely in the case of the construction of an entirely new plant to operate in conjunction with the existing plant. The person would know that Watercare has required 57 hectares to be designated for water

²⁶ At [31].

treatment purposes. He or she would therefore appreciate that Watercare is likely to build the new facility within that area and most probably in relatively close proximity to the two existing sites. This would enable the new facility to take advantage of the area's proximity to the sources from which water was to be drawn for the new plant. It would also enable the three sites to be operated in the most efficient way.

[60] I therefore consider the ordinary, reasonable person would understand the designation permitted the construction of a new water treatment facility within the area designated for that purpose but not in the same position as the two existing sites. This is the conclusion reached by the Environment Court for essentially the same reasons and applying the correct test. The Environment Court accordingly did not err in interpreting the wording of the designation as permitting water treatment activities beyond those carried on at the two existing plants.

Second alleged error: Did the Environment Court err in authorising a new water treatment plant, reservoirs and associated structures?

[61] Reading the decision of the Environment Court as a whole, I do not consider it amounted to authorisation of a new water treatment plant with reservoirs and associated structures. The Environment Court expressly declined to make a declaration in favour of the Council.²⁷ Having regard to the conclusions the Environment Court reached, however, it is implicit from the decision that it considered the construction of a new water treatment plant on a new site was covered by the designation. Having regard to my own conclusion in relation to the first alleged error, the Environment Court was entitled to reach that view.

[62] As argument developed, it became evident that the appellants' focus was directed to another issue. Mr Matheson for the appellants argued that the Environment Court had erred by failing to have regard to the fact that any new plant will inevitably add substantially to the scale and degree of the activity carried out on the designated land. He submitted this could place the new activity outside the scope of the designation. He also contended the Court needed to take into account the fact that the designated area falls within an ecologically important area. He contended it was

²⁷ At [36]-[37].

essential that the public be given the opportunity to provide input into the proposal to build a new plant by making submissions in opposition to an application for resource consent or a new designation.

[63] The appellants rely for this ground on observations made by the Court of Appeal in *Hogan* and the Planning Tribunal in *Olsen*. As noted above,²⁸ the Court of Appeal in *Hogan* held that the proposed erection of a playcentre within an area designated as a public recreation reserve was not covered by the designation because it would exclude the public from using a substantial portion of the reserve. Mr Matheson for the appellants submits it can be inferred from this that the Court of Appeal may not have decided the case the same way if the proposed activity had only excluded the public from using a small or minor part of the reserve.

[64] I do not accept this submission. I consider the Court's decision was based on its conclusion that the reserve was designated for the use of the general public and the designation would not extend to any activity that excluded the general public. I do not consider the proportion of the reserve that might be affected by the proposed use could affect that proposition.

[65] Mr Matheson points out that in the passage from *Olsen* set out above²⁹ the Planning Tribunal referred to the fact that the legality of the activity "eventually becomes a matter of degree". He submits this supports his argument that an increase in scale or degree of an activity can remove it from or place it outside the scope of a designation. I do not accept this submission because I consider the Planning Tribunal in *Olsen* was referring to the fact that eventually an increase in a different type of activity will change the nature or character of the purpose for which designated land is being used. In that case the use of a property designated as a boys home altered to that of a facility for the custodial detention of young persons on remand from the courts. The nature of the use therefore altered rather than the degree.

[66] In general terms, and in the absence of any conditions in the designation limiting the scale or intensity of the use to which the land may be put, I do not see how

²⁸ At [46].

²⁹ At [48].

an increase in the degree or scale of an activity falling within the purposes of a designation can result in the activity falling outside the designation. Either an activity is covered by a designation or it is not. For that reason the appellants' criticism that the Environment Court failed to set an "upper limit" for future development is without substance. This argument fails as a result.

Third alleged error: Did the Environment Court err by taking into account irrelevant considerations or giving undue weight to marginally relevant considerations?

[67] I begin by observing that it will be an error of law for a decision maker to take into account an irrelevant consideration but the weight to be given to relevant considerations will be for the decision maker to assess.

[68] The appellants' challenge under this ground relies on the Environment Court's observation that Watercare will still be required to obtain resource consents under the regional aspects of the AUP and it will also be required to file an OPW with the Council in respect of future work even if it is covered by the designation. These references appear in the following passage of the Environment Court's decision:³⁰

[22] Given the generality of the purpose, a reasonable person would understand that there may be changes to the operation and process for water treatment in the Auckland region over decades. The controls in this case are not exercised through the land use control, but through the conditions on the designation and the requirement for regional consents. In this designation there are significant constraints that would avoid the possibility of the entire site being converted to a water treatment plant, for example. Even if only aspects of the activity are non-complying, or fully discretionary, it is clear that the regional consents would require considerable attention to the details of design.

[69] I consider these issues were relevant to the Environment Court's reasoning process because they demonstrated that the designation, and in particular the conditions attached to the designation, contemplated future works being carried out within the designated area. Furthermore, I accept the submission for Watercare that the Environment Court may also have included these observations to provide the appellants with some assurance that Watercare would still be subject to some significant controls in relation to future construction works.

³⁰ *Titirangi Protection Group Inc v Watercare Services Ltd*, above n 1.

[70] Even if the observations were irrelevant, they can have no bearing on the outcome of the appeal because I have already concluded that the Environment Court's interpretation of the designation was correct using the established test.

[71] Before concluding, I acknowledge that the appeal does not, and cannot, address the appellants' primary concern. This is that they were effectively denied the opportunity to make submissions on the rollover of the designation because Watercare did not provide any hint at that time of its intention to construct a new plant on the designated land. The appeal does not, however, provide the appellants with a forum within which to ventilate that concern. Furthermore, they now have no means under the RMA by which they may challenge the incorporation of the designation within the AUP. It was partly for this reason that the Environment Court directed that costs were to lie where they fell.³¹

Result

[72] The appeal is dismissed.

Costs

[73] The respondents have succeeded and would ordinarily be entitled to an award of costs on a Category 2B basis together with disbursements as fixed by the Registrar. If counsel and the parties cannot reach agreement regarding costs the respondents are to file concise memoranda (no more than three pages in length) within 14 days. I will then give directions for the filing of submissions in response and reply.

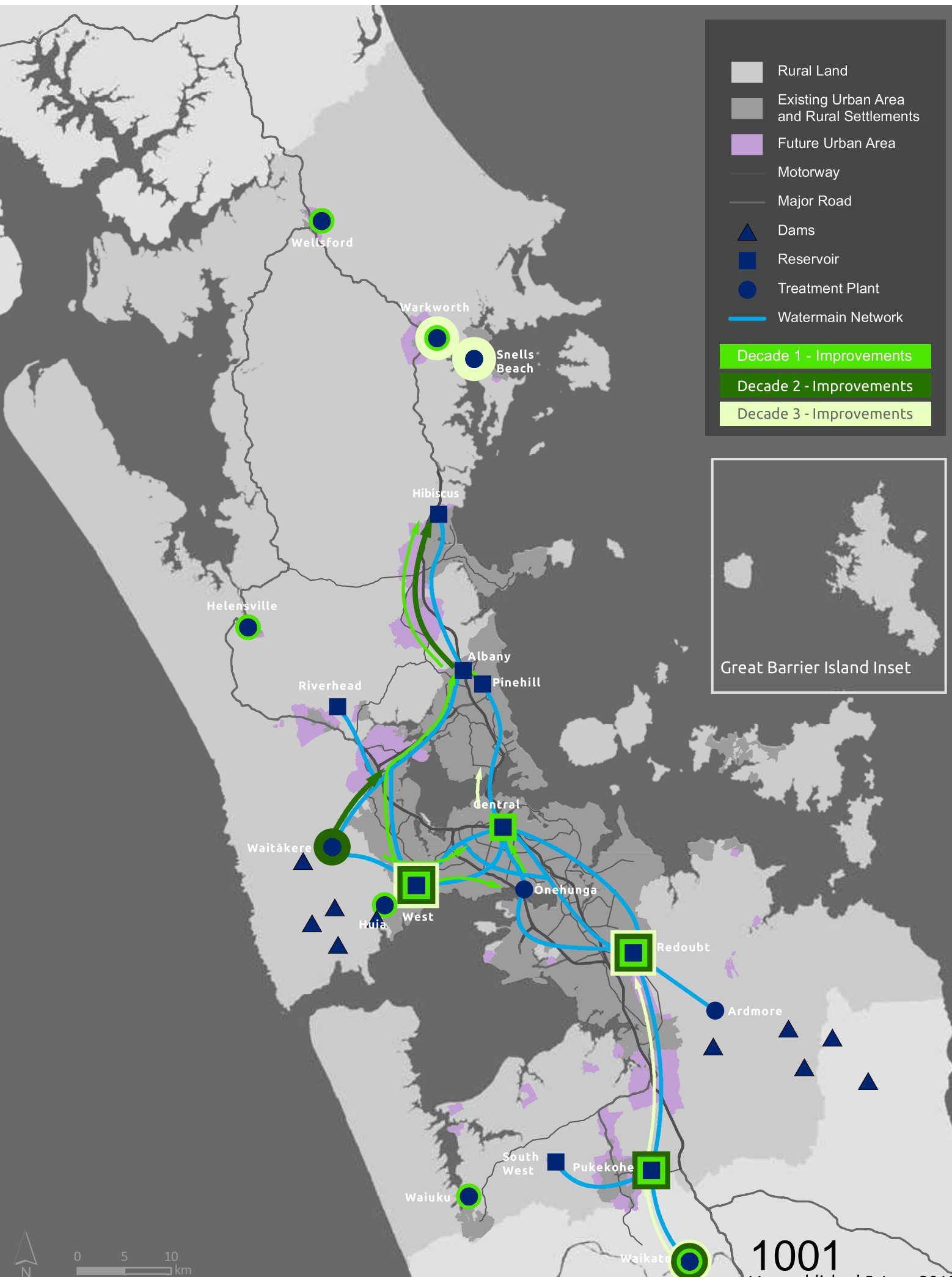
Lang J

Solicitors:
B Matheson, Barrister, Auckland
Doug Cowan, Barristers and Solicitors, Auckland
Simpson Grierson, Auckland
Brookfields, Auckland

³¹ *Titirangi Protection Group Inc v Watercare Services Ltd* above n 1, at [39].

ATTACHMENT NINE
AUCKLAND PLAN 2050 – MAP 22

- Rural Land
- Existing Urban Area and Rural Settlements
- Future Urban Area
- Motorway
- Major Road
- Dams
- Reservoir
- Treatment Plant
- Watermain Network
- Decade 1 - Improvements
- Decade 2 - Improvements
- Decade 3 - Improvements



ATTACHMENT TEN
RECOMMENDED CONDITIONS

RECOMMENDED CONDITIONS OF CONSENT

Under section 108, the grant of these resource consents is subject to the following conditions:

Definitions

“ACM” means Asbestos Containing Material;

“AMP” means Adaptive Management Plan;

“ARI” means Annual Recurrence Interval;

“ASCNVMP” means Activity Specific Construction Noise and Vibration Management Plan;

“ASDDP” means Armstrong Stream Diversion Design Plan;

“AUP(OP)” means the Auckland Unitary Plan (Operative in Part);

“ChTMP” means Chemical Treatment Management Plan;

“CLG” means the Community Liaison Group;

“CNVMP” means Construction Noise and Vibration Management Plan;

“Commencement of construction” means commencement of any construction works for the Project. For the avoidance of doubt, it excludes site investigations, fencing, and any activities that do not need resource consent and/or are permitted activities;

“Consent Holder” means Watercare Services Limited;

“Council” means the Auckland Council;

“CTMP” means Construction Traffic Management Plan;

“DoC” means the Department of Conservation;

“DSI” means Detailed Site Investigation;

“EMP” means Ecological Management Plan;

“ESCP” means Erosion and Sediment Control Plan;

“GSMCP” means Groundwater and Settlement Monitoring and Contingency Plan;

“HMP” means Herpetofauna Management Plan;

“KCZ” means Kauri Contamination Zone;

“KDMP” means Kauri Dieback Management Plan;

“Monitoring Team Leader” means the Council’s senior monitoring officer for the relevant area;

“NES Soil” means the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health, 2011;

“PIA” means Pavement Impact Assessment;

“Project” means the proposal as described in the documents detailed at Condition 2;

“RMA” means the Resource Management Act 1991;
 “SEA” means Significant Ecological Area;
 “SEV” means Stream Ecological Value;
 “SEVP” means Stream Ecological Valuation Plan;
 “SMP” means Site Management Plan;
 “SRP” means Stream Restoration Plan;
 “SVR” means Site Validation Report;
 “WBMP” means Waima Biodiversity Management Plan;
 “WTP” means Water Treatment Plant; and
 “YSDDP” means Yorke Stream Diversion Design Plan.

General conditions

Commencement and duration

- Pursuant to ss 123 and 125 of the RMA, the duration and lapse dates for the various resource consents shall be as set out in the table below:

Consent	Lapse Date	Duration (unless the consent has lapsed, been surrendered or cancelled at an earlier date)
Land use consents for land disturbance activities including earthworks, NES consent for disturbance of contaminated soils, and vegetation removal associated with replacement WTP and Reservoir 1.	10 years from commencement.	15 years from commencement.
Land use consents for works in the bed of a watercourse including disturbance, structures, reclamation and drainage.	10 years from commencement.	15 years from commencement.
Consent to divert a river or stream to a new course.	10 years from commencement.	15 years from commencement.
Consents for diversion and discharge of stormwater.	10 years from commencement.	35 years from commencement.
Consents for diversion and discharge of groundwater.	10 years from commencement.	10 years from commencement.
Land use consents for land disturbance activities including earthworks, NES consent for disturbance of contaminated soils, and vegetation removal associated with Reservoir 2.	10/15 years from commencement. ¹	20 years from commencement.
Consent to discharge contaminants to land associated with the disturbance of potentially contaminated soil (WTP and Reservoirs 1 and 2).	10 years from commencement.	25 years from commencement.

