WW1&2 consent application

Appendix A

Application Appendix.

NEW ZEALAND COMPANIES REGISTER

Certificate of Incorporation

WOLDWIDE ONE LIMITED

2158688

NZBN: 9429032629682

This is to certify that HILBRE INVESTMENTS NO 19 LIMITED was incorporated under the Companies Act 1993 on the 11th day of August 2008
and changed its name to WOLDWIDE ONE LIMITED on the 4th day of May 2009.

Registrar of Companies
31st day of July 2018

REGISTRAR OF COMPANIES NEW ZEALAND

Certificate generated 31 July 2018 10:15 AM NZST

NEW ZEALAND COMPANIES REGISTER

Certificate of Incorporation

WOLDWIDE TWO LIMITED

2200670

NZBN: 9429032432329

This is to certify that HILBRE INVESTMENTS NO 23 LIMITED was incorporated under the Companies Act 1993 on the 26th day of January 2009
and changed its name to WOLDWIDE TWO LIMITED on the 4th day of May 2009.

Registrar of Companies
31st day of July 2018

REGISTRAR OF COMPANIES NEW ZEALAND

Certificate generated 31 July 2018 10:16 AM NZST

NEW ZEALAND COMPANIES REGISTER

Certificate of Incorporation

WOLDWIDE FARM LIMITED

516389

NZBN: 9429039079978

This is to certify that NICO (NO.32) LIMITED was incorporated under the Companies Act 1955 on the 13th day of August 1991
and changed its name to WOLDWIDE FARM LIMITED on the 2nd day of December 1991
and was reregistered to become a company under the Companies Act 1993 on the 11th day of June 1997.

Registrar of Companies
31st day of July 2018

REGISTRAR OF COMPANIES NEW ZEALAND

Certificate generated 31 July 2018 10:16 AM NZST

NEW ZEALAND COMPANIES REGISTER

Certificate of Incorporation

WOLDWIDE RUN-OFF LIMITED

2200669

NZBN: 9429032432213

This is to certify that HILBRE INVESTMENTS NO 22 LIMITED was incorporated under the Companies Act 1993 on the 5th day of January 2009
and changed its name to WOLDWIDE RUN-OFF LIMITED on the 4th day of May 2009.

Registrar of Companies
7th day of August 2018

REGISTRAR OF COMPANIES NEW ZEALAND

Certificate generated 07 August 2018 09:54 AM NZST

Dairy Effluent Storage Calculator
Summary Report

Regional authority: Environment Southland Regional Council
Authorised agent: Dairy Green Ltd
Client: WW1
Program version: 1.50
Report date: Tuesday, 26 February 2019
General description:

WW1
700 milked at peak
640 in barn for contigency storage - actual max for barn is 625
Milk until 15 June
Yard diversion 16 June to 31 July
Pond capacity = 4,241 m3
Conservative estimate of 50 ha of low risk soils used.

Note there is a covered wintering shed on farm which has a small uncovered catchment of 170 sq m. The details are included under feedpad.

Climate

Rainfall site: Drummond Marson Rd
Mean annual rainfall: 1061 mm/year

Effluent Block

Area of low risk soil: 50.0 hectares
Minimum area of high risk soil: 150.0 hectares
Surplus area of high risk soil: 0.0 hectares

Wash Water

Yard wash:

- Milking season starts: 01 August
- Milking season ends: 15 June

Month	Number of Cows	Hours in Yard	Wash Volume (cubic metres)
January	670	3.5	34.0
February	660	3.5	33.0
March	640	3.5	32.0
April	580	3.0	27.0
May	500	3.0	25.0
June	180	0.0	9.0
July	0	0.0	0.0
August	300	3.0	15.0
September	500	3.5	25.0
October	680	4.0	34.0
November	700	4.0	35.0
December	700	3.5	35.0

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	640	12.0	0.0
June	640	24.0	0.0

July	640	24.0	0.0
August	370	23.0	0.0
September	75	23.0	0.0
October	0	0.0	0.0
November	0	0.0	0.0
December	0	0.0	0.0

Irrigation

Winter-spring depth:	2 mm
Spring-autumn depth:	4 mm
Winter-spring volume:	80 cubic metres
Spring-autumn volume:	160 cubic metres
Irrigate all year?	Yes

Catchments

Yard Area:	553 square metres
Diverted?	Yes
- diversion start:	16 June
- diversion end:	31 July
Shed Roof Area:	175 square metres
Diverted?	Yes
Feedpad Area:	170 square metres
Covered?	No
Diverted?	No
Animal Shelter Area:	0 square metres
Covered?	Yes
Diverted?	No
Other Areas:	0 square metres

