

29 January 2018

Environment Southland
Private Bag 90116
Invercargill 9348

Our ref: 17305
ES ref: APP-20171553

Attn: Lauren Maciaszek

Dear Lauren,

RE: Request for Further Information under Section 92(1) of the Resource Management Act 1991 - Application for a discharge permit and a water permit

In reference to your request for further information dated 15 December 2017, find outlined below our response to this request.

Application to abstract groundwater

- ✚ ***Confirmation of the maximum rate of abstraction from the bore. The application states that the maximum capacity of the pump is 9 L/s – is this the maximum rate that water will be abstracted?***

The maximum rate the water will be abstracted is 60 L/minute or 1 L/s.

- ✚ ***Clarification of the daily water volume being applied for, as the proposed volume is equivalent to 32.69 L/cow/day but the volumes entered into the Dairy Effluent Storage Calculator are less than this. If you wish to apply for the equivalent of 32.69 L/cow/day please provide an amended DESC report to show proposed water use in the dairy shed.***

Please see Attachment A for the revised DESC using 32.69 L/cow/day. Using this value for yard wash down, the pond volume requirement is now 1581 cubic metres. The pond's current storage capacity of 1906 cubic metres is still adequate.

Application to use land for expanded dairy farming

- ✚ ***Provision of the Overseer electronic files for the nutrient budgets***

The Overseer Budget files prepared by Kelly Heckler, a CNMA, will be sent through via email after you signed the agreement drafted by Kelly.

- ✚ ***A description of the mitigation measures which are to be used for the proposed scenario with the additional land as part of the farm***



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boundary. The Overseer summaries show a decrease in nutrient losses from the current operation of the farm to the proposed operation – please explain what changes were made to the operation of the farm between the two budgets which resulted in the decrease in losses.

The Overseer Nutrient Budget Report is attached (Attachment B). The assumptions and changes made to the operation are stated in the report. The previous land use of the additional land is commercial flower farm. Fertilisers were applied to flower crops and it is likely that nutrient losses are more in the previous land use than a dairy farm being managed properly.

The mitigation measures to be implemented on the additional land will be the same as to the rest of the farm which include nutrient management plan, use of stand-off facilities, and timing and placing of fertilisers.

Application to discharge dairy shed and feed pad effluent to land

- ✚ ***Confirmation of the rates and depths that the travelling irrigator can apply at, in relation to the rate and depth proposed in the application. This is because travelling irrigators are usually measured in terms of depth rather than rate and depth, and their rates tend to be significantly higher than the applied depths. Please describe how the travelling irrigator operates and is managed to achieve the proposed rates and depths – you may also find it helpful to include manufacturer’s specifications or the results of an application rate test.***

The model of the travelling irrigator is Briggs Model 15. The maximum depth of application is 25 mm for each individual application. The manufacturer’s specification is attached (Attachment C).

Fonterra has done a test (Attachment D) as well and the maximum depth of application during the sampling is 18.9 mm which is still less than 25 mm.

This is to confirm that the proposed condition be based on 25 mm maximum depth of application rather than rate and depth.

- ✚ ***An explanation of whether the damage caused by rats to the effluent storage pond identified in the structural assessment will be repaired. If the damage to the pond will be repaired, please also describe how the pond will be repaired, when the repairs will take place, and the expected duration of the works, assess the implications of any storage shortfall during this period.***

As indicated in the email sent to you on 27 November 2017, the applicant has engaged Dairy Green Ltd to repair the damage caused by rats. Dairy Green Ltd has committed to take a look on the pond this February identify what needs to be done and complete the repair. The estimated duration of the work is two weeks.

In case there is any shortage shortfall during pond repair works, a slurry tanker will be used which will not exceed the maximum depth of application of 25 mm. The effluent will be applied only on areas where it is suitable.

