To	From
Barker & Associates	*Woods* *Tony Wang – Stormwater Engineer* *W-REF: P21-395* *14 February 2022* *Reviewer: Pranil Wadan – Principal Engineer* *Revision 1*

Memorandum

Wellsford North Fast Track Referral Application – Preliminary Stormwater Assessment

1. Introduction

Wellsford Welding Club Limited ("the applicant") propose to lodge an application for a referred project under the Covid-19 Recovery (Fast-track Consenting) Act 2020 (the "Act") to utilise the fast-track consenting process via an expert consenting panel. This application relates to the development of a contiguous landholding at the northern end of Monowai Street ("Monowai site") and contiguous landholding adjacent to 358 Rodney Street ("Stage 1 site"). Both sites are all owned and controlled by the applicant.

The landholding forms part of a larger land area within Wellsford that is currently zoned Future Urban Zone and Single House Zone under the Auckland Unitary Plan ("AUP") and will soon form part of a private plan change (PPC) process to rezone the land from Future Urban to various live residential zones under the AUP. This will enable quality urban development and well-functioning urban environments, and will also generate affordable housing north of Auckland. This proposal for a referred project will give effect to the purpose of the Act to promote employment and New Zealand's recovery to the economic and social impacts of Covid-19 through the enabled construction and delivery of a comprehensive development that offers employment opportunities and an accelerated supply of quality housing choice and diversity.

To support the application for a referred project, this memo provides a high-level review of the stormwater aspects of the proposal, including:

- Summary of the proposal and site description;
- Summary of background analysis;
- High level stormwater assessment of proposal; and
- Overview of works required to achieve the proposal.

2. Site Description and Proposal

2.1. Site Description

The applicant owns 6.7ha of land at the northern end of Monowai Street, which is currently zoned Future Urban ("FUZ"), Single House Zone ("SHZ") and Rural Countryside Living Zone ("RCLZ") under the AUP as shown in Figure 1. The Monowai site is bounded by 24 Armitage Road to the west and Monowai Street to the south.

The applicant also owns 5.8ha of land adjacent to the south boundary of 358 Rodney Street, which is currently zoned Future Urban ("FUZ") and under the AUP as shown in Figure 1. The Stage 1 site is bounded by State Highway 1 (SH1) to the east and 358 Rodney Street to the north.