Storage

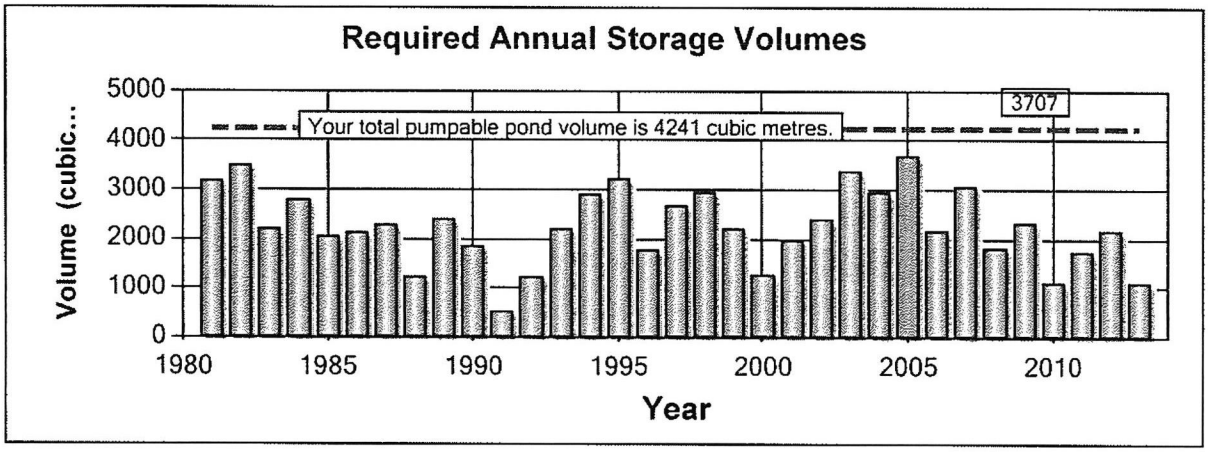
Pond/s present?	Yes
No. of ponds:	1 pond/s
Includes irregular ponds?	No
Pond 1	
- total volume:	5323 cubic metres
- pumpable volume:	4241 cubic metres
- surface area:	2282 square metres
- width:	46.1 metres
- length:	49.5 metres
- batter:	2.5:1
- total height:	3.4 metres
- pumped?	Yes
Tank/s present?	No
Emergency storage period:	0 days

Solids Separation

Solids separator/s present?	No

Outputs

Maximum required storage pond volume:	3707 cubic metres
90 % probability storage pond volume:	3257 cubic metres
During the period from:	01 July 1980
To:	30 June 2013



Dairy Effluent Storage Calculator
Summary Report

Regional authority: Environment Southland Regional Council
Authorised agent: Dairy Green Ltd
Client: WW2
Program version: 1.50
Report date: Tuesday, 26 February 2019
General description:

WW2 unit
800 milked
640 in barn for contigency storage - actual max for barn is 625
Split low risk (50 ha) and high risk (150 ha) soils
Sllage pad catchment 800 m2

Note that there is a small uncovered catchment of 170 sq m at the dairy shed. The details for the shed use are under feedpad.

Climate

Rainfall site: Drummond Marson Rd
Mean annual rainfall: 1061 mm/year

Effluent Block

Area of low risk soil: 50.0 hectares
Minimum area of high risk soil: 150.0 hectares
Surplus area of high risk soil: 0.0 hectares

Wash Water

Yard wash:

- Milking season starts: 01 August
- Milking season ends: 15 June

Month	Number of Cows	Hours in Yard	Wash Volume (cubic metres)
January	760	3.0	38.0
February	750	3.0	37.5
March	740	3.0	37.0
April	660	3.0	33.0
May	580	3.0	29.0
June	270	1.0	13.5
July	0	0.0	0.0
August	350	2.5	17.5
September	700	3.0	35.0
October	800	3.0	40.0
November	780	3.0	39.0
December	760	3.0	38.0

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	640	12.0	0.0
June	640	24.0	0.0
July	640	24.0	0.0
August	375	23.0	0.0

September	75	23.0	0.0
October	0	0.0	0.0
November	0	0.0	0.0
December	0	0.0	0.0

Irrigation

Winter-spring depth: 2 mm
Spring-autumn depth: 4 mm
Winter-spring volume: 80 cubic metres
Spring-autumn volume: 160 cubic metres
Irrigate all year? Yes

