Stantec

Memo

To: Andrew Maclennan
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From: Patrick Leslie
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Project/File: 310003418

Date: 24 July 2026

Reference: RM25.372 Parkburn, Compliance review of EMP

1 Introduction

Stantec NZ has been engaged by Otago Regional Council (ORC) to conduct an independent technical review of the Environmental Management Plan (EMP) included as part of the Fast Track Consent Application of Fulton Hogan Land Development Ltd, (the applicant) to transform an aggregate quarry into a residential subdivision alongside Lake Dunstan in the Central Otago District.

This technical memorandum details the technical review of the supplied EMP, proposed conditions and response to the specific questions set out by ORC (below) to support the preparation of their submission regarding the application to the Fast Track Panel:

- Overall ESC approach and alignment with GD05 best practice
- Suitability of measures for the scale, duration, and staging of earthworks
- Treatment devices, including design and sizing
- Staging and whether interim stages are appropriately managed
- Monitoring framework, including triggers and response actions
- Review of the proposed conditions of consent (if provided)
- Any other matters that are relevant to large scale earthworks

2 Scope of the review

This review was undertaken in accordance with the Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region version 2 – June 2026 (GD05), and Otago regional Councils Residential Earthworks in Otago – A Guide for Developers. Landowners, Contractors and Service Providers, June 2026 which is endorsed by Central Otago District Council. ORC considers best practice ESC to be general adherence to the recommendations of GD05 but provided further guidance of the differences that could be encountered between Otago and Auckland regions in their guide.

This review is limited to the three proposed stages of works for which information has been provided: the Area 1 filling operation from Area 4a cut, the Area 2 filling operation from Area 4b cut, and the works adjacent to the lake. The remaining areas of the site are not described in sufficient detail to support a complete technical review against ORC's requested matters. Accordingly, we recommend that reliance on the submitted EMP is limited to the first stage of works, that works within waterbodies are excluded until site-specific methodologies are certified, and that all future stages require a stage-specific EMP and ESCP. Some aspects of the works adjacent to the lake also remain insufficiently defined; therefore, appropriate consent conditions are required to address these information gaps, as outlined in Section 8.

3 Overall ESC approach and alignment with GD05 best practice.

GD05 has three main areas to align with for this site; erosion and control practices, sediment control practices and site-specific activities such as works in waterbodies. Each area has been covered to a varying degree in the EMP provided.

For erosion and control practices the EMP outlines how the site will be staged, stabilised and what measures the applicant plans to use to achieve this. The staged earthworks and progressive stabilisation approach incorporated in the EMP follows best practices. There are, however, a few items that need to be reviewed in detail ahead of the finalised EMP implementation.

Water management is a key part of prevention of sediment and erosion. The proposed clean water management on drawings 114_03, shows a concentrated flow of clean water being directed along the northern extent of Area 4a during the initial works then stopping at the construction entrance. It is not shown where the concentrated flow of water will go next. A review of aerial imagery of that area looks to show a flow path along the existing road edge, into an onsite drainage channel to a holding pond but that may not be correct. Secondly, this clean water diversion path is removed when works moves to Area 2 later in the project timeline, resulting in all of Area 4c (4.95ha) runoff entering completed works in area 4a, it is unclear how the transition of the elevation difference between the original ground and completed works will be managed.

Soil stabilisation practices outlined in the EMP cover best practices to stabilise the ground, with many options to use for different seasons, soil conditions and time required. We have no issue with the soil stabilisation practices.

Sediment control practices in the EMP relies on infiltration basins and turbidity curtains all of which are covered in detail further below. Silt fences are proposed to run along the edge of the works adjacent to the lake. No catchment size is provided for this. It is unclear if the catchment will exceed the guidance limits of GD05 or not.

Site specific activities for items like dust management or works in water body's have been covered in the EMP however there is missing information, and a lack of following best practices.

A staged approach is a good way to minimise the amount of open ground exposed at any one time across the works, limiting the generation of dust. The EMP states that water from the infiltration basins will be used for dust control. With each basin designed to empty within 24 hours, it is unclear how water will be retained for dust simultaneously as it soaks away.