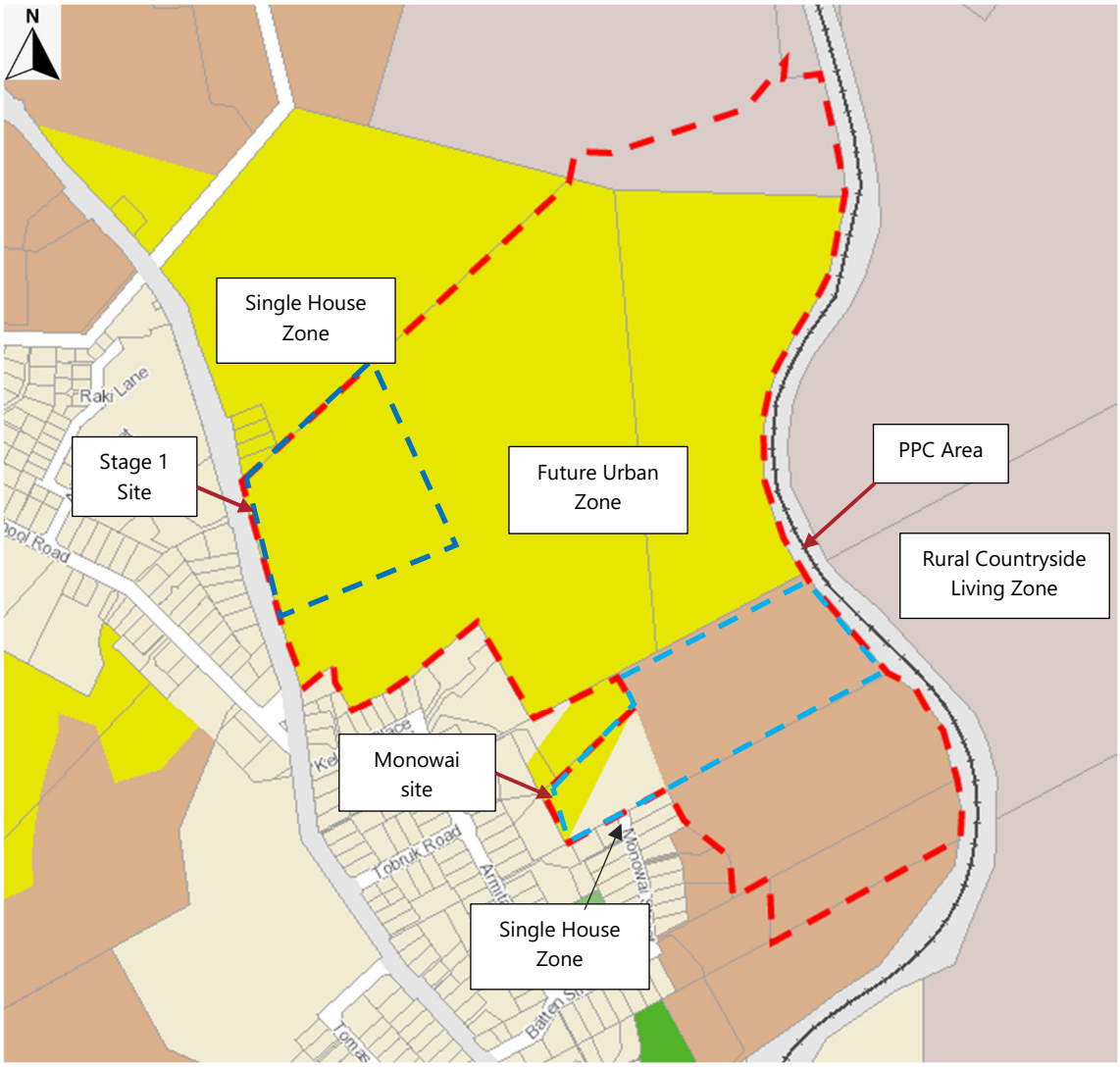

Figure 1: Existing zoning

The primary drainage infrastructure within Stage 1 and Monowai areas is predominantly provided via existing watercourses and culverts as shown in Figure 2. There is no primary drainage infrastructure found within the Stage 1 site, and two minor overland flow paths (OLFP) have been identified within the Stage 1 development area. There are multiple open channels identified along the Monowai site's north, south and west boundaries. Multiple OLFPs and one watercourse are also identified within the Monowai site.

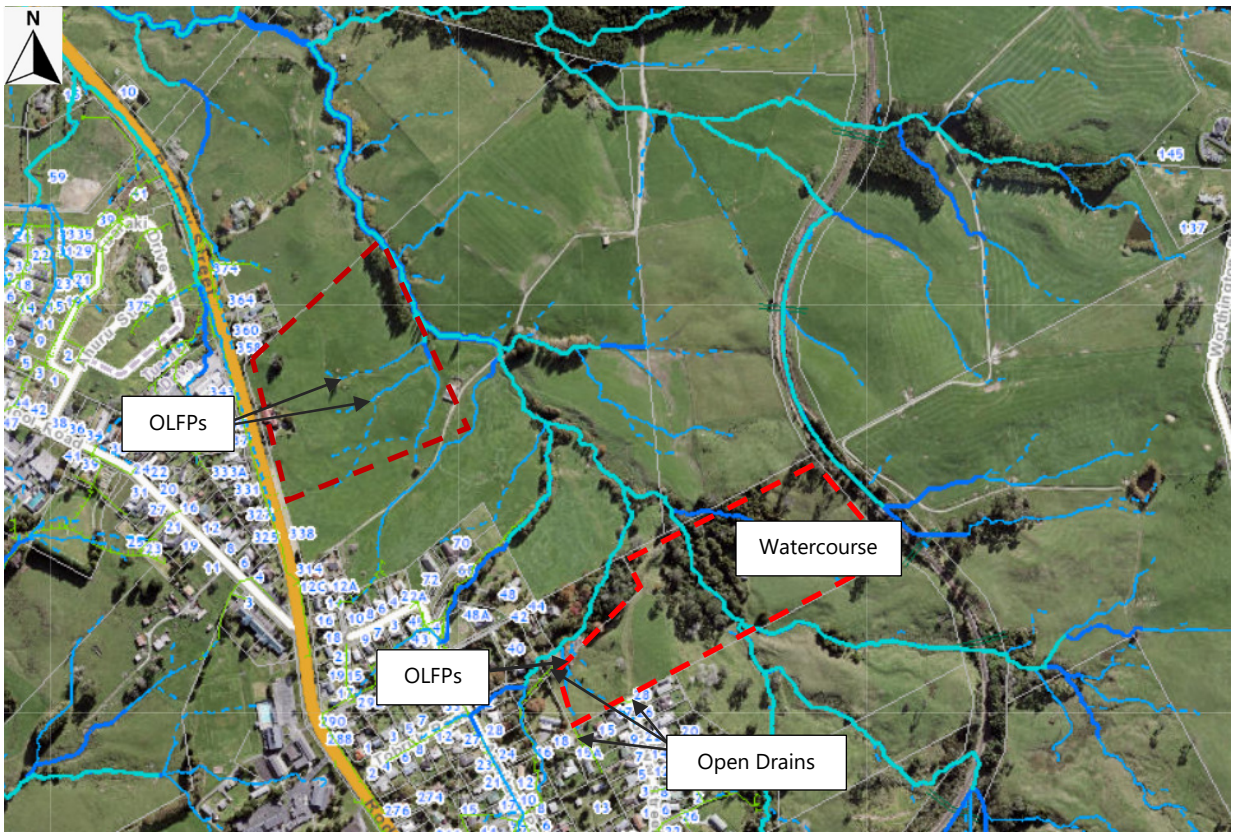

Figure 2: Existing Stormwater Features

2.2. Proposed development

The applicant is proposing the staged development of this land for residential use, with the inclusion of a small neighbourhood centre. Approximately 2,700m² GFA of retail is proposed centrally on the site. Residential development is proposed and will comprise of a mixture of terraced housing, duplex and standalone dwellings. There are 84 dwellings proposed as part of this application, with approximately 570 additional dwellings enabled through the PPC application, which will be lodged later this year.

The Monowai development is expected to create 19 residential lot and one balance lot (Lot 20 - 5.15ha) as part of this application, as shown in Figure 3.

The Stage 1 residential development is proposed to comprise a mixture of terraced housing, duplex and standalone dwellings. There are 65 residential lots proposed as part of this application, as shown in Figure 4.