Catchments

Yard Area: 1126 square metres
Diverted? Yes
- diversion start: 16 June
- diversion end: 01 August
Shed Roof Area: 175 square metres
Diverted? Yes
Feedpad Area: 170 square metres
Covered? No
Diverted? No
Animal Shelter Area: 0 square metres
Covered? Yes
Diverted? No
Other Areas: 800 square metres

Storage

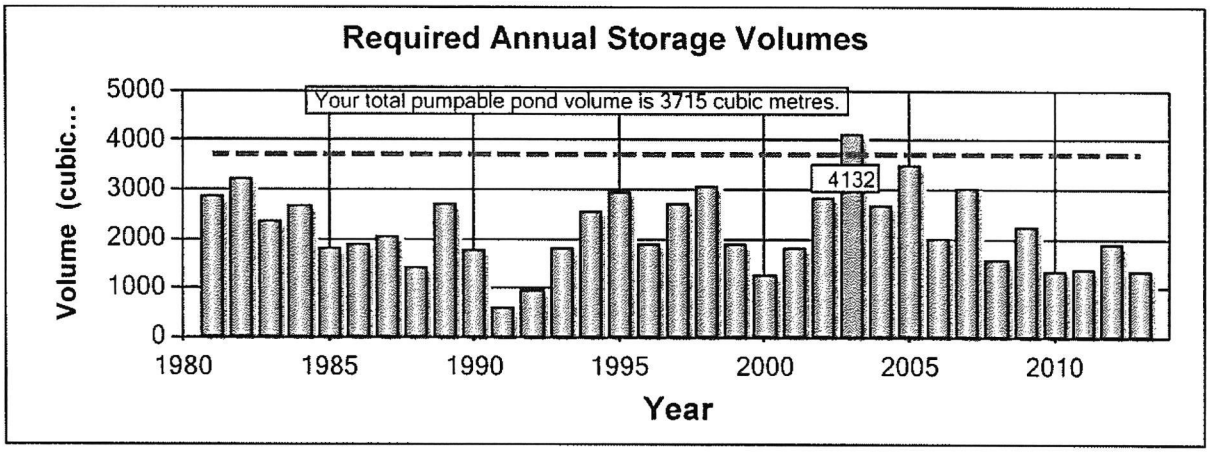
Pond/s present? Yes
No. of ponds: 1 pond/s
Includes irregular ponds? No
Pond 1
- total volume: 4463 cubic metres
- pumpable volume: 3715 cubic metres
- surface area: 1516 square metres
- width: 37.9 metres
- length: 40.0 metres
- batter: 0.5:1
- total height: 3.2 metres
- pumped? Yes
Tank/s present? No
Emergency storage period: 0 days

Solids Separation

Solids separator/s present? No

Outputs

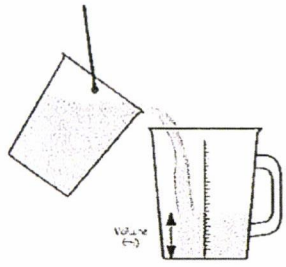
Maximum required storage pond volume:	4132 cubic metres
90 % probability storage pond volume:	3203 cubic metres
During the period from:	01 July 1980
To:	30 June 2013



WW1 - travelling irrigator test.

How to calculate application and depth rates

Round buckets with SLOPED sides



Record the depth from each container, e.g. on a sprinkler with a 40 m diameter wetted area, there may be 20-40 containers.

Container 1	Container 2	etc ...						
0	350	400	600	600	430	700	750	TOTAL (ml) 11350
+ 400	+ 650	+ 750	+ 650	+ 650	+ 800	+ 800	+ 1150	

TOTAL (ml)		NUMBER OF CONTAINERS		AVERAGE VOLUME (ml)
11350	÷	18	=	630.56

CONTAINER WIDTH (mm)			CONTAINER RADIUS (mm)
290	÷	2	= 145

		CONTAINER RADIUS (mm)		CONTAINER RADIUS (mm)		CONTAINER AREA (mm²)
3.14	X	145	X	145	=	66018

		AVERAGE VOLUME (ml)		CONTAINER AREA (mm²)		AVERAGE APPLICATION DEPTH (mm)
1000	X	630.56	÷	66018	=	9.55

WW1

AVERAGE APPLICATION DEPTH (mm)		TIME (hrs) (e.g 1hr 15 mins = 1.25 hrs)		AVERAGE APPLICATION RATE (mm/hr)
9.55	÷	1.25	=	7.64

NOTE: Maximum application depth = The CONTAINER with the deepest measurement.

Tip: To convert seconds or minutes to decimal, divide by 60 e.g. 21 mins = 21 ÷ 60 = 0.35 hrs.

