

Andrea Vincent

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By email

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cc: Courtenay Isherwood
Isherwood Consultants Limited

Job Title	205 Lud Valley Road Subdivision
Job Reference	19029-LET-001

Flow Environments Limited (FEL) have been engaged by Andrea and Paul Vincent (the Client) to respond to questions 11 to 14 of a request for information related to a Resource Consent application for subdivision of 205 Lud Valley Road, Hira.

Scope

FEL staff were present at the original site investigation which was undertaken by CGW Consulting Engineers (CGW). Following this investigation, CGW prepared a report detailing geotechnical conditions and stormwater and wastewater servicing for the proposed subdivision. This report was subsequently submitted to Nelson City Council (NCC) as part of the subdivision application. NCC have responded with a request for further information (RFI), dated 19 September 2019. As part of the response to these questions, FEL attended site a second time and excavated two shallow test pits to review ground conditions for the purposes on onsite wastewater disposal. Responses to each question are provided below.

RFI Response

Stormwater

11. It is proposed to direct runoff from the developed area on Proposed Lot 2 into a 5,000l detention tank and then into the stream via a pipe. This requires an additional discharge permit under rule FWr.22. It would be prudent to add this to your current application(s). Alternatively, you would need to obtain a separate consent at a later stage. Please address and advise how you wish to proceed.

Please note: the installation of an outlet structure in the stream, including erosion protection is not a permitted activity either and would require consent under section 13 of the RMA.

It is not necessary nor recommended to pipe directly to the stream. It is recommended that the tank discharge is piped past the extent of any earthworks and the disposal field and directed to an existing gully. The exact outlet configuration can be determined at detailed design however two options are considered suitable for this site:

- 1) A PVC outlet pipe with rock scour protection, nominally using 150mm Equivalent Spherical Diameter rock with an apron length of 1-2m and a width of approximately 0.5m.
- 2) Slotted drainage pipe such as "Novacoil" secured to the existing ground surface and installed perpendicular to the slope to evenly distribute flow over a 5-10m length.

With detained stormwater flows, it is considered possible to design either approach to prevent scour.

Wastewater discharge

12. The tests pits used to determine the soil type/ category of the disposal area are located outside the area proposed for the wastewater field. Please provide a soil evaluation, including soil investigations of the actual disposal area (Note: as per ANZS1547:2012 a detailed subsoil investigation shall examine and record the soil profile and solid features within the expected available areas).

Two figures from the CGW report showing the test pit locations and the proposed disposal field have been merged as shown in Figure 1 below. TP2 and TP3 are within the disposal field (green box), or close enough to have no material effect on the conclusions of the report. Following this investigation, the Client has indicated that the disposal field may be relocated further down slope. Two additional shallow test pits (TP4 and TP5) were excavated to a depth of 500mm in the two locations marked on Figure 1. These test pits were excavated 20m from the waterway, the furthest downstream extent of any disposal field. From a wastewater perspective, soil conditions in these two test pits were similar to those encountered in the CGW investigation with dark brown sandy clay topsoil to 280-300mm below ground surface and medium brown strongly structured sandy clay beneath this. Angular gravel inclusions were identified in both holes, more frequently in TP4. The strong, granular structure of the soil and the presence of frequent gravel inclusions will promote good drainage. The relatively conservative assessment of Category 5 soils with a disposal rate of 1.5mm/day and the avoidance of slopes greater than 35%, as concluded in the CGW report, is considered a sound design basis, applicable to the entire east facing slope where a disposal field could be constructed on site.

