

17 April 2019

Sonya Nicol
C/-Environment Southland
Private Bag 90116
Invercargill 9840

Dear Sonya,

Pyper's Produce, Branxholme – Request for further information

In response to the matters that you seek further information on in your letter dated 21 February 2019, I can advise as follows:

- 1. Further sampling and assessment of the wash water quality in order to characterise the load and concentration of nitrogen and dissolved reactive phosphorous (DRP) being discharged, and the effect of this on the environment. At a minimum please provide from each of the existing storage ponds sampling results from a sample of the wash water from the bottom of the pond (water extracted from close to the pond floor) and the top (pond surface), and commentary on the meaning of these results. This information is required to help understand the amount (load) of nitrogen and DRP being discharged to groundwater and land to assess potential risk of this activity to the aquifer below.*

As discussed at the meeting held on the 6 March 2019, sampling has been undertaken of the surface and base of two settling ponds testing for the following parameters;

- Total Oxidised Nitrogen
- Total Ammoniacal Nitrogen
- Total Nitrogen
- Dissolved Reactive Phosphorus

Field measurements were also undertaken for the following parameters;

- Dissolved Oxygen
- Conductivity
- Water temperature,
- Oxidation-Reduction Potential
- pH

The results of these samples are appended.

The sample results show that there is little variation between the surface and base of the ponds and are in line with other sampling that has been undertaken of the discharge in the past.

Results for total nitrogen showed a slight increase on the base of the pond, with the results for total ammoniacal nitrogen being slightly higher on the surface. Results for Nitrogen (Nitrate +Nitrite) and DRP were relatively consistent across both ponds and very low, which suggest that organic nitrogen is a significant proportion of the total nitrogen.

Details of the time, location, depth and weather conditions at the time of sampling are appended. The contractor that undertook the sampling has commented that the the lack of oxygen and the negative ORP readings in pond 2 could indicate that denitrification may be occurring but its significance is unknown.

- 2. Further sampling and assessment of the wash water quality of the proposed discharge to determine chlorine levels and the effect of this on the environment. Please also provide further information and discussion on the Sanitiser product that is used, including a copy of the Material Safety Data Sheet (MSDS).*

Further sampling in relation to chlorine levels has not been undertaken as it is not considered necessary. Generally sanitising products use chlorine at concentrations between 5-15mg/l. However, once the washwater is discharged the chlorine levels in the storage ponds will be at undetectable levels.¹

The sanitiser product that is used on site is HC Protect 800C. Information included on the safety data sheet provided, states that the sanitiser used is a strong oxidiser and will decompose on exposure to air, heat and sunlight which in turn will cause a loss of available chlorine.

The applicant has advised that sanitisers such as hypochlorous acid are very reactive and quickly oxidise in the presence of organic matter. Water that contains sanitiser is recycled back into the start of the wash system where there is a higher level of organic matter present rendering any remaining sanitiser neutral.

¹ Barber A, Smith S, Wharfe L, Hodgson V, 2017. Vegetable Washwater- Literature and Council Policy Review, Vegetable Research + Innovation Board, Horticulture New Zealand.

3. *Given the current state of shallow groundwater in the vicinity, please provide more information about the proposal. Please include provide details on:*
- a) consideration of any alternative denitrification process(es) prior to discharge of the wash water. If alternatives have been considered please describe, and if not please describe why this is not considered necessary;*
 - b) whether there is an established monitoring programme for their wash water. If so, please provide detail, and if not please propose a monitoring programme; and*
 - c) consideration of alternative disposal options, the reasons for proposed option, and the reasoning for not proposing other options.*

- a) There has not been any consideration of alternative denitrification processes prior to discharge. The nitrogen content of the wash water is considered to be very low, especially when compared to discharges such as dairy effluents.

The irrigation of wash water onto land has been discussed, however due to the high volume of wash water that is discharged into the ponds daily, high sediment loadings and lack of suitable land to use for this purpose, daily irrigation to land is not considered to be a viable option at present. It is also unclear what the advantage would be to the environment, in particular, groundwater quality given the level of nutrients in the discharge.

- b) Currently there is no established monitoring programme for wash water. The applicant would be agreeable to testing the wash water annually and this could be implemented by way of a consent condition. Due to the nature of the discharge, more frequent monitoring is not considered necessary.
- c) The current method of disposal allows water to infiltrate back into the groundwater under controlled conditions via soil percolation. This method of disposal is an effective way of removing suspended sediment and is determined to be good practice as determined by the Vegetable Washwater Code of Practice produced by Horticulture New Zealand (attached).

Other options for washwater disposal could include irrigation to land or removing all washwater off site for disposal elsewhere. Irrigation of wash water to land would involve high volumes of wash water being discharged daily, high sediment loadings and the daily management of an irrigation system. There is also the potential for overland flow of the wash water during saturated soil conditions that would potentially affect surface water quality. If adverse soil conditions have to be avoided, storage would be another

requirement. Due to the high level of management and potential risk of overland flow, daily irrigation is not considered to be a viable option at present.

The removal of washwater off site to be treated at a wastewater treatment plant would be cost prohibitive. It is also possible there is no wastewater treatment plant locally capable of accepting large seasonal volumes of washwater produced.

I hope that this information addresses the matters you have queried. Please contact me if any clarification is required.

Yours faithfully,



Bridgett Aitken
Planner Environmental