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,



Zen Gerente

Resource Management Planner

46 Vivian St | PO Box 8235 | New Plymouth 4310

M 027 528 0683

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Attached:

Attachment A – Revised DESC

Attachment B – Overseer Nutrient Budget Report

Attachment C – Specifications of Briggs 15 Irrigator

Attachment D – Result of Fonterra's Application Test on Irrigator

Attachment A – Revised DESC

Dairy Effluent Storage Calculator

Summary Report

Regional authority: Environment Southland Regional Council
Authorised agent: Landpro Ltd
Client: Firdale Farms Ltd - 50 Dobbie Road (with Old Feedpad and Wintering Barn)
Program version: 1.47
Report date: Thursday, January 25, 2018
General description:

The farm is milking 700 cows and has a disposal area of 210 ha with the whole farm being low risk soils.
 The rainfall site used for this calculation differs from that used for the previous consent. The Wyndham station has been used as it is nearer the property than Woodlands Garvie Road and has a higher rainfall than what is measured on the property. This allows for additional safety in storage capacity.
 The average daily volume of wash down water is provided by the client based on their usage.
 The feedpad is uncovered and not diverted from the pond. The wintering barn roof water does not go to effluent pond.
 Irrigation is calculated at 2.5 hours per day pumping throughout the year.
 The existing pond has an effective capacity of 1906 cubic metres. Freeboard used is 0.5m as opposed to 0.3m in previous calculation.
 Based on the input data, the current storage capacity is adequate to meet the 90% probability that is 1581 cubic metres.

Climate

Rainfall site: Wyndham
Mean annual rainfall: 1079 mm/year

Effluent Block

Area of low risk soil: 210.0 hectares
Minimum area of high risk soil: 0.0 hectares
Surplus area of high risk soil: 0.0 hectares

Wash Water

Yard wash:

- Milking season starts: 08 August
 - Milking season ends: 25 May

Month	Number of Cows	Hours in Yard	Wash Volume (cubic metres)
January	700	6.0	23.0
February	700	6.0	23.0
March	650	6.0	21.0
April	600	5.0	19.0
May	550	4.0	18.0
June	0	0.0	0.0
July	0	0.0	0.0
August	400	4.0	13.0
September	550	5.0	18.0
October	700	6.0	23.0
November	700	6.0	23.0
December	700	6.0	23.0

Feedpad wash:

Month	Number of Cows	Hours on Pad	Wash Volume (cubic metres)
January	0	0.0	0.0
February	0	0.0	0.0

March	0	0.0	0.0
April	0	0.0	0.0
May	350	5.5	0.0
June	350	24.0	0.0
July	350	24.0	0.0
August	300	24.0	0.0
September	0	0.0	0.0
October	0	0.0	0.0
November	0	0.0	0.0
December	0	0.0	0.0

Animal shelter wash:

Month	Number of Cows	Hours in Shelter	Wash Volume (cubic metres)
January	0	0.0	0.0
February	0	0.0	0.0
March	0	0.0	0.0
April	0	0.0	0.0
May	350	5.5	0.0
June	350	24.0	0.0
July	350	24.0	0.0
August	300	24.0	0.0
September	150	24.0	0.0
October	0	0.0	0.0
November	0	0.0	0.0
December	0	0.0	0.0

Irrigation

Winter-spring depth: 10 mm
 Spring-autumn depth: 20 mm
 Winter-spring volume: 125 cubic metres
 Spring-autumn volume: 125 cubic metres
 Irrigate all year? Yes

Catchments

Yard Area: 1549 square metres
 Diverted? Yes
 - diversion start: 21 May
 - diversion end: 20 May
 Shed Roof Area: 500 square metres
 Diverted? Yes
 Feedpad Area: 1750 square metres
 Covered? No
 Diverted? No
 Animal Shelter Area: 3187 square metres
 Covered? Yes
 Diverted? Yes
 - diversion start: 01 May
 - diversion end: 30 April
 Other Areas: 103 square metres

