

24 March 2017

Environment Southland
Private Bag 90116
Invercargill 9348

Our ref: S14303
ES ref: APP-20171005

Attn: Danielle Petricevich

Dear Danielle,

RE: Request for Further Information under Section 92(1) of the Resource Management Act 1991 - Application for a discharge permit, land use consents and a water permit, Schrader Mains Limited.

In reference to your request for further information dated 27 January 2017, and further phone discussion dated 1 February 2017, find outlined below our response to this request.

1. An assessment of the application against Policy 16 of the proposed Southland Water and Land Plan (pSWLP). In the application, it is stated that an assessment against this policy cannot be completed. However, I consider that this assessment can and should be undertaken as this policy is a key policy within the pSWLP for the activity of the use of land for new dairy farming of cows. I am requiring this information because:

- ✚ Schedule 4 of the RMA states that all applications must include an assessment of the activity against any relevant provisions of a document referred to in section 104(1)(b) and that the assessment under sub-clause (1)(g) must include an assessment of the activity against any relevant objectives, policies, or rules in a document including those in a proposed plan.***
- ✚ Policy 16 provides strong direction on how to manage the activities and provides understanding about the adverse effects and levels that are acceptable.***

Part 1 of Policy 16 seeks to minimise the environmental effects of farming activities on water quality. In the first instance, the policy directs the Consent Authority to strongly discourage the establishment of new dairy farming or new intensive winter grazing activities in close proximity to sensitive water bodies identified in Appendix Q of the pSWLP. The subject property is located within the Waituna Lagoon catchment, which is listed in Appendix Q. As the



LANDPRO

Make the most of your land

📍 **Cromwell**

Unit 7, Cromtrade, 2 McNulty Road
PO Box 302, Cromwell 9342, New Zealand
+64 3 445 9905

📍 **Gore**

23 Medway Street
Gore 9710, New Zealand
+64 3 208 4450

📍 **New Plymouth**

Vero House, Level 2, 10 Devon Street East
New Plymouth 4342, New Zealand
+64 6 769 5631

📍 **Timaru**

Shop 7, 300 Hilton Highway, Washdyke
Timaru 7910, New Zealand
+64 3 688 4645

0800 023 318

info@landpro.co.nz

www.landpro.co.nz

proposed dairy farming activity is to occur at a distance greater than 15 km upstream of the Waituna Lagoon, it is not considered to be in 'close proximity.' Therefore, the proposal is consistent with Policy 16(1)(a) of the pSWLP.

In terms of 16(1)(b), the policy indicates that "*where the effects on the quality of water, including cumulatively, of groundwater, waterbodies, coastal lakes, lagoons, tidal estuaries, salt marshes and coastal wetlands cannot be avoided or fully mitigated or in areas where water quality is already degraded to the point of being overallocated*" the direction is to strongly discourage applications to establish new dairy farming of cows.

In the absence of water quality limits, it is difficult to ascertain the allocation status of water quality in a complete sense, although it is generally understood that water quality in the Waituna Catchment may be nearing what could be considered as 'over-allocation' of water quality, but has not yet been definitively determined as 'overallocated'. The applicant has proposed many good management practices in the original FEMP, and proposes a new land use to be undertaken on the property, in which it is estimated by OVERSEER® that existing nutrient losses to water will reduce i.e. nitrogen losses to water will be reduced by 38% as a result of this proposal. In terms of phosphorous losses to water, OVERSEER® predicts an increase as a result of the proposal, however the application proposes good management practices (including those outlined in the Farm Environmental Management Plan (FEMP), and Table 8 of the original application), which are not rewarded in OVERSEER® that are expected to reduce the predicted increase in P losses. The proposal therefore presents significant benefits to the Waituna Lagoon catchment in that allocation of water quality is predicted to be reduced. Policy 16(1)(b) does not provide for reductions in overallocated water quality when they are proposed by way of changing an existing land use to dairy farming. It is requested that Council exercise their discretion when considering the proposal as a whole and the relevant policies, and take a pragmatic approach when considering the relative weighting of the pSWLP and the potential benefits the proposal may provide for water quality.

The second part of Policy 16 requires that all farming activities including existing (i.e. not excluding proposed farming activities) manage effects on water quality. A FEMP in accordance with Appendix N has been prepared for the proposal, and it is noted that a Register of Independently Audited Self-Management Participants does not presently exist. The FEMP outlines existing setbacks from waterbodies, riparian planting, limits on areas and duration of exposed soils, identification of Critical Source Areas (CSA's) and stock exclusion. These CSA's include (but not restricted to) laneways, infrastructure such as standoff pad, silage pads, and crossings. Good Management Practices, consistent with the identified Physiographic Zone, are proposed to manage the potential run-off and leaching of nutrients, microbial contaminants and sediment. Therefore, the proposal is wholly consistent with Part 2 of Policy 16.

2. *Electronic Overseer files for the scenarios modelled in the application. I require this information to be able to compare and assess the nutrient budgets provided in terms of the inputs and consistency with the application and proposed on farm practices. This is also to ensure that the budgets have been completed in accordance with the relevant guidelines.*

Please see attached USB.

3. *The proposed timing (months and hours per day) that the feed pad/standoff pad will be used during the year and maximum cow numbers that are likely to be on the facility at any one time:*

- ✚ I require this information as the only details included in the application regarding this facility, are that it is concrete and that it will be used to feed cows and stand cows off the paddocks during poor weather conditions.***

According to the DairyNZ publication 'Feed pads – design and construction (8 -2)' the overall space requirements are 3.5 m²/cow when it is being used for a short period of time (i.e. less than 12 hours) is sufficient. Therefore, a standoff pad up to 320 m² will fit 97 cows.

The purpose of providing for a feedpad/stand-off pad as part of this application is to allow the applicant flexibility for their proposed dairy operation, and to make a financial investment to reduce the times cows spend on paddocks. An 85-cow standoff pad will be sufficient to mitigate effects on water quality when there is an extreme risk of pugging, particularly during the very wet periods.

The standoff pad is intended to be used as a contingency measure when adverse weather conditions occur and stock can be fed while on the standoff pad. Stock can be stood off to enable restricted grazing of paddocks during adverse weather conditions and to mitigate associated potential effects on water quality.

It is only proposed to install the one concrete yard area which will be utilised as a stand-off pad/feed pad area. The effluent calculations have simply allowed for an additional feed pad area to ensure that should the applicant wish to consider this as an option at some future point that they have provided for sufficient future proofing in the size of the effluent pond. It is acknowledged that any future feedpad area would require further resource consents.

The standoff pad will be washed down after use.

4. An explanation of the inputs into the Dairy Effluent Storage Calculator and adjustment to the inputs if required as follows:

- ✚ Is the climate/rainfall site used in the application the most accurate for the site? I require this information because the climate station is not only used for rainfall but also is used to calculate soil moisture deficit, so changing the climate site may provide for a better representation of rainfall volume, but may not be accurate in terms of calculating when there is a soil moisture deficit and how much.***

As there are limited climate sites available within the DESC, a level of flexibility when selecting climate sites must be exercised. While it is recommended in the DESC user guide to choose the nearest site to the property, the rainfall at the nearest site to this property (Woodlands at Garvie Road) estimates 12 % less rainfall (1,013 mm) would be received in this area than the OVERSEER® climate tool (1,152 mm). The Woodlands at Garvie Road site is also 52 m above mean seal level (amsl) and the property is located at 40 m amsl (according to www.topomap.co.nz). When considering both of these aspects, the Waimahaka rainfall site was used for the purpose of calculating effluent storage requirements, as it is estimated to receive 1,149 mm of rainfall per annum and is at an elevation of 45 m amsl. Therefore, it is likely that this site is more representative of actual rainfall received, and is appropriate to use in this instance.

Each rainfall site within the DESC, estimates the volume of rainfall collected in the catchment areas, and the rainfall pattern throughout the year which determines the soil moisture deficit on any given day. The soils at the Waimahaka site and the property are both 'high risk' soils consistent with Houlbrooke (2009). The rainfall

pattern may differ slightly between the nearest site and the site used in the DESC, however this is irrelevant as it is evident that under either scenario sufficient storage is available.

Overall, the soil moisture site monitoring is irrelevant as the applicant will test soil moisture on farm independently of any soil monitoring site, and the DESC provides a crude indication of when soil conditions would be suitable for effluent application only. The site-specific monitoring cannot be input to the DESC.

As mentioned above, the subject site is closer to 40 m amsl. It is noted that the height above sea level was incorrect in the original application at 80 m amsl, and it is requested that the original application is amended to reflect that the property is at 40 m amsl.

✚ *The wash volumes used in the wash water section are based on the peak cow numbers produced by Overseer rather than the maximum consented cow numbers. This should be based on the maximum consented cow numbers, as this is the number of cows that wash water could be produced from.*

The attached DESC (Attachment A) has provided for the peak number of cows (i.e. 306 cows), from September to April (inclusive).

✚ *The wash volumes are based on 60 L/cow/day, but in the application, there is no explanation of why this is. The water volumes applied for in the application relate to 120 L/cow/day, which is usually split with 50 L/cow/day being allocated to wash water and 70 L/cow/day being allocated to stock drinking water.*

The attached DESC has been run with 50 L/cow/day wash water input for dairy shed wash down and standoff pad wash down. This is consistent with Environment Southlands recommended wash water use and consistent with the volumes of water applied for in the application.

This effluent calculation is attached as Attachment A to this further information response, and supersedes the original DESC contained within the RDAgritech report.

✚ *The irrigation depths used and volumes that relate to these, especially the figures used for the Winter/Spring depth and volume and how these will be achieved.*

Please refer to Attachment A.

✚ *The feed pad/standoff pad has been input into the other areas section of the catchment areas section, when there is a specific feed pad area input that this could be put into. Please explain why this has been done and how it may affect the outputs of the calculator.*

We understand that the effluent calculations were completed by RDAgritech before the applicant knew the details of the standoff pad, and therefore an approximate standoff pad area was input to the other areas section of the catchment areas section. The calculator assumes that this catchment area receives rainfall year-round and no diversion occurs.

The effluent calcs have been amended to anticipate a standoff pad used for up to 2 hours a day throughout the entire milking season, with 5 m³ wash water every second day, on days when the standoff pad is used but

not washed, the pad will be scraped. As a daily average, this equates to 2.5 m³/day. It is noted that the standoff pad will not be washed down every day it is used nor will it be used every day of the season, and will only be used as a contingency measure. These are appended as Attachment A and supersede the RD Agritech calculations. It is noted that the volumes of water sought therefore will need to increase slightly to account for the additional standoff pad wash down water. This is discussed further in Section 18 below.

5. *Electronic Dairy Effluent Storage Calculator files of the current scenario and any amended scenario. I require this information to be able to easily assess the inputs, consistency with the application and proposed on farm practices. This will also show any relevant outputs.*

Please see the attached documents.

6. *An explanation as to why the nearest soil moisture monitoring site is appropriate (in terms of climate and soil types) to use to help determine when the discharge of effluent is appropriate.*

There are two Environment Southland (ES) soil moisture monitoring sites within the Waituna Catchment. The soil moisture monitoring site at Woodlands is approximately 8 km north west of the property (in a straight line). The TopoClimate south and S-Maps soil surveys, map soil polygons and identify the dominant and less dominant soil series found within each polygon. The dominant soil types on the property are Woodlands and Dacre and S-Map estimates that 20 % of the soil series within the Woodlands mapped polygon, contains Waikiwi Soils. Waikiwi soils are well drained while Woodlands soils are imperfectly drained. While the Waikiwi soil type may be present on the property there is uncertainty to what extent, therefore the applicant proposes to use an onsite moisture monitoring.

It is acknowledged that the nearest Council moisture monitoring site is located on predominantly Waikiwi soils, therefore the applicant would be happy to undertake onsite soil moisture readings via the use of a Harvest system. Harvest utilises a moisture probe, which record soil moisture at up to half hour or hour intervals and reports the recorded soil moisture the Harvest webpage which the operator can check for the real-time moisture readings, immediately before applying effluent to land. It is requested that the application is amended to remove the reference to using the ES soil moisture monitoring site, and instead it is confirmed that Harvest will be used on farm.

7. *Information on the proposed hand held monitoring device that will be used to help determine which soils are suitable to receive effluent. This should include what factors it takes into account, and what data it provides to the effluent system operator.*

Please find attached a brochure (Attachment B) which explains the harvest system and how the likely soil moisture sensor will work. The actual type of soil moisture sensor will need to be determined when a representative from harvest can come out on site and the soil texture and site can be investigated. It is not considered necessary that Council limits the applicant to the model or type of soil probe to be used on the property, only that is generally in accordance with the brochure and will give the information required in the required format (i.e. field capacity/soil moisture content) to the person in charge of the effluent system (obtained by checking the Harvest webpage).

The use of the soil moisture information will be governed by the GMP's outlined in the attached FEMP, i.e. how the information obtained is used to inform the effluent application on the property, and what the person in charge of the effluent system must do next.

As mentioned above, please note that any reference to using the ES soil moisture monitoring site within the original application should be disregarded by the Consent Authority for the purpose of continuing the processing of this consent application.

8. The application states that the proposed activity will have positive benefits in terms of the applicant's ability to provide for their social and economic wellbeing, while additionally contributing to the regional economy in terms of wages and increased expenditure. The application also states that the proposed land use will also provide for a greater investment return than alternatives. It is requested that evidence is supplied to support the statements provided in the application, including the scale and intensity of positive effects and a quantitative assessment of these effects.

✚ I require this information to be able to assess and weigh up the positive and negative effects of the proposed activities.

To be provided to Council as soon as it has been received to the applicant.

9. An assessment of effects (including cumulative effects) relating to the proposed activities in terms of potential nutrient, sediment and microbial loss (identified in the application) to the environment and what the result of these losses will have on the receiving environment and the values associated with it (including lwi values).

✚ I require this information in order to understand what the effects of the activity are likely to be on the receiving environment. Whilst Overseer presents a scenario where the 'losses' of Nitrogen are decreasing and Phosphorus are increasing, the effect on the values of the receiving environment of the 'losses' need to be assessed.

Groundwater

A desktop exercise has been undertaken to assess the potential effects of the proposal on shallow groundwater concentrations, as summarised in Table 1 below. The Overseer modelling outputs from the existing and proposed land uses have been used to estimate the average nitrogen concentration in drainage water from the property. The state of groundwater quality under the property is conservatively assumed to reflect the upper end of the range for minor to moderate land use impacts (from Rissmann, 2012). Land surface recharge is based on the median drainage estimate for the Waihopai groundwater zone (Chanut, 2014).