¹ S42A Report, section 14.2.4

Advice Note:

The consents lapse in accordance with the above lapse dates unless, prior to the lapse date:

- (a) The consent is given effect to; or*
- (b) The Council extends the period after which the consent lapses.*

Development in accordance with plans

2. The proposed structures shall be designed, operated and maintained in accordance with the information provided with the application, and all referenced by the Council as consent number **BUN60339273** as follows:

- (a) The information provided with the application as follows:
 - Assessment of Environmental Effects report, titled “*Huia Replacement Water Treatment Plant (WTP) Project*”, Version V1, prepared by Tonkin & Taylor Ltd (“**T&T**”), dated 22 July 2019;
 - WTP Reservoirs Site Layout Development Report, prepared by GHD Ltd, dated May 2019;
 - Reservoirs storage, location and layout assessment, prepared by Beca Ltd, dated 22 May 2019;
 - Indicative design drawings, prepared by GHD Ltd, dated May 2019 (Rev 2);
 - Indicative Construction Methodology Report, prepared by Alta, dated 23 May 2019 (Rev 5);
 - Stormwater and Erosion and Sediment Control Report, prepared by Cook Costello, dated May 2019, Ref 14191;
 - Groundwater and Settlement Report, prepared by T&T, dated 24 May 2019, Ref 30848.2000;
 - Preliminary Land Stability Assessment, prepared by T&T, dated 24 May 2019, Ref 30848.2000;
 - Site Management Plan for Ground Contamination, prepared by T&T, dated May 2019, Ref 30848.2000v2;
 - Ecological Assessment, prepared by Boffa Miskell Ltd, dated 26 July 2019;
 - Traffic and Transport Assessment, prepared by Beca Ltd, dated 10 July 2019 (Rev 3.0);
 - Construction Noise and Vibration Assessment, prepared by Marshall Day Acoustics Ltd, dated 20 May 2019 (Rev 3); and
 - Draft Deed of Trust for the Waima Biodiversity Trust, prepared by Simpson Grierson, dated 23 May 2019.
- (b) The additional information provided by the applicant set out in the letter prepared by T&T, dated 13 August 2019, and the following attachments:
 - Appendix A – Stormwater Response, prepared by Cook Costello, dated 9 August 2019;

- Appendix B – Groundwater and Earthworks Response, prepared by T&T, dated 13 August 2019;
 - Appendix C – Ecology Response, being a memorandum from the applicant’s counsel regarding the Trust Deed dated 31 July 2019 and a memorandum from Boffa Miskell Ltd, dated 9 August 2019;
 - Appendix D – Arborist Response, prepared by GreensceneNZ Ltd, dated 9 August 2019; and
 - Appendix E – Transport Response, prepared by CH2M Beca Ltd, dated 9 August 2019.
- (c) The Preliminary Site Investigation, prepared by T&T, dated September 2019 (Version 1.1), Ref 30848.2000.
- (d) The additional information provided by the applicant set out in the letter prepared by T&T, dated 8 November 2019, and the following attachments:
- Attachment A – Regional stormwater and earthworks response, prepared by Cook Costello, dated 8 November 2019 and USLE calculations provided on 2 December 2019;
 - Attachment B – Streamworks, terrestrial ecology and kauri dieback response, prepared by Boffa Miskell Ltd, dated 20 October 2019;
 - Attachment C – Transportation response, prepared by CH2M Beca Ltd, dated 4 November 2019;
 - Attachment D – Road stability response, prepared by T&T, dated 8 November 2019; and
 - Attachment E – Social Impact Assessment response, prepared by Beca Ltd, dated 8 November 2019.
- (e) The Addendum to Stream Ecological Value Plan, prepared by Boffa Miskell Ltd, dated 26 November 2019.
3. In the event of any conflict between the documents listed above and the conditions of this consent, the conditions shall prevail.

Advice Note:

In the event that minor amendments to the approved plans and management are required, any such amendments should be limited to the scope of this consent. Any amendments which affect the performance of the proposed activity may require an application to be made in accordance with s127 of the RMA. Any minor amendments shall be provided to the Team Leader Monitoring prior to implementation to confirm that they are within the scope of this consent.

Monitoring

4. The consent holder shall pay the Council an initial consent compliance monitoring charge of \$5,000 inclusive of GST, plus any further monitoring charge or charges to recover the actual and reasonable costs incurred to ensure compliance with the conditions attached to this consent/s.

Advice note:

The initial monitoring deposit is to cover the cost of inspecting the site, carrying out tests, reviewing conditions, updating files, etc., all being work to ensure compliance with the resource consent. In order to recover actual and reasonable costs, monitoring of conditions, in excess of those covered by the deposit, shall be charged at the relevant hourly rate applicable at the time. The consent holder will be advised of the further monitoring charge. Only after all conditions of the resource consent have been met, will the Council issue a letter confirming compliance on request of the consent holder.

Pre-commencement

Site Meeting

5. Prior to the commencement of any construction activities or vegetation removal, the Consent Holder shall hold a pre-start meeting that:
- (a) is located on the subject site;
 - (b) is scheduled not less than 10 working days before the anticipated commencement of construction works;
 - (c) includes Auckland Council officer(s); and
 - (d) includes representation from the contractors who will undertake and or supervise the works.

The pre-start meeting is to ensure all relevant parties are aware of and familiar with the necessary conditions of these consents. At this pre-start meeting, the meeting shall discuss the following matters (not limited to):

- (i) Timeframes for key stages of the works authorised under these consents;
- (ii) Detailed run-through of the key aspects of the approved management plans, including specific details on the controls to minimise the spread of kauri diebck, the need to minimise vegetation removal and restrictions around transportation movements to and from the site; and
- (iii) Contact details of the site contractor(s).

Advice Note:

To arrange the pre-start meeting please contact the Monitoring Team Leader on 09 301-0101. The conditions of consent are to be discussed at this meeting. All additional information required by the Council is to be provided two days prior to the meeting.

Detailed engineering drawings and design

6. Following detailed design of the Project enabling works for each stage, and at least forty (40) working days prior to commencement of these works (excluding site investigations, demolition and removal of buildings and structures, and establishment of site entrances and fencing), the Consent Holder shall submit detailed engineering designs and drawings of earthworks for that stage to the Council's Monitoring Team Leader.

7. The Consent Holder shall ensure that the footprint of the replacement WTP and reservoirs is optimised through detailed design to ensure that, as far as practicable, the works provided for under this consent:
 - (a) Further reduce the extent of vegetation removal in the Significant Ecological Area (SEA); and
 - (b) Further reduce effects on individual trees of greatest significance that are located within the works footprint identified in the drawings referenced in Condition 2; and
 - (c) Further reduce effects on kauri trees that have rootzones within or extending into the works footprint identified in the drawings referenced in Condition 2.

8. Prior to commencement of works, the Consent Holder shall submit an updated optimised site layout report and associated plan(s) for written approval by the Council's Monitoring Team Leader confirming the works footprint and setting out the measures to further minimise impacts on vegetation in the SEA and significant trees as required by Condition 6.

Community Liaison Group

9. The Consent Holder shall support the establishment and ongoing involvement of a Community Liaison Group (CLG) comprised of representatives of the local community. The objectives of the CLG are to:
 - (a) Provide a means for all parties to give and receive regular updates on progress with the Project;
 - (b) Provide a regular forum through which information about the Project can be provided to the community;
 - (c) Enable opportunities for concerns and issues to be reported to and responded to by the Consent Holder; and
 - (d) Provide feedback on the development of the Ecological Management Plan (EMP), Waima Biodiversity Management Plan (WBMP), Construction Noise and Vibration Management Plan (CNVMP), Construction Traffic Management Plan (CTMP) and Kauri Dieback Management Plan (KDMP).

10. The Consent Holder shall:
 - (a) Consult with the CLG on the development and content of the EMP, WBMP, CNVMP, CTMP and KDMP;
 - (b) Provide reasonable administrative support for the CLG including:
 - Organising meetings at a local venue;
 - Inviting all members of the CLG;
 - Distributing an agenda to each CLG member no less than five working days prior to meetings; and
 - The taking and dissemination of meeting minutes,
 - (c) Provide an update at least every six months (or as otherwise agreed with the CLG) on compliance with consent conditions.

11. The Consent Holder shall endeavour to ensure that the CLG meets at least every three (3) months and more often as required during construction of the Project, and at least annually at other times, or as otherwise agreed with the CLG. The CLG shall continue for the duration of the construction period.

Management Plans – General

12. The following are general provisions related to all management (or control) plans required at the pre-commencement stage:
 - (a) Management Plans shall be submitted to the Monitoring Team Leader for written approval. Management Plans shall be submitted at least forty (40) working days prior to the Commencement of Construction unless otherwise specified in the conditions. The consent holder shall ensure that any changes to draft Management Plans are clearly identified.
 - (b) Management Plans may be submitted in parts or in stages to address particular activities or to reflect a staged implementation of the Project, and when provided in part or for a stage shall be submitted at least twenty (20) working days prior to Commencement of Construction of that part of stage unless otherwise specified in the conditions. Management Plans submitted shall clearly show the linkage with plans for adjacent stages and interrelated activities.
 - (c) Any approved Management Plan may be amended if necessary to reflect any minor changes in design, construction methods or management of effects. Any amendments are to be provided to the Monitoring Team Leader for confirmation in writing prior to implementation of the change, unless the Monitoring Team Leader determines at his or her discretion that those amendments once implemented would result in a materially different outcome to that described in the original Management Plan.
 - (d) Any changes to an approved Management Plan involving a materially different outcome shall be submitted to the Monitoring Team Leader to certify that they comply with the applicable requirements of these conditions. Any material change must be consistent with the purpose of the relevant Management Plan and the requirements of the relevant conditions of these consents. Where a Management Plan was prepared in consultation with affected parties, any material changes to that Plan shall be prepared in consultation with those same parties.
 - (e) All works shall be carried out in accordance with the approved Management Plans. No works shall commence until approval of all the relevant Management Plans for that stage have been received, unless otherwise approved in writing by the Monitoring Team Leader.

Erosion and Sediment Control Plan

13. Prior to the commencement of earthworks activity for each stage, finalised Erosion and Sediment Control Plans (ESCP) shall be prepared in accordance with Auckland Council's Guidance Document 005 '*Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region*' (GD05) and the preliminary erosion and

sediment control plans provided in the application (Condition 2). These finalised plans shall include, but not limited to:

- (a) Specific erosion and sediment control works (location, dimensions, capacity) in accordance with GD05;
- (b) supporting calculations and design drawings;
- (c) details of construction methods;
- (d) monitoring and maintenance requirements;
- (e) catchment boundaries and contour information;
- (f) cut and fill isopach plan; and
- (g) details relating to the management of exposed areas (e.g. grassing, mulching).

The ESCP shall be submitted to the Monitoring Team Leader on monitoring@aucklandcouncil.govt.nz. No earthworks activity on the subject site shall commence until confirmation is provided from the Council that the ESCP is satisfactory.

14. The ESCP shall include but is not limited to:

- (a) Staging details with stage specific erosion and sediment control works including location, dimensions and drawings. All controls should be in line with Industry Best Practice as well as in general accordance with the Council's GD05 guidance document;
- (b) Timing and duration of construction and operation of control works;
- (c) Details relating to the management of exposed areas (e.g. grassing, mulching or placement of hardfill); and
- (d) Monitoring and maintenance requirements for the proposed erosion and sediment controls.

15. All perimeter controls shall be operational before earthworks commence. All 'cleanwater' runoff from stabilised surfaces including catchment areas above the Project Site shall be diverted away from earthworks areas via a stabilised system, so as to prevent surface erosion.

Dewatering Plan

16. Prior to the commencement of earthworks activity on the subject site a Dewatering Plan shall be prepared for dewatering any surface water and/or groundwater that becomes impounded in the excavation pits. This dewatering plan shall include, but not limited to:

- Dewatering methodology;
- Pump size and specifications;
- Discharge locations; and

- Impounded water treatment methodologies in accordance with the approved Chemical Treatment Management Plan (required under Condition **18**).²

This Dewatering Plan shall be submitted to the Monitoring Team Leader. No earthworks activity on the subject site shall commence until confirmation is provided from the Council that the Dewatering Plan is satisfactory.

Adaptive Management Plan

17. Prior to commencement of earthworks activity on the subject site an Adaptive Management Plan (AMP) shall be submitted for the written approval of the Monitoring Team Leader. This AMP shall set out a monitoring programme of onsite devices and the downstream receiving environment. Specific trigger levels shall be set which can be used to trigger management actions if specified limits are exceeded. The AMP shall include but not be limited to:

- (a) Baseline testing;
- (b) Trigger levels;
- (c) Weather monitoring (rainfall, forecasting etc.);
- (d) Freshwater monitoring (water quality, MCI, sediment deposition etc.);
- (e) Erosion and Sediment control device monitoring (inlet/outlet turbidity etc.);
- (f) Reporting requirements (exceedance, quarterly, annual); and
- (g) Management actions.

Chemical Treatment Management Plan

18. Prior to the commencement of earthworks at the site, a Chemical Treatment Management Plan (ChTMP) shall be submitted for the written approval of the Monitoring Team Leader. The ChTMP shall include as a minimum:

- (a) Specific design details of the chemical treatment system based on a rainfall activated dosing methodology for the site's sediment retention ponds and batch dosing methodology for dewatering the excavation pits;
- (b) Monitoring, maintenance (including post storm) and contingency programme (including a record sheet);
- (c) Details of optimum dosage (including assumptions);
- (d) Results of initial chemical treatment trial;
- (e) A spill contingency plan; and
- (f) Details of the person or bodies that will hold responsibility for long term operation and maintenance of the chemical treatment system and the organisational structure which will support this system.

² Condition numbers where used for cross-referencing purposes have been left in highlight text for future amendments.

Advice Note:

In the event that minor amendments to the ChTMP are required, any such amendments should be limited to the scope of this consent. Any amendments which affect the performance of the ChTMP may require an application to be made in accordance with s127 of the RMA.

Ecological Management Plan

19. The Consent Holder shall prepare an Ecological Management Plan (EMP) for the Project Site to identify how the Project will avoid, remedy and mitigate potential adverse effects on the ecological values and biodiversity of the land within the Project Site, as well as a methodology for pre- and post-works monitoring. The EMP shall address how the Project will avoid, remedy and mitigate actual and potential adverse effects on ecological values including:
- vegetation / habitat;
 - individual large trees close to the works footprint;
 - herpetofauna (lizards and frogs);
 - bats;
 - avifauna (birds); and
 - streams.
20. The EMP shall provide detail on site-specific ecological management and mitigation measures that will be implemented on the Project Site which shall include:
- (a) Vegetation protection and clearance protocols, including surveying and demarcation of the works area and other protocols for minimising accidental encroachment and damage to individual trees and vegetation outside of the works footprint. This shall include input from an arborist including on-site monitoring where required as identified in the EMP.
- (b) Management measures and protocols to avoid, remedy or mitigate the impact of construction (vegetation clearance, earthworks and construction) on flora and fauna within the Project Site, including:
- (i) A Herpetofauna Management Plan (HMP) shall be prepared by a suitably qualified herpetologist holding the appropriate Wildlife Act authority to handle herpetofauna. The HMP shall detail lizard and Hochstetter's frog surveys, capture, salvage and relocation programme. The HMP is to be implemented within the delineated earthworks footprint by a herpetologist immediately prior to and during any vegetation clearance.
- The HMP shall include (in order of preference):
- Visual inspection and destructive searching of potential habitat features (including trees and ground cover habitats).

- Supervised felling where high-quality lizard habitat cannot be adequately searched (e.g. tall, dense tree species), felling should be supervised to allow a herpetologist to search through fallen trees for resident lizards.
- Passive dispersal – placing the felled vegetation outside of the works footprint to allow lizards to disperse. This method is not preferred as a standalone lizard management tool but may be suitable in some instances such as lower-quality potential habitat or following hand-searching if trees must be felled out of season.

