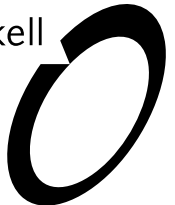


17 August 2018

Dean Miller
c/o Hamilton City Council
Private Bag 3010,
Hamilton, 3240

Boffa Miskell



Dear Dean

Amberfield subdivision development – Response to further information request

This letter provides additional information in regard to the further information request for the proposed Amberfield subdivision development, specifically items numbered 77 - 78, 80 and 82 - 88 in the document. Points 79, 81 and 89 have been addressed elsewhere by other technical experts. The items asked to be addressed have been italicised below with a response provided to each statement.

77. *The stream classification in the Argo Environmental Ltd (AEL) and Boffa Miskell Ltd (BML) Freshwater Ecological Assessments have used the ephemeral, intermittent and permanent stream definitions from the Auckland Unitary Plan Operative in Part (AUP OP). AUP OP definitions have been used in favour of the definitions in the Waikato Regional Plan (WRP) on the basis that the WRP does not include a definition for intermittent streams. Mapping provided and using AUP OP classifications provides different information compared to that preferred by HCC as set out in the ICMP REM which uses WRP definitions and includes mapping the boundaries of wetlands including stream associated wetland habitats. This is also an information requirement in Table 1.2.2.6b in Appendix 1 of the HCC District Plan. Please provide a map and supporting GIS data showing stream classifications using WRP definitions and including the extent and boundaries of any wetlands, including stream associated wetland areas.*

A map has been provided (Figure 3, Appendix 1) classifying streams using the WRP definitions for farm drainage canal, ephemeral stream and perennial stream. In addition, as requested during our phone conversation on 26 July 2018, macroinvertebrate and water quality sample locations as well as fish assessment reach have been included. Note that the sample locations are indicative only and have not been marked on the map using location co-ordinates.

78. *There is a recognised field assessment season for intermittent streams in the Auckland Region of July to October inclusive. This is on the basis that assessments should take place when flowing water is present in the stream, following a minimum of two months of winter flows to provide an accurate assessment of the biological values. Assessments undertaken by the applicant to date have been in November, February and April, albeit following some antecedent rainfall. Conditions during the 5*

June 2018 site visit were relatively wet and flowing parts of site streams more extensive than outlined in the ecology reports. Please provide discussion on the impact that site investigation timing may have had on the observed extent of intermittent sections of stream and the potential that biological values have been underestimated as a result of survey timing. Please advise if it is proposed to re-visit the site during the July to October period to confirm the extent of intermittent stream or how the mitigation is precautionary in terms of addressing this uncertainty. This has potential implications for the quantum of mitigation needed to address stream loss.

Only relying on stream flow (or requiring streams to flow for a set period i.e. at least three months) to determine if a stream is intermittent or not, in my opinion, is flawed. It is impractical and unnecessary to undertake repeated site visits to determine if, when and to what extent a potentially intermittent stream is flowing. The general lack of flow results in a lower aquatic biodiversity and any period can return that evidence, even if it is a no surface flow - no - biota to sample result, that still reflects the relative aquatic ecological value. Furthermore, the AUP OP provides a definition and six criteria for classifying intermittent streams. The criteria include characteristics outside of water flow and to meet the definition, at least three of those criteria must be met, thus not having to rely solely on water flow.

Approximately 47mm¹ of rainfall fell in the preceding 48 hours to the 5 June 2018 site visit. This was an inappropriate time to determine the classification of waterways (particularly intermittent) as water is likely to be flowing/ pooling in ephemeral and overland flow paths and is not reflective of baseline conditions.

In addition to the above, a second site visit was completed on 24 July 2018 to assess intermittent and ephemeral stream flows based on the AUP OP definitions. Approximately 3mm¹ of rainfall fell in the preceding 48 hours. An updated figure of stream classifications (updated from Figure 1 of the BML Freshwater Ecology Report (Appendix H)) for the site is provided in Appendix 1 (Figure 1). Please note the changes include:

- The addition of six ephemeral waterways (numbered 7 to 11 and 13),
- The addition of an intermittent waterway (numbered 12),
- A change of ephemeral waterway to intermittent along watercourse 2,
- The extension of ephemeral waterway at the upstream end of watercourse 3 that flows towards the south and out of the proposed development site. (Note that discretion was used when assessing the classification of this waterway due to recent activity (removal of instream vegetation and material damming waterflow), and
- The extension of ephemeral waterway along watercourse 4.