Storage

Pond/s present? Yes
 No. of ponds: 1 pond/s

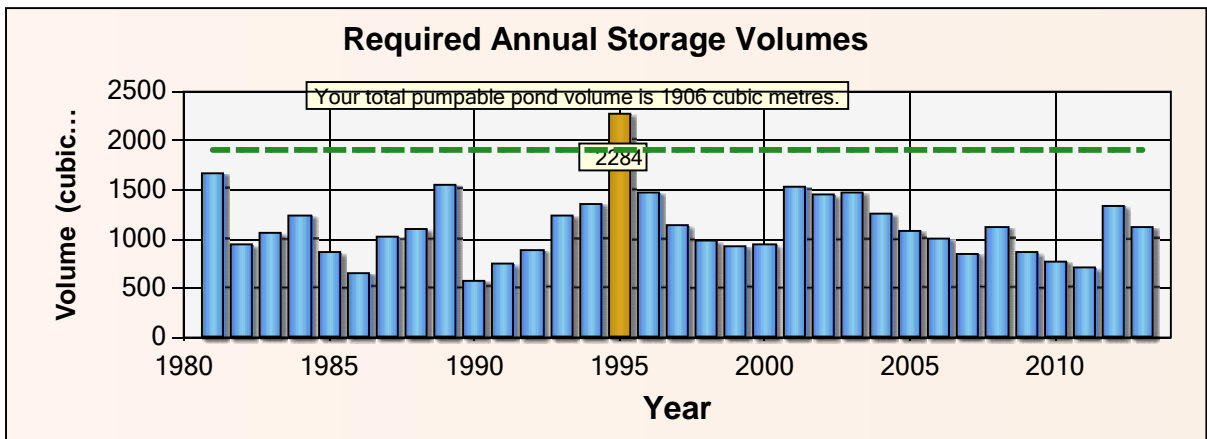
Includes irregular ponds?	No
Pond 1	
- total volume:	2943 cubic metres
- pumpable volume:	1906 cubic metres
- surface area:	1792 square metres
- width:	28.0 metres
- length:	64.0 metres
- batter:	3.0:1
- total height:	2.5 metres
- pumped?	Yes
Tank/s present?	No
Emergency storage period:	3 days

Solids Separation

Solids separator/s present? No

Outputs

Maximum required storage pond volume: 2284 cubic metres
 90 % probability storage pond volume: 1581 cubic metres
 During the period from: 01 July 1980
 To: 30 June 2013



Attachment B – Overseer Nutrient Budget Report



OVERSEER NUTRIENT BUDGET REPORT

FIRDALE FARMS LIMITED

DATE: November 2017

Prepared by: Kelly Heckler

AgriBasics Limited

Disclaimer

The following OVERSEER nutrient budgets and report has been produced with data provided from the client. AgriBasics Limited cannot accept responsibility for the accuracy of the data provided.

AgriBasics Limited cannot accept responsibility for any of the following, due to a range of factors which can affect the effectiveness of this Overseer Nutrient Budget or any plan derived from it. We do not accept responsibility for the information that has been provided by the client to AgriBasics Limited in preparing the budget or report, and the clients ongoing adherence to the budget or report. AgriBasics Limited cannot accept responsibility for the clients compliance with environmental laws and other requirements relating to the property, which will remain the responsibility of the clients.

AgriBasics Limited expressly disclaims any and all liabilities contingent or otherwise that may result in the use of this report.

Kelly Heckler CNMA Number 1008

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Property Information

Firdale Farms Limited are located in the Edendale region of Southland. This dairy farm is run by the Clarke Family.

Firdale Farms have recently purchased an adjoining block of 8ha of land (referred to as the House block) that will be incorporated into the dairy farm.

Firdale Farms runs a predominately grass based system with some silage supplement brought in. Silage is used in the wintering barn. All cows are wintered on farm in the wintering barn or pad. There is a covered wintering barn and an uncovered wintering pad with a self-feeding silage bun.

Replacements are grazed off farm from weaning in November.

As well as silage brought in for the wintering the cows, there is also PKE and Molasses brought in for in-shed feeding, of the cows, through the milking season. Supplements are also made on the milking platform.

Both of the blocks have the same soil type, Waikiwi, which runs over this whole farm and the surrounding area.

Waikiwi is a deep, well drained, silty loam soil. This soil has moderately limited aeration in the root zone so denitrification rates will not be high. Water logging is unlikely to occur on this soil. This soil has a high to very high Profile Available Water so is able to withstand high rain fall events and there is a good plant supply. Waikiwi soil has a low structural vulnerability, therefore is able to tolerate cultivation and heavy grazing very well. This soil has a medium level of P retention and therefore this should be accounted for in fertiliser applications. This soil has a FDE risk category of D. It is low risk and well suited to effluent application. Waikiwi soil has a low N leaching vulnerability and very low run off potential.