Table 1 shows that nitrate concentrations in shallow groundwater may decrease to a concentration of 4.1 g/m³ (from 5.4 g/m³) within the area immediately surrounding the applicants' property under the proposed land use. Nitrate concentrations in groundwater associated with losses from the applicants' property will dissipate as water moves through the aquifer.

Table 1: Estimate of the effects of the existing and proposed land use on shallow groundwater

| Component | Description | Volume of water (m³) | Nitrate concentration (g/m³) |
|--------------------------------|---|--|--|
| Existing groundwater condition | Assuming a zone of reasonable mixing that is 500 m wide, 1 km long with a shallow groundwater saturated thickness of 5 m and effective porosity of 0.2. It is conservatively assumed that | 500,000 | 3.0 |

| | | | |
|---------------------------|--|---------|------------|
| | groundwater in the mixing zone has an existing average nitrate concentration of 3.0 g/m ³ . | | |
| Current land use | | | |
| Applicant's input | Using a land surface recharge of 0.373 m/year over the property area of 103 ha with drainage water having a weighted average nitrate concentration of 8.6 g/m ³ . | 384,190 | 8.6 |
| New groundwater condition | | 884,190 | 5.4 |
| Proposed land use | | | |
| Applicant's input | Using a land surface recharge of 0.373 m/year over the property area of 103 ha with drainage water having a weighted average nitrate concentration of 5.6 g/m ³ . | 384,190 | 5.6 |
| New groundwater condition | | 884,190 | 4.1 |

E.coli loss to groundwater is considered to be minimal on the property. This reflects the low groundwater quality contaminant risk associated with the Gleyed physiographic zone on the property. Excellent securing of all boreheads will take place on the property, with concrete aprons, raised casings, bore caps and enclosed sheds over each of the bores. The proposed land use represents a lower winter stocking rate than currently occurs. On this basis, the risk of *E.coli* making its way through the soil profile into groundwater is low.

The effects of sediment and phosphorus losses to groundwater have not been assessed as this is considered to represent a low risk given the environmental setting (e.g. fine textured soils with moderate to high anion storage capacity) and adoption of good management practices.

As discussed in the technical assessment for the application (dated 7th December 2016), these concentrations are well within the maximum acceptable value for New Zealand drinking water and the annual median nitrate toxicity national bottom line in the National Policy Statement for Freshwater Management. With respect to cumulative effects, the technical comment showed that the modelled nitrogen losses from the proposed land use (25 kg N/ha/year) are less than the 2006-2012 average loss (35.8 to 41.3 N kg/ha/year based on water quality data) and the 2014 median farm loss (37 kg N/ha/year based on land use modelling).

Surface water

Contaminants that accumulate in the soil start moving when soil moisture levels are high (generally occurs in late autumn and winter) or following prolonged heavy rainfall. This initiates drainage which has the potential to carry phosphorus, sediment, microbes and nitrogen within the drainage water, either through the farm's mole-pipe drainage network or across the land surface via overland flow into waterways.

A range of good management practices are already undertaken on the property with further measures planned to prevent the loss of contaminants to waterways. These practices are outlined in the FEMP and are centered on protecting the soil structure to prevent the mobilization of topsoil and associated soil bound phosphorus, managing critical source areas, and reducing phosphate use or loss.

GMPs include re-sowing of bare and damaged soil as soon as practical, minimizing the heavy grazing of stock on wet soils (wintering-off). Managing CSA's is the most critical aspect of preventing the overland flow of contaminants to water. Management practices that are proposed to prevent overland flow include avoiding

grazing of CSA's when soils are near saturated, leaving grass areas around CSA's and their margins, planting/maintaining effective riparian margins, maintaining buffers between lanes and adjacent waterways. The use of phosphate fertilizer is going to be reviewed to ensure capital applications are only applied to those paddocks that have below optimum Olsen P levels.

These GMP's, as well as the general farm good management practices outlined in the FEMP have been shown to improve water quality outcomes (Monaghan, 2016). With the smaller number of flowing waterways on the farms, these management practices will effectively mitigate the overland flow of contaminants into surface waterways.

GMP's to prevent the discharge of contaminants to surface water from the farms mole-pipe drains network have also been investigated. Once contaminants enter tile drains they are transported directly to surface water bodies, bypassing the natural filtering properties of the soil. In order to prevent contaminants entering surface water bodies they either need to be prevented from entering the tile drain network or the outflow from the tile needs to be treated. A mixture of these strategies will be implemented on the property as outlined in the FEMP.

A proportion of the swales on the farm will discharge into the riparian buffer strip which is planted and stock excluded. It is noted that at least one spot the buffer will be increased by one meter or two with new fencing and will be planted out. This allows sediment to settle out (and associated phosphate) before outflows discharge into nearby waterways. This effectively removes sediment and phosphate from the drainage water prior to discharging into natural waterways.

Contaminants will be prevented from entering the tile drainage network via a range of methods including: avoiding grazing of paddocks where water has ponded on or around tile drains, minimizing the heavy grazing of stock on the farm when soils are close to saturation (i.e. wintering off), using lower inputs of nitrogen fertiliser that are matched to feed deficits, applying capital applications of phosphate fertilisers only to those paddocks with low Olsen P and carefully managing the application of effluent on and around tile drains. These mitigations have been shown (Monaghan, 2016) to restrict contaminant flows into subsurface drains and subsequently into surface waterways. In addition to the specific mitigations listed above, general GMPs outlined in the FEMP will be implemented.

With the implementation of measures to treat some tile drain outflows and prevent contaminants entering tile drains, the impacts on surface water as a result of the proposed farming operation are likely to be no more than minor. In addition, a monitoring strategy has been proposed to assess the effectiveness of GMP's and tile drainage treatment. This comprises groundwater quality monitoring (focusing on nitrogen and microbial losses) and surface water quality monitoring (nitrogen, phosphorus, sediment and microbes), with the latter including sampling of both the stream and tile drain discharge.

Impact on identified values

The impact of the predicted nutrient losses of the proposal will have positive benefits on the values associated with the receiving environment. These values have been identified in Table 3 of the original application.

As the identified effects of the proposal including proposed management practices seek to at worst, maintain existing water quality and where possible improve water quality, it is not expected that the proposal would single-handedly result in a reduction of the quality of freshwater in the Waituna Lagoon. The expected reduction in current N losses to water is consistent with reducing over-allocation of freshwater water quality.

Following this direction at a catchment scale, water within the Waituna Catchment would be able support mauri, provide for te te hauora o te tangata, te hauora o te taiao, mahinga kai and te hauora o te wai, and safeguard the aquatic ecosystem health, life-supporting capacity, of surface water bodies and their margins. Furthermore, possible recreational values such as bathing and trout fishing can also be supported.

The effects of the proposal on landscape, natural character and historic heritage have been assessed in Section 6.7 of the original application and are expected to be no more than minor.

The proposed volumes of water sought from the Awarua Groundwater Management Zone are considered efficient for the intended use.

10. A discussion as to why the application to establish a new dairy farm and the application to use land for new dairy farming of cows have been assessed together in the Assessment of Effects section of the application and the appropriateness of this considering that these are two separate activities with potentially different effects on the receiving environment. For example, how do the short-term effects of the establishment of the new farm relate to the ongoing use of land for dairy farming/ The alternate option is to provide an assessment that considers the effects of the two activities separately.

The application to establish a new dairy farm and the application to use land for dairy farming have been assessed together as they are inextricably linked, in that you cannot use land for dairy farming if you have not first converted the land to dairy farming. This is how the short-term effects of the actual conversion of the property to dairy effect the ongoing use of the land for dairy farming. The conversion of land to dairy sets the tone for development and the ongoing capabilities of the property, for example, the number of bays in the dairy shed, the size and type of supporting infrastructure and the magnitude and location of laneways. This is consistent with how ES have assessed dairy land use related applications for a number of years. It's therefore not considered inappropriate to assess the effects together.

For completeness, it is noted that the original application has assessed the effects of the proposed use of land for dairy farming. The effects of the conversion of land to dairy farming will be very little, as mentioned in the attached documents the applicant has already established the laneways, water reticulation, fenced water ways, initiated a regrassing program, on the property, renovated the existing house for worker's accommodation, and upgraded the cattle yards, which are all on their own permitted activities. As such the effects of the activities already completed are no more than minor. From a practical point of view, only the construction of a cowshed, standoff pad/feed pad, installation of effluent infrastructure and some small portion of laneways to be upgraded, i.e. improving the existing bridge crossings to provide nib walls, is required to convert the property to dairy. Additionally, the planting of riparian margins will continue on the property. The effects of the physical activities yet to occur on the property, would not be unexpected to occur within the surrounding rural area and will be no more than minor, due to the small scale of the dairy conversion proposed to be established (i.e. maximum of 306 cows) which is 37 % smaller than the average New Zealand herd size, and almost half of the Southland average herd size (581 cows) for the 2015/2016 season¹, and also the total effective conversion area will approximately 51% less than the southland average dairy farm effective dairy platform area (213 ha).

¹ New Zealand Dairy Statistics 2015-16. DairyNZ & LIC. Retrieved 1 March 2017.

11. A discussion and assessment (quantitative and qualitative) regarding the appropriateness and effectiveness of the monitoring and mitigation measures proposed in the application, in terms of mitigating and monitoring the effects of the proposed activities. This should include why particular mitigation measures were chosen over others and how the applicant proposes to respond to water quality monitoring results. Please also outline which mitigation measures are being used for the ongoing use of land, versus the establishment of the dairy farm.

The subject property is located within the Gleyed physiographic zone. The main risk to water quality in this zone is the rapid export of contaminants (sediment, microbes and nutrients) to surface waterbodies via artificial drainage. As outlined in the original technical assessment (7th December 2016), elevated nitrogen, phosphorus and microbial concentrations are occurring in Waituna Creek and land use activities on the applicants' property therefore need to minimise contaminant losses via artificial drains. Effluent and fertiliser needs to be applied in a manner that ensures nutrients are utilised by growing plants and are not transported through the subsurface drainage network or across the land surface into water bodies. There also needs to be adequate residence time within the soil for bacteria (faecal coliforms) to be filtered out.

A number of mitigation measures are proposed to occur on farm, with some of the particular mitigation measures discussed below to be implemented on farm as they will mitigate risks associated primarily with preventing contaminant loss to mole-pipe drains on the property, and also the contaminant risks associated with deep drainage and overland flow:

- *Deferred effluent irrigation:* national and international research shows that nitrogen and phosphorus losses from effluent applied to land using deferred irrigation methods are minimal provided effluent is not directly applied to surface water or into mole-pipe drains (e.g. Holbrooke, 2009). Similarly, research shows that microbial losses can be significantly reduced using deferred effluent irrigation. The proposed effluent system has been designed to operate to best practice deferred irrigation standards;
- *Low rate irrigation:* effluent will only be applied at low rates across the property (which is extensively mole-piped drained) and will only occur when soil moisture conditions are low (i.e. less than field capacity). This will minimise the risk of effluent discharge into the subsurface artificial drainage network. A West Otago study compared the environmental performance of a traditional rotating travelling irrigator with low rate effluent irrigation technology and found that under low rate irrigation (4 mm/hour), concentrations of total P, ammonium N and *E.coli* in drainage waters were, on average, 5, 3 and 25% of that found in the applied effluent (respectively). In comparison, a travelling irrigator (9 mm application depth) had concentrations of 33, 30 and 85% of that in effluent (Monaghan & Smith, 2004). This research was undertaken on soils that were at, or close to field capacity which would not be the case on the applicants' property. As a result, the concentrations of contaminant loss via effluent will be less than those reported in the above study and potentially at levels close to undetectable (unless effluent was applied under wholly unsuitable conditions or there was serious system failure). At such low contaminant loss levels, there are unlikely to be notable impacts on surface water quality due to effluent irrigation;
- *Effluent pump failsafe:* will be utilised to ensure any accidental failures are detected and the system is shut down before excessive ponding and contamination can occur;
- *Fertiliser application:* fertiliser will only be applied between spring and autumn when soils are below field capacity and will be applied in up to 7 applications per year. Fertiliser will not be applied within 10 metres of waterways to avoid direct losses. The amount of fertiliser required will be based on soil sampling to ensure excessive nutrient concentrations do not accumulate within the soil (e.g. Olsen P

is maintained at optimal levels) and that soil condition is maintained for maximum nutrient uptake by plants (e.g. minimising soil compaction).

- *Wintering-off*: The highest risk period for contaminant loss occurs when soils are wet, which typically occurs between late autumn and early spring on this property. During this period, grazed animals can exacerbate water and soil quality problems and erosion (Monaghan 2012). If stock are grazed on pasture or fodder crops during winter, there is a possibility of exposing bare ground which can lead to soils becoming pugged and the ground becoming saturated in water, urine and nutrients. As the nutrient uptake of plants is lowest during winter, nutrient leaching (especially of nitrate) are higher during winter months (Monaghan 2012). These excess nutrients could leach into groundwater or move into waterways via overland flow or subsurface drainage. A review of wintering research studies by AgResearch (Monaghan, 2012) found that the amount of nitrogen loss from winter forage crops grazed by cattle are in the order of 3 to 5 times greater than from grazed pastures and that wintering grazing has a very large influence on soil physical condition and thus the amounts of water and sediment yielded in overland flow. In addition, some studies showed that loss of nitrogen from winter-deposited urine was by far the greatest source of leached nitrogen (Lincoln trial by McDowell & Houlbrooke, 2008). The proposal is that dairy cows will be wintered off the property which will mitigate the risk of contaminant loss during the highest risk period. This approach was selected as it represents the best environmental outcome for this property.
- *Cropping*: The scale of the risk identified in the point above can also be a factor of the total area of land under crop, and grazing stock in-situ. Presently the applicant grazes up to 20 ha of Kale over winter, it is proposed to reduce this overall area of fodder crop by 90 % to a maximum cropped area of 2 ha. This also reduces the amount of soil left bare, and it is noted that the applicant will re-sow bare paddocks as soon as practical. When stock are grazing, at least a 3 m buffer will be provided between waterways and the crop, with swales to be fenced off from stock. This approach was selected as it represents the best environmental outcome for this property, and represents good management practices which can reduce the risks associated with contaminant losses on the property.