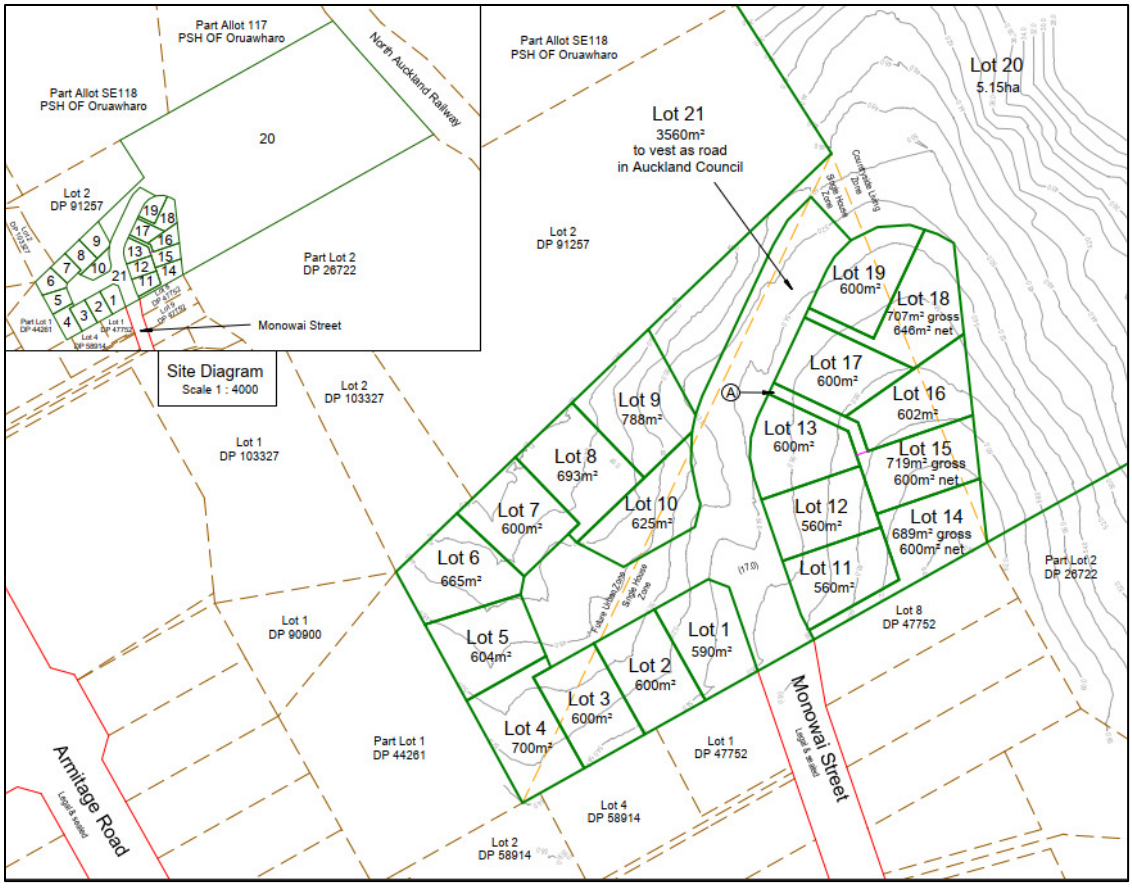

Figure 3: Monowai street site- proposed development

Figure 4: Stage 1 site - proposed development

3. Background Analysis

3.1. Watercourses and wetlands

An assessment of natural wetlands under National Environmental Standards for Freshwater (NESF) will be required as part of the wider PPC to confirm the extent and quality of natural wetlands.

A high-level ecology assessment has been undertaken by Bioresearches Group Ltd (BGP) for this application focusing on areas labelled as 1 and 2 within Stage 1 and Monowai development sites. The assessment concludes there are no wetlands within Areas 1 and 2 that meet the definition of a natural wetland under National Policy Statement for Freshwater Management 2020 and no intermittent or permanent streams as can be seen in Figure 5.