The area of site permitted to be open at any one time is 35ha, the EMP states that approx. 5mm/day across all exposed areas is required to always keep the ground damp. The maximum required volume of water per day therefore could be 1.75 million litres per day. The EMP notes a water bore application is in progress, but nowhere in the submission is it confirmed if there is sufficient water draw to meet the maximum required demand.

Existing quarry controls like a mist curtain, water cannons, and dust management plans are currently in place and operative. It is unclear if the water use for the environmental dust management will compromise the existing operation or if the existing controls will be implemented for both operations and how the applicant intends to obtain the required amount of water needed for dust control and implement dust control in a timely manner. Wind triggers cover in section 7.2 provide more detail.

Works in Parkburn Creek has no reference to section 4 of GD05, works within a watercourse. Best practice for the works in the Parkburn creek are the following:

- Temporary watercourse crossings where required,
- Dam and pump or dam and divert
- Temporary watercourse diversions

Throughout the region, temporary water course diversion has successfully been used on ephemeral streams to allow unrestrictive access to complete works and stabilise the bed before flows are introduced. The extent of excavation on the Parkburn stream would likely prove difficult to keep in suitable condition to convey flows at short notice. Based on the proposed methodology, of three rock check dams of unknown size, shape and construction methodology at the bottom, it cannot be confirmed it will be effective to manage sediment runoff or last against any large flows. The best practice is to remove the water from the area of works then undertake the works without the risk of being flooded.

Works in the coves shows a turbidity curtain is to be used. This is a great last line of defence and suitable for areas such as this where there is little to no flowing water. Issues do arise with these devices getting stuck to the bottom of the water body with sediment, and the water level increases releasing sediment related water to the lake. The depth the curtains are to be installed at it is unclear, so it cannot be determined if this site will experience this problem or not.

Upstream water management of the coves is not defined. Timing is stated to be after area 3 is completed, which would result in a large portion of the site directing runoff towards this area based on the site controls provided. Timing of the works in the lake is a key environmental management area and completing it after directing the site to it will increase the difficulty to manage the runoff and risk of environmental harm.

Based on the above, we recommend that the following matters are addressed before the relevant works are certified:

1. Provide further information confirming how works in active watercourses will be completed in accordance with GD05 best practice.
2. Prepare detailed site-specific methodologies and control plans for each waterbody works area before those works commence.
3. Review the order of operations to confirm how water management will be maintained over the full project duration.

4. Review how changing the flow paths for the clean water diversion will affect existing controls within the site.
5. Review the management of clean water prior to area 2 works starting, to account for any difference that occurs during the first stage of works

6. Provide clearer dust controls, confirmed onsite storage volumes, and verified available water supply in the EMP, or prepare a dedicated dust management plan with measurable implementation triggers.

4 Suitability of measures for the scale, duration, and staging of earthworks

The suitability of the proposed measures for the scale of works cannot currently be confirmed because the catchment plans, batter slopes, levels between neighbouring areas, and pre-works ground forms are not sufficiently defined. These uncertainties could increase catchment sizes, make infiltration basins undersized, or direct upstream flows into areas of works that do not currently have adequate controls.

Furthermore, the soil erodibility has been stated to be low to moderate, based on information provided by Insight Engineering, without any consideration for their statement *"We reiterate again that this factor is based on several assumptions and we strongly advise that this factor should be reviewed once further laboratory and/or field test data is available"*. With the EMP describing the ground as unweathered to slightly weathered, loose, sandy to silty, well-rounded gravel. This material is highly likely to erode, generating fine and course sediment that will affect the infiltration basin soakage if not monitored closely. Without any monitoring methods to ensure operational effectiveness of the infiltration basins, over the duration of the stages, the suitability of using them as the only method for disposal of sediment laden water is unable to be confirmed as acceptable.