This farm is made up of 2 pastoral blocks used in this OVERSEER Nutrient Budget.

Non Effluent Waikiwi – Only receives solid effluent applications

Effluent Waikiwi – Receives both liquid and solid effluent application.



The soils in this area of Southland are classed in the Oxidising Physiographic zone, in the Environmental Southland Land and Water Plan. Typically, these soils will lose nutrients from deep drainage pathways.



OVERSEER Assumptions

These assumptions have been used for data input for these OVERSEER Nutrient Budgets and should always be read in conjunction with the OVERSEER Nutrient Budgets.

The year 2016 – 2017 has the new land area incorporated so is the proposed nutrient budget. The 2015 – 2016 year is the previous nutrient budget as the new land isn't included. There is also a separate nutrient budget (House block) to analyse what the new land was leaching in 2015 – 2016 before it was incorporated to the dairy farm.

Total farm area is currently 242 ha. The effective area is 228 ha. This area included the new (house) block which has been added on. The new block totals 8ha with an effective area of 6.5 ha.

Soil tests were taken in May 2017.

There is no drainage on this farm.

Cow numbers on farm each month are based on peak cow numbers and the number of cows wintered. With the addition of the extra area, there is no increase in cow numbers. The additional area will be used to increase per cow production. There was a higher peak cows in 2015 -2016 but similar wintering numbers. Overall the numbers have remained relatively constant over the 2 years.

Production for the 2016 - 2017 year is 336,800 kg Milk Solids. This equates to 490 kg MS/cow/yr. The previous year the production was 323,306 kg MS which is 459 kg MS/cow/yr.

There is both an uncovered wintering feed pad and covered wintering feed pad/barn on this farm. OVERSEER limits each farm to only one wintering feed pad/barn system. For this model the pad is covered. All effluent from both pads is captured. All cows are wintered on the wintering feed pad and barn. The wintering barn/pad are lined with bark chips.

All effluent is captured from the wintering barn and pad. The solid effluent is spread over all the paddocks

Effluent is applied to the effluent area, as it is collected. Only when conditions aren't suitable, effluent diverted and stored in holding pond. The sand trap is emptied daily and spread over all paddocks.



Liquid Effluent is spread via travelling irrigator at low application depth. The pond is stirred and sprayed regularly.

This farm is growing around 18 ton DM/ha and animal intake is 15 ton DM/ha. It is higher than average for Southland, though very acceptable for this area of Southland and these operators.

In the 2016 – 2017 year there was no P fertiliser applied due to high Olsen P levels. In the 2015 – 2016 year there has been assumed that a maintenance dressing was applied.

One N application has been dropped on the 2016 – 2017 year due to the increase in land area.

Typical fertiliser application has been applied to the house block. It isn't known what was applied in the 2015 -2016 year, but there was fertiliser applied. The house block has, previously to the 2015 – 2016 year, has been in tulips and irises. There is very little data available on nutrient losses from flower crops. The nutrient losses from this system would likely to be a lot higher than the current losses.



OVERSEER Nutrient Budgets

Firdale Farms is leaching 30 kg Nitrogen/ha/yr for the 2016 – 2017 year. This is within the average figure for Nitrogen leaching for the region, and a respectable level for this operation.

Firdale Farm leached 33 kg N/ha/yr in the 2015 – 2016 year. The house block also leached 9 kg N/ha/yr this year.

The blocks on Firdale Farms have low N concentration in the drainage water. They all range from 1.4ppm to 7.9ppm over both years. The House block was the lowest at 1.4ppm and the 2015-2016 Effluent Waikiwi block was the highest at 7.9ppm. All these figures are well below the World Health Organization limit of 11.3ppm, the standard for drinking water.

Phosphate losses for the whole farm are low at 0.7 kg P/ha/yr. All blocks have very low P losses of 0.2 kg P/ha/yr. The increase over the whole farm is due to losses from the wintering barns and lanes etc.