Mitigations, centered on good management practices, are contained within the farm environmental management plan (FEMP) and recognize artificial drainage to surface water poses the greatest water quality risk.

Results of water quality monitoring on the property will influence future management practices on farm, as outlined in the original proposed conditions of consent for the ongoing use of the land for dairy farming. Condition 4(b)(v) of the proposed Land Use Consent for the use of land for dairy farming and Condition 11(a) of the proposed Discharge permit outline that water quality results will inform any changes/review of the FEMP or Collected Agricultural Effluent Management Plan.

The above mitigations and overall assessment relate primarily to the ongoing use of the land for dairy farming. Mitigations as they relate to the conversion of the property to dairy are outlined within the original Conversion Environmental Management Plan.

12. A discussion of the Good Management Practices (GMP's) that will be used on site in the upcoming year. This is required as part of the application under Rule 22 and in the Appendix N Management Plan for the site.

All of the GMP's contained within the FEMP will be implemented on farm. These will be implemented from the beginning of the first milking season, subject to granting of consent.

13. Please provide an explanation as to why the proposed conditions are suitable on each permit with particular reference to the primary purpose of each of the consents and activities being controlled and whether the conditions are effective and enforceable.

- ✚ The purpose of the Land Use Consent to establish a dairy farm is for converting the subject property from the existing land use to dairy farming.
- ✚ The purpose of the Land Use Consent for the ongoing use of land for dairy farming is for the purpose of dairy farming for a maximum of 15 years.
- ✚ The purpose of the Discharge Permit is to enable the discharge of farm dairy effluent and standoff pad effluent to land.
- ✚ The purpose of the Water Permit is to abstract water from two bores for dairy wash down and stock drinking purposes.
- ✚ The purpose of the Land Use Consent to Construct a Bore is to enable a bore to be constructed on the subject property so that stock drinking and dairy shed wash down water may be abstracted at a point near to the dairy shed.

Combined, the bundle of permits will enable the establishment of a dairy farm, and the ongoing use of the land for dairy farming. It is noted that the applicant also seeks Land Use Consent for the construction of agricultural effluent storage, although conditions of consent have not been proposed.

The proposed conditions are suitable on each permit and are effective and enforceable, as assessed in Attachment C.

14. Confirmation of the proposed riparian fencing of waterways, including the distance of fencing from waterways and what waterways are going to be permanently fenced. Currently the application has different or unspecific distances compared to the proposed conditions, including the land use for dairy farming fencing just being for cultivation and planting of fodder crop, not grazing of dairy cows.

The applicant can confirm that all waterways are fenced, and will continue to be fenced to a distance of 3 m for grazing of dairy cows. The original FEMP shows where waterways have been fenced.

15. All documents referenced in the application that relate to evidence provided for other consent applications. I require this information to be able to put the comments used in the application into context to be able to use them to assess the application. This is because each application for consent needs to be treated as a new application, with the supporting evidence included as it relates to that specific application.

Please see the attached.

16. A description of the activity and assessment of effects of constructing a new bore, that considers the relevant factors listed in the rules and policies. This should include how the bore design prevents infiltration of contaminants, the uncontrolled leakage of water to the surface and between aquifers, and an assessment of the activity in relation to the matters of control listed in Rule 22 and Policy 26 of the Regional Water Plan, and the conditions and matters of control listed in Rule 53 of the proposed Southland Water and Land Plan.

The applicant wishes to construct a groundwater bore to abstract groundwater for stock and shed water in conjunction with an existing groundwater bore on the property, at or about NZTM 2000 1264616E 4851107N. The bore is to be located close to the proposed dairy shed.

The bore will be designed and have headworks installed to the bore so that no contaminants may infiltrate the bore, and that the abstraction from the bore will be controlled by either a submersible or surface pump.

The bore will be sited approximately 160 m from the nearest waterway, and potential sources of groundwater contamination such as a 100 m buffer around the bore will be provided for effluent discharge. The bore will also be sited at least 50 m from any in ground effluent storage pond. The exact depth and the diameter of the bore is yet to be determined, but as this bore will be used for the supply of water, the bore will fully penetrate the source aquifer.

There are no known nearby historic heritage sites which may be affected by the proposed bore construction. The nearest bore is some 520 m to the north, and located within the subject property boundary.

The bore will be drilled via rotary drilling method, and the drillers to be employed will be McNeills.

The bore itself will be constructed and maintained in accordance with the NZS 4411:2001 Environment Standard for Drilling of Soil and Rock, which ensures that the proposal avoids potential degradation of groundwater. It is understood that Council may utilise these standards in the development of appropriate consent conditions.

A bore log will be provided to council upon completion of drilling of the bore.

The applicant is happy to adopt an Accidental Discovery Protocol, and suggests the following condition of consent, consistent with Attachment G of the original application, and Attachment D below:

"In the event of discovery, or suspected discovery, of a site of cultural importance (Waahi Taonga/Tapu), the consent holder shall immediately cease operations in that location and inform the local iwi authority (Te Ao Marama Inc., Phone: (03) 931 1242). Operations may recommence with the written permission of the Consent Authority. The discovery of Koiwi (human skeletal remains) or Taonga or artefact material (e.g. pounamu/greenstone) would indicate a site of cultural importance. Note: A protocol outlining the process in the event of such a discovery can be obtained from Environment Southland."

The above proposal is consistent with Policy 26 of the RWPS as the bore will be appropriately designed, constructed and maintained, in accordance with the relevant standard so that potential adverse effects are avoided.

The proposed bore is to be constructed for the purpose of abstracting groundwater for shed and stock water. The bore is to be used in conjunction with an existing bore located on the property. Overall, the construction of the subject bore is considered to be less than minor.

17. Can you please confirm with me whether or not water will be abstracted from both bores at the same time, and if they are then what max rate from each bore and combined rate will be abstracted.

As noted on Page 27 of the application for resource consent, it is intended that water may be abstracted from two locations, one being the existing bore which is located adjacent to the applicant's house, and the second which would be via a new bore to be constructed immediately adjacent to the proposed cowshed.

Coordinates for the two bores are given below:

Existing Bore: N: 4851615 E: 1264514 (NZTM)
 Proposed Cowshed Bore: N: 4851096 E: 1264657 (NZTM)

Water may be abstracted from both bores at the same time, a maximum rate of take of 2 L/s from each bore or a combined maximum rate of take of 4 L/s if pumping from both bores at the same time.

18. Further amendment to original application.

Effluent Storage Tank

As a result of rerunning the DESC for this application, the proposed effluent design has been revised and the applicant proposes to install an effluent storage tank, such as a Tasman Tank. It is noted that the applicant would like to amend the original application to remove reference to the effluent storage pond, and instead proposes to install an effluent storage tank. The Tasman Tank has been designed by a Chartered Professional Engineer and is issued with a PS1 for design and a PS4 for construction. A tank with 1,500 m³ capacity is proposed. The tank will be 2.1 m high with a diameter of 33.9 m. The applicant propose an uncovered tank, but may look to provide a cover at some point in the future, this will not alter the storage volume or other dimensions of the effluent tank.

The following resource consents are required under the RWPS and PSWLP.

Table 2: Consent Requirements

| Consent | Plan | Rule | Activity Status |
|--|-------|--------|---------------------------------|
| Land use consent to construct effluent storage | RWPS | 49 (a) | <i>Restricted Discretionary</i> |
| | PSWLP | 32 (a) | <i>Discretionary</i> |

The overall activity status of the application is for a ***discretionary activity***.

Tank specifications

The proposed effluent storage tank has been designed by a Chartered Professional Engineer and will be installed by a suitable qualified person (yet to be determined). It is noted that the applicant will inform council of the person to install the effluent tank prior to installation.

The effluent tank is to be sited within the vicinity of the dairy shed, as shown on the original Farm Plan in the same location as to where the effluent storage pond was proposed. The following buffers will be observed:

- 50 metres from any surface water body, artificial watercourse or coastal marine area;
- 200 metres from any dwelling not on the same property;
- 50 metres from the boundary of any other property; and
- 100 metres from any water abstraction point.

Soil testing has been undertaken by RD Agritech Limited to ensure that the proposed site is appropriate for effluent storage.

Effects of tank installation

The construction of effluent storage is considered a discretionary activity under Rule of the RWPS, and a restricted discretionary activity under Rule 32 of the PSWLP. An assessment of the activity commensurate to the scale and scope of the proposed amendment is provided below.

The effluent tank is to be constructed by Tasman Tanks, with the installation of the tank to be confirmed. The effects associated with the installation of the tank are considered to be less than minor as a result of the scale and duration of the proposed works. The installation of a tank as opposed to a pond will result in less earthworks than original proposed.

The proposed location of the effluent tank will be a sufficient distance (greater than 50 m) from any surface water bodies and will avoid any actual or potential adverse effects on surface water. The pond is to be located near to the cowshed and will observe the >45 m separation distance from the milking platform. The pond is to be located approximately 400 m from the nearest neighbouring property boundary. The location of the tank and the correct management of effluent will ensure that no objectionable odours occur beyond the property boundary. Also, the applicant is considering putting a lid on the effluent tank which further mitigate effects associated with odours.

The tank has been appropriately designed to ensure that no effluent is able to leach to groundwater from the tank and will meet the relevant engineering code of practice for effluent ponds.

Storage capacity

The storage volume has been calculated using the DESC in accordance with the Dairy Effluent Design Code of Practice (COP). The DESC takes into account the receiving soils, climate data, number of cows, catchment areas and irrigation methods to determine the appropriate volume of storage. The options considered to reduce the volume of effluent are consistent with those good management practices outlined in Attachments B and C of the original application.

There will be ample storage in case of pump failure or adverse weather conditions.

The effluent storage tank will be subject to regular visual inspection, including visual observations and cross checking the volume of effluent applied against the volume accumulated. Frequent inspection will reveal and signs of damage and/or leakage, in which case and observed damage will be immediately repaired using appropriate repair methods and experienced repairers.

In terms of the risk of tank failure or for the tank to leak, the tank has been designed by a Chartered Professional Engineer, in accordance with the *Environment Southland Code of Practice for Design and Construction of Agricultural Effluent Ponds* and the IPENZ Practice Note 21 as documented in the report by RD Agritech Limited.

A copy of the Massey Storage Calculator report, and tank design is appended as Attachment A to this report.

The proposed tank installation is not contrary to any of the relevant policies of the RWPS and PSWLP.

Water Volumes Sought

It is noted that within the original application that the applicant sought resource consent for the abstraction of groundwater from two bores from the Awarua Groundwater Management Zone for the purpose of stock drinking water and dairy shed wash down.

As part of this further information request and to enable the wash down of the proposed standoff pad, the applicant requests to amend the original application to enable slightly greater volumes of water to be abstracted.

It is proposed that a volume of 39,220 litres per day (39.22 m³) will be abstracted from either one of two bores for dairy shed, standoff pad and stock drinking water purposes. This daily volume is permitted under the PSWLP. Based on a 305-day milking season, the applicant seeks a seasonal volume of 11,962.1 m³/year.

This volume is considered efficient for the intended use and within best practice recommended volumes.

Policy 29 in the RWPS and Policy 23 of the PSWLP requires a stream depletion assessment when the daily average rate of take is more than 2 L/s as takes less than this are expected to have a minor effect on stream flows. As the proposed take is 39,220 L/day, over 24 hours of pumping the rate of take is less than 2 /s (at 0.45 L/s) and therefore does not require a stream depletion assessment.

Similarly, to stream depletion effect assessed above, the effect on neighbours is likely to be minor. As the proposal seeks to abstract a small volume of water across two bores, in terms of daily volume and rate of abstraction, it is unlikely that the radius of influence is such that interference effects would be experienced by any bore located within a 2 km radius of the property.

As the water to be abstracted represents only a small proportion of discretionary allocation, and is a permitted abstraction under the PSWLP water use is unlikely to have any effect on groundwater quality, however for completeness it is noted that any actual or potential effects on groundwater quality are less than minor.

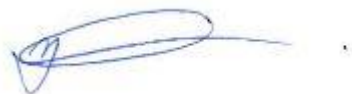
Water abstraction will be metered in accordance with Policy 42 of the PSWLP.

On the basis that allocation of water is available within the relevant groundwater zone and the total proposed rate of abstraction is in accordance with documented 'reasonable use' guidelines, the overall effects of the abstraction of water are considered to be negligible.

The proposed water abstraction is not considered to be contrary to any of the relevant policies of the RWPS or PSWLP.

I trust that the information set out above satisfies the request for further information, however if you have any further queries, please do not hesitate to contact me at any time.

Yours sincerely,



Zoe McCormack

Resource Management Planner

2 McNulty Road | PO Box 302 | Cromwell 9342

P 03 445 9905

zoe@landpro.co.nz | www.landpro.co.nz

References

Houlbrooke DJ, Monaghan RM 2009. The influence of soil drainage characteristics on contaminant leakage risk associated with the land application of farm dairy effluent. Prepared for Environment Southland.

Monaghan RM 2012. The impacts of animal wintering on water and soil quality. Report prepared for Environment Southland. Client report number: RE500/2012/029.

Attachment A – Dairy Effluent Storage Calculations

Dairy Effluent Storage Calculator

Summary Report

Regional authority: Environment Southland Regional Council
Authorised agent:
Client:
Program version: 1.47
Report date: Tuesday, 7 March 2017
General description:

A maximum of 306 cows and a washdown volume of 50 L/cow/day have been assumed.

The rainfall site of Waimahaka is used for this scenario (1,149 mm),

The total area available for effluent application is 96 ha, while 26 ha is the minimum required for best practice.

The catchment area of the proposed milking shed yard is 700m². The yard is to be diverted from 01 June to 31 July each year.

The milking shed roof (243 m²) is to be permanently diverted from the pond.

A low rate Larral Smart Hydrant system is proposed. The flow rate for this system is approximately 18 m³/hour, which is approximately 3 m³ more than what is generated daily. The Larral Smart Hydrant has 6 'pods' which pulse for 10 minutes every 1 hour and apply 1mm depth per hour. To achieve a Winter - Spring depth of 2 mm the Larral Smart Hydrant will be moved once every 2 hours, with a total pumping of 4 hours a day. This equates to a daily volume of 72 m³. To achieve a maximum spring- autumn depth of 22 mm, the Larral Smart Hydrant can be pumped for 20 hours a day at an hourly depth of 1mm. This equates to a maximum daily volume of 360 m³.