Native forest remnants within the Project Site that will remain undisturbed by site development works are the preferred location for translocated fauna. Intensive pest control and habitat enhancement is required in and around release sites prior to translocation of any target fauna.

- (ii) A pre-clearance bat survey shall be undertaken by a suitably qualified and experienced field ecologist holding a permit from DoC certifying the holder as competent for bat research and management skills. Bat surveying shall occur during months where the night temperature does not fall below 10°C (November-March) for ten consecutive nights immediately prior to any felling of trees in suitable bat roosting areas. Pre-clearance bat monitoring shall ensure possible roost trees are not occupied at the time of clearance, avoiding injury or mortality of bats. If bats are confirmed to be occupying a tree scheduled for removal, a buffer shall be placed around the active roost within which no works can be undertaken until the roost is vacated. If active roosts are identified immediately adjacent to the development footprint, a 50m buffer shall be retained for the duration of roosting to preserve microclimate conditions and protect the tree/s from windthrow.
- (iii) Vegetation clearance within the works footprints shall take place outside the native bird breeding season (August-February inclusive). Otherwise, pre-felling checks are required to check for nests of native birds if vegetation clearance is to be undertaken during the breeding season. An appropriately qualified and experienced field ornithologist shall undertake all avifauna work including the sighting and deployment of acoustic recorders, analysis of sound files and nest surveys. The nest survey protocol is as follows:
 - Any vegetation scheduled for removal shall be surveyed for nests within 24 hours prior to clearance
 - If an active nest is identified during the visual inspection, all vegetation removal within 20m of the nest shall cease until the Project Ornithologist has confirmed that the nest has failed, or the chicks have fledged. This area shall be clearly demarcated to ensure the vegetation is not accidentally felled.

- Once an area of vegetation has been confirmed clear of active nests, vegetation clearance shall be initiated as soon as possible to prevent birds establishing further nests.
- (c) A Revegetation Plan with a 10-year maintenance period for all parts of the Project Site that are outside the Project development area. This shall include riparian planting and mitigation and restoration planting such as:
- (i) Exposed bush edges, old tracks and open areas shall be revegetated with fast growing forest edge species to buffer the forest interior, inhibit weed encroachment and accelerate regeneration;
 - (ii) Edge habitats shall be planted with low-growing, lizard-friendly species such as pohuehue and shrubby *Coprosma* species to enhance these areas as habitat for lizards; and
 - (iii) Riparian buffer zones adjacent to watercourses within the Project Site shall be planted with species to buffer and enhance the watercourse and adjacent forest areas with a minimum width of 10m for the true right bank of the Armstrong-Manuka Stream.
- (d) Weed and animal pest management to be undertaken through those parts of the Project Site that are outside the project development area;
- (e) All of the SEA area outside of the project development area and where weed and pest management according to (d) above is to be undertaken, and where revegetation according to (c) above is undertaken is to be protected in perpetuity by a covenant or encumbrance on the Record of Title; and
- (f) Kauri dieback protocols (with reference to the requirements under Condition 23).
21. The EMP shall be prepared in consultation with the CLG in accordance with Condition 9.
22. The Consent Holder shall submit the EMP to the Council at least forty (40) working days prior to the commencement of works (excluding site investigations, demolition and removal of buildings and structures, and establishment of site entrances and fencing) for written approval that the EMP complies with the requirements of Conditions 19 - 21, as applicable. The EMP shall be prepared by a suitably qualified person with reference to relevant specialists as required.

Kauri Dieback Management Plan

23. At least forty (40) working days prior to any works commencing at the project site, the Consent Holder shall submit a Kauri Dieback Management Plan (KDMP) to the Council for approval by the Monitoring Team Leader. The purpose of the KDMP shall be to set out the protocols and monitoring to be used to avoid and minimise the risks of introducing or spreading kauri dieback disease. The KDMP shall be prepared by a suitably qualified expert in biosecurity, plant pathology or similar. The KDMP will as a minimum stipulate:
- (a) How Kauri Contamination Zones (KCZs) within the project sites will be protected from access, identified and signposted to clearly communicate the delineation and protocols required in relation to the KCZ.

- (b) The kauri dieback hygiene protocols to be followed by all staff and visitors.
- (c) The tree protection protocols to be followed in order to minimise damage or stress to kauri in the project site or with rootzones extending into the project site.
- (d) The general content of briefings on kauri dieback management that will be delivered to all plant operators, site staff and visitors that will access the site during the course of the works.
- (e) How works within KCZs will be carried out in a manner that minimises the impact on the kauri and the risk of introducing or spreading *P. agathidicida* within or between KCZs.
- (f) Identification of the suitably qualified person who will supervise works within KCZs.
- (g) Methods used to remove all soil from and decontaminate vehicles, equipment, personnel, footwear etc when entering and exiting KCZs, and how run-off from this activity will be contained and disposed of in a manner that poses minimal risk of spreading *P. agathidicida*.
- (h) The design and construction methodology that will be employed in establishing and maintaining accessways that intersect KCZs such that vehicles, plant and machinery will have separation from bare soil or kauri roots adequate to avoid damaging or compacting kauri roots and avoid tracking of material into, within or out of the KCZ.
- (i) How run-off from washdown facilities will be managed to avoid:
 - (b) Re-contaminating equipment, vehicles etc as they leave the facility;
 - (c) Creating wet or muddy conditions in the site that pose a risk of contaminating other equipment;
 - (d) Run-off leaving the washdown facility without containment; and
 - (e) Creating any further biosecurity risks.
- (j) How works will be planned and sequenced such that plant, vehicles and materials will be able to remain on site for the duration of the works for which they are required.
- (k) How the introduction of *P. agathidicida* to the site will be avoided in regard to sourcing of brought-in materials, vehicles, equipment, plant stock or other risk goods.
- (l) How drainage, run-off, or other water discharges from the site will be directed away from kauri and their rootzones.
- (m) Procedures that will be put in place to monitor sediment tracking or deposition outside of the project site and how this will be responded to in a timely manner.
- (n) How material from within KCZs will be transported to approved landfill facilities with minimal risk of material loss *en route*.

- (o) That the applicant will follow the protocols and procedures included in the KDMP at all times, except under the express circumstances (if any) where an exemption to any of the above might apply.

Yorke Stream Diversion Design Plan

- 24. The Consent Holder shall prepare a Yorke Stream Diversion Design Plan (YSDDP) for the Project. The YSDDP shall be in accordance with the recommendations and Yorke Stream SEVm-P assumptions detailed in the Addendum to Stream Ecological Value Plan by Boffa Miskell, dated 26 November 2019. The objectives of the YSDDP are to ensure the proposed diversion channel:
 - (a) Mimics, where practicable, the existing stream morphology for Yorke Stream and intermittent nature of the stream (including a minimum intermittent length of 70 m); and
 - (b) Achieves a Stream Ecological Value (SEV) of at least 0.65.
- 25. The YSDDP shall include:
 - (a) Detailed design for the new length of stream, including typical long-sections and cross-sections;
 - (b) Design of features that enhance instream ecology values;
 - (c) A Riparian Planting Plan that aims to enhance the ecological function of the riparian zone adjacent to the diversion channel;
 - (d) A programme to monitor scour and erosion at the downstream extent of the diversion channel. If monitoring identifies new erosion that is attributable to the Project by a suitable qualified engineer, the Consent Holder shall implement remedial action in the form of stream stabilisation measures;
 - (e) Detailed design of any energy-reducing engineered structures required to minimise scour and erosion within the diversion channel, and at the downstream extent of the diversion channel should monitoring indicate this is required; and
 - (f) An ecological monitoring programme of the diversion channel to demonstrate it provides ecological benefit.
- 26. The YSDDP shall set out the additional off-site compensation in the form of erosion protection works in the upper Yorke Gully downstream of the Project Site. This shall include detailed design of any structures and associated works.
- 27. The Consent Holder shall submit the YSDDP to the Monitoring Team Leader at least forty (40) working days prior to the commencement of stream diversion works for written approval that the YSDDP complies with the requirements in Conditions 24 - 26, as applicable. The YSDDP shall be prepared by a suitably qualified person.

Armstrong Stream Diversion Design Plan

- 28. The Consent Holder shall prepare an Armstrong Stream Diversion Design Plan (ASDDP) for the Project. The ASDDP shall be in accordance with the recommendations and Armstrong Stream SEVm-P assumptions detailed in the Addendum to Stream

Ecological Value Plan by Boffa Miskell, dated 26 November 2019. The objectives of the ASDDP are to ensure the proposed diversion channel:

- (a) Mimics, where practicable, the existing stream morphology for Yorke Stream and intermittent nature of the stream (including a minimum intermittent length of 70 m); and
- (b) Achieves a Stream Ecological Value (SEV) of at least 0.74 for the upper section and 0.58 for the lower section.

29. The ASDDP shall include:

- (a) Detailed design for the new length of stream, including typical long-sections and cross-sections;
- (b) Design of features that enhance instream ecology values;
- (c) A Riparian Planting Plan that aims to enhance the ecological function of the riparian zone adjacent to the diversion channel;
- (d) A programme to monitor scour and erosion at the downstream extent of the diversion channel. If monitoring identifies new erosion that is attributable to the Project by a suitable qualified engineer, the Consent Holder shall implement remedial action in the form of stream stabilisation measures;
- (e) Detailed design of any energy-reducing engineered structures required to minimise scour and erosion within the diversion channel, and at the downstream extent of the diversion channel should monitoring indicate this is required; and
- (f) An ecological monitoring programme of the diversion channel to demonstrate it provides ecological benefit.

30. The ASDDP shall set out the additional off-site compensation in the form of erosion protection works in the upper Armstrong Gully downstream of the Project Site. This shall include detailed design of any structures and associated works.

31. The Consent Holder shall submit the ASDDP to the Monitoring Team Leader at least forty (40) working days prior to the commencement of stream diversion works for written approval that the ASDDP complies with the requirements in Conditions 28 - 30, as applicable. The ASDDP shall be prepared by a suitably qualified person.

Stream Restoration Plan

32. Prior to streamworks commencing a Stream Restoration Plan (SRP) shall be prepared and submitted to the Monitoring Team Leader for written approval. The SRP shall incorporate all recommendations from the Addendum to Stream Ecological Valuation Plan (Boffa Miskell, November 2019), including the SEVm-P assumptions for the diversion channel and daylighting sections. The SRP shall consist of the following:

- (a) Yorke intermittent stream diversion channel design including stream bank grades (Condition 24);
- (b) Armstrong stream daylighting channel design including stream bank grades (Condition 28);

- (c) Long and cross sections of the stream channels demonstrating habitat heterogeneity in accordance with SEVm-P assumptions (including a minimum length of 70m for the Yorke stream diversion channel);
- (d) All Riparian Planting, true right and left bank riparian widths are to be in accordance with SEVm-P assumptions;
- (e) Plans identifying riparian planting zones (all measurements must be clearly depicted on the plans);
- (f) Appropriate species list of eco-sourced plants including planting densities to be applied across new planting areas and any infill planting areas;
- (g) All riparian planting shall be in accordance with the *Auckland Regional Council Riparian Zone Management Strategy for the Auckland Region*, Technical Publication 148, June 2001 (TP148);
- (h) A monitoring and maintenance plan for a period of no less than ten years to ensure that a 90% survival rate and canopy closure is achieved;
- (i) A weed management plan to ensure that the planting areas remain weed free for the length of the monitoring and maintenance period of ten (10) years; and
- (j) A programme to monitor scour and erosion at the downstream extent of the proposed diversion channel. If monitoring identifies new erosion that is attributable to the Project by a suitably qualified engineer, the Consent Holder shall implement remedial action in the form of stream stabilisation measures or similar.

Construction Traffic Management Plan

- 33. The Consent Holder shall prepare a Construction Traffic Management Plan (CTMP) in accordance with the Council's requirements for CTMPs and the New Zealand Transport Authority's Code of Practice for Temporary Traffic Management for each stage of the Project. The CTMP shall be in general accordance with the Draft CTMP provided as part of the application documents and shall address the management of construction traffic from the site enabling works.
- 34. The Consent Holder shall submit the CTMP for each stage of construction to the Team Leader Monitoring at least forty (40) working days prior to the Commencement of Construction. The purpose of the CTMP is to provide a comprehensive document that sets out the management procedures and construction methods to be implemented to avoid, remedy or mitigate potential adverse effects on the environment arising from construction activities and shall be consistent with the information provided in the Assessment of Environmental Effects and further information provided as part of the application. No construction activity shall commence until confirmation is provided from the Council that the CTMP satisfactorily gives effect to the objectives in Condition 35 and complies with the requirements in Conditions 36 and 37, as applicable to the particular stage of construction, the Council's requirements for CTMPs and New Zealand Transport Authority's Code of Practice for Temporary Traffic Management, and all measures identified in the CTMP as needing to be put in place prior to commencement of works have been put in place.
- 35. The objectives of the CTMP are to:

- (a) Limit and manage the number of construction traffic movements on the transport network;
- (b) Provide for the safety of everyone at all times;
- (c) Maintain pedestrian and vehicle access at all times to / from properties;
- (d) Minimise disruption from construction traffic on the travelling public and road users along the identified sections of the construction routes;
- (e) Seek to avoid full road closures and minimise any partial or managed closures;
- (f) Manage integration with other construction projects and Auckland Transport projects;
- (g) Manage the condition of roading assets to ensure road user safety and accessibility is maintained;
- (h) Provide for prior engagement with relevant stakeholders, including:
 - (i) when public access, particularly to properties, will be affected by construction traffic; and
 - (ii) with the Boards of Schools located along identified heavy vehicle routes (Titirangi Primary School, Kaurilands School, Woodlands Park School and Glen Eden Intermediate School),
- (i) Provide a mechanism for addressing queries and responding to complaints (including through the CLG or similar).