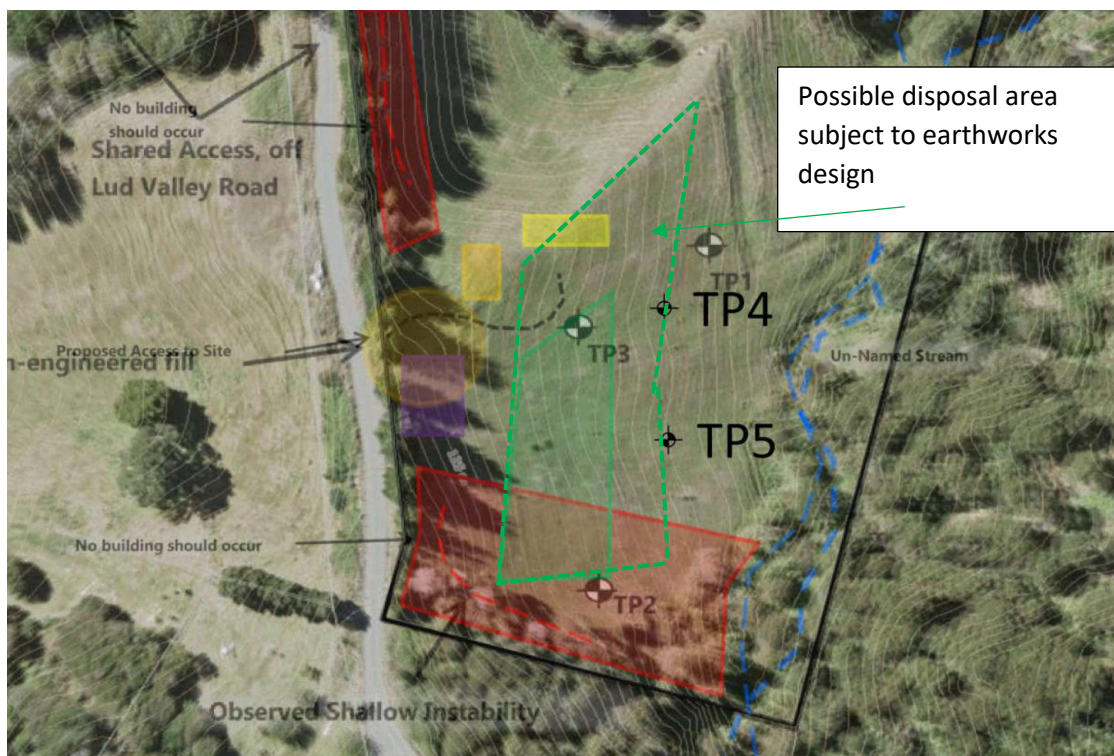


Figure 1: CGW investigation and disposal field locations.

13. As noted in the CGW report, all elements of the proposed onsite wastewater management system require detailed design – this information is required for Council to process the discharge permit, please provide. In particular, the following information is required:
- a. Proposed effluent quality for secondary treatment (BOD₅, TSS) and location of a sampling point;
 - b. Tank size;
 - c. Exact location of the proposed disposal field and reserve area, including proposed drip line layout;
 - d. Setback from nearest water body (I note the report, and FWr.291. recommend a minimum setback of 20m, but no exact measurement/ setback has been provided);
 - e. Distance to nearest other disposal field, incl. existing field on Propose Lot 1;
 - f. Distance to nearest bore;
 - g. The requirement for and location of stormwater cut off drains;
 - h. The requirement for visual and audible alarms;
 - i. Recommendations/ requirements for vegetation cover of the field;
 - j. Maintenance requirements & frequency.

Secondary treatment of effluent is required for land application using dripline. A range of proprietary systems are available these systems will have different tank sizes, alarm systems and sampling points in accordance with the manufacturers standard design. A response to question 13 has been provided where appropriate with references to item numbers a-j. Exact system details such as system type and dripline layout will not be specified until detailed design. AS/NZS1547:2012 has been developed to ensure onsite domestic wastewater discharge is sustainable without environmental effect. Provided the system is designed to comply with this standard, detailed system design details should not be necessary to understand the environmental effect of the proposed discharge.

Typical effluent quality limits imposed for secondary treatment plants are Biochemical Oxygen Demand (BOD) maximum of 30mg/L and Total Suspended Solids (TSS) maximum of 45 mg/L (item a). A range of proprietary systems are available which can easily exceed this requirement, it is recommended that a system is specified which has had its performance verified through the Onsite Effluent Testing (OSET) trials managed by Water New Zealand. As an example, a commonly used unit, an Oasis S2000 has 5 chambers with a total working capacity of 6,860L however different systems will have a different capacity (item b). The audible/visual alarm is mounted on the control cabinet which can be fitted to the unit or remotely mounted (item h). Maintenance requirements are specific to the system which is installed however typically, 12 monthly inspections are recommended which include an inspection of the system, checking sludge levels in the treatment plant chambers and flushing/inspection of driplines (item j). Sample points are typically provided as close to the treatment plant as possible downstream of the pump (item a).

From discussions with the Client, the exact field location may change once the earthworks design is finalised. At this point, it is recommended to keep the disposal field as far as possible from the earthworks to maximise flexibility in the site layout. A separation distance of 20m to the nearest water

body is proposed in the indicative layout below (item d). Again, the system designer should have flexibility when determining the layout of lines, subject to the conditions in the CGW report. It is recommended that if there is an elevation difference of more than 10m in the disposal field, the field is split into 2 zones with no more than 10m elevation difference per zone to minimise preferential disposal of effluent at lower elevations. Based on the layout plans at present, a field 10m wide and 88m long is recommended (item c). The elevation difference is less than 10m with this layout. The field location shown in Figure 2 below includes 1220m² of disposal area, exceeding the requirement of 880m² nominated in the CGW report. A reserve area is not specifically required by the NRMP however there is ample land within the nominated disposal area for additional wastewater field to be constructed. It is noted that for dripline, complete replacement of the field is unlikely. If remediation of the field is required, it is more likely that individual lines will require replacement if they are damaged. Ample land area is available for this to occur. The existing disposal field is in the order of 80m from the proposed new field (item e). FEL are unaware of any bores used for water supply in this area, a 50m offset from the disposal field (as required by the NRMP) is shown in Figure 2; there are no bores within this area. The distance to the nearest bore exceeds 50m (item f). The existing pasture vegetation cover is suitable for the disposal field. This should be maintained or enhanced with shrubs or other relatively small vegetation following installation of the field with stock access prevented (item i).