No solids separation occurs.

This calculation allows for the use of a stand off pad for up to 2 hours each day from a maximum of 97 cows throughout the milking season (August to May). The standoff pad area equates to 340 m². In addition, up to 306 cows can be on the yard for up to 8 hours a day during the milking season. It is noted that peak milking will only take 5 hours each day, no additional wash water is required for standing cows off in the yard. Stormwater is to be diverted from the standoff pad from 1 June to 31 July.

An uncovered 1500 m³ Tasman Tank with a diameter of 33.9 m and height 2.1 m, allowing for a sludge height of 200 mm and freeboard of 300 mm (consistent with Tasman Tank recommendations) the 90 % probability volume will be 1,238 m³

Climate

Rainfall site: Waimahaka
Mean annual rainfall: 1149 mm/year

Effluent Block

Area of low risk soil: 0.0 hectares
Minimum area of high risk soil: 96.0 hectares
Surplus area of high risk soil: 0.0 hectares

Wash Water

Yard wash:

- Milking season starts: 01 August
- Milking season ends: 31 May

| Month | Number of Cows | Hours in Yard | Wash Volume (cubic metres) |
|-------|----------------|---------------|----------------------------|
|-------|----------------|---------------|----------------------------|

| | | | |
|-----------|-----|-----|------|
| January | 306 | 8.0 | 15.3 |
| February | 306 | 8.0 | 15.3 |
| March | 306 | 8.0 | 15.3 |
| April | 306 | 8.0 | 15.3 |
| May | 306 | 8.0 | 15.3 |
| June | 0 | 0.0 | 0.0 |
| July | 0 | 0.0 | 0.0 |
| August | 306 | 8.0 | 15.3 |
| September | 306 | 8.0 | 15.3 |
| October | 306 | 8.0 | 15.3 |
| November | 306 | 8.0 | 15.3 |
| December | 306 | 8.0 | 15.3 |

Feedpad wash:

| Month | Number of Cows | Hours on Pad | Wash Volume (cubic metres) |
|-----------|----------------|--------------|----------------------------|
| January | 97 | 2.0 | 2.5 |
| February | 97 | 2.0 | 2.5 |
| March | 97 | 2.0 | 2.5 |
| April | 97 | 2.0 | 2.5 |
| May | 97 | 2.0 | 2.5 |
| June | 0 | 0.0 | 0.0 |
| July | 0 | 0.0 | 0.0 |
| August | 97 | 2.0 | 2.5 |
| September | 97 | 2.0 | 2.5 |
| October | 97 | 2.0 | 2.5 |
| November | 97 | 2.0 | 2.5 |
| December | 97 | 2.0 | 2.5 |

Irrigation

| | |
|-----------------------|------------------|
| Winter-spring depth: | 2 mm |
| Spring-autumn depth: | 20 mm |
| Winter-spring volume: | 72 cubic metres |
| Spring-autumn volume: | 360 cubic metres |
| Irrigate all year? | Yes |

Catchments

| | |
|----------------------|-------------------|
| Yard Area: | 700 square metres |
| Diverted? | Yes |
| - diversion start: | 01 June |
| - diversion end: | 31 July |
| Shed Roof Area: | 243 square metres |
| Diverted? | Yes |
| Feedpad Area: | 340 square metres |
| Covered? | No |
| Diverted? | Yes |
| - diversion start: | 01 June |
| - diversion end: | 31 July |
| Animal Shelter Area: | 0 square metres |
| Covered? | Yes |
| Diverted? | No |
| Other Areas: | 0 square metres |

Storage

| | |
|-----------------|----------|
| Pond/s present? | No |
| Tank/s present? | Yes |
| No. of tanks: | 1 tank/s |

Tank 1

- total volume: 1895 cubic metres
- pumpable volume: 1444 cubic metres
- surface area: 903 square metres
- diameter: 33.9 metres
- total height: 2.1 metres
- pumped? Yes

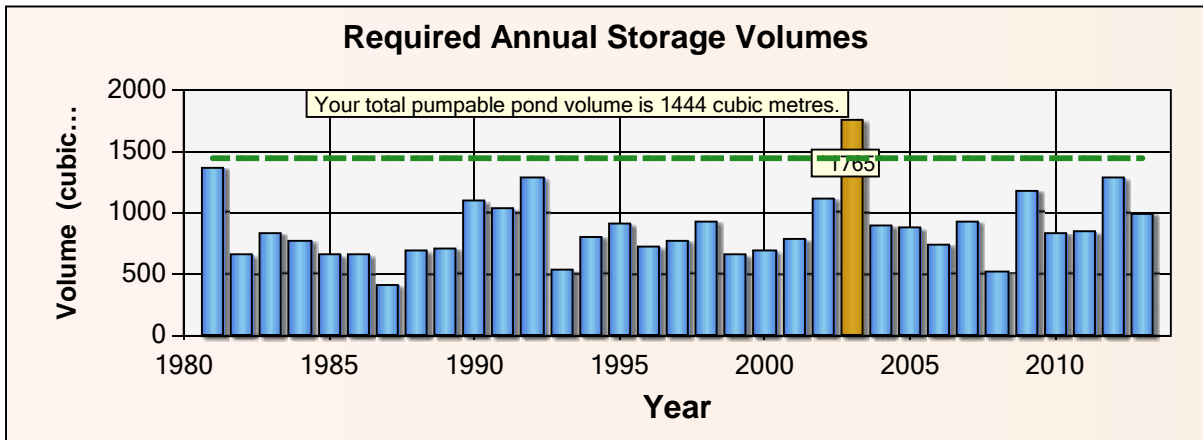
Emergency storage period: 3 days

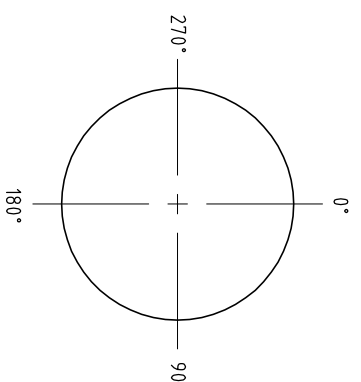
Solids Separation

Solids separator/s present? No

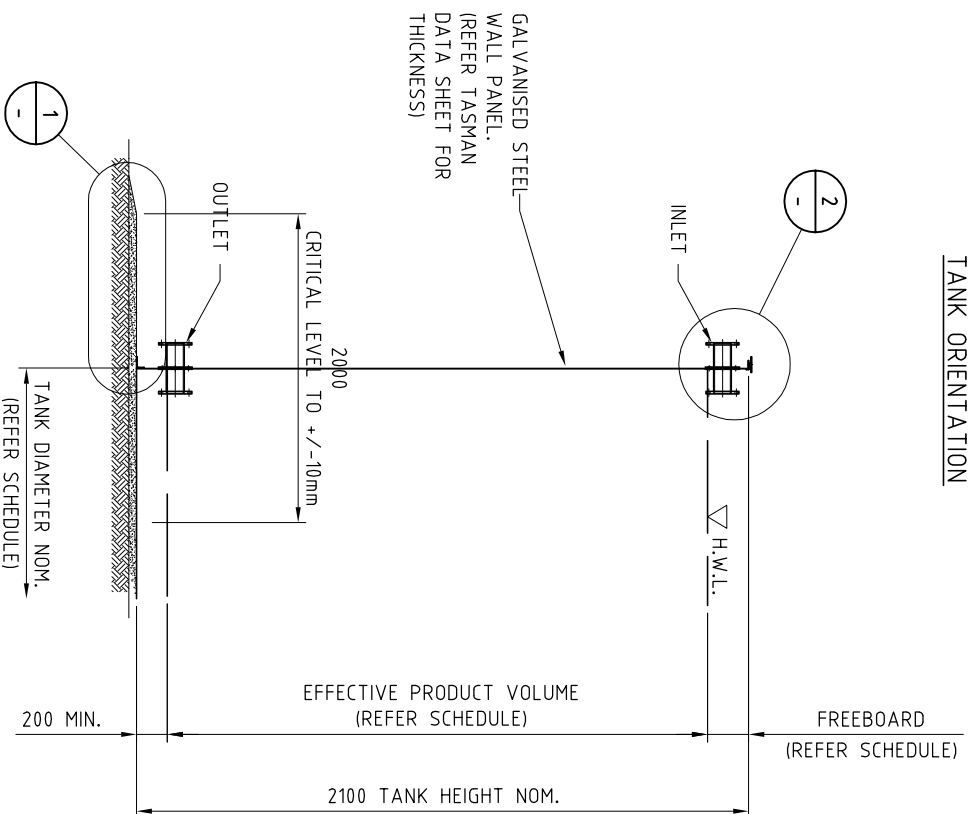
Outputs

- Maximum required storage pond volume: 1765 cubic metres
- 90 % probability storage pond volume: 1238 cubic metres
- During the period from: 01 July 1980
- To: 30 June 2013

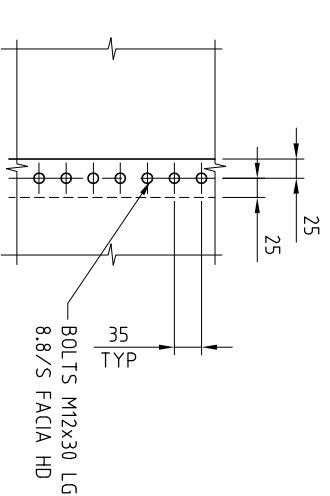




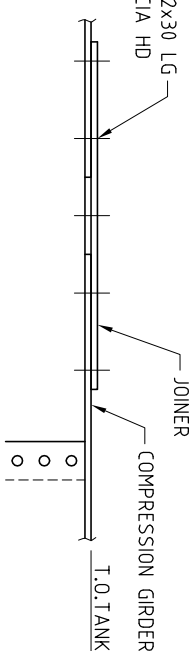
TANK ORIENTATION



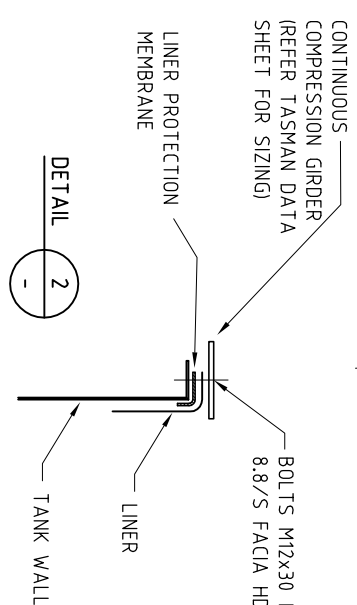
TYPICAL CIRCULAR TANK WALL CROSS SECTION



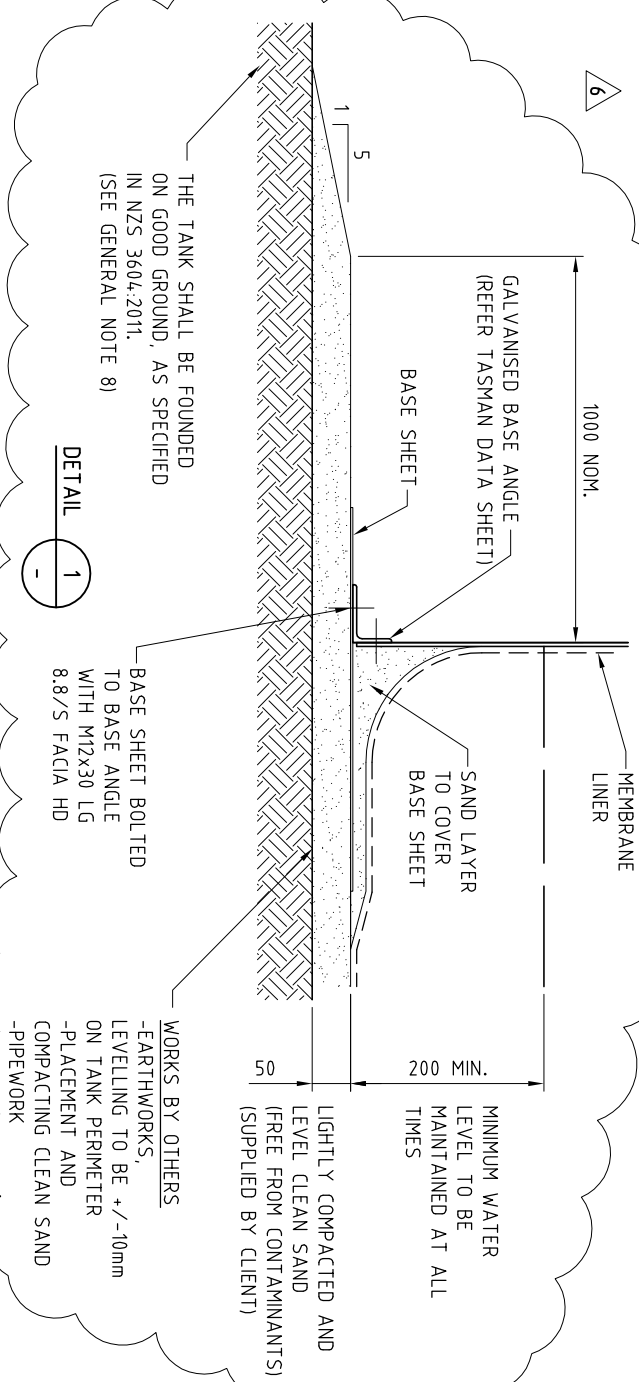
TYPICAL COMPRESSION GIRDER SPLICE (NOTE: SPLICE STAGGERED ON WALL SHEET)



TYPICAL BASE ANGLE SPLICE DETAIL (NOTE: SPLICE STAGGERED ON WALL SHEET)