36. The CTMP shall include:

- (a) The traffic management measures that will be required to be implemented, including in the vicinity of the site access points and at the Woodlands Park Road / Scenic Drive intersection;
- (b) A mechanism and nominated stakeholder manager responsible for receiving, addressing and monitoring queries and responding to complaints in relation to the construction works;
- (c) Provision of appropriate ingress and egress routes to/from the sites for the construction vehicles, including confirmation of appropriate heavy vehicles layover areas and over-dimensional vehicle routes;
- (d) For each Project stage, confirmation of typical numbers of heavy vehicle movements throughout the day for heavy vehicle access routes;
- (e) Coordination with Auckland Transport regarding other construction sites and road works;
- (f) Restricted parking for workers on construction sites, with parking prioritised for minor trades (i.e. those needing to bring tools for specialist activities), car / van pooling, staff working outside standard hours and mobility impaired staff / visitors;
- (g) Location of any shuttle bus interchange and operation of this (or similar) service to transport workers to and from the site;
- (h) Location and operation of any works staging site;
- (i) Limitations on heavy vehicle movements/ deliveries to and from the construction sites on the Titirangi Road routes on weekdays (excluding public holidays) during the weekday peak hours and from around midday on Saturdays;

- (j) The Titirangi Road route as the preferred ingress and egress route to/from the sites for the construction vehicles, instead of the Atkinson Road (South), Kaurilands Road, Glendale Road, Godley Road, Golf Road and Portage Road, whenever possible unless otherwise agreed with Auckland Transport;
- (k) Limitations on heavy vehicle movements to and from the construction sites on the Titirangi Road route during the following periods excluding public holidays, school holidays and vehicle movements associated with concrete pours:
 - (i) during morning and afternoon pick-up/drop-off periods for schools (generally being from 7:30 to 8:30 and from 14:30 to 15:30 on weekdays); and
 - (ii) after 13:00 on Saturdays,
- (l) No heavy vehicle movements to and from construction sites on the Atkinson Road (South), Kaurilands Road and Glendale Road route shall occur during morning and afternoon pick-up/drop-off periods for schools (generally being from 7:30 to 8:30 and from 14:30 to 15:30 on weekdays) excluding public holidays, school holidays and vehicle movements associated with concrete pours, unless approved via the CTMP with Auckland Transport and named stakeholders (e.g. schools boards);
- (m) No heavy vehicle movements / deliveries to and from construction sites on the Woodlands Park Road / Huia Road route (associated with any use of the Parau landfill site) during morning and afternoon pick-up/drop-off periods for schools (generally being from 7:30 to 8:30 and from 14:30 to 15:30 on weekdays), excluding public holidays and school holidays, unless approved via the CTMP with Auckland Transport and named stakeholders (e.g. schools boards);
- (n) Monitoring of pavements located on haulage routes and remediation of any damage resulting from Project construction traffic in accordance with Conditions 43 - 46;
- (o) Provision of heavy vehicle tracking on the proposed haulage route(s), and measures to address any conflicts, including potential removal of on-street parking as identified in the CH2M Beca Report dated 9 August 2019 (reference 6513515/s92/BUN60339273 NZ1-16354770-3);
- (p) Measures to address the restricted visibility for heavy vehicles turning right out from Woodlands Park Road into Scenic Drive, in the instance that permanent improvements have not been undertaken;
- (q) Specific measures to ensure continuous access to bus stops, a continuous footpath and cycling network, and to minimise detours and additional crossing points for pedestrians and cyclists;
- (r) The provision of construction traffic management staff to assist any construction trucks reversing into or out of the construction site;
- (s) Monitoring of and cleaning of spillage from construction trucks onto roads or footpaths;
- (t) Vegetation trimming or removal within the site to achieve sufficient sight lines from site accesses;
- (u) Educating construction staff of the safety needs of pedestrians and people cycling;

- (v) Provisions to ensure the ongoing ability of road pavements to withstand the proposed loading from heavy vehicles without affecting safety or behaviour of other road users; and
 - (w) Processes for monitoring, review and amendments to the CTMP, in particular in response to changes in the roading network including any change in the condition of roading assets.
37. The CTMP shall be prepared in consultation with the CLG in accordance with Condition 9, and in consultation with schools located along identified heavy vehicle routes (Titirangi Primary School, Kaurilands School, Woodlands Park School and Glen Eden Intermediate School).

Advice notes:

The CTMP required by Conditions 46 - 48 is required to address the management of construction traffic from the site enabling works (including earthworks and vegetation clearance). Overall traffic management, including for enabling works and construction of the Water Treatment Plant (WTP) and reservoirs, will be addressed by the separate Outline Plan of Works (OPW) process and does not form part of this consent.

The heavy vehicle tracking assessment undertaken by CH2M Beca on 9 August 2019 (reference 6513515/s92/BUN60339273 NZ1-16354770-3) is sufficient to address Condition 36(o) unless there have been changes to the road network that affect the conclusion of that assessment.

It is the responsibility of the consent holder to seek approval for the TMP from Auckland Transport. Contact Auckland Transport on (09) 355 3553.

All applications for temporary use of the road reserve during construction, including temporary removal of any on-street parking, must be submitted to Auckland Transport as a Corridor Access Request (CAR). The CAR application should be submitted to Auckland Transport at least 12 weeks prior to the scheduled commencement of works.

Works within the Auckland Transport road reserve will require a Works Access Permit and Engineering Plan Approval from Auckland Transport.

Pavement Impact Assessment

38. Prior to the activity approved in this consent and to the satisfaction of the Team Leader Western Monitoring, the consent holder shall provide a Pavement Impact Assessment (PIA) undertaken by a suitably qualified pavement engineer to determine the current condition of the pavement on any haulage route identified in Condition 39, or otherwise determined in the CTMP. The PIA shall quantify the extent of the reduced life of the pavements on the haulage route due to additional heavy vehicle movements, and shall include:

- (a) Analysis using a representative Equivalent Standard Axle (ESA) loading for the expected trucks expected to use the site and shall be in accordance with Austroads Guide to Traffic Management Part 12 Section 5.4; and
- (b) Falling Weight Deflectometer (FWD) testing of haulage routes at no more than 50m intervals.

Where this assessment determines there will be a loading increase greater than 5% of the existing ESA, and a subsequent reduction in the pavement life due to activities under this consent, the consent holder will undertake any strengthening and/or rehabilitation works as identified by the independent pavement engineer and to the satisfaction of the Monitoring Team Leader.

Advice notes:

All FWD test should be sent to Auckland Transport in RAMM format for entry into Auckland Transport's RAMM database.

Any required pavement strengthening works should be discussed with Auckland Transport to identify synergies with Auckland Transport's asset investment programme.

- 39. The PIA shall include the following sections of road, being identified as haulage routes:
 - (a) Woodlands Park Road, between the site access(es) and Scenic Drive;
 - (b) Scenic Drive, between Woodlands Park Road and Titirangi Road;
 - (c) Atkinson Road, for a distance of 100m from the intersection with Titirangi Road;
 - (d) Titirangi Road, for a distance of 100m from the intersection with Atkinson Road;
 - (e) Woodlands Park Road, between the site access(es) and Huia Road (in the instance of the Parau fill site being used); and
 - (f) Huia Road, between Woodlands Park Road and the Parau fill site (in the instance of the Parau fill site being used).
- 40. Prior to the commencement of construction works the consent holder shall submit a RAMM visual condition assessment, including a high definition video, of the haulage route identified in Condition 39, to the Monitoring Team Leader.
- 41. Prior to the commencement of construction works the consent holder shall undertake an assessment of Scenic Drive, between Titirangi Road and Woodlands Park Road, and submit a visual condition assessment to the Monitoring Team Leader. The assessment shall include:
 - (a) Logging of existing road and footpath deformation (on drawings and/or photographic records); and
 - (b) Recording of the condition of retaining walls and other structures supporting the road and footpath; and
 - (c) Engineering geological mapping of the slopes beneath Scenic Drive to identify existing areas of slope instability or areas where instability may potentially occur based on topography and drainage; and

- (d) Establishing the existing RL (reduced level) of the footpath at locations agreed by Team Leader Monitoring.
42. The Consent Holder shall arrange a site meeting with the Council's Monitoring Team Leader and Auckland Transport's Asset Roading Manager to discuss the findings of the visual assessment agree on the existing condition of Auckland Transport assets on the haulage routes. The consent holder's representative shall take minutes of the meeting and these minutes shall be circulated to attendees within five working days of the meeting taking place. No construction activity shall commence until the minutes from this meeting have been confirmed as being accurate by the Consent Holder and the Monitoring Team Leader.
43. At no more than three monthly intervals, and one week after the earthworks activity has ceased, a RAMM Visual Condition inspection of the haulage routes shall also be undertaken.
44. At no more than the following intervals an inspection of the footpath and outside traffic lane on Scenic Drive, between Titirangi Road and Woodlands Park Road, shall be undertaken to identify any degradation or evidence of the on-set of slope instability:
- (a) Once per two weeks whenever more than 80 heavy vehicle movements are generated within any 24-hour period; and
 - (b) Once per month whenever more than 20 heavy vehicle movements are generated within any 24-hour period.
45. At no more than the following intervals an inspection of the slopes, retaining walls, and footpath RL on Scenic Drive, between Titirangi Road and Woodlands Park Road, shall be undertaken to identify any degradation or evidence of the on-set of slope instability:
- Once per three months whenever more than 80 heavy vehicle movements are generated within any 24-hour period.
46. The outcome of the visual assessment shall be provided within 10 working days of the assessment to Auckland Transport's Asset Roading Manager and the Monitoring Team Leader by way of:
- (a) A written report of the asset conditions; and
 - (b) Photographic evidence and NZTM coordinates of those assets that have experienced damage.

If in the opinion of the Council's Monitoring Team Leader any Auckland Transport asset has been damaged as a result of the activity undertaken as part of this consent, the consent holder shall arrange for repair of the asset to the Council's satisfaction. Such repair shall be at the expense of the Consent Holder and undertaken no more than five days after the damage has been indicated to the consent holder as needing repair, excepting any damage that may compromise public safety, in which case such repair shall be undertaken as soon as practicable.

Advice notes:

All staff engaged in undertaking rating surveys should hold current NZIHT RAMM Road Condition Rater for Sealed Roads course accreditation at the time of undertaking the surveys.

Should any pavement deterioration or slope instability be identified, the CTMP is to be reviewed in accordance with Condition 47(v) and (w).

Construction Noise and Vibration Management Plan

- 47. The Consent Holder shall prepare a Construction Noise and Vibration Management Plan (CNVMP) for each stage of the Project that addresses the management of construction noise and vibration from the site enabling works. The CNVMP shall be submitted to the Council’s Monitoring Team Leader no less than forty (40) working days prior to works on that stage commencing (excluding site investigations and establishment of site entrances and fencing) for written approval that the CNVMP complies with the requirements of Conditions 49 - 53, as applicable. The CNVMP shall be prepared by a suitably qualified person.
- 48. An Activity Specific Construction Noise and Vibration Management Plan (ASCNVMP) shall be prepared for any night-time works or works predicted to exceed the project construction noise limits and shall be appended to the main CNVMP.
- 49. Noise from activities shall where practicable comply with the limits contained in Table E25.6.27.1 of the AUP(OP) as modified by Standard E25.6.27(4), being:

Time	Noise Level
Monday to Saturday 7am – 10pm Sunday 9am – 6pm	50 dB LAeq
All other times	40 dB LAeq 75 dB LAFmax

Advice Note:

The Consent Holder is reminded of their general obligation under s16 of the RMA to adopt the best practicable option to ensure that the emission of noise does not exceed a reasonable level. May delete, relates to operational noise

- 50. Noise from construction work activity shall be measured and assessed in accordance with the requirements of New Zealand Standard NZS 6803:1999 Acoustics – Construction noise.
- 51. Tonal reverse alarms vehicles shall not be used on the site. Broadband reverse alarms are permitted.
- 52. Vibration levels arising from construction work activity of more than three days in a given location shall comply with Standard E25.6.30(1)(b), Table E25.6.30.1, of the AUP(OP) or limits otherwise approved through an ASCNVMP.
- 53. Vibration levels arising from construction work activity of three days or less in a given location shall comply with the limits stipulated in Standard E25.6.30(1)(a) of the AUP(OP), as set out in German Industrial Standard DIN 4150-3 (1999) Structural

Vibration – Part 3 Effects of Vibration on Structures, when measured in accordance with that standard.

54. The Consent Holder shall engage a suitably qualified acoustic specialist to prepare the CNVMP and ASCNVMPs (where required) to identify how Conditions 49 – 53 will be met. The CNVMP / ASCNVMP shall identify the best practicable option for management and mitigation of all construction noise and vibration, including where full compliance with the levels in Conditions 49 – 53 cannot be achieved at all times. The CNVMP / ASCNVMP shall as a minimum include, but not be limited to, the following information:
- (a) Construction noise/vibration criteria;
 - (b) Identification of the most affected premises where there exists the potential for noise/vibration effects and the methodology for communication and consultation with these stakeholders;
 - (c) Description and duration of the works, anticipated equipment and the processes to be undertaken including general acoustic management and mitigation measures proposed to be implemented throughout the course of the Project consistent with best practice;
 - (d) Hours of operation, including specific times and days when construction activities causing noise/vibration would occur;
 - (e) Mitigation options where noise/vibration levels are predicted or demonstrated to approach or exceed the relevant limits. Specific noise/vibration mitigation measures must be implemented which may include, but are not limited to, acoustic screening,
 - (f) time management procedures and alternative excavation/construction/piling method technologies;
 - (g) Identification of the nearest sensitive receptors and approach to pre- and postconstruction building condition surveys at these locations where vibration limits in
 - (h) Condition 61 will be exceeded and where agreed to with the owners of adjacent sites;
 - (i) The erection of temporary construction noise barriers where appropriate;
 - (j) Schedule and methods for monitoring and reporting on construction noise/vibration;
 - (k) Details of noise/vibration monitoring to be undertaken in the event of any complaints received. The results of such monitoring shall be submitted to the Council's Monitoring Team Leader within one week of receiving the complaint;
 - (l) Implementation of a complaint management system with contact numbers for key construction staff responsible for the implementation of the CNVMP and complaint investigation. This system should include procedures for maintaining contact with stakeholders, notifying of proposed construction activities and handling of noise/vibration complaints;

- (m) Notification shall be provided to the owners and occupiers of adjacent buildings prior to construction activities commencing on the site; and
 - (n) Training procedures for construction personnel.
55. The CNVMP shall be prepared in consultation with the CLG in accordance with Condition 9.

Advice note:

The CNVMP required by Condition 55 is required to address the management of construction noise and vibration from the site enabling works (including earthworks and vegetation clearance), and not construction of the WTP and reservoirs. Overall noise and vibration management for enabling works as well as construction of the WTP and reservoirs will be addressed by the separate OPW process and does not form part of this consent.