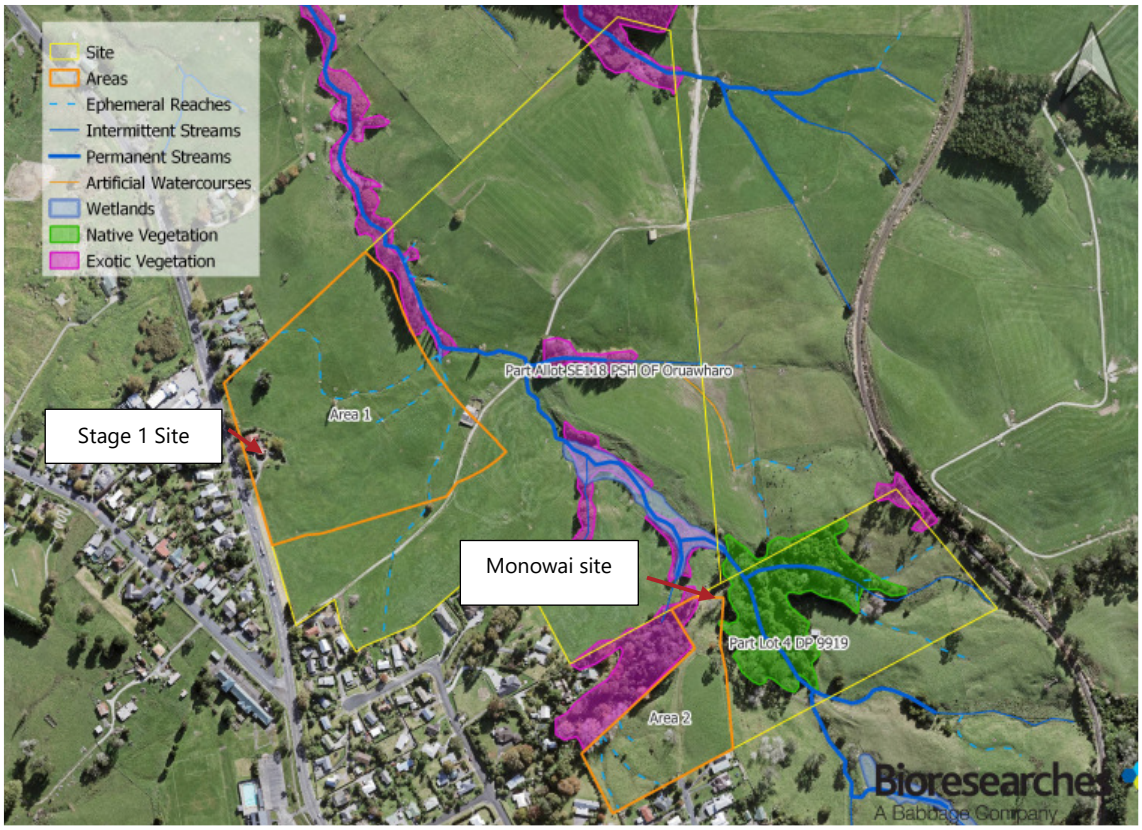

Figure 5: High level freshwater constrains (Source: BGL)

3.2. Geotechnical

Published drainage maps of the wider PPC area obtained from the S-map indicate the subject PPC area is poorly drained, as shown in Figure 6.

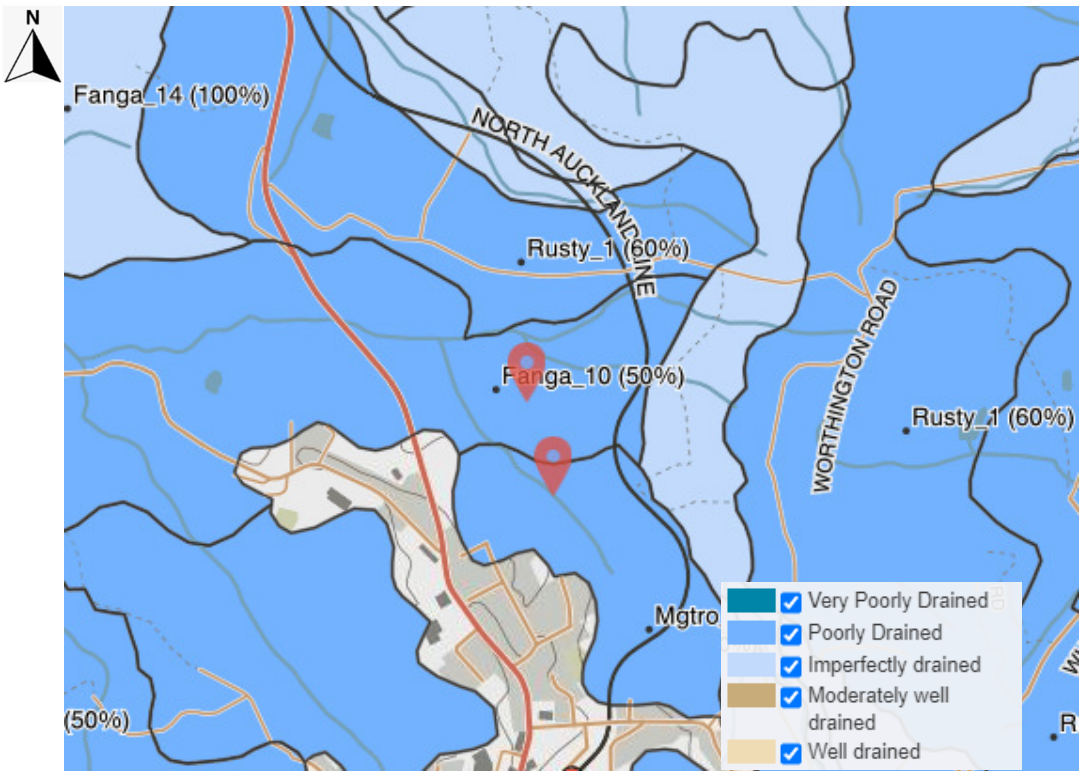

Figure 6: Soil Drainage (Source: S-map)

Geotechnical assessments for the fast-tracking sites are to be prepared to support the subject application.

3.3. Biodiversity

No significant ecological areas have been identified within the sites on the AC GeoMaps AUP management layer. Macroinvertebrate community index- exotic and Macroinvertebrate community index- rural are identified within the wider PPC area on the AC GeoMaps AUP management layer. Therefore, an ecological assessment for the PPC area is required.