Based on the existing topography, there is no requirement for stormwater cut-off drains above the field as water will runoff relatively quickly. This should be reviewed once the earthworks design is complete. Again, piped stormwater from the house and shed should be diverted or piped away from the disposal field (item j)

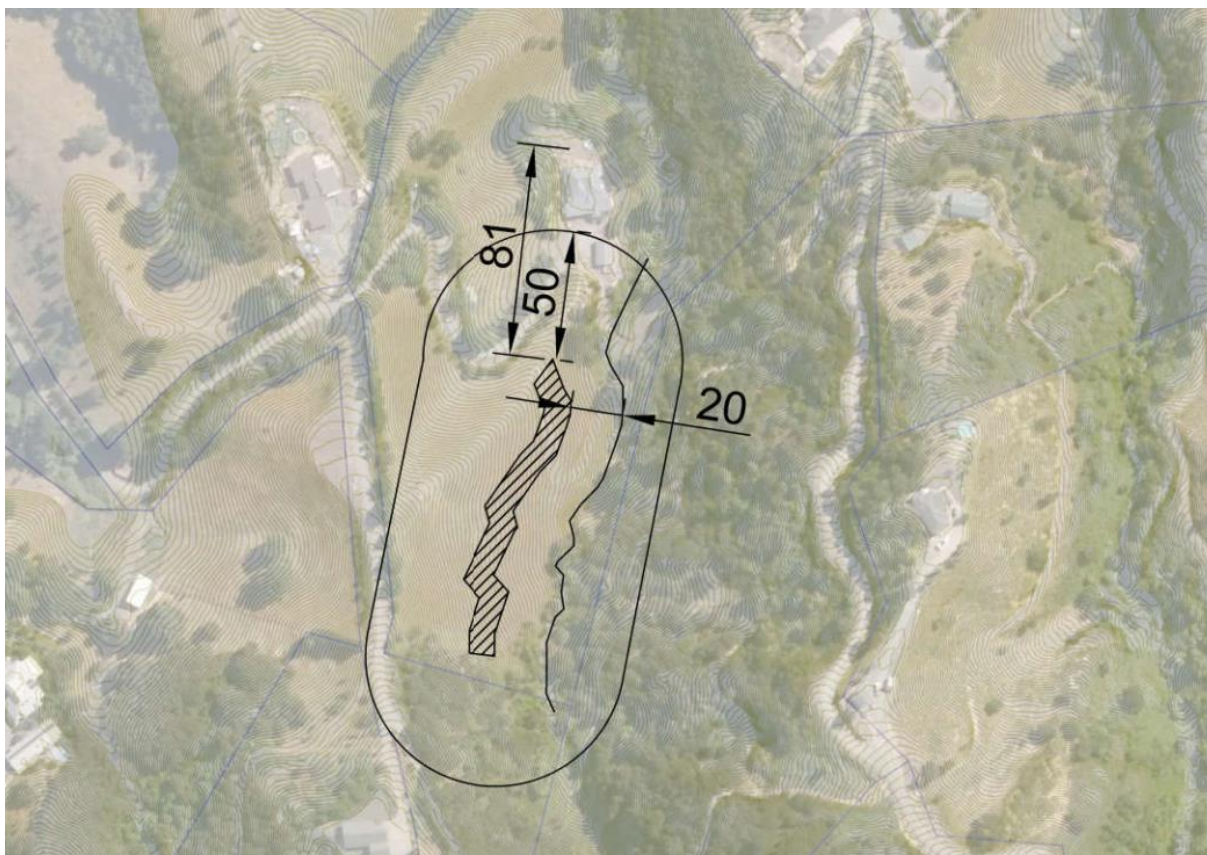


Figure 2: Indicative Field Location.

14. I note that the proposed flow allowance for the site water supply is reliant on the new dwelling on Proposed Lot 2 being fitted with water reduction fixtures ("CGW understand that water saving appliances will be installed"). Please confirm that you are offering this proposed mitigation measure as a condition of consent and note that the fixtures would need to be maintained to ensure the discharge volume limit is met. Otherwise the flow allowance would need to be increased to 200l per person per day.

Following discussions with the Client, I confirm that "Standard water reduction fixtures" in accordance with AS/NZS1547:2012 are offered as a mitigation to reduce wastewater production rates.

Please contact the undersigned should you have any further questions regarding this letter.

Regards



David Carlson-McColl

Water and Wastewater Engineer | CP.Eng

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