Waima Biodiversity Trust

56. As soon as practicable after the grant of this consent and in any event prior to commencement of works being undertaken under this consent (excluding site investigations, demolition and removal of buildings and structures, and establishment of site entrances and fencing), the Consent Holder shall establish a charitable trust (the “Waima Biodiversity Trust”) on the terms set out in Conditions 57 – 60, by finalising, executing and proceeding in accordance with the draft trust deed for the Trust referenced in Condition 2.
57. The resource management purposes of the Trust, as set out in the trust deed, shall be to mitigate or compensate for residual adverse ecological effects from the construction of the Replacement Water Treatment Plant and Reservoirs within an area of significant ecological vegetation.
58. The terms of the Trust Deed must, as set out in the draft trust deed, provide for the Trust to:
- (a) Be established as an accountable administrative structure committed to implementing the projects and achieving the targets set out in the Waima Biodiversity Management Plan (WBMP);
 - (b) Provide an appropriate mechanism through which the following objectives of the WBMP can be achieved:
 - (i) To coordinate and increase conservation efforts to protect and restore viability to populations of native flora and fauna within the Waima catchment by:
 - Undertaking multi-species vertebrate pest management throughout the Waima catchment to suppress pests below target thresholds, by contributing funding to an appropriate organisation or engaging suitably qualified contractors;
 - Undertaking weed management throughout land owned by the Consent Holder, public reserve land and private properties (where landowner

- consent has been obtained), by contributing funding to an appropriate organisation or engaging suitably qualified contractors; and
- Monitoring of Argentine ants and effective eradication of localised populations (where assessed as viable),
- (ii) To repair and strengthen connective linkages throughout the catchment through promoting natural forest regeneration;
 - (iii) To improve the health and resilience of remnant kauri forest through tree health assessments and site-specific management including on private properties;
 - (iv) To increase community-wide engagement in stewardship and sustainable environmental management of the Waima catchment by seeking acceptance of landowners and residents within the area for the Trust's activities on their properties; and
 - (v) To undertake biodiversity monitoring within the Waima catchment by using key indicator species/guilds.
- (c) Facilitate setting priorities and allocating funding for projects within the Waima catchment to achieve these objectives.
 - (d) Have measurable targets that the Trust is required to meet in order to achieve the objectives set out in (b) above for:
 - (i) Multi-species vertebrate pest management throughout the Waima catchment;
 - (ii) Weed management throughout land owned by the consent holder and public reserve land as required;
 - (iii) 'Kauri Rescue' procedures;
 - (iv) Monitoring and control of Argentine ants;
 - (v) Biodiversity monitoring using key indicator species/guilds; and
 - (vi) Other measures as determined by the Trust to be necessary or appropriate following each annual report.
59. At least three months prior to the commencement of construction, the Consent Holder shall provide a lump sum of \$5,000,000 to the Trust. For the avoidance of doubt, the Trust shall have the ability to access additional funding from other sources in addition to the Consent Holder's contribution (including from the Consent Holder itself).
60. The terms of the Trust Deed shall also, as set out in the draft Trust Deed:
- (a) Require the trustees of the Trust, in relation to their appointment of additional or replacement trustees, to invite and act upon the following nominations:
 - (i) One representative trustee from the Consent Holder (the Manager of the Water Treatment Plant or similar);
 - (ii) One representative trustee from the Council (a Manager within the Biodiversity Team or similar);
 - (iii) One representative from the CLG (established under Condition 9);
 - (iv) Two community representative trustees connected with local community-led conservation projects; and
 - (v) One mana whenua representative trustee from Te Kawerau ā Maki.

- (b) Provide for the trustees of the Trust to appoint at least one additional, appropriately qualified trustee to be responsible for overseeing the Trust's financial reporting.
- (c) Prescribe the basic procedures for the trustees of the Trust to govern the Trust and otherwise provide the trustees with the power to regulate their own procedures, provided that:
 - (i) No change may be made which would alter the charitable nature of the Trust or the funding the consent holder is required to provide in Condition 59 above;
 - (ii) The Trust is to operate for a minimum period of ten years following the grant of resource consent; and
 - (iii) No change may be made to the objectives set out in Condition 58(b).
- (d) Provide for the appointment of a person to hold the position of operations manager / project coordinator and to be responsible for:
 - (i) Strategic and operational planning;
 - (ii) Implementation of project initiatives; and
 - (iii) Ongoing evaluation against the measurable targets.
- (e) Require annual reporting regarding the distribution of the trust fund and reporting against the measurable targets to:
 - (i) The Consent Holder;
 - (ii) Auckland Council; and
 - (iii) The CLG (established under Condition 9).

Waima Biodiversity Management Plan

61. Prior to the commencement of any vegetation removal works the Consent Holder shall submit a Waima Biodiversity Management Plan (WBMP) prepared by a suitably qualified and experienced ecologist and in accordance with the Assessment of Ecological Effects report, prepared by Boffa Miskell Ltd for Watercare Services, dated 21 May 2019.
62. The WBMP shall include as a minimum:
 - (a) Ecological enhancement works carried out within the area described by the Little Muddy Creek catchment; and
 - (b) Control of weeds consistent with Auckland Council weed priorities; and
 - (c) Control of vertebrate animal pests; and
 - (d) Undertaking of other activities that contribute to an improvement in ecological health or management of ecological risk (e.g. identification of kauri dieback disease areas, eradication of localised Argentine ant infestations, public education and advocacy as may be needed to achieve the stated goals of the WBMP project); and
 - (e) Monitoring and reporting on the results and outcomes of the WBMP project to Auckland Council.
63. The requirements for the WBMP programme shall include, but not be limited to achieving:

- (a) Agreement of the owners of at least 400 private properties, appropriately dispersed across the whole of the catchment, to secure access for vertebrate pest control; and
 - (b) Control of rats, possums and mustelids over the 400 private properties to the target control levels stated in the WBMP (averaged over 400 properties, on an annual basis), for a period of no less than eight consecutive years; and
 - (c) Progressive recruitment of the owners of private properties containing native forest to secure access for weed control; and
 - (d) Suppression of target weed species to the extent that no mature plants exist.
64. No vegetation clearance within the Huia WTP area may commence until written approval from the Council is obtained that the WBMP has been prepared to the satisfaction of the Council.

Stormwater diversion and discharge

65. The detailed design, including drawings, specification, design report and calculations for the stormwater management devices for each stage of the Project shall be submitted to the Monitoring Team Leader for written approval and at least 30 working days prior to initiation of construction of the devices for that stage.
66. The Consent Holder shall ensure (through detailed design) that stormwater management devices are designed in accordance with the Council's guidance document GD01 '*Stormwater Management Devices in the Auckland Region*'. The detailed design shall be constructed for the following catchment areas and design requirements, and shall be completed prior to discharges commencing from the site:

Works to be undertaken	Catchment Area (ha)	Design Requirements
Existing Dry Detention Pond	3.139	Detention of the 95th percentile storm (SMAF1) and slow release over a 24-hour period. Peak flow attenuation of the 10 year ARI storm event to predevelopment levels. Peak Flow discharge of the 100 year event to be attenuated or shown to only increase nominally from the predevelopment discharge.
Proposed Dry Pond	1.224	Detention of the 95th percentile storm (SMAF1) and slow release over a 24-hour period. Peak flow attenuation of the 10 year ARI storm event to predevelopment levels. Flow discharge of the 100 year event to be attenuated or shown to only increase nominally from the predevelopment discharge.
Roof material	All	Inert materials only and no exposed unpainted metal surfaces.
Stormwater outfalls	Varies	Erosion protection measures in accordance with TR2013_018 or higher standard
Proprietary devices	Varies	Water Quality treatment to all Heavy Contaminant Generating Activity (HCGA) areas in accordance with GD01 or higher standard.

67. A final site plan with stormwater management features and supporting calculations shall be provided to the Monitoring Team Leader for written approval prior to the commencement of works. The final site plan must give due consideration to additional stormwater treatment measures that achieve stormwater quality benefits for the Project Site. Consideration shall be given to providing living roofs on one or both of the reservoirs in accordance with the Council's Guidance Document GD01.
68. In the event that any modifications to the stormwater management system are required, the following information shall be provided:
 - (a) Plans and drawings outlining the details of the modifications; and
 - (b) Supporting information that details how the proposal does not affect the capacity or performance of the stormwater management system. All information shall be submitted to, and approved by, the Monitoring Team Leader prior to implementation.
69. For stormwater flows in excess of the capacity of the primary drainage systems, overland flow paths shall be provided and maintained to allow surplus stormwater from critical storms, up to the 100 year Annual Recurrence Interval (ARI) event, to discharge with the minimum of nuisance and damage to properties. Overland flow paths shall be kept free of all obstructions.

Contaminated soil disturbance

70. The Consent Holder shall engage a suitably qualified and experienced practitioner to undertake soil investigations in according to Section 4 of the *Site Management Plan for Ground Contamination* (Tonkin & Taylor, May 2019) (SMP), and at least 10 working days prior to commencement of earthworks, provide to the acceptance of the Monitoring Team Leader a Detailed Site Investigation report (DSI) confirming the site soil contamination status.
71. The Consent Holder shall engage an asbestos surveyor to carry out inspection of the building and confirm and identify the presence of lead-based paint and any (potential) asbestos containing material (ACM) within the building structures prior to demolition of the building to commence, and include the survey results into the DSI required by Condition 70.
72. If the survey required by Condition 71 demonstrates there is the potential of soil contamination from lead-based paint and/asbestos/ACM, the Consent Holder shall include the soil investigation of the existing WTP site into the sampling plan proposed in SMP, and include the test results in the DSI required by Condition 70;
73. If the DSI required by Condition 70 shows significant soil contamination present at the site, the Consent Holder shall provide an updated SMP for written approval by the Monitoring Team Leader.

During construction

Erosion and Sediment Management

74. All sediment retention ponds shall be chemically treated in accordance with the approved ChTMP.
75. Prior to each stage of earthworks commencing, an as-built certificate signed by a suitably qualified and experienced person shall be submitted to the Monitoring Team Leader, to certify that the erosion and sediment controls specific to that stage have been constructed in accordance with the approved erosion and sediment control plans and GD05.
76. Certified controls shall include the stabilised entrance ways, sediment retention ponds, super silt fences, silt fences and clean and dirty water diversion bunds. The certification for these measures shall be supplied immediately upon completion of their construction. Information supplied, if applicable, shall include:
 - (a) Contributing catchment area;
 - (b) Shape and volume of structure (dimensions of structure);
 - (c) Position of inlets/outlets; and
 - (d) Stabilisation of the structure.
77. Erosion and sediment control measures shall be constructed and maintained in accordance with GD05, and any amendments to this document, except where a higher standard is detailed in the documents referred to in conditions above, in which case the higher standard shall apply.
78. There shall be no deposition of earth, mud, dirt or other debris on any road or footpath resulting from earthworks activity on the subject site. In the event that such deposition does occur, it shall immediately be removed. In no instance shall roads or footpaths be washed down with water without appropriate erosion and sediment control measures in place to prevent contamination of the stormwater drainage system, watercourses or receiving waters.

Advice Note:

In order to prevent sediment laden water entering waterways from the road, the following methods may be adopted to prevent or address discharges should they occur:

- *provision of a stabilised entry and exit(s) point for vehicles*
- *provision of wheel wash facilities*
- *ceasing of vehicle movement until materials are removed*
- *cleaning of road surfaces using street-sweepers*
- *silt and sediment traps*

- *catchpit protection*

In no circumstances should the washing of deposited materials into drains be advised or otherwise condoned.

It is recommended that you discuss any potential measures with the Council's monitoring officer who may be able to provide further guidance on the most appropriate approach to take. Please contact the Team Leader – Compliance Monitoring North West 2 for more details. Alternatively, please refer to Auckland Council's Guidance Document 005, Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region.

79. Upon completion or abandonment of earthworks on the subject site all areas of bare earth shall be permanently stabilised against erosion to the satisfaction of the Monitoring Team Leader.

Advice Note:

Should the earthworks be completed or abandoned, bare areas of earth shall be permanently stabilised against erosion. Measures may include:

- *the use of mulching;*
- *top-soiling, grassing and mulching of otherwise bare areas of earth;*
- *aggregate or vegetative cover that has obtained a density of more than 80% of a normal pasture sward.*

The on-going monitoring of these measures is the responsibility of the consent holder. It is recommended that you discuss any potential measures with the Council's monitoring officer who will guide you on the most appropriate approach to take. Please contact the Monitoring Team Leader for more details. Alternatively, please refer to GD05.

80. The operational effectiveness and efficiency of all erosion and sediment controls and associated measures specifically required as a condition of resource consent or by the earthwork methodology shall be maintained throughout the duration of the earthworks activity, or until the site is permanently stabilised against erosion.
81. The sediment and erosion controls at the site of the works shall be inspected on a regular basis and within 24 hours of each rainstorm event that is likely to impair the function or performance of the erosion and sediment controls. A record shall be maintained of the date, time and any maintenance undertaken in association with this condition which shall be forward to the Monitoring Team Leader on request.

Seasonal Restrictions

82. No earthworks or streamworks on the site shall be undertaken between 1 May and 30 September in any year, without the prior written approval of the Monitoring Team Leader. Revegetation/stabilisation is to be completed by 30 April in accordance with measures detailed in GD05 and any amendments to this document.

Advice Note:

Any 'Request for winter works' submitted in accordance with Condition 84 will be assessed against criteria in line with the information required to assess a comprehensive application. Principally that will focus on the level of risk, the propensity to manage that risk with contingency planning and a 'track record' of good compliance with consent conditions. Each 'Request for winter works' submitted, should include the following:

- Description of works proposed to be undertaken between 1 May and 30 September and the duration of those works;
- Details of proposed measures to prevent sediment discharge from these specific works, particularly during periods of heavy rainfall;
- Details of area(s) already stabilised;
- Revised erosion and sediment control plan detailing stabilisation to date and time-line/staging boundaries showing proposed progression of stabilisation;
- Contact details for contractor who will undertake stabilisation of the site including date(s) expected on site;
- Alternatives/contingencies proposed if the contractor referred to above becomes unavailable;
- Details of site responsibilities, specifically who is responsible for erosion and sediment controls and stabilisation processes over the specified period.

Adaptive Management

83. The requirements of the Adaptive Management Plan (AMP) under Condition 17 and any subsequent revisions shall be implemented throughout the duration of the earthworks activity on the sites.
84. A Freshwater Baseline Report containing the pre-construction in-stream monitoring shall be provided to the Monitoring Team Leader for written approval prior to any earthworks or streamworks commencing. The minimum requirements of this report shall be:
 - (a) Freshwater Monitoring sites shall be located both upstream and downstream of each earthwork site on both the Yorke stream and on the Armstrong stream. The locations of these monitoring sites will allow water quality to be tested as freshwater flows into the site and downstream of the site.
 - (b) The pre-construction environmental conditions shall be represented by:
 - (i) Water quality (turbidity, pH, etc.);
 - (ii) Sediment deposition over a transect; and
 - (iii) Macro Invertebrate sampling.
85. Pre-rain forecast inspections as defined within the AMP must be undertaken at a minimum of 24 hours prior to the forecasted event. If the forecast is not made available

within 24 hours of the proposed event, all reasonable attempts shall be made to inspect the site prior to the proposed event.

86. An earthworks catchment which has been stabilised as a result of a trigger level exceedance as defined and required by the AMP may only be re-opened on the written approval of the Monitoring Team Leader.
87. Any proposed revisions to the AMP must be submitted to the Monitoring Team Leader for written approval prior to formalising and implementing the revised AMP.
88. If in the Council's opinion, there are changes required to be made to the AMP as a result of observing inefficiencies on site or identified within the site reporting, the Council may request that the AMP be updated to address these inefficiencies. If a request is made, the revised plan shall be submitted to the Monitoring Team Leader within five working days of the request for written approval prior to implementation.