For the Crown Land works the drawings show there to be a very limited extent of work, with the cut or fill terminated at legal boundaries creating vertical faces. The catchments that align with this are also unclear due to missing information on when this work will occur and how the ground will be finished around the area before the works starts. It is based off current ground levels but with the crown works noted as item 19 to be completed in the bulk construction methodology of Drawing 113_01. Additionally, as covered through this review, batter slopes between stages of works are not incorporated into the works. This means the catchments could be larger than what is shown and overwhelm a silt fence leading to untreated water entering the lake.

For the works adjacent to the lake, dewatering methods are not covered, but the methodology states there is to be work on top of the water. Excavation below water level will generate a large amount of dirty water and best practise would be to have this separated from the clean water or sensitive environments for as long as possible. The detailed methodology and how keeping the working area separated from the lake for as long as possible is not documented.

We recommend that a site-specific methodology and control plan is provided as part of the works in the waterbody and that each stage has a finalised EMP updated prior to work. See section 8.3 for the proposed condition to cover this.

4.1 Scale

The proposed works for Area 1 filling from Area 4a cut is noted as 31ha, with the EMP stating once areas of 1ha are finished it will be stablished, which is unlikely to occur without the next 1 ha being open and worked on. Having up to 31ha open at one given time could be manageable if runoff is broken up into smaller or slower moving flows, dust suppression measures can react to any changing conditions within a timely manner and the vehicle movements within the site are contained to specifc haul roads.

ORC's guideline, Residential Earthworks in Otago, states that an Adaptive management plan may be required for large-scale earthworks operations, which includes but is not limited to earthworks exceeding 5 hectares in area, earthworks that are undertaken over multiple stages, earthworks requiring an extensive duration, and earthworks within close proximity of sensitive ecological systems, all of which the proposed earthworks include. With regards to the standards that AMPs must be designed to meet, ORC refers to Auckland Council's guideline, Erosion and Sediment Control Adaptive Management Plan Guidance Document (RC 3.2.22). AMPs normally include parameters for discharges from certain sediment control measures, monitoring protocols for these measures and the receiving environment, and reporting procedures. This will assist ORC and the applicant in ascertaining the performance of the implemented ESC practices and measures, particularly for the works in the lake and streams or if groundwater is contaminated during works.

We recommend that an Adaptive Management Plan is prepared for this scale of works; an appropriate consent condition is provided in Section 8.3.

4.2 Duration

Staging is currently outlined at yearly, with Area 1 in year 1 (1 million m3 of fill to be placed) followed by Area 2 in year 2. After that there is insufficient information to assess the ongoing project time lines. The bulk earthwork methodology of drawing C113_01 outlines that R3 is to be first, but there is no time frame for this or controls proposed so it is unclear if this is included in Year 1 works or not. If the EMP was tailored to be stage specific this would eliminate any overlap between other works not required to comply with this EMP.

5 Treatment devices, including design and sizing

With limited information in the GD05 and ORC guide on the use of soakage devices, the applicable standard listed below have been used to assess the appropriateness of the infiltration basins for long term use:

- Stormwater Soakage and Groundwater Recharge in the Auckland Region – GD07

- Queenstown Lakes District council – Land development and subdivision code of Practise, section 4.3.8 – soakage devices.

Proposed infiltration basins instead of SRPs: we generally have no issue with this deviation from GD05 if there is the ability to soak water away onsite. However, the design needs to account for issues arising with the basins from sediment, winter conditions, groundwater, etc. As stated above the environmental management standards like GD05 or the ORC guide don't cover off how an infiltration basin should be designed, or how one is required to test the ground to ensure an infiltration basin will work for the project duration. GD07 is best practice when it comes to soakage and groundwater. This is commonly referred to in the neighbouring council's Code of Practice for soakage devices (QLDC COP 2025). Therefore, to reduce the risk of a device failure cause environmental harm, GD07 has been used as the standard for infiltration basin design and soakage testing.

Soakage testing of the 3 locations on the site yielded 1 usable result in relation to the site context. Test 3 failed to soak any water and was abandoned demonstrating there could be a lack of soakage present in some areas of the site. The validity of the soak pit 1 test is questionable with the proposed works in that area. The test was conducted at 0.6m deep below the current ground in an area where there is 6m of cut to be complete. The deeper ground conditions are not covered off in the EMP to verify that there is consistent soakage to deeper depths or not.