80. *No sediment quality data are provided for the streams on site that would be receiving environments for site discharges. Stormwater design drawings show stormwater outfalls to Streams 2 and 3 and directly to the Waikato River. Sediment quality data for receiving environments are required as set out in Table 1.2.2.6b in Appendix 1 of the HCC District Plan and are required to serve as baseline ICMP data. Sampling and testing should follow the protocol set out in HCC's Comprehensive Stormwater Discharge Consent (CSDC) monitoring plan (HCC can provide). Please provide*

¹ Rainfall data sourced from NIWA CliFlo database <https://cliflo.niwa.co.nz/> - specifically the Hamilton Automatic Weather Station.

sediment quality data for receiving streams in accordance with the methods outlined in HCC's CSDC monitoring plan.

As discussed at the meeting on 24 July 2018, sediment quality data will be provided at a later date (post hearing and pending consent for the development if granted), when the development and layout has been confirmed. The data is required for baseline purposes (as opposed to consenting purposes) which can be collected before construction begins.

82. *Ecological values and effects have been assessed in the BML report using the EIANZ (2015) framework. The report states this framework has been used in preference to the Stream Ecological Valuation (SEV) method on the basis that the EIANZ method 'allows a reflection on holistic values and features rather than a focus on an arbitrary "function representing" number of a representative reach as well as the ability to use experience and relativity when determining appropriate mitigation'. Please clarify what is meant by "reflection on holistic values" with respect to the EIANZ method used.*

Reflection on holistic values means the value of the entire stream can be assessed using the EIANZ framework as opposed to basing the stream value on an arbitrary "function representing" number from only a proportion of a reach surveyed (i.e. 100m stream reach). We consider this to be more appropriate for small catchments with multiple waterway types where an SEV is unlikely to capture all the values. There is also potential that an SEV reach may miss important components which can have a significant impact on values for smaller catchments (i.e. piped inflows, barriers to fish migration, etc).

83. *The use of the EIANZ framework for determining values and magnitude of impacts, does not provide a basis for determining the quantum of mitigation required, rather whether mitigation, offset or compensation efforts are needed to address effects. The SEV provides a standardised and quantitative means for determining mitigation quantum but is just one tool. If a quantitative method like the SEV is not used then some other form of ecological accounting should be provided. If mitigation or offset quantum is based on qualitative professional judgement then how the mitigation or offset addresses the effects should be fully detailed, justified and precautionary. Consistent with case law, the SEV also considers "potential" ecological function and condition, which is relevant when considering permanent stream loss. The potential value should also be considered as part of a precautionary judgement-based mitigation assessment.*

Please provide some form of ecological accounting methodology to demonstrate how aquatic ecology values and functions are addressed by the ecological mitigation, offset (or other mechanisms). Our preference is that the SEV method is applied as it is standardised and tested. However, an alternative method may be appropriate and clear justification should be provided as to why it is more appropriate.

In this case the mitigation approach is based on qualitative professional judgement. The report provides ecological values for each of the watercourses which has been further updated under Point 85 of this response. We consider ecological mitigation to be required only where ecological value is assessed as being at a minimum of low (i.e. mitigation for watercourses with negligible value is not provided).

The development will result in the loss of 208m of intermittent waterway and 27m of permanent waterway across the site. Proposed mitigation (to watercourse three) will include riparian enhancement for approximately 154m of permanent waterway and 543m of intermittent waterway.

It should be noted that it is proposed to create permanent waterway within, as a minimum, 120m of intermittent waterway along watercourse three (most downstream section of intermittent waterway of the watercourse). Although it is difficult to determine if the created stream reach will have permanent surface flowing water, it is my opinion that it will be (or at least large parts will be) based on the following points:

- Permanent water appears to be flowing (slowly) where a channel is present towards the upstream end.
- Large proportions of this area were wet underfoot during the initial site assessment (high ground water table).
- It appears willow tree roots and the culvert, at the downstream end, have caused a build-up of sediment and the loss of a stream channel which once would likely have existed (currently sub-surface flows).
- Presence of stock in the area may also be contributing to a build-up of sediment through pugging and a lack of any stream channel.
- Small pockets of what appears to be permanent pools of water are present further upstream within the gully (beyond the area described).