LINER MECHANICAL CONNECTION DETAIL



TYPICAL VERTICAL SPLICE DETAIL

DETAIL 1

| GENERAL DESIGN CRITERIA | | | | | |
|---|----------------|--------|-----------------------|-----------|---------------------------|
| IMPORTANCE LEVEL | 1 | | | | |
| DESIGN LIFE (STRUCTURAL) | 50 YEARS | | | | |
| DESIGN LIFE (DURABILITY) | 25 YEARS | | | | |
| WIND LOAD DESIGN CRITERIA (AS/NZS 1170.2) | | | | | |
| WIND REGION | A7 | | | | |
| TERRAIN CATEGORY | 2 | | | | |
| RETURN PERIOD | 100 YEARS | | | | |
| WIND SPEED v_w | 41 m/s | | | | |
| EARTHQUAKE LOAD DESIGN CRITERIA (NZS 1170.5:2004) | | | | | |
| HAZARD FACTOR Z | REFER TO TABLE | | | | |
| SUBSOIL CLASS | D | | | | |
| RETURN PERIOD | 100 YEARS | | | | |
| ANNUAL PROBABILITY OF EXCEEDENCE p | 0.01 | | | | |
| TANK DIMENSIONS | | | | | |
| EFFECTIVE VOLUME | DIAMETER | HEIGHT | EFFECTIVE WATER LEVEL | FREEBOARD | SEISMIC HAZARD FACTOR 'Z' |
| 300KL | 15455 | 2100 | 1600 | 300 | 0.41 |
| 400KL | 17662 | 2100 | 1635 | 265 | 0.41 |
| 500KL | 19870 | 2100 | 1615 | 285 | 0.41 |
| 600KL | 21342 | 2100 | 1680 | 220 | 0.41 |
| 800KL | 25022 | 2100 | 1625 | 275 | 0.41 |
| 1000KL | 27965 | 2100 | 1630 | 200 | 0.41 |
| 1250KL | 30909 | 2100 | 1670 | 230 | 0.41 |
| 1500KL | 33853 | 2100 | 1670 | 200 | 0.31 |
| 2000KL | 39004 | 2100 | 1675 | 225 | 0.32 |
| 2500KL | 44156 | 2100 | 1635 | 265 | 0.31 |
| 3000KL | 48372 | 2100 | 1620 | 280 | 0.16 |

GENERAL NOTES:

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANT'S DRAWINGS, SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE SUPERINTENDENT FOR DECISION BEFORE PROCEEDING WITH WORK.
2. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE STRUCTURAL DRAWINGS.
3. SETTING OUT DIMENSIONS SHOWN ON DRAWINGS SHALL BE VERIFIED BY BUILDER.
4. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE SAA CODES AND THE BY-LAWS AND ORDINANCE OF THE RELEVANT BUILDING AUTHORITIES.
5. UNLESS NOTED OTHERWISE, ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES.
6. ALL DIMENSIONS AND LEVELS TO BE VERIFIED ON SITE BEFORE WORKS ARE COMMENCED.
7. INSTALLATION TO BE UNDERTAKEN BY APPROVED CONTRACTOR. THE CONTRACTOR IS TO SUBMIT A METHODOLOGY FOR INSTALLATION OF THE TANKS FOR ENGINEER'S APPROVAL. REFER TO TASMAN TANKS INSTALLATION MANUAL FOR DETAILED INSTALLATION INSTRUCTION AND REQUIREMENTS.
8. TANK IS TO BE FOUNDED ON GOOD GROUND WITH A MINIMUM SAFE BEARING CAPACITY OF 100 kPa. TO BE CONFIRMED WITH GEOTECHNICAL SOIL TESTS BY EXPERIENCED PERSONNEL. RESULTS TO BE SUBMITTED TO TASMAN TANKS/CHARTERED PROFESSIONAL ENGINEER FOR REVIEW.
9. THE DESIGN DOES NOT COVER SEISMIC LIQUEFACTION AND LATERAL SPREADING HAZARDS AT SPECIFIC SITES. THIS MAY RESULT IN LOSS OF BEARING OR UPLIFT OF THE TANK IN HIGH SEISMIC EVENTS. SPECIFIC DESIGN IS REQUIRED IN THIS CASE.
10. THE TANK IS NOT TO BE CONSTRUCTED ALONG SLOPES OR WITHIN 5m OF THE TANK FROM THE SLOPE EDGE UNLESS A CHARTERED PROFESSIONAL ENGINEER PROVIDES SPECIFIC FOUNDATION DESIGN.
11. SUITABLE ONLY FOR AN IMPORTANCE LEVEL 1 STRUCTURE AS DEFINED IN NZS1170.5:2004.
12. SPECIFIC DESIGN IS REQUIRED FOR SITE SUBSOIL CLASS E AS DEFINED IN NZS1170.5:2004.
13. SPECIFIC DESIGN IS REQUIRED WHERE SEISMIC HAZARD FACTOR IS ≥ 0.41 AS DEFINED IN NZS1170.5:2004.
14. IF THE WATER TABLE IS ENCOUNTERED DURING CONSTRUCTION, TASMAN TANKS/CHARTERED PROFESSIONAL ENGINEER SHOULD BE CONSULTED.
15. THE FOUNDATIONS NEED TO BE FREE OF GROUND WATER AND EITHER PROVIDE SUITABLE SUB SOIL DRAINAGE AROUND THE TANK OR SUFFICIENT COMPACTED HARDPAIL IS PROVIDED TO RAISE THE TANK AND ALLOW RUNOFF AWAY FROM THE TANK.
16. TANKS ARE TO COMPLY WITH ENVIRONMENTAL REGULATIONS WITH REGARD TO CONTAINMENT (EARTHQUAKES) IN THE EVENT OF SPILLAGE/OVERFLOW ETC.
17. THE OWNER IS TO COMPLY WITH TERRITORIAL REQUIREMENTS FOR RESOURCE AND BUILDING CONSENTS WHERE NECESSARY.

FOR REFERENCE ONLY
NON-STRUCTURAL DWG

STEELWORK NOTES:

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH ACEE STRUCTURAL STEELWORK SPECIFICATION AND AS1554, AS1400 & NZS 3404, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
2. UNLESS OTHERWISE NOTED, ALL STEEL SHALL BE IN ACCORDANCE WITH:
 - AS/NZS3679.1 GRADE FOR BHP-300 PLUS ROLLED SECTIONS AND MERCHANT BAR, EXCEPT WHERE NOTED.
 - AS/NZS3679.2 GRADE 300 FOR ALL WELDED SECTIONS (WB & WJ)
 - AS1163 GRADE C350 FOR RECTANGULAR HOLLOW SECTIONS
 - AS1163 GRADE C350 FOR CIRCULAR HOLLOW SECTIONS GREATER THAN 88.9Ø
 - AS1163 GRADE C350 FOR REMAINING CIRCULAR HOLLOW SECTIONS
 - AS1397 COLD FORMED STEEL PURLINS AND GRITS
 - AS3678 GRADE 250 FOR ALL PLATE
 - HIGH STRENGTH STRUCTURAL BOLTS AND WASHERS SHALL BE HOT DIPPED GALVANISED (HGO) AND COMPLY WITH AS1252.
 - COMMERCIAL GRADE BOLTS, NUTS AND WASHERS SHALL COMPLY WITH ASTM1, ASTM2 & AS1237 RESPECTIVELY. HIGH STRENGTH FRICTION GRIP BOLTS, NUTS AND WASHERS SHALL BE INSTALLED IN ACCORDANCE WITH AS4100 AND SHALL BE TIGHTENED TO CORRECT TENSION USING APPROVED LOAD INDICATING WASHERS. CONTACT SURFACES OF ALL CONTACT FRICTION GRIP BOLTED CONNECTIONS SHALL BE LEFT UNPAINTED. UNLESS OTHERWISE NOTED, ALL BOLTS TO BE 20 DIAMETER HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8.8 SNUG TIGHT (M20-8.8/S) (EXCEPT PURLIN AND H.D. BOLTS DESIGNATED BY THE NUMBER, DIAMETER, GRADE AND TIGHTENING PROCEDURE, EG. 4#16-4.6/S MEANS 4 x #16 COMMERCIAL GRADE BOLTS, SNUG TIGHT.
 - 6#20-8.8/TF MEANS 6 x M20 HIGH STRENGTH STRUCTURAL BOLTS FULLY TENSIONED IN A FRICTION JOINT.
 - 6#24-8.8/TF MEANS 6 x M24 HIGH STRENGTH STRUCTURAL BOLTS FULLY TENSIONED IN A BEARING JOINT. (SOME SLIP ALLOWED)
3. CORROSION PROTECTION AND MAINTENANCE:
 - REGULAR INSPECTION SHALL BE CARRIED OUT AT MAX. 2 YEARS INTERVALS AS PART OF STANDARD MAINTENANCE PROCEDURE. THIS REQUIREMENT SHALL BE INCLUDED IN THE MAINTENANCE MANUALS PROVIDED TO THE OWNER.
 - THE BUILDER SHALL PROVIDE ALL CLEATS AND DRILL ALL HOLES NECESSARY FOR FIXING STEEL TO STEEL AND TIMBER TO STEEL WHETHER OR NOT DETAILED IN THE DRAWINGS.
 - ALL THE REQUIREMENTS OF THE STRUCTURAL STEEL SPECIFICATION SHALL APPLY AS APPLICABLE (U.N.O.).
 - THE BUILDER IS TO MAKE GOOD AND/OR REPAIR ALL DAMAGED SURFACES DURING PERFORMANCE OF WORK.

| By | Date | Remarks |
|--------|----------|------------------------|
| By VSS | 05.07.13 | BASE SHEET ADDED |
| By VSS | 05.07.13 | REVISED AS NOTED |
| By VSS | 15.03.13 | TANK DIMS REVISED |
| By MA | 16.8.12 | REVISED AS NOTED |
| By MA | 28.05.12 | REVISED AS NOTED |
| By MA | 15.05.12 | GENERAL NOTE 8 REVISED |
| By MA | 0 | ISSUED FOR INFORMATION |

1st Floor,
John Wildlife House
265 - 269 Princess Street,
Dunedin 9054,
+64 3 477 7133
spire.co.nz

spire
Innovation in Infrastructure

PO Box 10-000,
Phillipstown Christchurch NZ
Ph. +64 3 379 9444
Fax. +64 3 379 9445
info@tasmantanks.com.au

© Copyright. This document and design remain the copyright of Tank Services Pty Ltd T/A the Tasman Tank Co. and cannot be reproduced in any way without written consent.

TASMAN TANKS

Project: **STANDARD DRAWINGS**

Title: **DAIRY EFFLUENT TANK LAYOUT**

Drawing #: **STD - DE001**

Attachment B – Soil Moisture Monitoring

HARVEST.com

wireless telemetry 0800 HARVEST

Farm Monitoring & Control Systems

“Information and control at your fingertips”

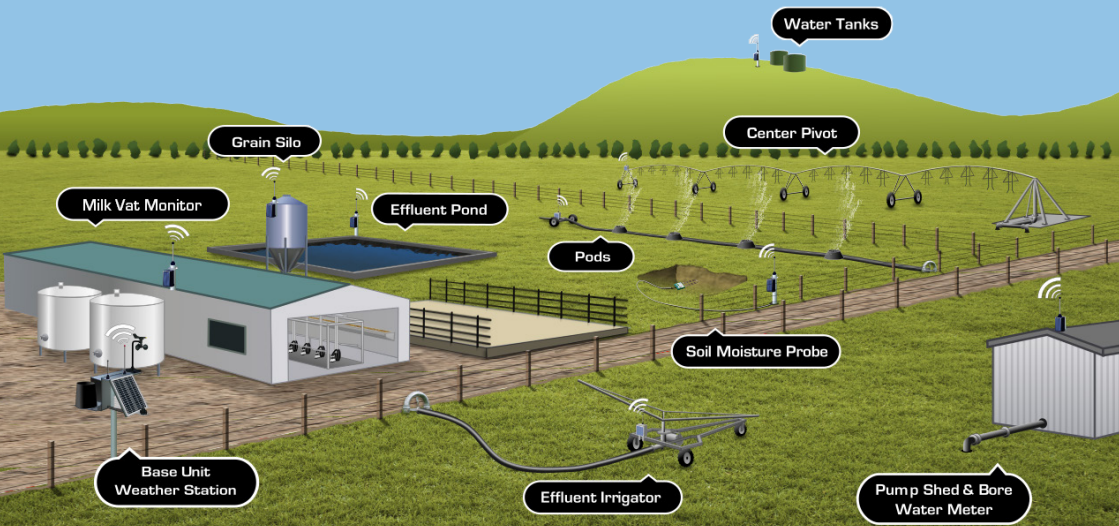


The Harvest System is an internet based online solution covering a range of applications, to assist with efficient management of resources and maximise return on investment.

Features:

- Soil Moisture Monitoring
- Weather/Evapotranspiration Monitoring
- Irrigator Tracking and Failsafe (speed, pressure, GPS tracking, pond level)
- Water Monitoring (flow meters, pressure, well and bore depth)
- Milk Vat Monitoring and Alarms
- Web App for Smartphones

An integrated cellular modem is used to send data to the Harvest servers. Information can be viewed using any computer or smartphone.



HARVEST.com

wireless telemetry 0800 HARVEST

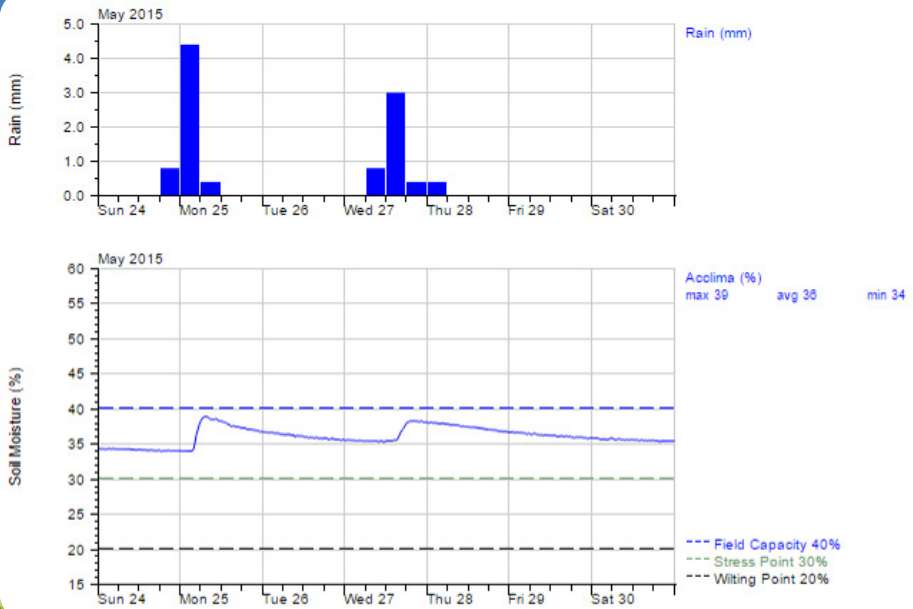
Soil Moisture Monitoring

Harvest systems provide reliable, real-time soil moisture readings to show the effects of rainfall and irrigation and assist with effective water management.