Soak test 2 is the only result conducted in relative proximity to Infiltration Basin 2 and its likely floor level. The test method did not follow the testing parameters of GD07 Appendix A, which require the hole to be pre-soaked to specified requirements and the test to record measurements until the test hole is empty or until there is no further level change; neither endpoint was reached.

Furthermore, the design of the infiltration basins have no factor of safety. GD07 outlines what factors of safety should be applied for different situations where soakage could be affected by factors like insufficient pretreatment (i.e. sediment build up), difficulty to access, insufficient confidence in the soakage testing (distance from the pipe the test), frequency of maintenance. Infiltration basins will have lower factors of safety when following the GD07 testing and design requirements, but this should still be followed and state why each safety factor was used.

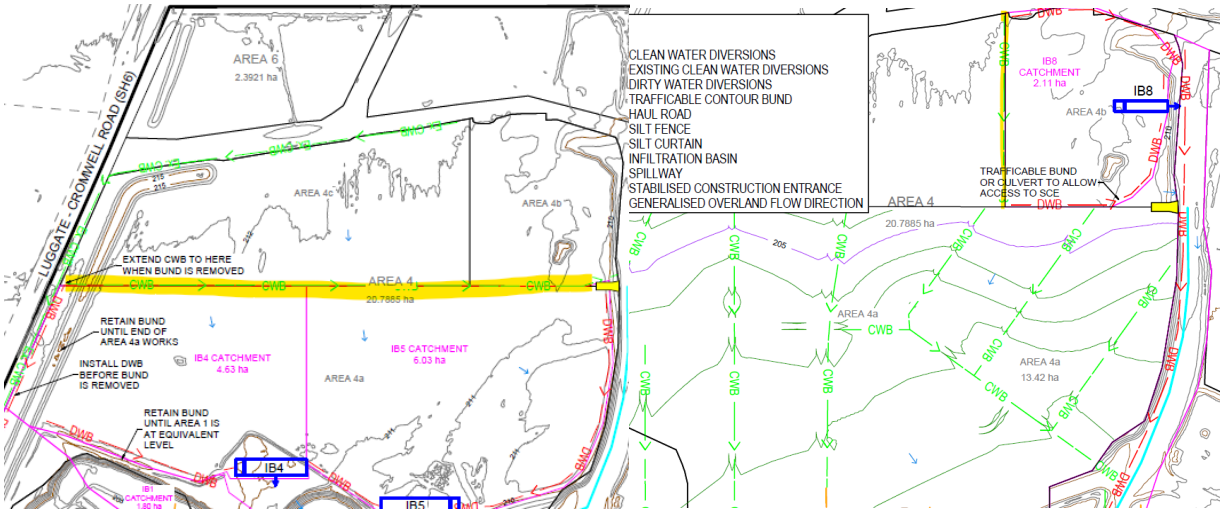
The limited testing, absence of stated safety factors, and uncertain basin geometry may result in undersized or inefficient infiltration basins, creating a material risk of water management failure, environmental incidents, or inoperable soakage devices.

5.1 Catchment sizing

Catchment sizes for each area terminate on the edge boundary of works where it seems earthworks will create a vertical wall. For example, the north edge of Area 4a, east edge of area 1, east edge of area 2 and area 4B on more than one edge. Given it is best practices to batter the edge of works to safer slopes, especially if left for a prolonged period, it is expected that the extent of earthworks is going to exceed the current proposal to achieve this. No extent for temporary batters has been included in the catchment sizes of the site controls. Drawing 113_06 noted and depicts temporary batters for area 2, but no further information is provided.

Infiltration basin 6 (IB6), appears to be undersized with area 4c (4.95ha) to be directed towards clean water diversion in area 4a and into IB6 pushing the catchment area closer to 40ha, with most of it shown as clean runoff entering the area of works generating a large amount of runoff to manage. Best practice is to separate clean water upstream of the works. The use of a temporary clean water diversion channel or piping clean water flows across the area of works should be considered.