In addition to the above, approximately 130m of permanent stream enhancement is proposed for watercourse two which was not included in the additional freshwater report.

Although I'm reluctant to quantify the "mitigation to stream loss ratio", based on the calculated numbers above, the proposed mitigation to stream loss ratio for permanent waterway is approximately 10.5:1 and approximately 2.6:1 for intermittent waterway (this is a very conservative approach and assumes the proposed recreated permanent stream habitat will be intermittent). In my experience, these ratios are far greater than those applied on other similar developments (i.e. Transmission Gully has a ratio of approximately 6:1 for enhancement to permanent loss).

As stated in the EIANZ 2018 guidelines "*The SEV was developed for application to permanent streams and extended in application to intermittent streams in Auckland, and has not been tested for use in other regions, although regulatory authorities in some regions are adopting the SEV as a practice*". Although it is my understanding that the SEV approach has been modified for the Wellington region and has been through a peer-review process (NIWA). It is not a fully accepted (in Council and wider) and always used tool and the default aspects continue to be debated. SEV may be the Council "preferred" method to account for stream loss and justify mitigation, but I'm unaware of any such process where the SEV has been formally modified for use in Waikato region and been subject to peer review. This is a common process to create a robust and widely used method in a science discipline.

We do acknowledge that the waterways classified as having negligible ecological value still provide function (i.e. hydraulic and biogeochemical). We consider that the proposed development (in particular the stormwater components described further under point 88) will

provide similar functions to what currently exists on site (i.e. mitigating flood flows, water temperature control, decontamination of pollutants).

84. *In light of conditions observed on the 5 June 2018 site visit are any of the “additional watercourses” referred to in Section 3.1.7 of the BML report likely to be more intermittent in nature than seepage as described. Some of the watercourses in the northern part of the site had formed channels and were flowing and therefore may be intermittent in nature. This is relevant in terms of the cumulative effect of seepage and intermittent stream habitats as a result of the proposed development (Policy 21.2.1b of the DP). Please confirm if it is appropriate to exclude the “additional watercourses” from the effects assessment in light of channel and flow conditions observed on the 5 June 2018 site visit and any reasoning, including specific reference to potential conditions anticipated to occur between July to October.*

As discussed in point 78, a second site visit was completed on 24 July 2018 to assess intermittent and ephemeral stream flows based on the AUP OP definitions. An updated figure has been provided in Appendix 1 (Figure 1) while the values of these waterways have been provided for under point 85 below.

Figure 3 (Appendix 1) provides the location of two seepages. These seepages are heavily degraded due to stock pugging and grazing and are likely to be lost/ modified as part of the development. Several seepages (not mapped) are present within the gully systems (there are likely to be more that were not observed) in watercourse two and three and which will be protected and enhanced as part of the gully planting and restoration.

85. *Further to the above, please confirm if the values conclusions set out in Table 5 of the BML report are still appropriate. For example, limited connectivity within intermittent reaches is referred to as reasoning but may be better if assessed during the July to October window.*

Values have been reassessed based on the site visit conducted on 24 July 2018. Note that changes include the addition of six ephemeral waterways (watercourses 7 – 11 and 13) and one intermittent waterway (watercourse 12). Note that ephemeral waterways 7 – 9 and 13 will be lost.

In response to the example of limited connectivity provided in point 85, while it is acknowledged that intermittent and ephemeral habitat can have limited connectivity, the limited connectivity within the explanations mostly refers to natural barriers (i.e. waterfalls) near the confluences of the waterways with the Waikato River, as well as perched culverts. An updated Table 5 from BML’s Freshwater Ecology Report follows.

Table 5: Freshwater features and associated ecological value

Watercourse	Flow type	Ecological value	Explanation
1	Intermittent	Negligible	Limited habitat available, degraded habitat, poor connectivity.
2	Ephemeral	Negligible	Limited habitat available, degraded habitat, poor connectivity.