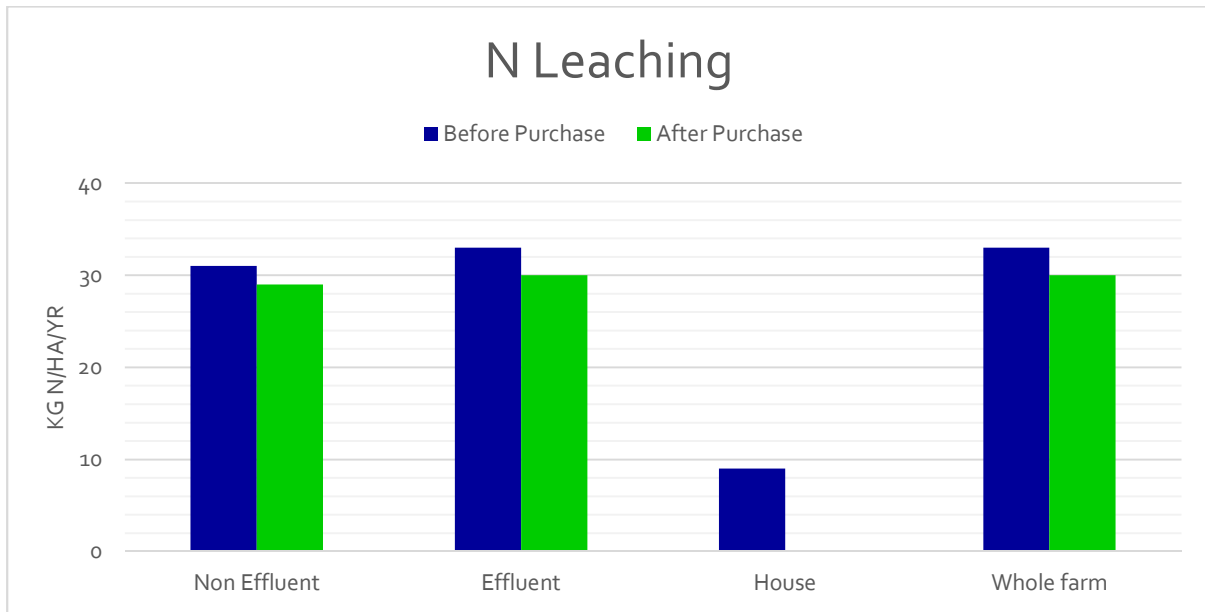
The effluent area in 2016-2017 is receiving 90 kg N/ha/yr from the farm dairy effluent. In 2015-2016 the effluent area received 97 kg N/ha/yr. Both years are well below the recommended maximum of 150 kg N/ha/yr to come from farm dairy effluent. A larger effluent area is always beneficial both, economically and environmentally. Effluent spread over a larger area should pose lower risk of nutrient losses.

Of note the total N loss from the whole farm in the 2016 – 2017 year is 7,235 kg N/yr. In the 2015 – 2016 year the N loss from the whole farm and House block is 7,684 kg N/yr. This has decreased with new area incorporated into the dairy farm.



OVERSEER Nutrient Budget Comparisons

The N leaching on the proposed dairy farm is 3 kg N/ha/yr less than the previous year over the whole farm.



There is no difference in P loss from any of the nutrient budgets.