Example of the issue with catchments are shown below with clean water bund highlighted, changing the catchment areas. Clean water diversion bund installed to completed cutting of area 4a on the left, then moved to direct clean water into area 4a on the right.



5.2 Infiltration basin levels and positions

The following basin-specific concerns require resolution before reliance is placed on the infiltration basin strategy:

The size and depth of all basins has used 700mm to determine the volume and if it can hold 5%AEP in 24 hour events. The ORC guide requires 300mm freeboard in this situation but no clarity on if soakage is to be included too. This means the pond sizes for the event should be based on a depth of 400mm with no soakage as the worst-case scenario. Or a reduction in infiltration rate with an applied safety factor (GD07) incorporated and a monitoring plan to ensure the infiltration remains constants. The applicant should present the method they select to overcome the lack of redundancy and suitable reason to go with it.

IB2 – the elevation level of this basin is unknown but shown on the controls plan to be with the emergency spillway at the end of the pond in the batter above the ground level of the basin, making it unclear how the spillway intends to work.

IB3 – If the basin is excavated into the ground, the level of the ground that IB3 will be set in is depicted as RL196 on drawing 114_03, with fill up to 8m immediate next to the basin. That would mean the dirty water bund direction flows to the pond will progressively get steeper as the level of fill rises. This will

generate runoff with an increased velocity and create more sediment and erosion, comprising the infiltration rate of the basins.

IB4 – invert level is unknown but depth is showing in the calculations to be only 0.7m deep noting to avoid the high ground water table. If the levels of drawing 114_03 are correct for the ground level around IB4 (RL210), it is unclear how water from area 4a is conveyed to IB4 when cutting to a finished ground level (RL202) -8m below the infiltration basin.

IB5 – Similarly to IB4, the ground shown that the basin is to be set at (RL211) is 9m above the finish ground levels from cutting.

IB6 - The existing water course currently holds water in the location of IB6, the ability to soak water away here may have been overlooked. IB6 is proposed to take a large amount of clean water from upstream that is crossing over the exposed earth creating a larger amount of water to be treated and manage. Any compromise in soakage could create major issues to deal with during bad weather events.

IB7 – the ground level surrounding IB7 is shown to be close to RL195, with a distance from the level spreader to the floor of the infiltration basin a minimum of 850mm. If the basin is excavated into the ground, the floor would be RL194.15. The groundwater level noted in section 5.2.2 as mimicking Lake Dunstan (Rl194.5 to 193.5), as such there is a risk that the floor of the infiltration basin is under water, making it ineffective as an infiltration basin and may require a consent for discharging sediment laden water to water. Secondly the catchment area used in the calculation is 12.8ha, made up of 8.78ha of IB7 catchment but an unclear catchment area of Area 1. Lastly IB7, will be 7m below the finished earthworks levels of area 2 and installed immediately at the end of the vertical wall of works. There is no temporary batter proposed.

We recommend that the applicant:

1. Confirm basin locations relative to the final extent of works, including temporary batter slopes and water conveyance routes from filled areas to the basins.

2. Review basin levels against existing and proposed ground levels to confirm each basin can operate effectively and receive flows as intended.

3. Incorporate GD07 factors of safety to account for sedimentation, seasonal reduction in soakage, groundwater level effects, and uncertainty in soakage testing.

4. The applicant should review the clean water catchment areas following the works of Area 1 and produce plans showing the clear and accurate catchments for each infiltration basin.

5. The applicant should review the best practice for clean water management and reduce the need to send over 40ha of water to 1 infiltration basin.

6. The applicant should review the extent of required work to include temporary batters and have this reflected in the catchment sizes, basin positions and water management.

6 Staging and whether interim stages are appropriately managed

Section 2.2 of the EMP covers off the construction sequencing with two areas, 4a and 1, to be opened simultaneously in year 1, which is a total of 31ha to have open in addition to the gravel extraction operation. This is then followed by Area 2 and 4B the following year.