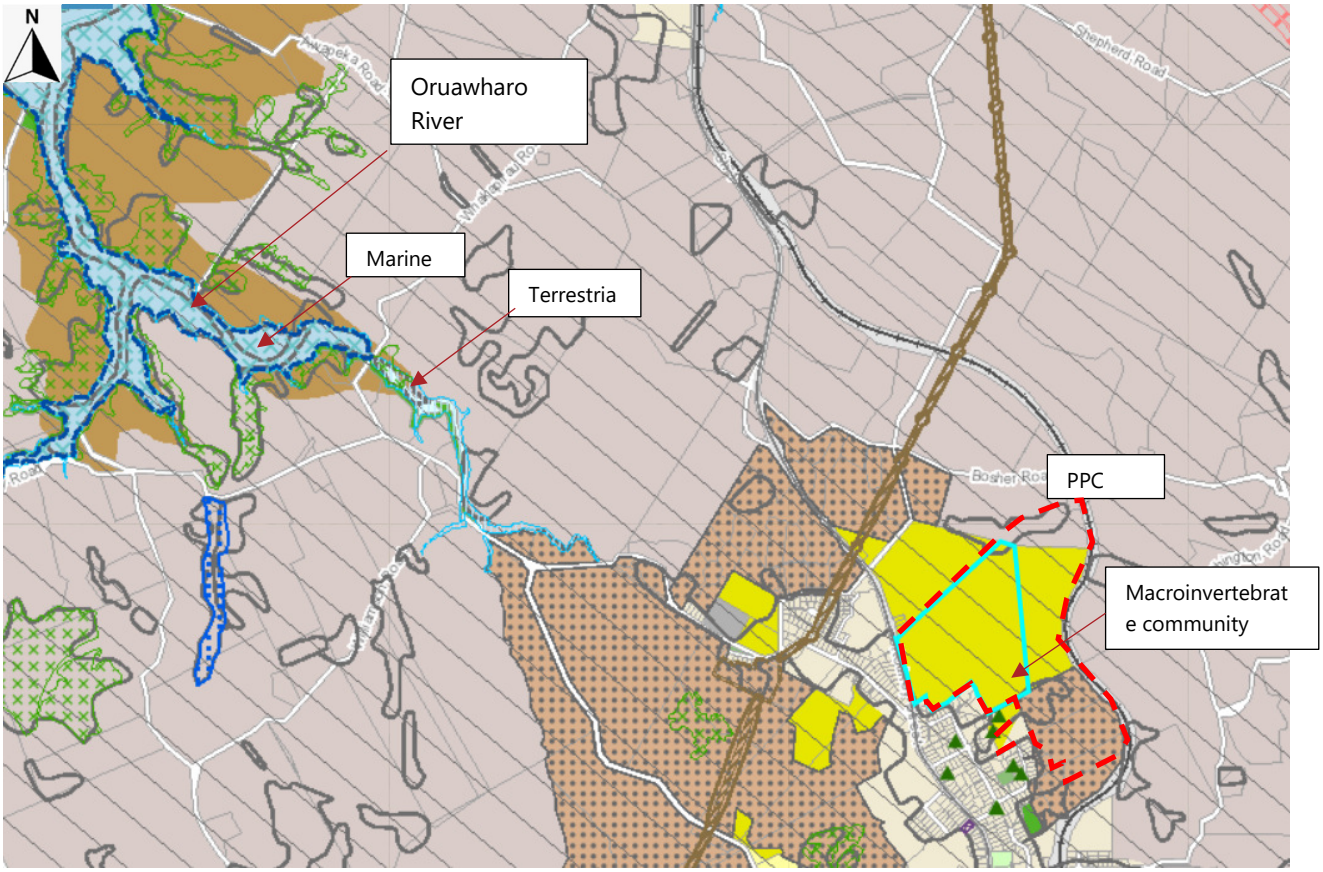

Figure 7: Significant ecological areas – (Source: AC GeoMaps AUP management layer)

3.4. Cultural and heritage sites

No historical heritage, special character and natural heritage overlayer or places of significance to Mana Whenua have been identified on the AC GeoMaps AUP management layer within the subject sites. Two notable trees were identified adjacent to the Monowai Street site as shown in Figure 8.

Cultural/ heritage site assessment (archaeological) is to be prepared to support the subject application.

Figure 8: Notable trees (Sources AC GeoMaps AUP management layer)

3.5. Contamination

A site contamination is to be prepared to support the subject application.

3.6. Existing flood hazards

There are multiple open channels identified along Monowai and Stage 1 sites identified as ephemeral reaches in the high-level ecological assessment. The open channels convey primary and secondary stormwater runoffs from small upstream contributing catchments. The location of the existing channels is shown in Figure 9 and Figure 10.

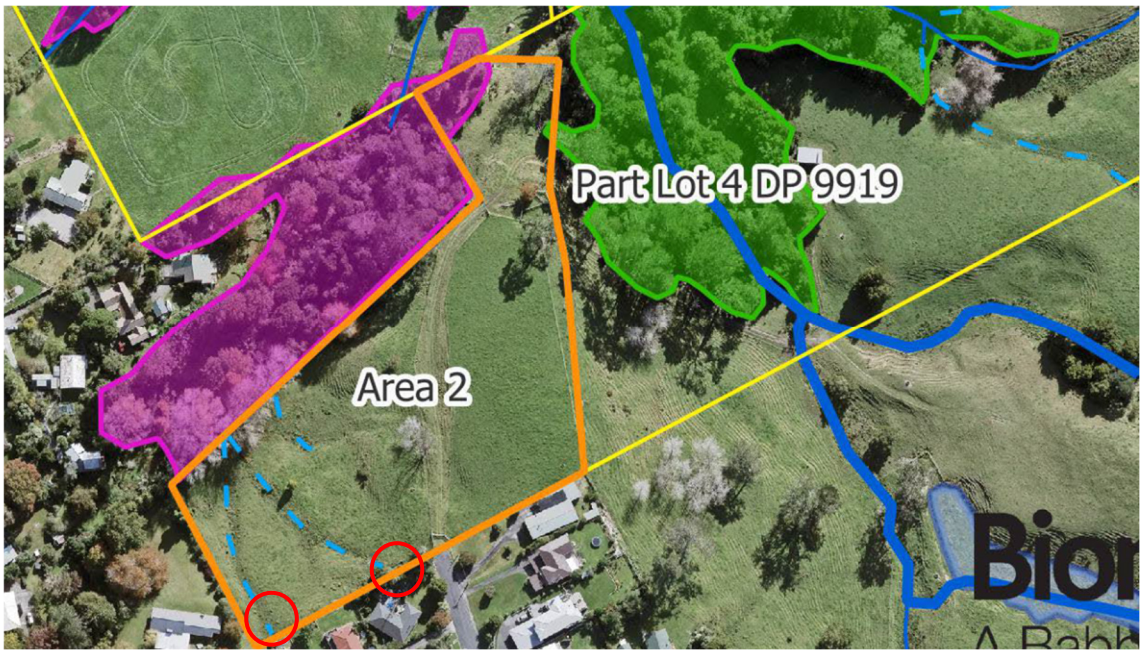

Figure 9: Monowai site (Source: BGL)

Figure 10: Stage 1 (Source: BGL)

The entrance and exit points existing OLFPs are to be maintained within the development. A flood risk assessment is being undertaken as part of the PPC to assess any upstream or downstream flooding effects.