Acclima TDT Soil Moisture Sensor

- True "Time Domain Transmission" technology (no calibration required)
- Works in all soil types
- $\pm 1\%$ accuracy
- Research grade TDR probe also available



- Data sampled every minute
- Data graphed on Harvest website (compatible with any smartphone)
- Web App customised for individual property
- Field Capacity, Stress Point and Permanent Wilting Point markers shown on graphs
- Checking of all sensors and data integrity 3x a week
- Soil moisture and soil water deficit calculation (requires Harvest weather station)
- Current weather/localised forecast shown on web app (requires Harvest weather station)

Some features apply to Premium Service only.

Attachment C – Proposed Conditions of Consent

Table 3: Assessment of purpose, effectiveness and enforceability of the proposed conditions for Land Use Consent of Land to dairy

| Condition proposed | Primary purpose of condition | Is this | Is this |
|--|---|------------|--------------|
| Land Use Consent for Conversion of Land to dairy | | effective? | enforceable? |
| 1. The term of this consent is unlimited. | To align the consent with Section 123 of the Resource Management Act 1991. | Y | Y |
| <p>2. This consent authorises the conversion and establishment of the subject land for use as a dairy farm as described in the application for resource consent dated 11 January 2017, <u>and further information dated 8 March 2017</u>. The scope of the dairy farm activity to be established is described in the application as being:</p> <ul style="list-style-type: none"> ➤ The milking of up to 306 cows up to twice per day; ➤ The use of land as a dairy farm on which winter grazing (between 1 June – 31 July) is not undertaken; ➤ The construction, maintenance and operation of: <ul style="list-style-type: none"> ◆ A dairy milking shed; and ◆ Feed pad/standoff pad; ➤ The discharge of dairy shed effluent and feed pad/stand-off pad effluent to a discharge area of no more than 96 hectares as per the plan attached as Appendix 1; ➤ The establishment of environmental management practices as detailed in the Conversion Environmental Plan date 11 January 2017. | <p>To enable the change of the land use from the existing land use as a dairy grazing and wintering operation to a dairy farm (as described in the original application).</p> <p>This condition defines the scope of the activity that may be authorised to occur on the property, and the establishment of environmental practices which are outlined within the Conversion Environment Plan</p> | Y | Y |
| 3. Prior to the exercise of this consent, all permanent waterways shall be fenced in such a way to exclude stock access at all times. Fences shall be set back from the waterways to create a minimum buffer zone of 3 metres between waterways and grazed pasture. 3 metres shall be measured horizontally from the outside edge of the wet bed of the waterway. For clarity, this shall apply to both sides of a waterway. | To ensure that all waterways are fenced at least 3 m from the waterway so that once the conversion is completed, the necessary infrastructure is in place to exclude stock from waterways, and create a buffer of grazing dairy cows from waterways. | Y | Y |
| <p>4.</p> <p>(a) Within 12 months of the first exercise of this consent, a riparian planting programme for the property shall be developed.</p> <p>(b) The riparian planting programme shall be designed by a suitable qualified person, and be designed to limit the degradation of riparian margins and surface water quality.</p> | To ensure that the applicant establishes a riparian planting program which has been designed by a suitably qualified person. Riparian planting has demonstrable benefits in reducing contaminant loss to water ways. As such establishment of riparian planting as part of the land use conversion will assist in managing the risks of the conversion | Y | Y |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|---|--|--------------------|----------------------|
| Land Use Consent for Conversion of Land to dairy | | | |
| | itself and provide for the Land Use Consent to use land for dairy farming. | | |
| <p>5. The consent holder shall notify the Consent Authority in writing within two months of the completion of the conversion authorised by this consent. The conversion is deemed to be complete when all infrastructure, including riparian fencing, is in place and the riparian planting programme is complete.</p> | <p>This condition will ensure that the applicant gets in touch with Council once the conversion is complete (i.e. the property has been established to the details outlined in Condition 2, and is generally in accordance with the original application, and further information). This will also notify the Council when the conversion consent has been given effect to and the operation is being carried out in accordance with the land use consent for ongoing dairy farming.</p> | Y | Y |
| <p>6. In accordance with Section 125(1) of the Resource Management Act, this consent shall lapse after a period of seven years after the date of commencement unless it is given effect to or an application is made to extend the lapse period before the consent lapses.</p> | <p>This condition provides the applicant with seven years to give effect to this consent. Seven years is appropriate as it will enable a reasonable amount of time for the consent holder to give effect to their consent should unforeseen circumstances arise. It also provides adequate time for conditions such as the riparian planting plan to be implemented, as required by Condition 4 above</p> | Y | Y |
| <p>7. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, or on receiving monitoring results, for the purposes of:</p> <p>a) Determining whether the conditions of this permit are adequate to deal with any adverse effect on the environment, including cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit; or</p> <p>b) Ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and/or the Environment Southland Regional Policy Statement.</p> | <p>This enables the Council to review these conditions of consent to address any effects that might arise during the exercise of the consent. Condition 7(c) aligns this consent with Policy 40 of the pSWLP in lieu of granting a shorter consent term.</p> | Y | Y |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|---|------------------------------|--------------------|----------------------|
| Land Use Consent for Conversion of Land to dairy | | | |
| c) Providing for review in the event that nutrient limits are determined for the Waituna Catchment. | | | |

Table 4: Assessment of purpose, effectiveness and enforceability of the proposed conditions for Land Use Consent for dairy farming

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|--|--|--------------------|----------------------|
| Land Use Consent for use of land for dairy farming | | | |
| 1. This consent is granted for a period of 15 years | To align the consent with Section 123 of the Resource Management Act 1991. The term proposed is less than 35 years and consistent with the relevant policies of the RWPS and pSWLP. | Y | Y |
| 2. This consent authorises the use of the subject land for dairy farming as described in the application for resource consent dated 11 January 2017 <u>and further information dated 8 March 2017</u> . The scope of the dairy farm activity is described in the application and Farm <u>Environmental</u> Management Plan as being: <ul style="list-style-type: none"> ➤ the use of 109.52 hectares of land as a dairy farm; ➤ the use of land as a dairy farm on which the grazing of dairy cows between 1 June – 31 July is not undertaken; ➤ milking of up to 306 cows up to twice per day; ➤ the construction and maintenance of: <ul style="list-style-type: none"> ◆ a dairy milking shed; ◆ Feed pad/standoff pad; ➤ the establishment of environmental management practices as detailed in the Management Plan dated 11 January 2017. | To enable the use of land for dairy farming consistent with the scope of the original application and the bullet points beneath Condition 2. This condition defines the scope of the activity that is authorised to occur on the property. Compliance with this condition will be confirmed through the implementation of a Farm Environmental Management Plan (FEMP). | Y | Y |
| 3. The consent holder shall maintain a 3 metre riparian buffer from any waterway on the property of any cultivation and planting of fodder crop, <u>and grazing of dairy cows</u> | This condition ensures that those riparian buffers established under the conversion consent are maintained through this consent to ensure the benefits of the riparian planting continue to accrue whilst the land use activity is carried out. | Y | Y |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|--|---|--------------------|----------------------|
| Land Use Consent for use of land for dairy farming | | | |
| <p>4. (a) The consent holder shall have and maintain a Management Plan for the subject site. This management plan shall be prepared in accordance with Appendix N of the proposed Southland Water and Land Plan and shall be a concise document which shall include, but not be limited to:</p> <ul style="list-style-type: none"> (i) A site map showing the location of critical source areas; physiographic zones; permanent or intermittent rivers, streams, lake, drains, ponds or wetlands; where known the location and depth of any subsurface drainage systems including outlets, riparian vegetation and fences adjacent to waterways and stock access points across waterways. (ii) A nutrient budget based on soil nutrient tests prepared using OVERSEER in accordance with OVERSEER Best Practice Data Input Standards, or an equivalent model approved by the Chief Executive of Southland Regional Council. (iii) Good management practices for the site. (iv) A riparian management plan. (v) A cultivation map showing waterbodies, where cultivation is planned for the proceeding 1 June to 30 May and any proposed good management practices. (vi) If winter grazing is to be undertaken, a winter grazing management section. (vii) A Collected Agricultural Effluent Plan. (viii) If water irrigation is to be undertaken, an irrigation management section. <p>(b) The Management Plan required by Condition 4 shall be reviewed once every twelve months. The results of the review shall be reported to the Consent Authority within one month of the review being undertaken. The review shall include but not be limited to:</p> <ul style="list-style-type: none"> (i) A site map showing the location of critical source areas; physiographic zones; permanent or intermittent rivers, streams, lake, drains, ponds or wetlands; where known the location and depth of any subsurface drainage systems including outlets, riparian vegetation and fences adjacent to waterways and stock access points across waterways. (ii) Details of the implementation of Good Management Practices | <p>The pSWLP policy and rule framework addresses nutrient losses from farming activities through the FEMP. This condition ensures that the consent holder is aware of the information requirements of the FEMP.</p> <p>The FEMP sets out in detail the land management techniques to be employed on the farm to avoid, remedy and mitigate effects and potential risks of the land use activity. It provides a process for demonstrating compliance, ongoing monitoring and continuing improvement to ensure that the farm continues to operate in accordance with good management practices (GMP's).</p> <p>This means that as GMP's evolve and improve over time the consent holder will be able to incorporate them into the FEMP where they assist in managing the risks identified at this site.</p> <p>The FEMP is not the sole mechanism to provide reassurance that water quality objectives will be achieved and therefore monitoring conditions are proposed below.</p> | Y | Y |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|--|------------------------------|--------------------|----------------------|
| Land Use Consent for use of land for dairy farming | | | |
| <p>(iii) OVERSEER® parameter inputs report to confirm that the activity being carried out is in accordance with Condition 1 and nutrient losses remain consistent with those proposed at the time consent was sought.</p> <p>(iv) A property specific environmental risk assessment, including a description of the risks to water quality, which shall be prepared by a suitably qualified person and which identified any farm specified environmental risks along with measures to mitigate the identified risks.</p> <p>(v) Review of the data obtained from the monitoring undertake in accordance with the FEMP and any changes made or to be made as a consequence of that monitoring.</p> <p>(vi) A report detailing items (i) – (iv) above shall be submitted to the consent authority no later than 31 July each year and shall include an updated version of the FEMP if any amendments have been made.</p> <p>(vii) A report shall be prepared every three years by a suitable qualified independent person, i.e. a person who is a Certified Nutrient Management Advisor (or equivalent qualification and accreditation), and provided to the Southland Regional Council, Te Ao Marama and Southland Fish & Game by 31 July (2020, 2023, 2026, 2029, 2032) to demonstrate, using OVERSEER® modelling, that nutrient losses remain consistent with those proposed at the time the consent was sought.</p> <p><i>Advice note: It is recognised that changes to the OVERSEER® model may give rise to changes in the modelled losses for the application site. Therefore, this condition does not require modelled nutrient losses to remain exactly the same as those modelled at the time consent was sought. Reviews of the Overseer Parameter Reports will enquire into and confirm that the farm system being applied by the consent holder is consistent with that promoted at the time the application for consent was sought whilst allowing for minor adjustments to be made to take account of varying climatic, soil conditions etc. that arise during the usual course of operating a dairy farm but that do not fundamentally alter the nature of the operation.</i></p> | | | |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|---|--|--------------------|----------------------|
| Land Use Consent for use of land for dairy farming | | | |
| <p>(c) Where there is a material change in the land use associated with the farming activity, the nutrient budget as required under Condition 4(a)(ii) shall be reviewed and a new one shall be prepared at the end of the year the change occurs.</p> <p>(d) If/when the plan is amended, a copy of the amended version, (or amended sections) shall be sent to the Consent Authority as soon as practicable following amendment.</p> <p>(e) This permit shall be exercised in accordance with the Collected Agricultural Effluent Management Plan at all times. Where there is inconsistency between the Effluent Management Plan and the conditions of this consent, the conditions of this consent shall prevail.</p> | | | |
| <p>5. If changes are made to the Management Plan, as part of the review required by Condition 4, the consent holder shall explain why the changes are required and how they ensure the continued use of land for dairy farming in accordance with good management practices.</p> | <p>The purpose of this condition is to enable the FEMP to be a 'living document' where updates and changes can be made so that the consent holder can continue to operate in accordance with GMP's. This condition ensures that the Council is made aware of changes to the FEMP so that it can confirm that constant review is taking place and amendments made to reflect any recommendations arising from audits and water quality monitoring results.</p> | Y | Y |
| <p>6.</p> <p>a. Annual monitoring to be undertaken to assess effects on water quality. Details of the farm monitoring program are to be developed by a suitably qualified person and carried out by the consent holder for the purpose of improving understanding of the effects of land use, and the discharge of effluent on water quality and to identify areas for improvement in management practices and further development of the FEMP. The monitoring program will include but not be limited to;</p> <p>(i) Baseline sampling (i.e. prior to the dairy conversion);</p> <p>(ii) Instream monitoring including in high flow events;</p> <p>(iii) Monitoring of discharges from tile drains;</p> <p>(iv) Soil sampling;</p> | <p>The purpose of annual monitoring is to reduce the level of uncertainty about any potential adverse effects the use of the land for dairy farming may have on water quality.</p> <p>This condition outlines a well-designed monitoring and investigation program.</p> <p>Monitoring of water quality can help ensure critical additional information is available as part of a review condition of consent or to be used to inform reviews of the FEMP by helping identify any areas</p> | Y | Y |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|--|---|--------------------|----------------------|
| Land Use Consent for use of land for dairy farming | | | |
| <p>(v) Details regarding sampling methods and recording requirements for the information above;</p> <p>(vi) The steps to be taken if monitoring identifies an increase in contaminants, particularly dissolved forms of nitrogen and phosphorous in water exiting the farm as compared to the quality of the water entering the farm;</p> <p>(vii) The frequency of monitoring;</p> <p>(viii) The parameters of monitoring including but not limited to;</p> <ul style="list-style-type: none"> • (Nitrate +Nitrite) – Nitrogen • Total Ammonimical Nitrogen • Dissolved Reactive Phosphorous • <i>E.coli</i> <p>(ix) The frequency of reporting.</p> <p>b. Agricultural Good Practices to be employed on farm to minimise nutrient losses and mitigate effects on water quality. Implementation of industry agreed good management responses to avoid, remedy or mitigate any farm specific environmental risks to water quality and progress toward implementation of those management responses.</p> <p>c. Nutrient Management including;</p> <p>(i) preparation and review of Overseer Budgets by a suitably qualified person to ensure that nutrient losses remain consistent with those proposed;'</p> <p>(ii) Process for preparation and review of Overseer Budgets to account for changing versions of Overseer.</p> <p>(iii) Application rates, locations and timing of fertiliser application;</p> <p>(iv) Application rates and locations of dairy effluent application; Specify and implement a nutrient management system for the property, which is consistent with on farm management proposed in Overseer modelling submitted with the consent application;</p> <p>(v) Maintenance of the following records for each year between 1 July and 30 June:</p> <ul style="list-style-type: none"> • Fertiliser application, including rates; • Types of crops, including winter feed / forage crops; • Cultivation methods; | <p>of risk that need to be addressed further in the FEMP.</p> <p>In addition to GMPs outlined in the FEMP, this condition specifically requires that the consent holder employs Good Agricultural Practices. Once again this will ensure that on farm management remains current with best practice measures over time.</p> <p>Obviously nutrient management has a significant influence on potential contaminant loss to water. The nutrient management requirements ensure that appropriate planning, monitoring and recording keeps taking place so that nutrient management is consistent with regime promoted in the original application.</p> | | |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|--|--|--------------------|----------------------|
| Land Use Consent for use of land for dairy farming | | | |
| <ul style="list-style-type: none"> • Stock units by reference to type, age and breed; • Prediction of realistic crops yields that are used to determine crop requirements and all other inputs to the Overseer nutrient budgeting model. (vi) Fertiliser and soil management, including management and application of fertiliser in accordance with 'The Code of Practice for Nutrient Management (With Emphasis of Fertiliser Use)' Fertiliser Association, 2013, ISBN 978-0-473-28345-2' or any subsequent updates; <ul style="list-style-type: none"> (a) Effluent Management Plan. (b) Water Quality Management techniques. (c) Methods for Achieving Consent Compliance. | | | |
| 7. Results obtained from the monitoring undertaken in accordance with the FEMP shall be provided to the Consent Authority by 31 July each year or no later than 2 weeks following a written request by the Southland Regional Council. | Providing results of monitoring undertaken ensure that a) monitoring has been undertaken and b) that there is a record of monitoring results this enables the Council to review the monitoring data obtained and confirm that the consent holders response to that data is appropriate, i.e. possible changes to management practices. | Y | Y |
| 8. Subject to Condition 4 and 5, the Consent Holder shall at all times comply with the FEMP and any subsequent amendments or updates to the mitigation measures as required by conditions of consent or as a result of the annual review of the FEMP. | The purpose of this condition is to make the consent holder accountable to council to comply with Conditions 4 and 5 of this consent. | Y | Y |
| 9. The consent holder shall pay an annual administration and monitoring charge to the Consent Authority, collected in accordance with Section 36 of the Resource Management Act, 1991. This charge may include the costs of inspecting the site up to three times each year (or otherwise as set by the Consent Authority's Annual Plan) | This condition is consistent with Section 36 of the Resource Management Act (1991) | Y | Y |
| 10. All cows must be transported out of the Waituna Catchment for grazing during 1 June and 31 July each year. | This condition is to ensure that high risk activities are avoided during the higher risk times of the year i.e. the applicant will stop winter grazing on the property, and remove all dairy cows on the property from the Waituna Catchment during June and July each year. | Y | Y |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|---|---|--------------------|----------------------|
| Land Use Consent for use of land for dairy farming | | | |
| <p>11. In accordance with Section 125(1) of the Resource Management Act, this consent shall lapse after a period of seven years after the date of commencement unless it is given effect to or an application is made to extend the lapse period before the consent lapses.</p> | <p>This condition provides the applicant with seven years to give effect to this consent. Seven years is appropriate as it enables a reasonable amount of time for the consent holder to give effect to their consent should unforeseen circumstances arise.</p> | Y | Y |
| <p>12. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, or on receiving monitoring results, for the purposes of:</p> <p>(a) Determining whether the conditions of this permit are adequate to deal with any adverse effect on the environment, including cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit; or</p> <p>(b) Ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and/or the Environment Southland Regional Policy Statement.</p> <p>(c) Ensuring the Maituna Freshwater Management Unit and Waituna Freshwater Sub Unit meets the freshwater objectives and freshwater quality limits set in an operative regional plan pursuant to Policy A1 of the National Policy Statement for Freshwater Management.</p> | <p>This enables the Council to review these conditions of consent to address specific and significant adverse effects that might arise during the exercise of the consent. Condition 12 (c) enables the consent to be brought into line with any water quality limits set by a plan consistent with pSWLP Policy 40</p> | Y | Y |