The EMP further states that the works on more refined staging is yet to be completed, so the finalised EMP prior to construction needs to include the more detailed staging for the specific stage it applies to. The stabilisation of land once 1 ha in size is completed shows that there is intention to close finished areas when able to do so, and the soil stabilisation practices follow the best practise, so overall the interim staging is going to follow the closing of completed areas once material is extracted and placed.

It is not clear whether the sequences of works plans to use any stockpiled material form R3 works ahead of open cut in area 4a, so some refinement of the interim staging is required. Nonetheless, it is expected that the applicant will address these matters in the finalised EMPs and ESCPs that will be required by the proposed consent conditions.

The bulk earthworks methodology on drawing 113-01 details that area R3 will be excavated and stockpiled first with 18 stages to follow. The EMP doesn't include anything for R3 or a number of the following stages, as such the conditions of consent need to reflect the limited area the accepted EMP will cover.

We recommend that:

1. The EMP staging is aligned with the specific works intended to be authorised under the relevant stage of the consent.
2. The EMP includes further refinement of staging, timing, open-area limits, and control transitions for each year of works.
3. Each EMP is limited to the works proposed for approval within that stage, recognising that site conditions, design details, and control requirements may change over time.

7 Monitoring framework, including triggers and response actions

7.1 Monitoring frameworks

Generally, the site monitoring frameworks aligns with the ORC guide and GD05, with daily site checks, weekly, pre/post event inspection and monthly site audits outlined in the EMP.

The EMP makes several references to QLDC, which appear to have been carried over from an earlier EMP for a different district. As the works are located in the Central Otago District and fall within ORC's

jurisdiction for regional earthworks matters, references should be updated to the relevant consent authorities. The site is also described as high risk in accordance with QLDC EMP guidelines, but no corresponding assessment is made against ORC's Residential Earthworks in Otago Guide, Table 2: Environmental Risk for EMP category. The ORC guidance should take precedence for assessing the site risk level.

7.2 Triggers

The applicant has applied a QLDC standard rain event of 20mm/12hrs as the event that triggers an inspection. In accordance with ORC guidelines a rain event is defined as any precipitation event that is capable of, or generates, overland flow. This differs from the QLDC guideline with sites where soils are permeable requiring more rain before an event triggers an inspection but also means sites with less permeable soils requires less rain to trigger an inspection. The applicant should confirm that a rain event of less than 20mm in 12 hours will not generate overland flow or amend the trigger to a valid rain event based on experience of the site with rain. Onsite monitoring of rainfall vs overland flow runoff of current exposed areas will determine the appropriate pre/post rainfall event.

Table 7 titled: discharge water quality limits, outlines the testable parameters to monitor water quality that could discharge from site such as via the silt fence or turbidity curtain to the lake. However, it is unclear how the values have been determined or where the results will be taken from.

No flocculant treatment is proposed which is a good point to consider for a soakage device. The use of flocculant treatment will cause fine sediment particals to cluster and settle at the base of the basin reducing the soakage rate of the infiltration basins. If flocculate is to be used as outline in section 5.2.2 as a corrective action, the applicant will need a way to verify the soakage rate is unaffected or have additional measures in place to ensure infiltration operational is not affected.

Appendix X of footnote 7 is missing for the correlated TSS to turbidity limit.

With groundwater noted not far below the ground level of some infiltration basins, it will not be difficult to have monitoring wells nearby the end of infiltration basins so that during and following rain events where water is soaking away in the basin water quality can be collected and measured to ensure compliance.

Wind triggers have not been outlined in the EMP. Reactive dust controls are described once dust becomes an issue, but there is no proactive wind monitoring trigger for suspending works or implementing controls before dust becomes problematic. Given the time required to manage such large exposed areas, wind speed triggers and onsite monitoring should be included.

We recommend that:

1. Inspection triggers are set to suit the site and include lower rainfall events where they are capable of generating overland flow.

2. The applicant develops a method for monitoring groundwater quality near basins that are close in elevation to groundwater.

3. ORC review the implication of discharging sediment laden water directly to groundwater that is hydraulically linked to Lake Dunstan, and if a consent for discharge to water is required.