Watercourse	Flow type	Ecological value	Explanation
	Intermittent (farm drain)	Negligible	Limited habitat available, degraded habitat, poor connectivity.
	Intermittent	Low	Marginal habitat, poor connectivity.
	Permanent	Low	Sub-optimal habitat, poor connectivity, high nutrient concentrations.
3	Ephemeral	Negligible	Limited habitat available, degraded habitat, poor connectivity.
	Intermittent (farm drain)	Negligible	Limited habitat available, degraded habitat, poor connectivity.
	Intermittent	Low	Marginal habitat, poor connectivity, moderate MCI index.
	Permanent	Moderate	Sub-optimal habitat with connectivity. One common fish species present, moderate MCI index, high nutrient concentrations.
4	Ephemeral	Negligible	Limited habitat available, degraded habitat, poor connectivity.
	Intermittent	Low	Sub-optimal habitat, poor connectivity.
5	Ephemeral	Negligible	Limited habitat available, degraded habitat, poor connectivity.
	Intermittent	Low	Sub-optimal habitat, poor connectivity.
6	Ephemeral	Negligible	Limited habitat available, degraded habitat, poor connectivity.
	Intermittent	Negligible	Limited habitat available, degraded habitat, poor connectivity.
	Permanent	Low	Sub-optimal habitat, poor connectivity, high nutrient concentrations.
7	Ephemeral	Negligible	Limited habitat available, degraded habitat, poor connectivity.
8	Ephemeral	Negligible	Limited habitat available, degraded habitat, poor connectivity.
9	Ephemeral	Negligible	Limited habitat available, degraded habitat, poor connectivity.
10	Ephemeral	Negligible	Limited habitat available, degraded habitat, poor connectivity.
11	Ephemeral	Negligible	Limited habitat available, degraded habitat, poor connectivity.
12	Intermittent	Negligible	Limited habitat available, degraded habitat, poor connectivity.
13	Ephemeral	Negligible	Limited habitat available, degraded habitat, poor connectivity.

86. *HCC District Plan Policy 21.2.1c states that that “the ecological functions of waterways shall be restored and protected by minimising the modification of natural watercourses and riparian margins”. Neither the BML report nor the AEE or ICMP documents describe how the proposal has considered avoiding or minimising stream loss. The BML report reaches the conclusion that the loss of stream habitats with low ecological value is moderate in magnitude on the basis that post development character/composition/attributes of baseline will be partially changed. This does not take into account potential value and the proposal to completely fill extensive headwater areas which is considered a “fundamental change” (with reference to the EIANZ guidelines). The BML report (and AEE) go on to recommend mitigation in the form of riparian planting and offset in the form of stream channel creation through parts of the Watercourse 3 system. However, there is no ecological accounting or breakdown to specifically outline how the mitigation and offset balances the impacts. More detail is needed on the justification for the quantum of mitigation proposed. At this stage there will be an overall loss of stream habitat. Please advise how stream loss has been avoided and minimised and provide more clarity on how the proposed mitigation relates to identified habitat loss effects. Please include full justification for the quantum of mitigation proposed and how the ecological mitigation or other project features will adequately mitigate or offset the various stream values and functions that will be permanently lost.*

Harrison Grierson (Engineers for the project) have provided the following italicised description addressing the layout of the proposed subdivision.

“Consideration was given to a wide range of potential constraints in determining the design of the subdivision. The earthworks and civil designs have been based on retention of the natural contours and avoidance of direct loss of streams and riparian vegetation, wherever possible. Despite this, some modifications to existing streams will be required to ensure that the earthworks design is functional and to achieve an adequate development density across the site, noting that the development already results in a relatively low density overall due, in particular, to retention of important esplanade and gully features. The streams that will be directly affected have been assessed as low value and the effects associated with the loss of the streams is able to be mitigated for.”

As discussed under Point 83, the mitigation approach is based on qualitative professional judgement and we consider ecological mitigation to be required only where ecological values, assessed as being at a minimum of low, are lost/ modified (i.e. mitigation for watercourses with negligible value is not provided). The “extensive headwater areas” consist of highly modified watercourses which are unlikely to have existed in their current state or potentially not at all (or may have existed as another form i.e. wetland) prior to the area being modified for agricultural use.

Further discussed under Point 83, we also acknowledge that the waterways classified as having negligible ecological value still provide function (i.e. hydraulic and biogeochemical). We consider that the proposed development (in particular the stormwater components described further under point 88) will provide similar functions to what currently exists on site (i.e. mitigating flood flows, water temperature control, decontamination of pollutants).