Table 5: Assessment of purpose, effectiveness and enforceability of the proposed conditions for Discharge Permit to discharge agricultural effluent to land from dairy shed and Feed pad/standoff pad

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|--|--|--------------------|----------------------|
| Discharge Permit to Discharge Agricultural Effluent to Land from a Dairy Shed and Feed Pad/Standoff Pad | | | |
| <p>1. This consent is granted for a period of 15 years.</p> | <p>To align the consent with Section 123 of the Resource Management Act 1991. The term proposed is less than 35 years and consistent with the relevant policies of the RWPS and pSWLP.</p> | Y | Y |
| <p>2.</p> <p>(a) This consent authorises the discharge of dairy shed effluent and feed pad/stand-off pad effluent onto land, via a land disposal system, as described in the application for resource consent dated 11 January 2017, and as amended by these conditions. The scope of the activity is described as being:</p> <ul style="list-style-type: none"> ➤ The discharge to land of dairy shed effluent generated from milking of up to 306 cows up to twice per day; ➤ The discharge of feed pad/stand-off pad effluent generated from the use of the pad to land; ➤ The discharge of effluent to land via a Larral Smart Hydrant system or equivalent low rate system and slurry tanker; ➤ The discharge of effluent to 93 hectares of land as per the plan attached as Appendix 1; and ➤ The discharge of effluent from a dairy farm on which winter grazing (1 June – 31 July) is not undertaken. <p>(b) The consent excludes the discharge of dairy shed effluent from winter milking (defined as milking undertaken from 1 June to 31 July)</p> | <p>To enable the discharge of effluent collected at the dairy shed and feedpad/standoff pad to land consistent with the activity proposed in the consent application and with the parameters set out in the conversion consent and the land use consent so that all the consents work together in an integrated way.</p> <p>This condition defines the scope of the activity that may be authorised to occur on the property.</p> <p>Compliance with this condition will be confirmed through the implementation of a Collected Agricultural Effluent Management Plan (CAEMP).</p> | Y | Y |
| <p>3. The discharge authorised by this consent shall not exceed the following rates at any time:</p> <p>(a) For the low rate system, a maximum depth of application of 20 millimetres for each individual application, at an instantaneous rate not exceeding 10 millimetres per hour;</p> <p>(b) For the slurry tanker, a maximum depth of application of 5 millimetres for each individual application;</p> <p>(c) The maximum loading rate of nitrogen onto any land area shall not exceed 150 kilograms of nitrogen per hectare per year; and</p> | <p>This condition specifies a limitation of the depth of effluent that can be applied, a rate of effluent that can be applied, a maximum annual loading per hectare and the minimum return period. The condition ensures that potential adverse effects of over application of effluent and/or nutrients are avoided.</p> | Y | Y |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|--|--|--------------------|----------------------|
| Discharge Permit to Discharge Agricultural Effluent to Land from a Dairy Shed and Feed Pad/Standoff Pad | | | |
| (d) The minimum return period for the discharge of effluent to land shall be no less than 28 days. | Compliance with this condition will be confirmed through the implementation of a CAEMP, including maintaining effluent disposal records (consistent with Condition 10 below). | | |
| 4. There shall be no discharge when the soil moisture content of the soils is at or above field capacity. The consent holder shall measure soil moisture levels on farm prior to each effluent application to assess the suitability of the soils for receiving effluent. The consent holder shall keep a record of each measurement and the volume of effluent applied to the paddock, which shall be provided to Council by 31 July each year for the preceding 12-month period. | This condition requires the consent holder to test soil moisture on farm before application of effluent occurs to ensure that effluent is only applied when a soil water deficit exists. This condition ensures that the potential adverse effects of applying effluent when soil moisture levels are at or above field capacity are avoided. Records are required to ensure compliance with this condition, which will be contained within the CAEMP. | Y | Y |
| 5. Effluent shall not be discharged within: (a) 20 metres of any surface watercourse; (b) 100 metres of any potable water abstraction point; (c) 200 metres of any residential dwelling not located on the subject property; and (d) 20 metres from any property boundaries; Where there is inconsistency between the plan shown in Appendix 1 and the conditions of this consent, the conditions of this consent shall prevail. | Condition 5 specifies limitations for where effluent application must be excluded. Once again this ensures that potential adverse effects of effluent application are avoided by requiring appropriate set backs from sensitive environments and locations. Compliance with this condition will be confirmed through the implementation of a CAEMP. | Y | Y |
| 6. Prior to exercising this consent the consent holder shall provide at least <u>1,238</u> m ³ of effluent storage capacity for the purpose of avoiding irrigation of effluent when soils are at or above field capacity. | Requiring sufficient storage for dairy shed effluent enables deferred application to occur which avoids any need to apply effluent when soil conditions are inappropriate. This is an integral part of avoiding the risks of effluent application to land. | Y | Y |
| 7. No effluent shall be discharged to any surface watercourse by overland flow, run-off, or via a pipe, nor shall there be any surface run-off/overland flow, ponding or contamination of water resulting from the exercise of this consent. | This condition confirms that effluent application is to land only and ensures that adverse effects of effluent discharge to water are avoided. | Y | Y |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|--|--|--------------------|----------------------|
| Discharge Permit to Discharge Agricultural Effluent to Land from a Dairy Shed and Feed Pad/Standoff Pad | | | |
| 8. There shall be no odour beyond the boundary of the site as a result of the exercise of this consent that is offensive or objectionable | Effluent can give rise to adverse odour effects if not managed appropriately. This condition avoids such effects by ensuring any odour effects are internalized. | Y | Y |
| 9. (a) Prior to the first exercise of this consent, the consent holder shall install and maintain an alarm and automatic switch off system as a contingency measure in the event of an effluent system failure, such as a sudden pressure drop, irrigator stoppage or break down. (b) Where the effluent reticulation system is installed in such a way that effluent can be siphoned when pumping ceases, the consent holder shall install and maintain an anti-siphon device in the effluent pipeline. | This condition further reduces the risk of ponding or system failure, by requiring that an automatic switch-off alarm system is installed on farm. It avoids the risk of large effluent discharges by putting a fail safe in place. | Y | Y |
| 10. (a) Prior to the first exercise of this consent, the consent holder shall prepare, and submit to the Consent Authority, a Collected Agricultural Effluent Management Plan. The purpose of the plan is to provide direction to the consent holder's staff about the operation of the effluent system, including identification of environmental risks, to ensure compliance with the conditions of this consent. The plan shall be a concise document that is easy to use by all farm staff and shall include (but not limited): <ul style="list-style-type: none"> ➤ a plan of how effluent will be managed when soils are at or above field capacity and/or during adverse weather conditions; ➤ a maintenance schedule for effluent disposal infrastructure (maintenance of irrigators, checking anti-siphon/switch-off systems, desludging the storage system etc); ➤ identification of drains, surface waterways, sub-surface drainage and critical source areas in the effluent disposal area so that appropriate management procedures can be implemented to avoid the risk of effluent entering water; ➤ a plan of how effluent application rates and soil temperature will be monitored to ensure the consent requirements are being met; ➤ Methodology for monitoring and completing calibration tests of the effluent system to ensure the system is operating in accordance with the conditions of this consent. | The CAEMP will be used to specify how compliance with conditions will be achieved and demonstrated. This condition clearly outlines what the management plan should include (at a minimum), all of which are relevant to the proposed discharge activities. | Y | Y |

| Condition proposed | Primary purpose of condition | Is this | Is this |
|---|---|------------|--------------|
| Discharge Permit to Discharge Agricultural Effluent to Land from a Dairy Shed and Feed Pad/Standoff Pad | | effective? | enforceable? |
| <ul style="list-style-type: none"> ➤ Details regarding the management of effluent generated from the operation of the feed pad/stand-off pad or any other associated infrastructure; ➤ Details of the methodology for undertaking soil moisture monitoring prior to the application of Effluent; and ➤ Details of records to be kept to demonstrate compliance with the conditions of this consent. <p>(b) The Collected Agricultural Effluent Management shall be reviewed at least on an annual basis to check that it still accurately reflects on-site activities and whether any improvements to management procedures need to be made. The results of the review shall be reported to the Consent Authority within one month of the review being undertaken.</p> <p>(c) If/when the plan is amended, a copy of the amended version, (or amended sections) shall be sent to the Consent Authority as soon as practicable following amendment.</p> <p>(d) This permit shall be exercised in accordance with the Collected Agricultural Effluent Management at all times. Where there is inconsistency between the Collected Agricultural Effluent Management Plan and the conditions of this consent, the conditions of this consent shall prevail.</p> <p>(e) The Collected Agricultural Effluent Management Plan required by Condition 10(a) can also be part of the Management Plan required under Land Use Consent [CONSENT NUMBER].</p> | <p>The Collected Agricultural Effluent Management Plan may be incorporated to the FEMP for ease of use and reference for the Consent Holder.</p> | | |
| <p>11.</p> <p>(a) Annual Monitoring to be undertaken by the consent holder to assess effects on Water Quality. The FEMP shall provide details of the farm monitoring program to be carried out by the Consent Holder for the purpose of assessing the effectiveness of, and demonstrating compliance with good management practices and to identify areas for improvement in management practices which may reduce the effects of the discharge</p> | <p>Monitoring by consent holder to check whether the performance standards, other restrictions are being complied with and to identify any unanticipated effects arising from the effluent discharge activity. This condition provides for a comprehensive monitoring programme to be</p> | Y | Y |