4. Wind triggers are set for when action is required with onsite monitoring undertaken.

5. The applicant undertakes benchmark testing of the stream and lake to determine existing water quality during rain events and either justifies the proposed water quality parameters or updates the turbidity and total suspended solids limits to avoid increased harm to the receiving environment.

7.3 Response action

The response action for items like dust, reactive measures, additional onsite materials are covered in the EMP and align with GD05 practices, however little information for dirty water entering the lake from lake works or streams works is covered.

8 Review of the proposed conditions of consent (if provided)

8.1 Provided draft conditions.

The draft conditions of the consent are appropriate and cover off the generic ORC proposed conditions that one would expect for undertaking residential earthworks in Otago. We have no objection to the proposed standard conditions, but some amended and additional conditions outlined below are recommended.

8.2 Amendments to draft conditions

Draft conditions for the consent note maximin unstabilised land shall not exceed 35ha, however there is ambiguity on how this is to be measured and if there is any requirement to verify this. With the existing operations underway within the same land title, a lot of area could be open at any one time and it could be deemed to be included as part of the consent condition, especially for items like R3 cut to stockpile completed to gain material for filling operations under this EMP. A suggested improvement to clarify this is below:

> *The maximum area of unstabilised land within Lot XXXX shall not exceed 35 hectares including gravel extraction operations. For the purpose of this condition the area of unstabilised land does not include areas which are covered with 50mm (or more) of washed gravels or stabilised with a dust suppressant (excluding water).*

And

During the exercise of this consent, the Consent Holder must complete and submit reporting to the Otago Regional Council in the form of a Monthly Environmental Report. The Monthly Environmental Report must be submitted within 5 working days of the end of each month. The Monthly Environmental Report must include reporting and statements actively addressing but not limited to the following that occurred during the reporting month:

a) Updates to the EMP or ESCP;

b) Weekly Site Inspections – number of inspections completed, and summary of corrective actions undertaken;

c) Reporting on monitoring undertaken (including Pre- and Post-Rainfall Events and water quality sampling and results as required by the EMP and ESCP.

d) Measure of unstabilised land through aerial imagery

Draft conditions 7 and 8 of the discharge permit both reference an Erosion and Sediment Control Adaptive Management Plan (ESCAMP), but the conditions do not appear to include a clear requirement to prepare one. As noted above, we recommend that ORC require the consent holder to prepare and obtain certification of an ESCAMP before the relevant earthworks commence.

At least 15 working days prior to the commencement of any earthworks within each stage/area, an Erosion and Sediment Control Adaptative Management Plan (ESCAMP) must be submitted to Otago Regional Council for certification. The ESCAMP must address erosion and sediment control monitoring requirements and changes to management procedures in response to the results of the monitoring. It must also include the following details at minimum:

a) Pre-construction Baseline monitoring containing the in-stream results for turbidity and / or total suspended solids (TSS) within the receiving environment;

b) Baseline monitoring results from an appropriate location within the affected waterbodies;

c) Weather forecasting and monitoring, including implementation of an onsite weather station with a telemetered system that provides electronic notifications;

d) Trigger levels for water quality of the stream and lake, and rainfall events (actual and forecasted events);

e) Ongoing monitoring and sampling regime for the receiving environment, including turbidity and / or TSS monitoring downstream within the receiving environment;

f) Ongoing monitoring and sampling regime for sediment retention devices at the inlet of devices;

g) Management responses when a trigger level is exceeded, including undertaking immediate remedial actions to mitigate adverse effects and the ability to reduce exposed area;

h) Proposed timeframes for investigating and rectifying the cause of any breaches of trigger levels or discharge water quality limits set in the conditions of this consent; and

i) Reporting to Council.

With the EMP covering different area or stages of works with the order in question, the requirement to have the EMP finalised should be amended to include staging. This will result in an area/stage of works having a stage-specific EMP tailored to the works for that operation and avoids having a larger number of revisions to a single generic EMP across a site in operation for many years As covered above there are stages to the works over a number of years not covered in detail by this EMP. As such the following conditions is proposed to be included in the consent.