Attachment C – Specifications of Briggs 15 Irrigator

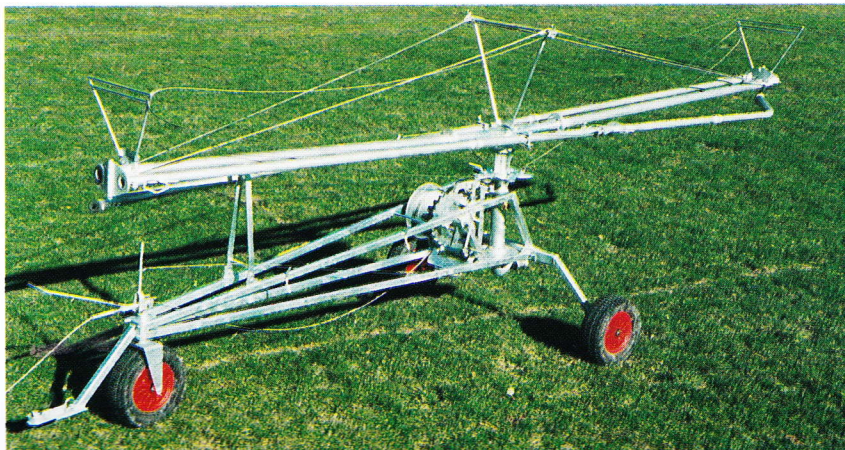
BRIGGS MODEL 15 **Effluent Applicator**



*A very efficient, low cost, low pressure
Travelling Effluent Applicator*

Big Features — Small Machines

- * Fully Hot Dipped Galvanised
- * Simple to Operate
- * Trouble Free Rotating Drive
- * Five Travel Speeds
- * Low Pressure Operation
- * Also Suitable for Irrigation
- * Thermoplastic Bearings
- * Operates with Lay Flat and Hard Hoses
- * Low Running Costs



BRIGGS **MODEL 15** **Effluent Applicator**

Effluent Applicator is Mechanically Efficient:

The Briggs Effluent Applicator performs a complex task by means of a few simple mechanisms. The retro-action of the effluent causes the boom to rotate for an even spread of effluent. The rotation of the boom provides the motive force that propels the machine using a drive roller rotating around a series of cams which operates a simple lever mechanism to the wire rope winch drum.

Effluent Applicator's Performance:

The Briggs Model 15 Effluent Applicator dragging a 150 metre length of 63mm medium density polyethylene hose operating at a flow rate of 20m³/hr (75 gpm) with a wetted width of 35 metres, will on its fastest travel speed of 85m/hour apply effluent onto the ground at a rate of 6.7mm per pass. On the slowest travel speed of 17m/hour this applicator will apply 34mm of effluent per pass.

Based on a 500 cow herd producing 25 cubic metre of effluent daily, for a 25 mm application this applicator would only have to operate for 1.25 hours per day.

The machine would take 10.5 days to complete a full 300 metre run before being shifted to a new location.

Effluent is applied at less than 2 metres from the ground surface; this is environmentally acceptable to the regional councils throughout New Zealand.

Effluent Applicator's Features:

Briggs effluent applicators are manufactured to very high engineering and dimensional standards with each component being identical to one another. All bearings are manufactured from high molecular weight thermoplastic which are very abrasive and corrosive resistant and are an excellent medium to transfer the working loads of this machine.

A 316 stainless steel wear sleeve is fitted around the inner tower assembly to provide an improved wear surface; this sleeve can be easily replaced when required.

The upper tower assembly contains a Y junction to help prevent any build up of solid material accumulating at this point. The boom itself is segmented to allow for ease of dismantling if required. Rubber drive nozzles allow for large size segments of solid material to pass without causing any blockages. A very simple sealing arrangement is provided to prevent any effluent from entering into the tower area.

An automatic starting mechanism and a forward travel release are provided to allow for ease of operation of this machine.

With its 15 metre long boom, this applicator can provide substantially more torque than is required to pull the 150 metre of 63mm diameter drag hose, and can easily start under load at any point along its travel path.

With the machine pulling up to 150 metres length of hose, with a central supply, a 300 metre run can be achieved.

SPECIFICATIONS

Boom Length	15 metres
Wetted Width	35 metres
Lane Spacings	35 metres
Hose Length	up to 150 metres
Run Length	up to 300 metres
Hose Diameter	up to 63mm
Flow Range	2 to 6 L/s
Operating Pressure	150 to 250 k.p.a. (20 to 30 psi)
Travel Speeds	17 to 85 metres per hour
Area Covered	1.05 hectares (300m Run)

The above figures are for reference purposes and are not binding in detail.
We reserve the right to introduce changes to the specifications of the machine without prior notice.

Manufactured in NEW ZEALAND by:

Rainer
Irrigation Ltd.