It is noted there is a permanent stream within Monowai site (Figure 9); however, this is located within the balance lot, Lot 20, which is not proposed to be developed at this stage.

4. Flood risk assessment

The wider PPC area and the fast-tracking sites can be seen in Figure 11. The multiple overland flow paths converge to the north of the PPC area draining northwest across the State Highway (SH)1 via Culvert 1 where a flood prone area is indicated.

The published floodplain on Geomaps (Figure 11) is noted to be based on Rapid Flood Hazard Assessment of the Auckland Region published in 2008 and Healthy Waters have advised they currently do not have a flood model for the Wellsford catchment. Therefore, detailed 1D/ 2D flood modelling is currently being undertaken by Woods for the PPC area. It is noted the flood modelling undertaken is inclusive of a climate change factor of 3.8^0C.

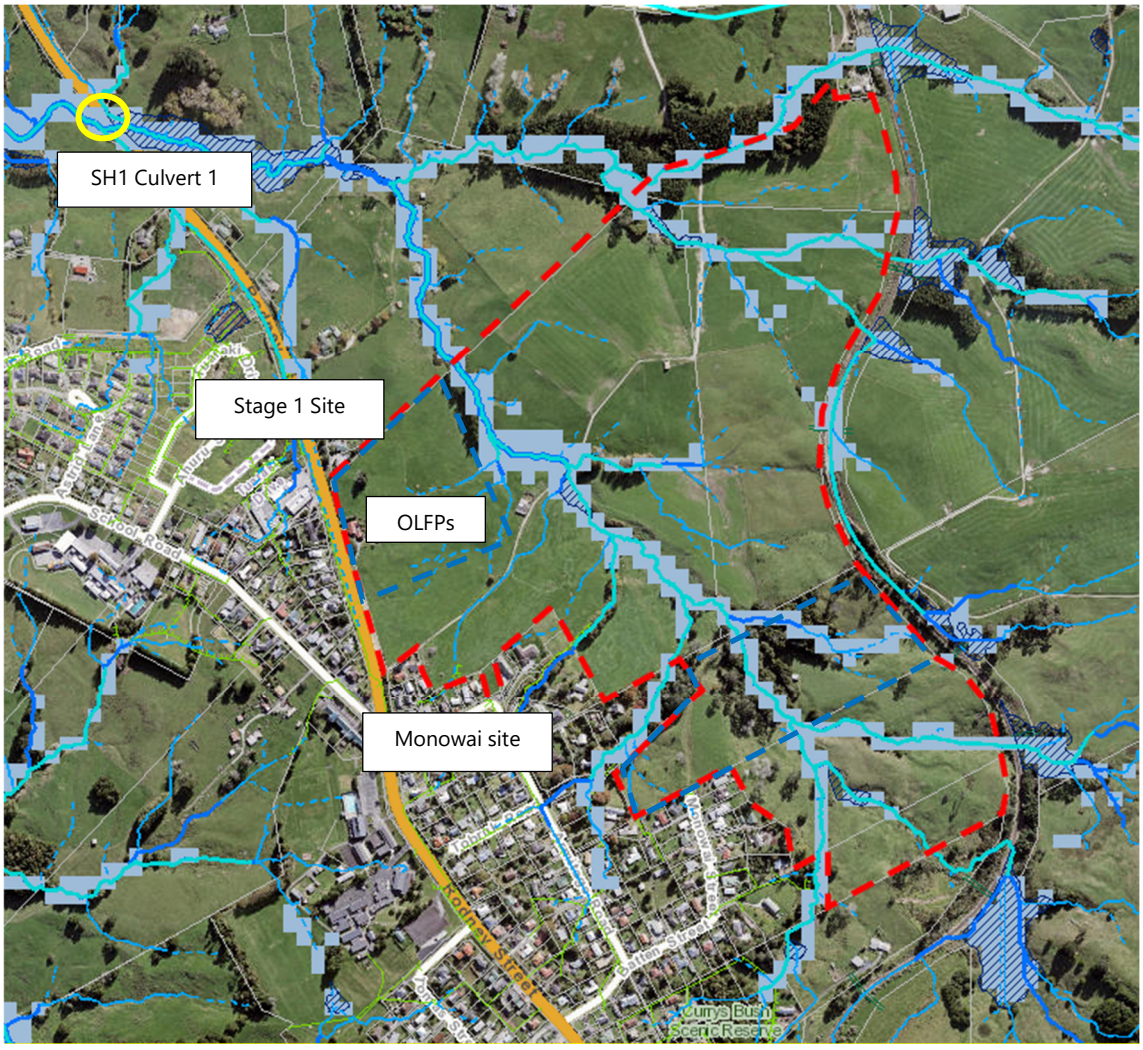

Figure 11: Existing OLFP and floodplains (Source: Auckland Council Geomaps

Preliminary flood modelling undertaken for the PPC and post-development (maximum probable development permitted impervious coverages as per AUP: OiP) scenarios indicate the flood extents are largely similar between rainfall scenarios and that flooding is mostly contained within watercourses.