87. *The BML report and the AEE reach a conclusion that water quality and ecological effects will be no more than minor on the basis that Waikato Regional Plan requirements for erosion and sediment control are implemented during earthworks. There is no assessment of effects related to the specific receiving environments but the drawings provided with the application materials show discharges from treatment devices direct to the Waikato River bank and to the main gully (Watercourse 3). The BML assessment states effects will be avoided but there will inevitably be sediment discharges to surface water and potential effects on water quality and aquatic fauna (species migration for example). There is also no detail on any discharge or receiving environment monitoring proposed. Please provide an assessment of potential water quality and ecological effects for erosion and sediment control discharges specific to identified receiving environments. Please provide an overview of the monitoring proposed.*

Harrison Grierson (Engineers for the project) have provided the following italicised description addressing erosion and sediment control.

“A draft erosion and sediment control plan has been prepared and submitted with the resource consent application based on erosion and sediment control devices being designed and positioned in accordance with best practice and Waikato Regional Council’s “Erosion and Sediment Control Guidelines for Soil Disturbing Activities 2009”. Careful consideration has been given to the location and alignment of the sediment control devices to minimise direct and indirect effects on existing watercourses. Erosion and sediment control devices will include silt ponds, decanting earth bunds, clear water diversion channels and silt fences. Refer to the HG drawings and USLE calculations for further control details. HG has also considered locations of the stormwater outlets during the design process (i.e. avoiding placing outlets near steep slopes, aligning headwalls with existing watercourses, minimising pipe sizes etc) to reduce and manage erosion and sediment generation as far as practical.”

A final erosion and sediment control plan will be developed for each stage by the contractor and approved by Waikato Regional Council prior to construction works beginning within each area of the site. Erosion and sediment control plans will be designed to limit the amount of sediment being discharged into the receiving environments.

Provided erosion and sediment control plans are robust, effects from sediment discharges are likely to be temporary (during the earthworks period and only then at certain times depending on rainfall and device management) and are unlikely to significantly impact on aquatic fauna. We say this following the company’s (BML) monitoring of major earthwork projects over the last 5 years (e.g. Westwond wind farm, Mackays to Peka Peka and Transmission Gully motorways) where best endeavour sediment management has often resulted in numerous sediment discharges of differing magnitude and our effects monitoring has quantified the level of disturbance to the habitat and biota. We know that sediment, from the discharges, will settle in slower flowing stream reaches, such as pools, which already have a substrate dominated by fine silts. These habitat types are likely to consist of mostly robust aquatic fauna tolerant of fine sediment. Our experience is that sediment discharges after treatment will not have measurable adverse effects.

Nevertheless, we recommend a monitoring plan is developed to address potential ecological effects as part of consent conditions with a requirement that it is approved by the appropriate

person at Waikato Regional Council. The parameters and sites monitored will depend on the erosion and sediment controls but will likely include a form of sediment deposition monitoring following methods outlined in Clapcott *et al.* 2011 and macroinvertebrate monitoring following methods outlined in Stark *et al.* 2001.

There is also likely to be a reduction in sedimentation within the receiving environments due to the change in land use. Stock typically graze right to the waterway edge (and in some cases within the waterway) causing erosion and pugging, and subsequently, sediment to become suspended within the waterway.

88. *Receiving environment effects as a result of stormwater contaminant discharges have not been assessed in detail, although this is required by the HCC District Plan Appendix 1 Table 1.2.2.6b. This is more important for the site stream receiving environments (design drawings show some discharge points to Watercourses 2 and 3) as opposed to the Waikato River, although the main river should be addressed. A no more than minor effects conclusion has been reached on the basis that “stormwater treatment systems are designed to treat stormwater to the permitted standards outlined in the Waikato Regional Plan”. This is a vague conclusion and it is not clear from the information provided what those standards are, if they are protective for the specific receiving environments for the development or if water quality will be maintained or improved with respect to stormwater contaminants as is anticipated by the NPS for Freshwater Management. The means of compliance table in the Sub-catchment ICMP includes no specific standards and there is no recommended monitoring. Please provide an assessment of potential water quality and ecological effects for stormwater discharges specific to identified receiving environments, including an assessment of long-term cumulative effects as required by HCC District Plan Appendix 1 Table 1.2.2.6b and any monitoring recommendations.*

Mike Chapman (stormwater expert from Harrison Grierson) has provided the following italicised description addressing the potential effects from stormwater discharges.