10 Robinson Street,
Ashburton, New Zealand.

Phone (03) 3079049

Fax (03) 3079047

Email rainer@ashburton.co.nz

DISTRIBUTOR

PROGRESSIVE ENGINEERING

Southland Ltd
140 BOND STREET, INVERCARGILL
Ph: 214-4292

Attachment D – Result of Fonterra’s Application Test on Irrigator

29 April 2016

Brendon Clarke
19 Dobbie Road
RD 3
Wyndham 9893

Dear Brendon

Effluent Irrigation System testing for S/N 32172

Thank you for the opportunity to visit your farm and analyse the performance of your effluent irrigation system.

The information provided below provides important details of your system and will help you or staff to manage the application of effluent to maximize pasture growth and comply with Local Regional Council rules.

Testing was carried out on your Briggs15 travelling irrigator located in paddock 47 which was at the midway point from the pump of the regular effluent area, speed settings of the irrigator was on its fastest speed (picking up 5 cams), nozzles were in good condition

The irrigator was set up correctly with the hose in close to avoid drag; trays were laid out 2m apart, across the full wetted area of the irrigator.

Testing was carried out in accordance with the Dairy NZ procedures contained in "A staff guide to operating your effluent system" – Travelling Irrigator.

An inline flow meter (Seametrics WMP 104 electromatic flow meter) and pressure gauge was connected into the effluent line at the first join back from the irrigator.

The following results were obtained:

- Operating pressure = **39 PSI (spec give 30)**
- Flow rate = **6.8 l/sec on average**
- Effluent volume = **12.8 cubic meters total for a 31 min run(25 cubes/hour)**
- Average application depth = **9.17 mm**
- Maximum application depth from tray 6 = **18.9 mm**

Your discharge consent will require a maximum depth of application of 10mm for a high rate travelling irrigator; you meet this requirement with your average depth of 9.17 mm.

On the day of the test there was a lot of sludge being pumped due to irrigating out of the sump, this would have a big impact on the results, I would not consider slowing the irrigator down unless there had been a long period of dry conditions.

Please do not hesitate in contacting me if you wish to discuss the attached results in more detail

Yours sincerely

Brian Goodger- 0277036550

Sustainable Dairy

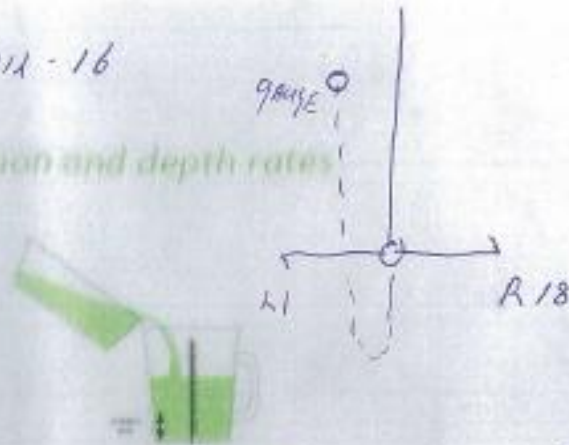


S/N 32172 7 APRIL - 16

How to calculate application and depth rates

Rectangle trays with SLOPED sides

Paddock 47
 BRISSES 15
 picking up 5 cans



Container 1 Container 2 etc

L1	10	630	1425	1070	880	730	745	670	715	710
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680	710	750	880	1175	1675	1150	R18	20	TOTAL (ml)	14625
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TOTAL (ml)	NUMBER OF CONTAINERS	AVERAGE VOLUME (ml)
14625	18	= 812.5

CONTAINER WIDTH (mm)	CONTAINER LENGTH (mm)	CONTAINER AREA (mm ²)
242mm	X 366mm	= 88572 mm

1000	X	AVERAGE VOLUME (ml)	CONTAINER AREA (mm ²)	AVERAGE APPLICATION DEPTH (mm)
		812.5	88572 mm	= 9.17

AVERAGE APPLICATION DEPTH (mm)	TIME (hrs)	AVERAGE APPLICATION RATE (mm/hr)
9.17	= min/60 0.51	= 17.9

Note: Maximum application depth = The CONTAINER with the deepest measurement

FLOW START - 1540.4

END - 1553.2

FLOW RATE = 6.8 l/sec.

PSI w IRRIGATOR : 39

TIME 31.17



Fonterra Co-operative Group Limited

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