At least 15 working days prior to the commencement of earthwork activity for each stage of works, the Consent Holder must submit a finalised Environmental Management Plan (EMP) and Erosion and Sediment Control Plan (ESCP) for certification by the Otago Regional Council. This document must be prepared by a Suitable Qualified and Experienced Persons(s) (SQEP) as described in Otago Regional Council's Residential Earthworks in Otago Guide. The ESCP must be in accordance with Auckland Council's Guideline Document 2016/005 (GD05). For the first stage of works be based on the draft EMP/ ESCP dated XXX and submitted as part of the application, and must address the following (as a minimum):

a) <u>Administrative Requirements</u>
- *i. Weekly site inspections*
- *ii. Monthly environmental reporting*
- *iii. Pre and post rainfall inspection as required by GD05;*
- *iv. Independent audit by Suitably Qualified and Experienced Person*
- *v. Notification and management of environmental incidents*
- *vi. Records and registers*
- *vii. Environmental roles and responsibilities of personnel (including nomination of Principal Contractor)*
- *viii. Site induction*

b) <u>Operational Requirements</u>
- *i. Erosion and sedimentation, including an ESCP to be prepared by a SQEP*
- *ii. Water quality monitoring including sampling locations*
- *iii. Dust management*
- *iv. Chemical and fuel management*

c) <u>Sufficient detail to address the following matters</u>
- *i. Specific erosion and sediment control works, including clean and dirty water diversions and sediment basins (locations, dimensions, capacity etc);*
- *ii. Supporting calculations and design drawings;*
- *iii. Catchment boundaries and contour information;*
- *iv. Details of construction methods;*
- *v. Timing and duration of construction and operation of control works;*
- *vi. Processes in place if unexpected contaminated land is encountered;*

vii. Contingency measures for snow and/ or frost events;
viii. Measures to avoid silt and/or sediment tracking onto roads and then to water for the duration of the earthworks, such as:
a. Providing stabilised entry and exit point(s) for vehicles;
b. Providing wheel wash facilities; and
c. Cleaning of road surfaces using street-sweepers immediately where sediment has been tracked onto road;
ix. Details relating to the management of exposed areas;
x. Monitoring and maintenance requirements;
xi. Details relating to the management of long-term stockpiling over 28 days.

8.3 Additional conditions

To ensure the appropriate infiltration rate is applied for each infiltration basin, the condition below is recommended.

> *Prior to commencement of earthworks the Consent Holder must complete site specific infiltration testing for each infiltration basin in accordance with the testing methods outlined in GD07, Appendix A1. Test results shall be used to verify the size of the infiltration basins. If results are found to be less then than 175mm/hr, the infiltration basin shall be redesigned to an appropriate size and submitted for certification.*

As covered above there is more information required for the works within the water courses, as such the following condition is proposed to be included.

> *At least 15 working days prior to the commencement of earthworks within any waterways (Parkburn Creek and Cove works), a Site-Specific Erosion and Sediment Control Plan (SSESCP) must be submitted to Otago Regional Council for certification. The SSESCPs must describe how earthworks within the waterways will be undertaken in accordance with Auckland Council's Guideline Document 2016/005 (GD05). The SSESCP must be prepared by a suitably qualified and experienced person, and must also include the following details at minimum:*
>
> *a) Management measures to demonstrate how erosion and sediment controls will avoid sediment or sediment-laden water entering waterways in accordance with best practice;*
>
> *b) Management of contaminants to water (e.g., hydrocarbons, construction materials);*
>
> *c) Detailed methodology for the ground water management during works*
>
> *d) Details of stabilisation or remediation upon completion of the works.*
>
> *e) Water quality monitoring, trigger and response action*

9 Any other matters that are relevant to large scale earthworks

No additional large-scale earthworks matters have been identified beyond the issues addressed above. The key outstanding matters are therefore the certification scope of the EMP, stage-specific control design, infiltration basin verification, monitoring triggers, and site-specific methodologies for waterbody works.

Yours sincerely

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