Stream Restoration Plan completion

89. The Stream Restoration Plan shall be completed within the following timeframes:
 - (a) The Armstrong stream daylighting shall be undertaken during the first earthworks season of land disturbance having commenced with riparian enhancement undertaken the following planting season.
 - (b) The Yorke stream diversion channel shall be created following completion of earthworks on the replacement water treatment plant site. Riparian enhancement of this stream shall be undertaken the following planting season.
 - (c) All plantings shall be carried out between the months of May to August. Written confirmation in the form of a planting completion report shall be provided to the Monitoring Team Leader, within 30 working days of the stream planting works being completed. This report shall confirm the species and number of plants planted and that the planting has been completed in accordance with the approved plans.
90. Written confirmation in the form of an Offset and Compensation Report shall be provided to the Monitoring Team Leader, within 30 days of the offset and compensation work being implemented and completed, confirming that the works have been completed in accordance with the approved Stream Restoration Plan.
91. Plant maintenance in accordance with the Stream Restoration Plan shall occur for 10 years. The 10-year period shall commence once all the naturalisation works for each respective stream have been completed. The Monitoring Team Leader shall be notified once the naturalisation planting has been completed.

Advice Note:

The ten year period can only commence once all planting has been completed to the satisfaction of the Monitoring Team Leader.

92. The Consent Holder shall ensure that all machinery operates from the stream banks at all times. No machinery shall enter the wetted cross section of the watercourses at any time.
93. All machinery shall be operated in a way, which ensures that spillages of fuel, oil and similar contaminants are prevented, particularly during stabilisation and machinery servicing and maintenance. Refuelling and lubrication activities shall be carried out away from any water body such that any spillage can be contained so it does not enter the watercourse associated with this consent. The use of grouts and concrete products shall also be limited adjacent to the watercourse with all mixing of products carried out outside the 100 year floodplain area such that any spillage can be contained so it does not enter the watercourses, associated with this consent.
94. The Consent Holder shall monitor the SEV of the mitigation sites and the constructed stream channels at three (3), five (5) and ten (10) years after completion of the Armstrong stream daylighting and Yorke stream diversion channel creation respectively, or until the monitoring shows that the offsetting site or constructed stream channels have achieved the predicted SEV values (Table 1 and Appendix 2 of 'Addendum to Stream Ecological Valuation Plan', prepared by Boffa Miskell, dated 26 November 2019), whichever time period is the lesser. Monitoring shall be undertaken at times that avoid transient conditions, such as flood events.
95. Where the monitoring concludes that the SEV values of the mitigation streams and constructed stream channel have not reached the predicted SEV value within ten (10) years of completion, a Further Offset Works Plan shall be prepared and submitted to the Monitoring Team Leader for approval. The Further Offset Works Plan shall include, but not be limited to the repair or improvement of mitigation works along the existing offset stream reaches to meet the predicted SEV values and further monitoring until such time that the requirements of the Further Offset Works Plan are achieved.

The SEV values to be met are:

Yorke Stream Diversion	Upper Armstrong Daylighting	Lower Armstrong Daylighting
0.65	0.74	0.58

Advice Note:

In the event that a suitably qualified freshwater ecologist determines that the predicted SEV values when planted vegetation matures are unlikely to be met, offsite mitigation works may be required. The Future Offset Works Plan can address this and must ensure no net loss of ecological function based on the SEV values of the stream reach that have been lost.

96. The Consent Holder shall provide the Further Offset Works Plan within six (6) months of the monitoring required by Condition 94, and shall implement any additional offsetting identified in the approved Further Offset Works Plan within six months of the approval

by the Monitoring Team Leader or during the next planting season (whichever is appropriate to the measures adopted).

97. Within two months of each round of monitoring being completed, the Consent Holder shall provide the SEV assessments and associated calculations used for monitoring the sites required by Condition 94 to the Monitoring Team Leader for written approval and comparison against the SEV values required to be met in Condition 95.
98. Within six months of construction of the stream diversion channel the Consent Holder shall enter into a covenant in accordance with s108 of the RMA that is in favour of Auckland Council for NZ62B/924, NA62B/925, NZ60C/619 and NZ77B/260. The consent holder shall contact the Council to initiate the preparation of the covenant. A copy of the updated Computer Register and /or Record of Title showing that the covenant has been registered shall be provided to the Council within six months of completion of the Armstrong stream daylighting and Yorke stream diversion (referenced in Condition 90).
 - (a) The covenant shall:
 - (i) secure the protection in perpetuity of all Stream Restoration areas, including riparian margins and as specified in the conditions of this consent (Condition 91);
 - (ii) ensure that the area is maintained free of pest animals, noxious weeds, exotics and environmental pest plants;
 - (iii) not do anything that would prejudice the health or ecological value of the areas of native bush to be protected, their long-term viability and/or sustainability; and
 - (iv) not (without the prior written consent of the Monitoring Team Leader and then only in strict compliance with any conditions imposed by the Monitoring Team Leader) cut down, damage or destroy, or permit the cutting down, damage or destruction of the vegetation or wildlife habitats within the areas to protected.
 - (b) The covenant shall:
 - (i) be drafted by the Council's nominated Solicitor at the Consent Holder's cost; and
 - (ii) and be registered against the Computer Register(s) (NZ62B/924, NA62B/925, NZ60C/619 and NZ77B/260) to the affected land by the Consent Holder at their cost; and
 - (iii) require the Consent Holder to:
 - 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

- 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.

Management of contaminated soil

99. The Consent Holder shall carry out earthworks and implement the control measures in accordance with an approved Site Management Plan (SMP). Any changes to the SMP shall be approved in writing by the Monitoring Team Leader.
100. Excavated soil or waste exposed during earthworks shall be disposed of at a disposal site, which is authorised by the Council to accept the relevant levels of contamination. If the Parau Landfill is chosen as an alternative disposal site, written confirmation shall be provided to the Monitoring Team Leader to confirm that Parau Landfill has appropriate consent, at least five working days prior to the disposal commencing. Copies of the disposal dockets for the material removed from the sites shall be retained.
101. The Consent Holder shall not result in any airborne and deposited dust beyond the property boundary of the site that is determined to be noxious, objectionable or offensive. Good practice measures, such as those described the *Good Practice Guide for Assessing and Managing Dust* (Ministry for the Environment 2016) shall be adopted at all times.
102. If evidence of contamination, which has not been previously identified is discovered during any excavation at the site, the Consent Holder shall immediately cease the works and notify the Monitoring Team Leader and agree on appropriate remediation and validation actions.
103. The Consent Holder shall ensure that the contamination level of any imported soil complies with the definition of 'Cleanfill material', as per the AUP(OP). Any imported material shall be solid material of an inert nature and must not contain hazardous substances or contaminants above natural background levels of the receiving site. Imported soils shall be tested at a rate of 1 sample per 500m³ of material imported to site.
104. All land disturbance works shall be managed to minimise any discharge of debris, soil, silt, sediment or sediment-laden water from beyond the subject site to either land, stormwater drainage systems, watercourses or receiving waters.
105. Any perched groundwater, or surface water encountered within the excavation area requiring removal shall be considered potentially contaminated, and shall either be:
 - (a) disposed of by a licenced liquid waste contractor; or
 - (b) pumped to sewer, providing the relevant permits are obtained; or
 - (c) discharged to the site's stormwater system or surface waters provided testing demonstrates compliance with the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000)* for the protection of 80 percent of species, except for benzene where 95 percent of species shall apply; and

- (d) water is free from petroleum hydrocarbons.

Advice Note:

All testing and analysis should be undertaken in a laboratory with suitable experience and ability to carry out the analysis. For more details on how to confirm the suitability of the laboratory please refer to Part 4: Laboratory Analysis, of Contaminated Land Management Guidelines No.5.

Management of kauri dieback

106. There shall be no deposition of earth, mud, dirt, sludge or slurry or other debris that might contain *P.agathidicida* on any road or footpath resulting from earthworks or transport activity on or from the subject site or associated sites such as landfill disposal facilities utilised in the course of the works. In the event that such deposition does occur, it shall immediately be removed.
107. Sediment control devices, drains, and perimeter controls treating or controlling run-off shall direct run-off away from kauri and their Kauri Contamination Zones (KCZs, being three times the canopy dripline radius).
108. Vehicle washdown facilities shall not be located within or allow run-off or splash to enter any KCZ.
109. Fill, soil, aggregate, organic material (or other substances or goods that may harbour *P. agathidicida*) brought into the project site shall be sourced from areas free, as established by inspection and diagnostic testing, of kauri dieback disease and without kauri in the source site.
110. Planting stock species lists used for planting associated with the project shall not include *Agathis* species, or species identified as hosts or carriers of *P. agathidicida* according to current scientific knowledge at the time of planting.
111. Where sediment control devices receive run-off or redirected water from areas that have kauri or any part of a KCZ present within them, sludge and sediment removed from those devices shall be disposed of at an approved landfill facility.
112. KCZ shall be established around all kauri on the Project site, with area being defined by three times the canopy dripline radius of the tree in question, including kauri with trunks outside of the project site but with rootzone extending into the project site.
113. All works shall be in accordance with the applicable best-practice guidance for works around kauri provided by the Kauri Dieback Programme, as available at <https://www.kauridieback.co.nz/how-to-guides/> and the KDMP.
114. No physical works shall commence without an approved KDMP.
115. In the event of archaeological site evidence (e.g. shells, middens, hangi or ovens, pit depressions, defensive ditches, artefactual material or human bones) being uncovered during construction/earthworks, the Consent Holder shall ensure that operations shall cease in the vicinity of the discovery and that the Monitoring Team Leader is contacted so that the appropriate action can be taken before any work may recommence there.

Should earthworks on the site result in the identification of any previously unknown archaeological site, the land disturbance – Regional Accidental Discovery rule [E11.6.1] set out in the AUP(OP) shall be applied.

Section 128 review (earthworks)

116. The conditions of this consent may be reviewed by the Council pursuant to s128 of the RMA (with the costs of the review process being borne by the Consent Holder), by giving notice pursuant to s129 of the RMA, at one or more of the following times:

- within one year of initiation of the earthworks; and/or
- at two yearly intervals after that time.

The purpose of the review may be for any of the following purposes, namely:

- (a) To deal with any adverse effect on the environment which may arise from the exercise of this consent or upon which the exercise of the consent may have an influence and which becomes apparent, or is found appropriate, to deal with at a later stage, and in particular but without limiting the ambit of this clause to:
 - (i) Insert conditions, or modify existing conditions, to require the consent holder to identify the character or nature of any discharges authorised by this consent and to report the results of that monitoring to the Council; and/or
 - (ii) Insert conditions, or modify existing conditions to require the consent holder to monitor the effects of any discharges authorised by this consent on the local receiving environment and to report the results of that monitoring to the Council;
- (b) Insert conditions, or modify existing conditions, requiring the consent holder to adopt the Best Practicable Option to remedy, mitigate or minimise any adverse effects on the environment resulting from the discharges authorised by these consents, including remedying or mitigating any adverse effect on the environment which may arise from the exercise of these consents and which it is appropriate to deal with at a later stage.

Post-completion

Site Validation Report

117. The Consent Holder shall, within three months following the completion of the earthworks, provide to the acceptance of the Monitoring Team Leader a Site Validation Report (SVR). The Site SVR shall include, but not be limited to:

- (a) confirmation of performance of earthworks, remediation (if required) conducted in accordance with approved plans and consent conditions;
- (b) details and tabulated results of testing undertaken including testing of soil, water, vapour, and interpretation of the results in the context of the National Environmental Standard for Assessing the Managing Contaminants to Soil to Protect Human Health (NES Soil) and Chapter E30 of the AUP(OP);

- (c) any unexpected contamination identified during excavation on the site and response actions;
- (d) volume of soil excavated from the site, disposed off-site and landfill receipts; and
- (e) any complaints received and response during remediation works.

Conditions – Groundwater diversion (WAT60339409)

Definitions

Words in the ground dewatering (take) and groundwater diversion consent conditions below have specific meanings as outlined in the table below.

Alarm Level	Specific levels at which actions are required as described in the relevant conditions.
Alert Level	Specific levels at which actions are required as described in the relevant conditions.
Completion of Dewatering	Means, in the case of a tanked building or structure construction, the stage when all the external base slab and walls are essentially watertight, the structures internal support mechanisms, including basement floors have been completed any temporary retention removed and no further groundwater is being taken for the construction of the basement.
Commencement of Excavation	Means commencement of Bulk Excavation or excavation to create perimeter walls.
Completion of Construction	Means when the Code Compliance Certificate (CCC) is issued by Auckland Council
Completion of Excavation	Means the stage when all Bulk Excavation has been completed and all foundation/footing excavations within 10 meters of the perimeter retaining wall have been completed.

Condition Survey	Means an external visual inspection or a detailed condition survey (as defined in the relevant conditions).
Damage	Includes Aesthetic, Serviceability, Stability, but does not include Negligible Damage. Damage as described in the table below.
External visual inspection	A condition survey undertaken for the purpose of detecting any new external Damage or deterioration of existing external Damage. Includes as a minimum a visual inspection of the exterior and a dated photographic record of all observable exterior Damage.
GSMCP	Means Groundwater and Settlement Monitoring and Contingency Plan
Monitoring Station	Means any monitoring instrument including a ground or building deformation station, inclinometer, groundwater monitoring bore, retaining wall deflection station, or other monitoring device required by this consent.
RL	Means Reduced Level.
Seasonal Low Groundwater Level	Means the annual lowest groundwater level – which typically occurs in summer.
Services	Include fibre optic cables, sanitary drainage, stormwater drainage, gas and water mains, power and telephone installations and infrastructure, road infrastructure assets such as footpaths, kerbs, catch-pits, pavements and street furniture.
SQEP	Means Suitably Qualified Engineering Professional
SQBS	Means Suitably Qualified Building Surveyor

Category of Damage	Normal Degree of Severity	Description of Typical Damage <i>(Building Damage Classification after Burland (1995), and Mair et al (1996))</i>	General Category <i>(after Burland – 1995)</i>
0	Negligible	Hairline cracks.	Aesthetic Damage
1	Very Slight	Fine cracks easily treated during normal redecoration. Perhaps isolated slight fracture in building. Cracks in exterior visible upon close inspection. Typical crack widths up to 1mm.	
2	Slight	Cracks easily filled. Redecoration probably required. Several slight fractures inside building. Exterior cracks visible, some repainting may be required for weather-tightness. Doors and windows may stick slightly. Typically crack widths up to 5mm.	
3	Moderate	Cracks may require cutting out and patching. Recurrent cracks can be masked by suitable linings. Brick pointing and possible replacement of a small amount of exterior brickwork may be required. Doors and windows sticking. Utility services may be interrupted. Weather tightness often impaired. Typical crack widths are 5mm to 15mm or several greater than 3mm.	Serviceability Damage
4	Severe	Extensive repair involving removal and replacement of walls especially over door and windows required. Window and door frames distorted. Floor slopes noticeably. Walls lean or bulge noticeably. Some loss of bearing in beams. Utility services disrupted. Typical crack widths are 15mm to 25mm but also depend on the number of cracks.	Stability Damage
5	Very Severe	Major repair required involving partial or complete reconstruction. Beams lose bearing, walls lean badly and require shoring. Windows broken by distortion. Danger of instability. Typical crack widths are greater than 25mm but depend on the number of cracks.	