The afflux plot, indicating difference between existing development and PPC, for the 100-year event inclusive of climate change is shown in Figure 12.

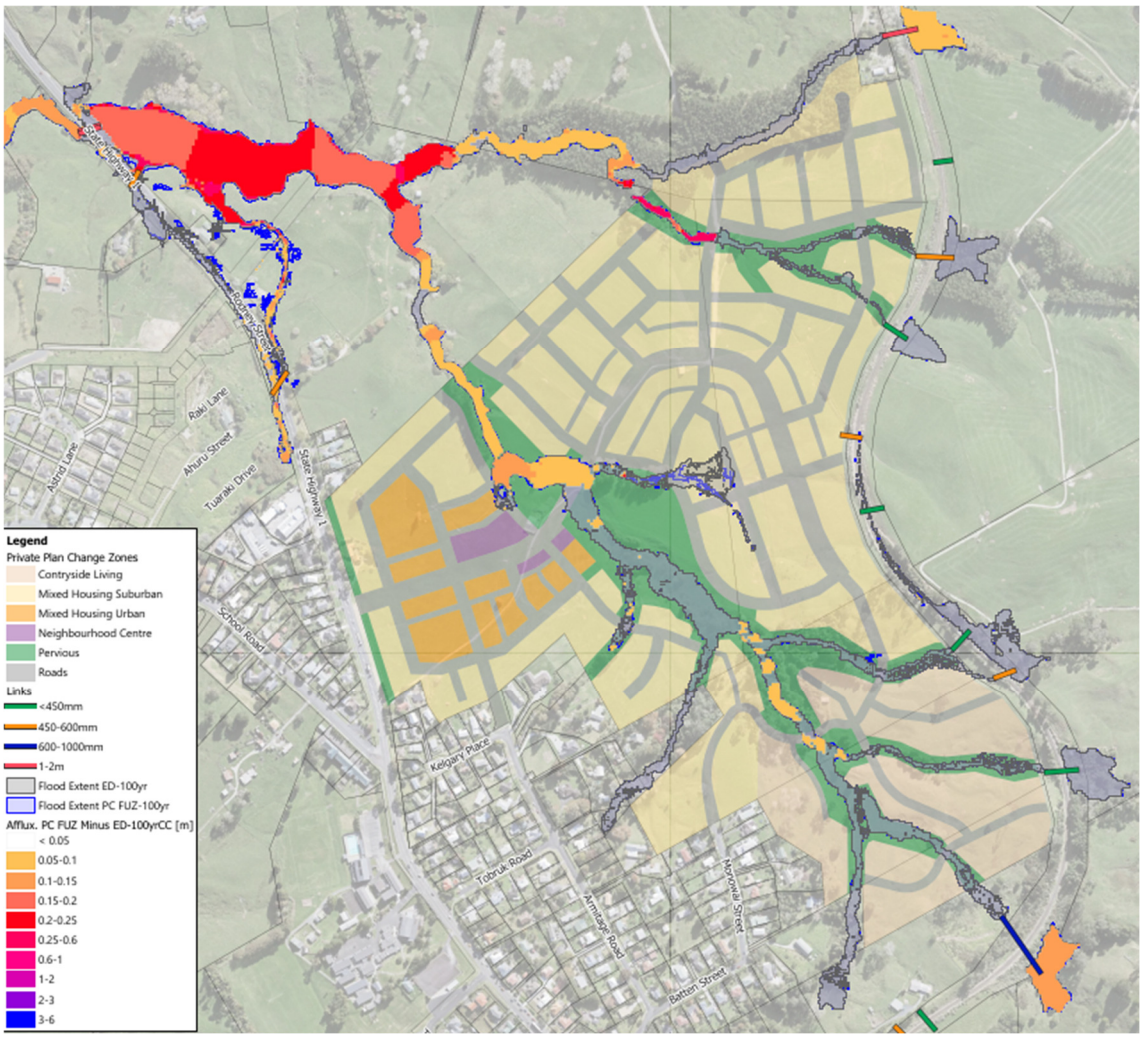

Figure 12: 100-year afflux between pre-development and MPD + PPC scenario

Minimal increases (less than 50mm) are indicated along SH1 in the 10-year and 2-year scenarios inclusive of climate change. In the 100-year inclusive of climate change scenario, flood depth increase of up to 140mm is indicated along SH1 as can be seen in Figure 13. The increases are a result of cumulative development.