“The potential effects are an increase in contaminants to the receiving environment resulting from a change in landuse from agriculture to urban. Contaminants include elevated levels of suspended sediment, higher temperatures, heavy metals and phosphorus. Likewise a resulting decrease in typical rural contaminants such as nitrogen and phosphorous. The stormwater devices proposed in the ICMP and taken through to resource consent will be designed in accordance with the RITS (supported by TP 10 where relevant).

Bio retention to treat first flush followed by soakage up to the 2yr ARI level of service will ensure contaminant removal efficiencies as supported by the International Best Practice management database (<http://www.bmpdatabase.org/performance-summaries.html>). This database has informed the development of GD.01 and the Waikato Regional Stormwater Guidance. Devices designed according to guidance will therefore achieve the treatment efficiencies as documented by the database (based on monitoring data from 1000's of WSD sites around the world).

In the absence of downstream water quality monitoring and a detailed contaminant loading model, the assumption has to be drawn that the proposed treatment system will achieve the required water quality targets and volume reduction targets.”

In the first instance we reference the tolerance and robustness of the current waterway systems and while these will improve with the mitigation recommended, typical urban stormwater which exceeds the proposed treatments, will be small in quantum and scale and is highly unlikely to have a measurable effect. The change in land use is more likely to result in a reduction over all in nutrients and E.coli / bacteria and it will be zinc and copper that may increase. Those increases will be long term in occurring and increases in these metals and perhaps some polyaromatic hydrocarbons are extremely problematic in relating to an adverse biological impact.

Again, and nevertheless, we recommend a monitoring plan is developed to address potential ecological effects as part of consent conditions with a requirement that it is approved by the appropriate person at Waikato Regional Council. The parameters and sites monitored will depend on the stormwater treatment and discharge locations but will likely include sediment quality monitoring and macroinvertebrate monitoring following methods outlined in Stark *et al.* 2001.