Table 1: Building Damage Classification

Note: In the table above the column headed “Description of Typical Damage” applies to masonry buildings only and the column headed “General Category” applies to all buildings.

General conditions

118. The take (dewatering) and diversion of groundwater associated with the construction of the replacement Huia Water Treatment Plant shall be carried out in accordance with the plans and all information submitted with the application, detailed below, and all referenced by the Council as consent number WAT60339409 including:

(a) Application for Resource Consent entitled “*Huia Replacement Water Treatment*

Plant (WTP) Project, Woodlands Park Road prepared by Tonkin & Taylor Limited for Watercare Services Ltd, dated May 2019

- (b) Report entitled "*Huia WTP Replacement & Woodlands Park Road Reservoir Project – Indicative Construction Methodology*" prepared by Alta for Watercare Services Ltd, rev 5 dated 23/05/2019
- (c) Report entitled "*Huia Replacement Water Treatment Plant Project Preliminary Land Stability Assessment*" prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated May 2019
- (d) Report entitled "*Huia Water Water Treatment Plant Replacement Project Groundwater and Settlement Effects*" prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated May 2019
- (e) Drawing set included as Appendix E of the AEE and entitled "*Huia Replacement Water Treatment Plant*" prepared for Watercare Services Ltd by GHD, 26 No. A3 sheets, drawing numbers 51-3357505-G001 to 51-3357505-C016 (dated 11/18) and 3255336 K110 to 3255336 K116 (dated 21/05/2019);
- (f) Letter entitled "*Huia Water Treatment Plant Replacement Project. Response to s92 request for further information - groundwater effects*" prepared by Tonkin & Taylor Limited, dated 15 July 2019;
- (g) Report entitled "*Huia Water Treatment Plant Replacement Project: Addendum to the Groundwater and Settlement Report*" prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated July 2019;
- (h) Letter entitled "*Huia Water Treatment Plant Replacement Project Response to draft request for further information - Land Stability*" prepared by Tonkin & Taylor Limited, dated 15 July 2019; and
- (i) Report entitled "*Huia Water Treatment Plant Replacement Project Addendum to the Preliminary Land Stability Assessment Report*" prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated July 2019.

Duration of consent

119. The take (dewatering) and groundwater diversion consent WAT60339409 shall expire ten (10) years from the granting of this consent unless it has lapsed, been surrendered or been cancelled at an earlier date pursuant to the RMA.

Section 128 review

120. Under s128 of the RMA the conditions of this consent may be reviewed by the Manager Resource Consents at the consent holder's cost, at intervals of not less than one year following Commencement of Dewatering, in order:
- (a) To deal with any adverse effects on the environment which may arise or potentially arise from the exercise of this consent and which it is appropriate to deal with at a later stage; and/or

(b) To vary the monitoring and reporting requirements, and performance standards, in order to take account of information, including the results of previous monitoring and changed environmental knowledge on:

- ground conditions;
- aquifer parameters;
- groundwater levels; and
- ground surface movement.

Notice of Commencement of Dewatering

121. The Monitoring Team Leader shall be advised in writing at least 10 working days prior to the date of the Commencement of Dewatering.

Design of Excavations and Retaining Systems

122. The design and construction of the excavations, shafts, fill platform, retaining walls and permanent drainage system shall be undertaken in accordance with the specifications contained in the reports referenced in Condition 119 above.

Excavation Limit

123. The Bulk Excavation shall not extend below:

- (a) 15 m bgl **for Reservoir 1**;
- (b) The cut / fill depths shown on the drawing entitled "*RESERVOIR CONCEPT EARTHWORKS PLAN*" drawing no. 3255336-K116, rev OB dated 05/19, **for Reservoir 2**; and
- (c) The cut / fill depths shown on the drawing entitled "*EARTHWORKS CUT/FILL DEPTHS WATER TREATMENT PLANT SITE*" drawing no. 51-3357505-C006, rev 1 dated 11/18, **for the WTP**.

Performance Standards

Damage avoidance

124. All excavation, dewatering systems, retaining structures and works associated with the diversion or taking of groundwater, shall be designed, constructed and maintained so as to avoid Damage to buildings, structures and Services on the site or adjacent properties, outside that considered as part of the application process unless otherwise agreed in writing with the asset owner.

Alert and alarm levels

125. The activity shall not cause any settlement or movement greater than the Alarm Level thresholds specified in Schedule A below. Alert and Alarm Levels are triggered when the following Alert and Alarm Trigger thresholds are exceeded:

Schedule A: Alarm and Alert Levels			
Movement		Trigger Thresholds (+/-)	
		Alarm	Alert
a)	Differential vertical settlement between any two Ground Surface Deformation Stations (the Differential Ground Surface Settlement Alarm or Alert Level): <ul style="list-style-type: none"> GS1 to GS18 	1:500	1:750
b)	Total vertical settlement from the pre-excavation baseline level at any Ground Surface Deformation Station (the Total Ground Surface Settlement Alarm or Alert Level): <ul style="list-style-type: none"> G1, G2, G10, G11, G12, G14, G15, G16, G17 and G18 G13 G3, G4, G8 and G9 G5, G6 and G7 	7 mm 20 mm 40 mm 80 mm	10 mm 25 mm 50 mm 95 mm
c)	Total lateral deflection from the pre-excavation baseline level at any retaining wall deflection station (the Retaining Wall Deflection Alarm or Alert Level): <ul style="list-style-type: none"> RW1 to RW5 	32 mm	40 mm
d)	Distance below the pre-dewatering Seasonal Low Groundwater Level and any subsequent groundwater reading at any groundwater monitoring bore (the Groundwater Alert Levels 1 & 2):	n/a	(1) 80% of calculated (2) 100% of calculated

Advice Note:

The locations of the Monitoring Stations listed in Schedule A are shown on the drawing entitled "Proposed monitoring points" prepared by Tonkin & Taylor Ltd, Figure No. A3, and appended to the s92 response dated 13 August 2019.

These levels may be amended subject to approval by the Monitoring Team Leader as part of the Groundwater Settlement Monitoring and Contingency Plan (GSMCP) approval process, and, after the receipt of pre-dewatering monitoring data, condition surveys and recommendations from a suitably qualified engineering professional (SQEP), but only to the extent that avoidance of Damage to building, structures and Services can still be achieved.

There are conditions below that must be complied with when the Alert and Alarm Level triggers are exceeded. These include actions that must be taken immediately including seeking the advice of a SQEP.

Alert level actions

126. In the event of any Alert Level being exceeded the Consent Holder shall:

- (a) Notify the Monitoring Team Leader within 24 hours.

- (b) Re-measure all Monitoring Stations within 50m of the affected monitoring location(s) to confirm the extent of apparent movement.
- (c) Ensure the data is reviewed, and advice provided, by a SQEP on the need for mitigation measures or other actions necessary to avoid further deformation. Where mitigation measures or other actions are recommended those measures shall be implemented.
- (d) Submit a written report, prepared by the SQEP responsible for overseeing the monitoring, to the Monitoring Team Leader within five working days of Alert Level exceedance. The report shall provide an analysis of all monitoring data (including wall deflection) relating to the exceedance, actions taken to date to address the issue, recommendations for additional monitoring (i.e. the need for increased frequency or repeat condition survey(s) of building or structures) and recommendations for future remedial actions necessary to prevent Alarm Levels being exceeded.
- (e) Measure and record all Monitoring Stations within 50m of the location of any Alert Level exceedance every two days until such time the written report referred to above has been submitted to the Monitoring Team Leader.

Alarm level actions

127. In the event of any Alarm Level being exceeded at any ground deformation pin, building deformation pin, retaining wall deflection pin or inclinometer Monitoring Station required by this consent, the Consent Holder shall:
- (a) Immediately halt construction activity, including excavation, dewatering or any other works that may result in increased deformation, unless halting the activity is considered by a SQEP to be likely to be more harmful (in terms of effects on the environment) than continuing to carry out the activity.
 - (b) Notify the Monitoring Team Leader within 24 hours of the Alarm Level exceedance being detected and provide details of the measurements taken.
 - (c) Undertake a condition survey (this could comprise either a detailed condition survey or an external visual inspection at the discretion of the SQEP responsible for overseeing the monitoring) by a SQEP or suitably qualified building surveyor (SQBS) of any building or structure located adjacent to any Monitoring Station where the Alarm Level has been exceeded.
 - (d) Take advice from the author of the Alert Level exceedance report (if there was one) on actions required to avoid, remedy or mitigate adverse effects on ground, buildings or structures that may occur as a result of the exceedance.
 - (e) Not resume construction activities (or any associated activities), halted in accordance with (a) above, until any mitigation measures (recommended in accordance with (d) above) have been implemented to the satisfaction of a SQEP.
 - (f) Submit a written report, prepared by the SQEP responsible for overseeing the monitoring, to the Monitoring Team Leader, on the results of the condition

survey(s), the mitigation measures implemented and any remedial works and/or agreements with affected parties within five working days of recommencement of works.

Groundwater and Settlement Monitoring and Contingency Plan (GSMCP)

128. At least forty (40) working days prior to the Commencement of Dewatering, a final Groundwater and Settlement Monitoring and Contingency Plan (GSMCP) prepared by a SQEP, shall be submitted to the Monitoring Team Leader for written approval. No activities shall commence on site until written confirmation is provided from the Monitoring Team Leader that the GSMCP meets the conditions of consent.

The overall objective of the GSMCP shall be to set out the practices and procedures to be adopted to ensure compliance with the consent conditions and shall include, at a minimum, the following information:

- (a) A monitoring location plan, showing the location and type of all Monitoring Stations including groundwater monitoring bores, ground and building deformation pins and retaining wall deflection pins. The monitoring plan should be based on the drawing entitled "*Proposed monitoring points*" prepared by Tonkin & Taylor Ltd, Figure No. A3, and appended to the s92 response dated 13 August 2019. In any case where the location of a Monitoring Station differs substantively from that shown on the drawing entitled "*Proposed monitoring points*" prepared by Tonkin & Taylor Ltd, Figure No. A3, and appended to the s92 response dated 13 August 19, a written explanation for the difference shall be provided at the same time that the final GSMCP is provided.
- (b) Final completed Schedules B to E (as per the conditions below) for monitoring of groundwater drawdown, and, ground surface, building and retaining wall deformation (including any proposed changes to the monitoring frequency) as required by conditions below.
- (c) All monitoring data, the identification of Services susceptible to Damage and all building/Service condition surveys undertaken to date and required by conditions below.
- (d) A bar chart or a schedule, showing the timing and frequency of condition surveys, visual inspections and all other monitoring required by this consent, and a sample report template for the required two monthly monitoring.
- (e) All Alert and Alarm Level Triggers (including reasons if changes to such are proposed, for example as a result of recommendations in the building condition surveys or data obtained from pre-dewatering monitoring).
- (f) Details of the contingency actions to be implemented if Alert or Alarm Levels are exceeded.

The consent holder may request amendments to the GSMCP by requesting amendments in writing to the Monitoring Team Leader for approval at least 10 working days prior to any changes taking effect. Any changes to the GSMCP shall remain

consistent with the overall intent of the GSMCP and shall be consistent with the requirements of the relevant conditions of these consents. No changes shall take effect without the prior written approval of the Monitoring Team Leader.

129. All construction, dewatering, monitoring and contingency actions shall be carried out in accordance with the approved GSMCP. No Bulk Excavation (that may affect groundwater levels) or other dewatering activities shall commence until the GSMCP is approved in writing by the Monitoring Team Leader.

Additional geotechnical investigations

130. Prior to the submission of the GSMCP, additional investigations as shown on the drawing titled "*Indicative Geotechnical Investigation Plan*" appended to the s92 response letter dated 15 July 2019 are to be undertaken. A minimum of two boreholes shall be drilled to 50m depth to investigate large-scale instability within the rock mass. The results of the investigation are to be summarised in a Geotechnical Interpretive / Design report and reporting shall include: confirmation sufficient investigation has been undertaken to address uncertainties and confirm the ground model (including deep-seated instability, geotechnical and hydrogeological parameters), confirmation of groundwater levels across the site(s), updated assessments of global stability, a summary of detailed design analyses undertaken and an updated assessment of environmental effects where different to that presented at the time of consenting, and detail any residual geotechnical risks that may not be fully addressed by the design.

Pre-Dewatering Building and Structure Survey

131. The Consent Holder shall undertake a risk assessment to identify existing buildings and structures at risk of damage due to settlement caused by the project. The risk assessment process shall be set out in the GSMCP required by Condition 128 and shall be based upon the additional site investigation and analyses, and final design and construction methodology. The risk assessment shall include:
- (a) Identification of the zone of settlement or ground movement influence;
 - (b) Identification of the building types in this zone, and their susceptibility to ground movement induced damage;
 - (c) Identification of the buildings and structures at risk of damage due to the project works and requirements for monitoring; and
 - (d) The schedule of existing buildings and structures identified as being potentially at risk of damage (Schedule B of this condition set) shall be updated through the building risk assessment process shall be included in the GSMCP.
132. Prior to the Commencement of Dewatering, a detailed condition survey of buildings and structures, identified as being at risk of damage due to settlement caused by the project, as specified in Schedule B below and as updated by the risk assessment required by Condition 131, shall be undertaken by a SQEP or SQBS and a written report shall be prepared and reviewed by the SQEP responsible for overseeing the monitoring. The report shall be submitted for written approval by the Monitoring Team Leader.

This condition does not apply where written evidence is provided to the Monitoring Team Leader that the owner of a property has confirmed they do not require a detailed condition survey.

The detailed condition survey shall include:

- (a) Confirmation of the installation of any required building deformation stations;
- (b) A description of the type of foundations;
- (c) A description of existing levels of Damage considered to be of an aesthetic or superficial nature;
- (d) A description of existing levels of Damage considered to affect the serviceability of the building where visually apparent without recourse to intrusive or destructive investigation;
- (e) An assessment as to whether existing Damage may or may not be associated with actual structural Damage and an assessment of the susceptibility of buildings/structures to further movement and Damage;
- (f) Photographic evidence of existing observable Damage;
- (g) A review of proposed Alarm and Alert Levels to confirm they are appropriately set and confirmation that any ground settlement less than the Alarm Level will not cause Damage;
- (h) An assessment of whether the monitoring frequency is appropriate; and
- (i) An assessment of whether the locations and density of existing ground and building deformation stations are adequate and appropriate for the effective detection of change to building and structure condition.