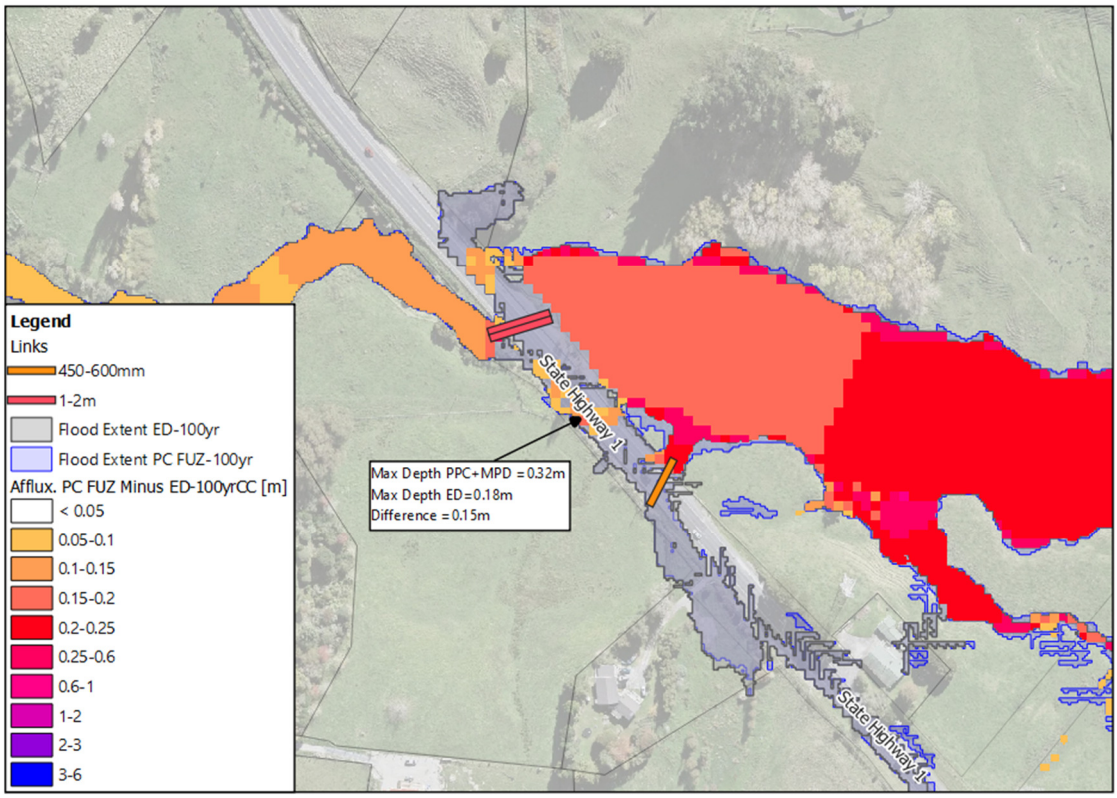

Figure 13: SH1 differences – 100-year + CC for MPD + PPC scenario

Given the results for wider MPD + PPC scenarios indicate flooding is largely contained within existing watercourse, a scenario indicating development of fast-track sites only was not deemed necessary to be simulated.

5. Stormwater management requirements

The PPC area is classified as a greenfield site under the Regionwide stormwater network discharge consent (NDC) and therefore requirements under Schedule 4 of the NDC is likely to be applied. A stormwater management plan will be prepared as part of the wider PPC application addressing all Schedule 4 matters of the Regionwide Network Discharge Consent.

The requirements are summarised in the following sections.

5.1.1. Water quality

Treatment of impervious areas by a water quality device designed in accordance with GD01/ TP10 for relevant contaminants.

It is noted that guidance will likely be provided in the near future regarding treatment of '*all*' impervious areas based on plan changes currently occurring. The guidance will be around treating surfaces that are only generating contaminants.

Stormwater devices for the PPC area could be in combination but not limited to:

- Raingarden
- Grassed/vegetated swale
- Wetland
- Other equivalent devices

5.1.2. Stream Hydrology

The site is not located within a Stormwater Management Area Flow (SMAF) overlay as per the AUP: OiP. However, as the site discharges to a stream, the following is required:

- Achieve equivalent hydrology (infiltration, runoff volume, peak flow) to pre-development (grassed state) levels:
    - Provide retention (volume reduction) of a minimum of 5mm runoff depth for all impervious surfaces; and
    - Provide detention (temporary storage) with a drain down period of 24 hours for the difference between pre-development (grassed state) and post-development runoff volumes from the 95th percentile, 24-hour rainfall event minus the retention volume for all impervious areas.

The proposed intensification will generate additional stormwater runoff and reduce ground recharge. To protect the receiving environment, being the Oruawharo River, water sensitive design techniques are proposed.

Water efficiency measures being at least one water sensitive technique for stormwater to be incorporated, connected to, achieved or maintained as part of all impervious areas within the subject plan change area. Water sensitive devices for the subject site could be in combination but not limited to:

- Raingarden
- Soakage trench
- Rainwater tank for non-potable reuse system
- Pervious pavement or porous concreted used for hardstand areas
- Underground storage tanks with base filtration
- Other equivalent features

These measures are required in addition to any quality and quantity requirements.

5.1.3. Flooding – Property/ pipe capacity 10% AEP event

The primary stormwater runoff is be conveyed through stormwater networks up to 10-year ARI stormwater events. The proposed network will be designed in accordance with the Auckland Council Stormwater Code of Practice.

5.1.4. Flooding – Buildings 1% AEP event

The secondary flow, events greater than a 10-year ARI storm event and up to a 100-year ARI storm, will be conveyed along the road corridor, conveyance channels as overland flow paths. Overland flow path alignments will be dependent on the overall built environment and maintain existing discharge locations where possible.

The overland flow paths should meet the following design criteria:

- Overland flow paths will be designed with sufficient capacity to accommodate the 100-year ARI storm event for the MPD, including climate change, in accordance with the Auckland Council SWCOP.
- They will be unobstructed, with capacity to safely convey runoff through the development.
- Overland flows to follow either road reserves or dedicated green areas. All flow paths are proposed to be located within public areas (roads/parks) where practicable and not over private properties without easement or other approval by Auckland Council.

6. Conclusion

Wellsford Welding Club Limited ("the applicant") propose to lodge an application related to the development of the Monowai site and the Stage 1 site. The two sites are classified as 'Greenfields' under the NDC. Therefore, a stormwater management plan will be required to be developed. The stormwater management requirements will be in accordance with Schedule 4 of the NDC.

The site currently discharges to a twin 2200mm dia. culvert underneath SH1 located to the north. Detailed 1D/ 2D flood modelling is currently being finalised, and any adverse effects are to be managed as part of the PPC application.

The assessment concludes there are no significant impediments with respect to stormwater matters.