Yours sincerely

BOFFA MISKELL LTD

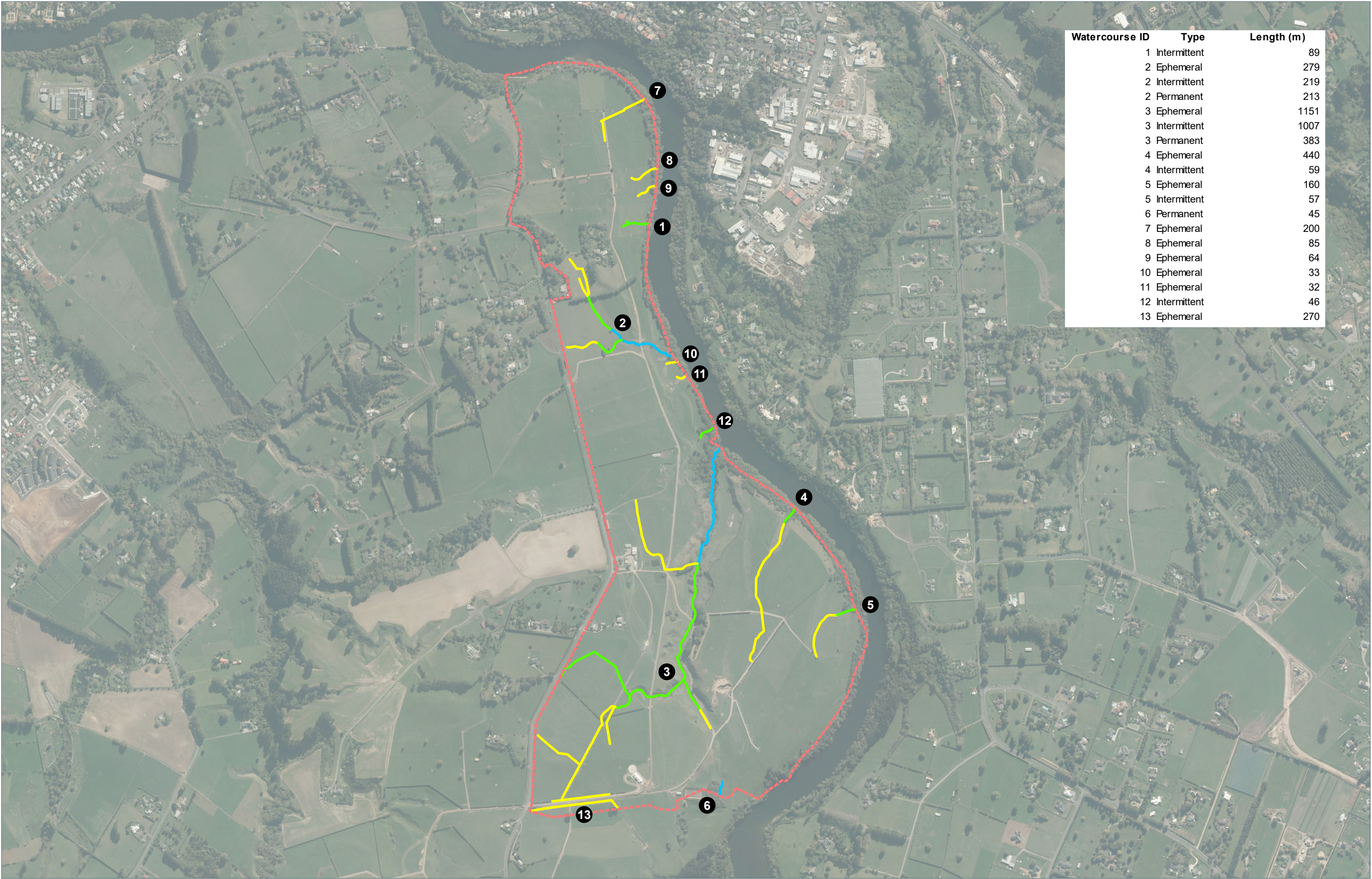


Kieran Miller
Senior ecologist

Attachments: Figures in Appendix 1

Appendix 1:

- Figure 1: Watercourse type (revised)
- Figure 2: Watercourse loss (revised)
- Figure 3: Watercourse type (WRC definitions)



Watercourse ID	Type	Length (m)
1	Intermittent	89
2	Ephemeral	279
2	Intermittent	219
2	Permanent	213
3	Ephemeral	1151
3	Intermittent	1007
3	Permanent	383
4	Ephemeral	440
4	Intermittent	59
5	Ephemeral	160
5	Intermittent	57
6	Permanent	45
7	Ephemeral	200
8	Ephemeral	85
9	Ephemeral	64
10	Ephemeral	33
11	Ephemeral	32
12	Intermittent	46
13	Ephemeral	270



Legend

- Site Boundary
- Watercourse Type
 - Ephemeral
 - Intermittent
 - Permanent

HAMILTON SOUTH DEVELOPMENT

Watercourse Type

Date: 31 July 2018 | Revision: 0

Plan prepared for Adare Co Limited by Boffa Miskell Limited

Project Manager: Rachel.deLambert@boffamiskell.co.nz | Drawn: JWa | Checked: KMj

Figure 1



Watercourse ID	Type	Length of loss (m)
1	Intermittent	68
2	Ephemeral	273
2	Intermittent	193
2	Permanent	27
3	Ephemeral	964
3	Intermittent	372
4	Ephemeral	440
4	Intermittent	9
5	Ephemeral	160
5	Intermittent	17
7	Ephemeral	172
8	Ephemeral	67
9	Ephemeral	52
12	Intermittent	8
13	Ephemeral	268



Legend

Watercourse Type	Watercourse Loss
 Ephemeral	 Site Boundary
 Intermittent	 Development Extent
 Permanent	