Schedule B: Buildings/Structures that require Detailed Condition Survey and/or Installation of Deformation Stations		
Number	Address	Number of building deformation stations required
1	94 Scenic Drive, Titirangi	To be determined by detailed design
2	96 Scenic Drive, Titirangi	To be determined by detailed design
2	98 Scenic Drive, Titirangi	To be determined by detailed design
3	100 Scenic Drive, Titirangi	To be determined by detailed design
4	12 Manuka Road, Titirangi	To be determined by detailed design
5	13 Manuka Road, Titirangi	To be determined by detailed design
6	14 Manuka Road, Titirangi	To be determined by detailed design
7	16 Manuka Road, Titirangi	To be determined by detailed design

8	18 Manuka Road, Titirangi	To be determined by detailed design
9	20 Manuka Road, Titirangi	To be determined by detailed design
10	11 Taraire Road, Titirangi	To be determined by detailed design
11	15 Taraire Road, Titirangi	To be determined by detailed design
12	17 Taraire Road, Titirangi	To be determined by detailed design
13	12 Ngaio Road, Titirangi	To be determined by detailed design
14	14 Ngaio Road, Titirangi	To be determined by detailed design
15	16 Ngaio Road, Titirangi	To be determined by detailed design

Advice Note:

The need for deformation stations at any building listed in Schedule B is to be considered as part of the risk assessment outlined in Condition 131.

Pre-Dewatering Services Condition Survey

133. Prior to the Commencement of Dewatering, a condition survey of potentially affected stormwater services shall be undertaken in consultation with the relevant service provider.

This condition does not apply to any service where written evidence is provided to the Monitoring Team Leader that the owner of that service has confirmed they do not require a condition survey.

This condition does not apply to any land, building or structure where written evidence is provided to the Monitoring Team Leader confirming that the owner of the land, building or structure does not require visual inspections to be carried out.

External Visual Inspections during Dewatering

134. External visual inspections of the surrounding ground (including Scenic Drive, Woodlands Park Road and Manuka Road) and any neighbouring buildings and structures identified through the risk assessment required by Conditions 132 and 133, shall be undertaken for the purpose of detecting any new external Damage or deterioration of existing external Damage.

Inspections are to be carried weekly from the Commencement to Completion of Dewatering. A photographic record is to be kept, including time and date, of each inspection and all observations made during the inspection, and should be of a quality that is fit for purpose.

The results of the external visual inspections and an assessment of the results are to be reviewed by the SQEP responsible for overseeing the monitoring and included in the bimonthly monitoring report for the relevant monitoring period.

Completion of Dewatering - Building, Structure and Service Condition Surveys

135. Between six and twelve months after Completion of Dewatering a detailed condition survey of all previously surveyed buildings, structures and stormwater Services, shall be undertaken by a SQEP or SQBS and a written report shall be prepared. The report is to be reviewed by the SQEP responsible for overseeing the monitoring and then submitted to the Monitoring Team Leader, within one month of completion of the survey.

The condition survey report shall make specific comment on those matters identified in the pre-dewatering condition survey. It shall also identify any new Damage that has occurred since the pre-dewatering condition survey was undertaken and provide an assessment of the likely cause of any such Damage.

This condition does not apply to any building, structure or Service where written evidence is provided to the Monitoring Team Leader confirming that the owner of that building, structure, or Service does not require a condition survey to be undertaken.

Additional surveys

136. Additional condition surveys of any building, structure, or Service within the area defined by the extent of groundwater drawdown or ground movement (as defined in the reports titled "*Huia Water Treatment Plant Replacement Project: Addendum to the Groundwater and Settlement Report*" prepared by Tonkin & Taylor Limited for Watercare Services Ltd, rev 1 dated July 2019) shall be undertaken, if requested by the Team Leader Compliance Monitoring NW2, for the purpose of investigating any Damage potentially caused by ground movement resulting from dewatering or retaining wall deflection. A written report of the results of the survey shall be prepared and/or reviewed by the SQEP responsible for overseeing the monitoring. The report shall be submitted to the Monitoring Team Leader.

The requirement for any such additional condition survey will cease six months after the Completion of Dewatering unless ground settlement or building deformation monitoring indicates movement is still occurring at a level that may result in Damage to buildings, structures, or Services. In such circumstances the period where additional condition surveys may be required will be extended until monitoring shows that movement has stabilised and the risk of Damage to buildings, structures and Services as a result of the dewatering is no longer present.

Groundwater monitoring

137. Groundwater monitoring is to be undertaken at the groundwater monitoring bore locations shown on the drawing entitled "*Proposed monitoring points*" prepared by Tonkin & Taylor Ltd, Figure No. A3, and appended to the s92 response dated 13 August 2019, or in the approved GSMCP. Groundwater level monitoring is to be undertaken in accordance with Schedule C below:

Schedule C: Groundwater Monitoring Frequency					
Bore Name	Location		Groundwater level monitoring frequency (to an accuracy of 10mm)		
	Easting (m E)	Northing (m N)	From bore construction until one month before Commencement of Dewatering	One month before Commencement of Dewatering to Completion of Dewatering	From Completion of Dewatering until 3 months later
PZ1	tbc	tbc	Monthly (with a minimum of three (3) monthly readings)	Twice-weekly	Monthly
PZ2	tbc	tbc			
PZ3	tbc	tbc			
PZ4	tbc	tbc			
PZ5	tbc	tbc			
PZ6	tbc	tbc			

The monitoring frequency may be changed if approved by the Monitoring Team Leader. Any change shall be specified in the GSMCP. In addition, the three-month monitoring period post Completion of Dewatering may be extended by the Monitoring Team Leader, if measured groundwater levels are not consistent with inferred seasonal trends or predicted groundwater movement.

Advice Note:

If groundwater level measurements show an inconsistent pattern immediately prior to the Commencement of Dewatering (for example varying more than +/- 200mm during a month), then further readings may be required to ensure that an accurate groundwater level baseline is established before dewatering commences.

Ground Surface and Building Deformation Monitoring

138. Ground Surface Deformation Monitoring Stations (and Building Deformation Monitoring Stations, if required) shall be established and maintained at the approximate locations shown on the drawing entitled “*Proposed monitoring points*” prepared by Tonkin & Taylor Ltd, Figure No. A3, and appended to the s92 response dated 13 August 2019, or in the approved GSMCP. The Monitoring Stations will be monitored at the frequency set out in Schedule D. The purpose of the Monitoring Stations is to record any vertical or horizontal movement. Benchmark positions shall be established no less than 50m away from the excavated area.

Schedule D: Ground Surface and Building Monitoring	
	Frequency

Monitoring Station and type	Pre-Commencement of Dewatering	Commencement to Completion of Dewatering	Post- Completion of Dewatering
Ground markers G1 to G18	Twice to a vertical accuracy of +/-2mm (achieved by precise levelling)	Weekly	Monthly for 6 months
Building markers <i>(if identified as required by the risk assessment in condition 11)</i>	Twice to a vertical accuracy of +/-2mm (achieved by precise levelling)	Weekly	Monthly for 6 months

The monitoring frequency may be changed, if approved by the Monitoring Team Leader.

Retaining Wall Monitoring

139. Five retaining wall deflection stations (RW1 to RW5), for the measurement of lateral wall movement shall be installed along the top of the southern Reservoir 1 retaining wall. Monitoring of the retaining wall deflection stations shall be undertaken and recorded in accordance with Schedule E below and shall be carried out using precise levelling.

Schedule E: Retaining Wall Monitoring		
Frequency		
Pre-Commencement of Dewatering	Commencement of Dewatering to one month after Completion of Excavation	One month after Completion of Excavation to Completion of Dewatering
Twice to a horizontal and vertical accuracy of +/-2mm	Once for every 2 metres depth (on average) of excavation, and, in any case, at a minimum of once weekly.	Fortnightly

The monitoring frequency may be changed, if approved by the Monitoring Team Leader, through the GSMCP.

Access to third party property

140. Where any monitoring, inspection or condition survey in this consent requires access to property/ies owned by a third party, and access is declined or subject to what the consent holder considers to be unreasonable terms, the Consent Holder shall provide a report to the Monitoring Team Leader prepared by a SQEP identifying an alternative monitoring programme. The report shall describe how the monitoring will provide sufficient early detection of deformation to enable measures to be implemented to prevent Damage to buildings, structures or Services. Written approval from the Monitoring Team Leader shall be obtained before an alternative monitoring option is implemented.

Contingency actions

141. If the consent holder becomes aware of any Damage to buildings, structures or Services potentially caused wholly, or in part, by the exercise of this consent, the Consent Holder shall:
- (a) Notify the Monitoring Team Leader and the asset owner within two working days of the consent holder becoming aware of the Damage.
 - (b) Provide a report prepared by a SQEP (engaged by the Consent Holder at their cost) that describes the Damage; identifies the cause of the Damage; identifies methods to remedy and/or mitigate the Damage that has been caused; identifies the potential for further Damage to occur, and, describes actions that will be taken to avoid further Damage.
 - (c) Provide a copy of the report prepared under (b) above, to the Monitoring Team Leader and the asset owner within 10 working days of notification under (a) above.

Advice Note:

It is anticipated the Consent Holder will seek the permission of the damaged asset to access the property and asset to enable the inspection/investigation. It is understood that if access is denied the report will be of limited extent.

Building, Structure, and Services Surveys and Inspections

142. A copy of all pre-dewatering building, structure condition surveys, and Service condition surveys and photographic records of external visual inspections required by this consent shall be submitted to the Monitoring Team Leader with the GSMCP. All other condition surveys and photographic records required by this consent shall be provided to the Monitoring Team Leader upon request.
143. At two monthly intervals, a report containing all monitoring data required by conditions of this consent shall be submitted to the Monitoring Team Leader. This report shall include a construction progress timeline, the monitoring data (including the results of condition surveys) recorded in that period, and, a comparison of that data with previously recorded data and with the Alert and Alarm Levels for each Monitoring Station.

Upon Completion of Construction, one electronic data file (excel workbook) containing digital data for all groundwater monitoring bores shall be provided to the Monitoring Team Leader. Data should include the monitoring bore name, type, location (NZTM easting / northing and elevation), screened depth for groundwater monitoring bores, absolute and relative readings (and their units of measure) and the date / time of each reading. The worksheets should contain data values only (no formulas, circular references or links to other sheets).

The final post-construction report shall constitute a close-out report and present a summary of overall trends observed on the project and confirmation that monitored

readings post-construction (groundwater level, and / or ground and building movement) have reached steady state conditions (accounting for seasonal variation).

Requirement for Close-out Report

144. The final post-construction report shall constitute a close-out report and present a summary of overall trends observed on the project and confirmation that monitored readings post-construction (groundwater level, and / or ground and building movement) have reached steady state conditions (accounting for seasonal variation).

Notice of completion

145. The Monitoring Team Leader shall be advised in writing within 10 working days of when excavation and dewatering has been completed.

Permanent drainage

146. After Completion of Construction, any permanent backfill or drainage systems installed behind retaining walls or below base slabs shall not cause groundwater levels adjacent to the site to be reduced below pre-existing seasonal low levels, or, to rise above seasonal high levels (as measured during pre-construction monitoring) or in accordance with any subsequent monitoring.

Advice Note:

The Consent Holder is advised that the discharge of pumped groundwater to a stormwater system or waterbody will need to comply with any other regulations, bylaws or discharge rules that may apply.

Advice notes

General

1. *Any reference to number of days within this decision refers to working days as defined in s2 of the RMA.*
2. *For the purpose of compliance with the conditions of consent, “the Council” refers to the Council’s Monitoring Team Leader unless otherwise specified.*
3. *For more information on the resource consent process with Auckland Council see the Council’s website www.aucklandcouncil.govt.nz. General information on resource consents, including making an application to vary or cancel consent conditions can be found on the Ministry for the Environment’s website: www.mfe.govt.nz.*
4. *If you disagree with the additional charges relating to the processing of the application, you have a right of objection pursuant to s357B of the RMA. Any objection must be made in writing to the Council within 15 working days of notification of the decision.*
5. *The consent holder is responsible for obtaining all other necessary consents, permits, and licences, including those under the Building Act 2004, the Wildlife Act 1953 and the Heritage New Zealand Pouhere Taonga Act 2014. This consent does not remove the*

need to comply with all other applicable Acts (including the Property Law Act 2007 and the Health and Safety in Employment Act 1992), regulations, relevant Bylaws, and rules of law. This consent does not constitute building consent approval.

6. *The Consent Holder shall obtain a Corridor Access Request from Auckland Transport prior to the commencement of any works within the legal road.*
7. *Compliance with the consent conditions will be monitored by the Council in accordance with s35(d) of the RMA. This will typically include site visits to verify compliance (or non-compliance) and documentation (site notes and photographs) of the activity established under the consents. In order to recover actual and reasonable costs, inspections will be charged at the relevant hourly rate applicable at the time.*
8. *The Consent Holder is advised that the proposed works will be subject to an Outline Plan of Works process pursuant to s176A of the RMA.*

ATTACHMENT ELEVEN
EXPERIENCE AND QUALIFICATIONS

Section 42A Report Author – Qualifications and Experience Statement

1. My full name is Richard James Blakey. I hold the qualification of Bachelor of Planning from the University of Auckland (1990). I have been a full member of the New Zealand Planning Institute since 1995, and I have worked as a planner and resource management professional for more than 25 years. I have worked for several local authorities including the former Auckland City Council (1996-2000) and have been working as a planning consultant in a private capacity since 2000. I am a director of my own planning consultancy, Blakey Planning Limited.
2. In my role as a consultant planner I have provided planning and resource management advice to a range of local authority and private sector clients on resource consent and district plan preparation matters, primarily within the Auckland Region. This has included assessments on behalf of the Auckland Council in respect of the following other significant resource consent applications by Watercare Services Limited:
 - (a) the Central Interceptor wastewater conveyance project (2013);
 - (b) subsequent assessment reports for the Combined Sewer Overflow collector sewers in the Auckland Isthmus (2014); and
 - (c) an upgraded wastewater treatment plant located on the site of the existing Waiuku Wastewater Treatment Plant (2017).
3. I was certified with merit in the Ministry for the Environment's "Making Good Decisions" programme in 2008 and received Chairing Endorsement in December 2016. I am a member of the Council's Panel of Independent Hearing Commissioners (since June 2014, re-appointed June 2017), and the Council's Duty Commissioner Panel (since June 2015). I am also a lecturer in the University of Auckland's fourth year and masters course in urban planning and practice (since 2013).
4. I was engaged by the Council in October 2018 to review, on a pre-application basis, Watercare's present proposal for the WTP at Huia, and to prepare the s42A report for the hearing. I have visited the site and environs on two occasions since being appointed to review the proposal on behalf of the Council (most recently on 1 November 2019).

