

Our Ref: 268089

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Date: 04 November 2009

To: Chrisle Sargent

Re: RFI for Resource Consent for a Subdivision and Dwellings at Hans Bay, Lake Kaniere: - Stormwater and Wastewater

Dear Chrisie,

I respond to Fiona Aston's request for further information as follows.

Wastewater

- The wastewater treatment and land application system will consist of a proprietary treatment device and subsurface drip irrigation into a designated disposal area. The treatment device will provide secondary treatment to the effluent prior to discharge. These treatment systems require at least annual inspections and maintenance to ensure that they provide correct treatment. These inspections will ensure that there is very little likelihood of septic tank failure. Because of this maintenance requirement only systems with local agents have been recommended. In addition to the regular maintenance, as the dwellings may be intermittently occupied, it is recommended that the systems have telemetry monitoring, so that should a fault occur the local maintenance agent is notified that there is a problem with the unit.
- The effluent will be pumped from the treatment plants to the land application area. The pump stations will require specific design depending on the number of bedrooms proposed for the dwellings. They will be designed with one days storage and a two level alarm to notify the occupier that the pump is not working and when there is 50% storage remaining. These alarms would also be connected to the treatment systems telemetry system.
- The pipe work from the pump stations to the disposal fields will be polyethylene (PE) rated to withstand the pressures they will be subject to during their operation. This type of pipe when correctly installed is expected to have a 100-year life. PE pipes have the ability to stretch without rupture should there be any ground slippage. Following any slippage the pipe route would require inspection to determine whether any sections of pipe require maintenance.
- The location of the land application field cannot be defined exactly until the dwelling for each lot has been finalised and hence the area required determined. They will cover an area of up to 500m² and will be positioned a minimum of five metres from the adjacent lot boundaries and 25m from top of bank. To prevent any increase in water loadings above the terrace, an interceptor swale/bund is to be formed above the lots. This will take surface water away from the terrace by diverting it to the

north^[c1], and to the south along the legal road to discharge into the existing small drain.

- As the properties will be reliant on roof water for their water supply, should there be a power outage there will be limited water available for use in the dwellings and so there will be limited wastewater flows.
- Whilst it would be worthwhile connecting the wastewater from these lots to the wastewater system for recently approved subdivision at the top of Stuart Street, that wastewater treatment and land application system has not been built and it is unlikely to be built before these lots will be developed.

Stormwater

- An assessment of historic flooding of the area showed that ponding might have extended beyond the proposed ROW to a maximum RL matching the low point in the Hans Bay Road, which is assessed as being RL 133.2. The formation of the ROW and elevated building platforms for each lots above this level will require filling over an estimated area of 800m². The average depth of fill will be about 200mm, or a volume of about 160m³ for the Right of Way. This filling could reduce the storage available for ponded water on site.
- The proposal will increase the impermeable areas and may increase the runoff from the permeable areas through loss/change of vegetation. These changes occur at the bottom of the catchment so will not affect the flows from the rest of the catchment as the peak runoff will occur at different times. If the rain occurs when the lake level is high, creating a back water effect in the 600mm culvert under Hans Bay Road that drains the site, it could lead to more ponding occurring on site.
- The diversion of surface runoff from above the terrace, to prevent any increase in water loadings will reduce the catchment draining to the area of ponding. The reduction in area is estimated to be 10,000m².
- The impact of these changes on the ponding area by Hans Bay Road is assessed as follows:

The critical duration event for this catchment is assessed as between a the 2 hour and 6-hour rain events, which from HIRDS for a 5-year rain event (20% AEP) is a rain depth of 62.8mm or 115.7mm.

The volume runoff entering the ponding area has been calculated as
area x runoff coefficient x rain depth

For the 2-hour rain event the change in volume is

The reduction due to the diversion is
 $10,000 \times 0.3 \times 0.0628 = 188\text{m}^3$

The increase from change in land use is
 $5 \times 0.0628 \times (140 \times (0.9 - 0.3) + 300 \times (0.45 - 0.3)) = 41\text{m}^3$

the loss in volume is 160m^3

so the change in volume is $160 + 41 - 188 = 13\text{m}^3$, which over a ponding area of 800m^2 is an increase in depth of 16mm.

For the 6-hour rain event the change in volume is

The reduction due to the diversion is
 $10,000 \times 0.3 \times 0.1157 = 347\text{m}^3$

The increase from change in land use is
 $5 \times 0.1157 \times (140 \times (0.9 - 0.3) + 300 \times (0.45 - 0.3)) = 75\text{m}^3$

the loss in volume is 160m^3

so the change in volume is $160 + 75 - 347 = -112\text{m}^3$, which over a ponding area of 1200m^2 is a decrease in depth of 140mm.

- From the above assessment it is considered that the effect of the filling and change in land use will have minimal impact on the catchment.

Yours sincerely,
ELIOT SINCLAIR & PARTNERS LTD



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[c1]Does this mean we need a concession? Or at least ask Doc for affected parties approval?