HAMILTON SOUTH DEVELOPMENT

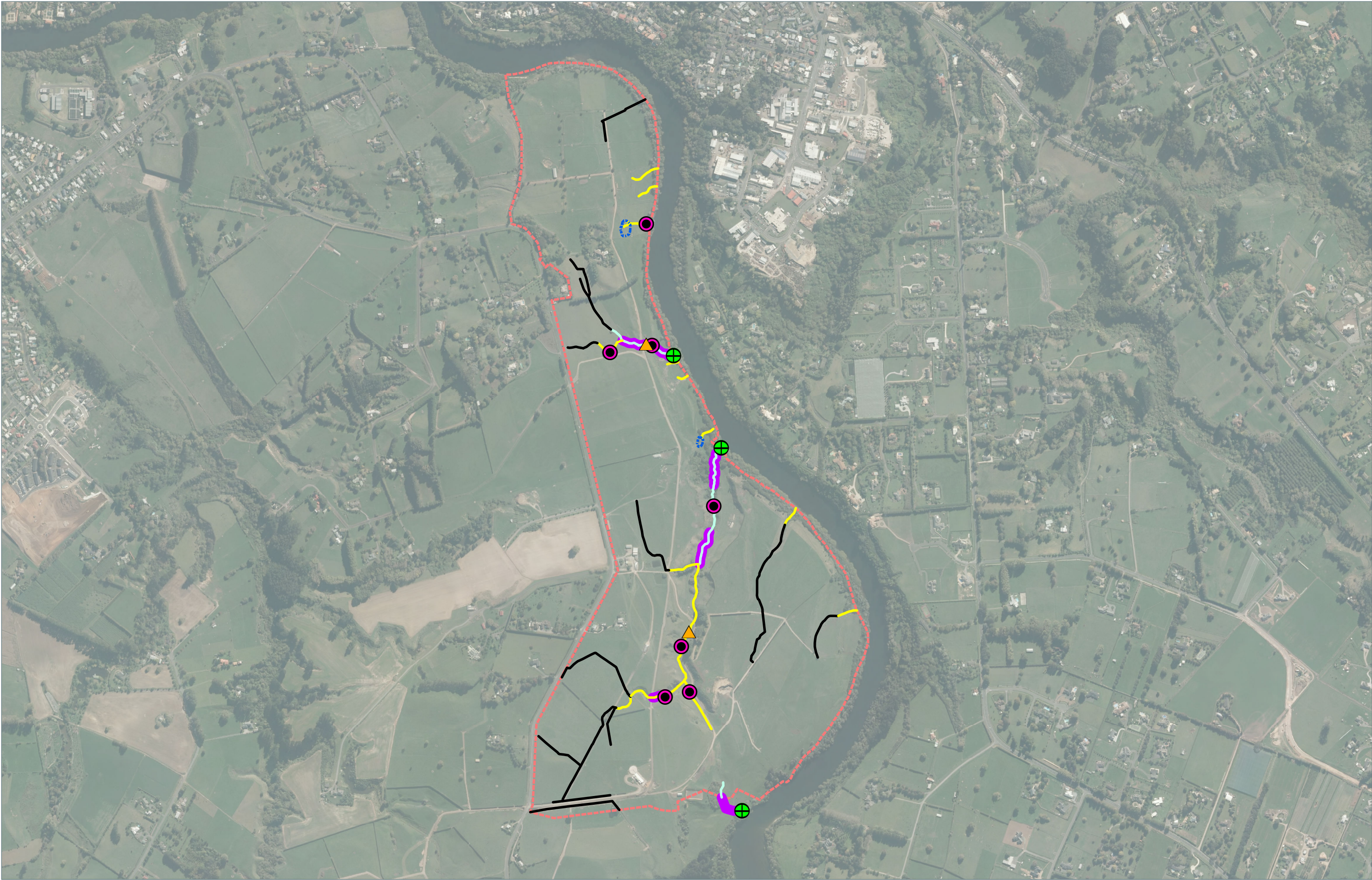
Watercourse Loss

Date: 31 July 2018 | Revision: 0

Plan prepared for Adare Co Limited by Boffa Miskell Limited

Project Manager: Rachel.deLambert@boffamiskell.co.nz | Drawn: JWa | Checked: KMt

Figure 2



Legend

Watercourse Type (WRC)
●●● Seepage
— Ephemeral
— Farm Drain
— Perennial

Indicative Sampling Site
▲ Fish Survey
● Macroinvertebrate
⊕ Water Quality
■ Electro Fishing Extent

--- Site Boundary

HAMILTON SOUTH DEVELOPMENT

Indicative Sampling Sites

Date: 30 July 2018 | Revision: 0

Plan prepared for Adare Co Limited by Boffa Miskell Limited

Project Manager: Rachel.deLambert@boffamiskell.co.nz | Drawn: JWa | Checked: KMi

Figure 3