| Condition proposed | Primary purpose of condition | Is this | Is this |
|--|---|------------|--------------|
| Discharge Permit to Discharge Agricultural Effluent to Land from a Dairy Shed and Feed Pad/Standoff Pad | | effective? | enforceable? |
| <p>of effluent on water quality as on-going development of the FEMP. The monitoring program will include but not be limited to;</p> <p>(a) Monitoring of Critical Source Areas and tile drain discharge from the property; Bi-annual (i.e. at least twice per year) sampling of discharge from a minimum of 3 tile-drain outlets per sampling occasion is to occur when soil moisture is at or above 75% of field capacity and there is (or predicted) more than 10 mm of rainfall over a 24-hour period or when flow in Environment Southland's Waituna Creek at Marshall Road monitoring site is above 5,000 litres per second. The tile-drain sampling sites shall be measured for:</p> <ul style="list-style-type: none"> • Flow • Total suspended solids • Nitrate + Nitrite – Nitrogen • Total ammoniacal nitrogen • Dissolved organic nitrogen • Total nitrogen • Dissolved reactive phosphorous • Total dissolved phosphorus • Total phosphorus • <i>E. coli</i> • Electrical conductivity <p>Water quality samples are to be analysed by an ISO accredited laboratory and samples taken in accordance with the United States Geological Survey (USGS) National Field Manual for the Collection of Water-Quality Data (October 2015)</p> <p>(ii) Monitoring of Groundwater Quality; A groundwater sample is to be taken between 1st September and 31st October and between 1st March and 30th April each year. All samples shall be tested for:</p> <ul style="list-style-type: none"> • Nitrate + Nitrite – Nitrogen • Dissolved reactive phosphorous • <i>E. coli</i> • Electrical conductivity | <p>established by a suitably qualified professional to monitor the areas of risk associated with the activity.</p> <p>Monitoring will inform the reviews of the Collected Agricultural Effluent Management Plan and the FEMP.</p> | | |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|--|------------------------------|--------------------|----------------------|
| Discharge Permit to Discharge Agricultural Effluent to Land from a Dairy Shed and Feed Pad/Standoff Pad | | | |
| <ul style="list-style-type: none"> • Total chloride <p>The first year of sampling shall also include:</p> <ul style="list-style-type: none"> • Total iron • Total manganese • Total ammoniacal nitrogen <p>Water quality samples to be analysed by an ISO accredited laboratory and samples taken in accordance with the United States Geological Survey (USGS) National Field Manual for the Collection of Water-Quality Data (October 2015).</p> <p>(iii) The consent holder shall ensure that a bore or well is available onsite for the purpose of monitoring groundwater quality as set out in (ii) above. The bore or well shall;</p> <ul style="list-style-type: none"> • Be located downstream of the discharge area, as shown on the plan attached as Appendix 1 to this consent, or at an alternative location agreed in writing with the Consent Authority; • Be 4-5 metres below the static groundwater level, and screened on the bottom 2 metres; • Have an internal diameter of between 50 and 100 millimetres; • Be used solely for monitoring purposes, or otherwise as agreed upon in writing with the Consent Authority. <p>(iv) If groundwater sampling results indicate that nitrate concentrations exceed 8.5 mg/L (i.e. 75% of the maximum acceptable level for the New Zealand Drinking Water Standards) and/or if the averaged tile drain load exceeds 29 kg N/ha/year or 0.7 kg P/ha/year (or equivalent if the Overseer version changes), then an investigation into the cause of nutrient loss must be undertaken by a suitably qualified person(s) within 2 weeks of receiving the lab results. The investigation may consist of, but not be limited to:</p> <ul style="list-style-type: none"> • a farm inspection to identify likely contaminant sources, including and elevation of Critical Source Areas • Additional water quality monitoring (e.g. upstream and downstream of the property) to determine whether the issue is | | | |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|--|--|--------------------|----------------------|
| Discharge Permit to Discharge Agricultural Effluent to Land from a Dairy Shed and Feed Pad/Standoff Pad | | | |
| <p>occurring on the property, and/or sampling of additional water quality parameters to help identify the contaminant source(s)</p> <ul style="list-style-type: none"> • The result of the investigation including any changes in farm management practices, must be reported to Environment Southland within 2 weeks of the completion of the investigation and must be incorporated within the annual review of the FEMP. <p>(v) Annual soil sampling; A representative soil sample at a block level will be undertaken at least once during any 12-month period for the duration of the consent to establish the nutrient status of the soils. All samples are to be analysed by an ISO accredited laboratory.</p> <p>(vi) A monitoring report shall be provided to Environment Southland by the 31st July each year and shall consist of, but not be limited to:</p> <ul style="list-style-type: none"> • field sampling notes • lab results | | | |
| <p>12. Prior to the exercise of this consent, the consent holder shall notify the Consent Authority of who is the assigned operator of the effluent disposal system. If a new operator is appointed, the consent holder shall notify the Consent Authority within five working days.</p> | <p>This condition ensures that Council have the correct contact details of the person in charge, and that the person in charge of the system may be held accountable.</p> | <p>Y</p> | <p>Y</p> |
| <p>13. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, or on receiving monitoring results, for the purposes of:</p> <p>(a) Determining whether the conditions of this permit are adequate to deal with any adverse effect on the environment, including cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit; or</p> <p>(b) Ensuring the conditions of this consent are consistent with any National Environment Standards Regulations, relevant plans and/or the Environment Southland Regional Policy Statement; or</p> <p>(c) Amending the monitoring programme to be undertaken; or</p> <p>(d) Adding or adjusting compliance limits; or</p> | <p>This enables the Council to review these conditions of consent to address specific and significant adverse effects that might arise during the exercise of the consent.</p> | <p>Y</p> | <p>Y</p> |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|---|---|--------------------|----------------------|
| Discharge Permit to Discharge Agricultural Effluent to Land from a Dairy Shed and Feed Pad/Standoff Pad | | | |
| (e) Requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment arising as a result of the exercise of this permit. | Condition 13 (f) enables the consent to be brought into line with any water quality limits set by a plan consistent with pSWLP Policy 40. | | |
| (f) Ensuring the Mataura Freshwater Management Unit and Waituna Freshwater Sub Unit meets the freshwater objectives and freshwater quality limits set in an operative regional plan pursuant to Policy A1 of the National Policy Statement for Freshwater Management. | | | |

Table 6: Assessment of purpose, effectiveness and enforceability of the proposed conditions for Water Permit to abstract groundwater

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|---|---|--------------------|----------------------|
| Water Permit – To Abstract Groundwater for Stock and Shed Water Purposes | | | |
| 2. This consent is granted for a period of 15 years. | Term is consistent with the land use consent it is associated with. | Y | Y |
| 3. The permit authorises the taking of groundwater from up to two bores located at; NZTM 2000: 1264502E 4851627N NZTM 2000: 1264616E 4851107N | Identifies the location of the take point for certainty and to enable cumulative effects of future take applications to be assessed. | Y | Y |
| 4. The rate of abstraction shall not exceed: <ul style="list-style-type: none"> • 2 litres per second; • 36,720 litres per day; and • 11,120 cubic metres per year. <p>For the purpose of this consent a 'year' shall be 1 July to 30 June in the following calendar year.</p> | This condition restricts the amount of water which may be abstracted and used on the subject property. Take volume reflects the volume of water required in order to supported the proposed land use activity and is an efficient use of water. | Y | Y |
| 5. Prior to the first exercise of this consent, the consent holder shall install a backflow prevention device or take other appropriate measures to ensure water and/or contaminants cannot return to the water source. <p>(a) Prior to the first exercise of this consent, the consent holder shall install a water meter to record the water take, within an error accuracy range of +/- 5% over the meter's nominal flow range, and datalogger with at least 24 months data storage to record the rate and volume of take, and the date and time this water was taken. The consent holder shall forward a copy of the installation certificate to the Consent Authority within one month of installing the water meter and datalogger.</p> | These requirements ensure that water take infrastructure does not provide an opportunity for water quality to be compromised and enables the take to be monitored to ensure that the consent is exercised in accordance with the conditions. | Y | Y |

| Condition proposed | Primary purpose of condition | Is this | Is this |
|--|------------------------------|-------------------|---------------------|
| Water Permit – To Abstract Groundwater for Stock and Shed Water Purposes | | effective? | enforceable? |
| <p>(b) The water meter shall be installed in a straight length of pipe, before any diversion of water occurs. The straight length of pipe shall be part of the pump outlet plumbing, easily accessible, have no fittings and obstructions in it. There shall be a straight length of pipe on either side of the water meter: on the upstream side there shall be a distance that is 10 times the diameter of the pipe and on the downstream side there shall be a distance of 5 times the diameter of the pipe.</p> <p>(c) The consent holder shall ensure the full operation of the water meter and datalogger at all times during the exercise of this consent. All malfunctions of the water meter and/or datalogger during the exercise of this consent shall be reported to the Consent Authority within 5 working days of observation and appropriate repairs shall be performed within 5 working days. Once the malfunction has been remedied, a Water Measuring Device Verification Form completed with photographic evidence must be submitted to the Consent Authority within 5 working days of the completed of repairs.</p> <p>(d) If a mechanical insert water meter is installed it shall be verified for accuracy each and every year from the first exercise of this consent;</p> <ol style="list-style-type: none"> 1. Any electromagnetic or ultrasonic flow meter shall be verified for accuracy every five years from the first exercise of this consent; 2. Each verification shall be undertaken by a Consent Authority approved operator and a Water Measuring Device Verification Form shall be completed and supplied to the Consent Authority with receipts of service. These shall be supplied within 5 working days of the verification, and at any time upon request. <p>(e) The consent holder shall provide records from the datalogger to the Consent Authority via a system that can automatically send the data into the Consent Authority's computer database in CSV format, Hilltop or Tideda format, or XML formatted as required by Hilltop software. The consent holder shall provide records from the datalogger to the Consent Authority by 31 July each year and at any other time on request.</p> | | | |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|--|--|--------------------|----------------------|
| Water Permit – To Abstract Groundwater for Stock and Shed Water Purposes | | | |
| 5. The consent holder shall pay an administration and monitoring charge to the Consent Authority collected in accordance with Section 36 of the Resource Management Act, payable in advance on 1 July each year. | These charges enables the Council to carry out monitoring of the consent. | Y | Y |
| <p>6. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, or on receiving monitoring results, for the purpose of:</p> <p>(a) Adjusting the consented rate or volume of water under Condition 3, should monitoring under Condition 4(a) or future changes in water use indicate that the consented rate or volume is not able to be fully utilised; or</p> <p>(b) Determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; or</p> <p>(c) Ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and/or the Environment Southland Regional Policy Statement; or</p> <p>(d) Adjusting or altering the method of water take data recording and transmission.</p> | This condition enables Council to review these conditions of consent to address specific and significant adverse effects that might arise during the exercise of the consent and to review the consent where any new National Environmental Standard, Regional Plan or Regional Policy Statement imposes new restrictions. | Y | Y |

Table 7: Assessment of purpose, effectiveness and enforceability of the proposed conditions for Land Use Consent to construct a bore

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|---|--|--------------------|----------------------|
| Land Use Consent – Bore Consent | | | |
| 1. This consent is granted for a period of 5 years | To align the consent with Section 123 of the RMA. The term is consistent with the relevant policies of the RWPS and pSWLP. | Y | Y |
| 2. This resource consent authorises the construction of a bore at or about N: 4851107 E: 1264616 (NZTM), within the area shown on the map attached as Appendix A. | Identifies the location of where the new bore may be drilled for certainty. | Y | Y |
| <p>3. Where the bore/well is to be maintained as a permanent installation, construction shall comply with NZS4411:2001. In particular:</p> <ul style="list-style-type: none"> a) The top of the bore/well casing shall extend at least 300 mm above ground level. b) A seal, made of concrete or similar material, is to be placed at ground level around the outside of the casing. The seal shall be sufficient to prevent foreign material, surface water, spillage or other leakage entering the space between the casing and the wall of the borehole. c) The top of the casing shall be sealed to prevent the entry of contaminants. d) Flowing artesian bores/wells shall be fitted with headworks to control artesian pressures and avoid the uncontrolled discharge of water. e) The following shall be provided; <ul style="list-style-type: none"> (i) A filter pack comprising clean, washed sand (typically 2 to 4 mm) shall be placed around the screened interval. The filter pack shall extend at least 200 mm above the screened interval; (ii) A bentonite seal (typically bentonite pellets) shall be placed above the filter to prevent ingress of water via the bore annulus. The bentonite seal shall typically extend >2 m above the filter pack; (iii) The remainder of the bore annulus can be back-filled with clean material. f) Bores/wells intended for water abstraction or groundwater monitoring shall comply with the following: <ul style="list-style-type: none"> (i) The screened interval should be placed near the estimated lowest water table depth. (ii) A structure shall be placed around the bore/well to exclude stock from the immediate vicinity of the bore/well. | Condition 3 outlines the scope of the activity which may occur at this location. | Y | Y |

| Condition proposed | Primary purpose of condition | Is this effective? | Is this enforceable? |
|--|---|--------------------|----------------------|
| Land Use Consent – Bore Consent | | | |
| In the event that the bore/well is not to be maintained as a permanent installation, decommissioning and filling shall also be in accordance with NZS4411:2001. | | | |
| <p>4. Prior to the expiry of this consent, the following information shall be provided to the Consent Authority:</p> <p>(a) Details of the bore/well location(s) (GPS reference or site plan)</p> <p>(b) Details of bore/well construction including:</p> <ul style="list-style-type: none"> • Drilled depth • Casing depth • Screened intervals; and • Casing and screen materials <p>(c) Geological logs, including water table depth</p> <p>(d) Details of pumping tests carried out.</p> | The provision of this information will confirm compliance with Conditions 2 and 3 above, and the scope of the activity as proposed in the original applicant and the further information. | Y | Y |
| 5. Where more than one aquifer is encountered during drilling, the bore/well shall be constructed so that groundwater is drawn from one primary aquifer, and so that leakage between zones of differing pressure or water quality is prevented. | This condition ensures that there is no mixing of groundwater zones. | Y | Y |
| 6. In the event of discovery, or suspected discovery, of a site of cultural importance (Waahi Taonga/Tapu), the consent holder shall immediately cease operations in that location and inform the local iwi authority (Te Ao Marama Inc., Phone: (03) 931 1242). Operations may recommence with the written permission of the Consent Authority. The discovery of Koiwi (human skeletal remains) or Taonga or artefact material (e.g. pounamu/greenstone) would indicate a site of cultural importance. <i>Note: A protocol outlining the process in the event of such a discovery can be obtained from Environment Southland.</i> | This condition ensures that the application is consistent with relevant policies of the Iwi Management Plan, and Rules of the pSWLP and RWPS. | Y | Y |