For assistance and advice on testing application depths and rates on pivot systems, please contact DairyNZ.

The maximum application depth and rate will be driven by a number of factors, such as the soil type, drainage, topography, the type of applicator being used and the soil moisture conditions. For more about how to identify the soil risk features on your farm, see Farmfact 6-61: How landscape and climate affect effluent management.

WW2 -

environment SOUTHLAND Te Taiao Tonga

Measuring Application Depth for Travelling Irrigators

Date	06/10/2017	Dairy Supply Number:	32651
Consent Number:	AUTH - 300626 - V2		
:			
GPS (Paddock number): 44	E - 46.049746	N 168.165085	
Diameter of irrigation:	29.5 metres		
Irrigator make/model:	Numedic ADCAM750		
Irrigator setting	2 Cams	6 teeth	
Time taken for full pass of irrigator:	90 minutes	seconds	

Tray Number	Volume of Effluent in tray (ml)	Depth *(office use only)*
1	2	
2	6	
3	9	
4	13	
5	13	
6	13	
7	13	
8	13	
9	13	
10	10	
11	8	
12	4	
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
$\bar{x}$ *(office use only)*		
	Rate *(office use only)*	

NUMEDIC

superior dairy technology

IRRIGATOR TEST

Paddock Number 44 **Date:** 14/11/16

READ ALL THE INSTRUCTIONS BEFORE STARTING!! **There are two pages.**

Measurements to be taken:

- Depth in containers
- Time taken between pegs
- Spread of irrigator (m)
- Boom revolutions per minute

Container #	1	2	3	4	5	6	7	8	9	10	11	12
Depth (mm)	2	6	9	13	13	13	13	13	13	10	8	4

Measuring Application Depth in each container:

1. Place containers of the same size in a line across the path of the irrigator. Place them evenly and also ensure that you have enough containers to cover the total wetted width. Place them so that no effluent will be entering any container when the irrigator starts working. The table above is for 12 containers but you may use more. The more containers you use, the more accurate the results will be. The containers must have straight sides.

2. Once the irrigator has passed over the containers and no more effluent is going into any container, measure the depth in each container with a ruler and record them in the chart above.

Calculating the Average Application Depth:

The **average application depth(mm)** is the sum total of the depths in all the containers divided by the number of containers eg if using 8 containers and depths were 6, 8, 10, 12, 14, 9, 8, 7, the total is 74mm and 74 divided by 8 is 9.25mm. So the average depth is 9.25mm

1. Record the depth (mm) in each container in the boxes above
2. Add up the depths to give the Total 117 mm
3. Calculate the average application depth. 9.75 mm WW2.

Measuring the speed of the irrigator:

1. Place two pegs (fence standards are fine) in the ground 10 metres apart. Measure the time the irrigator takes to travel from one peg to the next. The speed is calculated as distance divided by the time. Eg if the time taken is 5 minutes for 10 metres, calculation is 10 divided by 5 = 2 metres/minute _____time taken (minutes) for _____distance (m)

Measuring the spread of the irrigator:

1. Measure the diameter of the wetted area of the irrigator. This measurement will be used when setting up your runs.
   29.5 m

Measuring the boom rotations

1. Count how many full revolutions the boom makes in one minute _____revs/minute

Dairy Green Ltd
Practical Engineering Solutions
Consents, Effluent, Stock water, Irrigation
Design through to Installation
Irrigation NZ Accredited Designer

19th December 2017

Abe De Wolde
Woldwide Two
104 Shaws Trees Road
RD 3
Winton 9783

Dear Abe

Drop Test Results: Effluent Pond, 17 – 19 November 2017

1. Background
The current discharge consent for the property is 20171278-01

As required by Environment Southland, to confirm your effluent pond is not leaking, a drop down test was carried out between the 17 & 19 November 2017.

Site and Set Up
The farm is located at 1915 Winton-Wreys Bush Hwy

Effluent flows by gravity from the dairy shed to a sand trap sump. Whole effluent is then pumped to a clay lined storage pond if it is not pumped to the irrigator. The pond also services a wintering barn. Therefore, it stores thick slurry and a crust on the pond is inevitable, as can be seen by the photo below. The pond has been emptied in the last 12 months. The surface was not frozen during testing.

The pond was isolated by not allowing any inflow and by not pumping out during the test period.

The dimensions of the storage pond at the water level during the test period were:
North 36.0m
East 40.1m
South 37.0m
West 36.0m

The dimensions of the storage pond at the top bank level during the test period were:

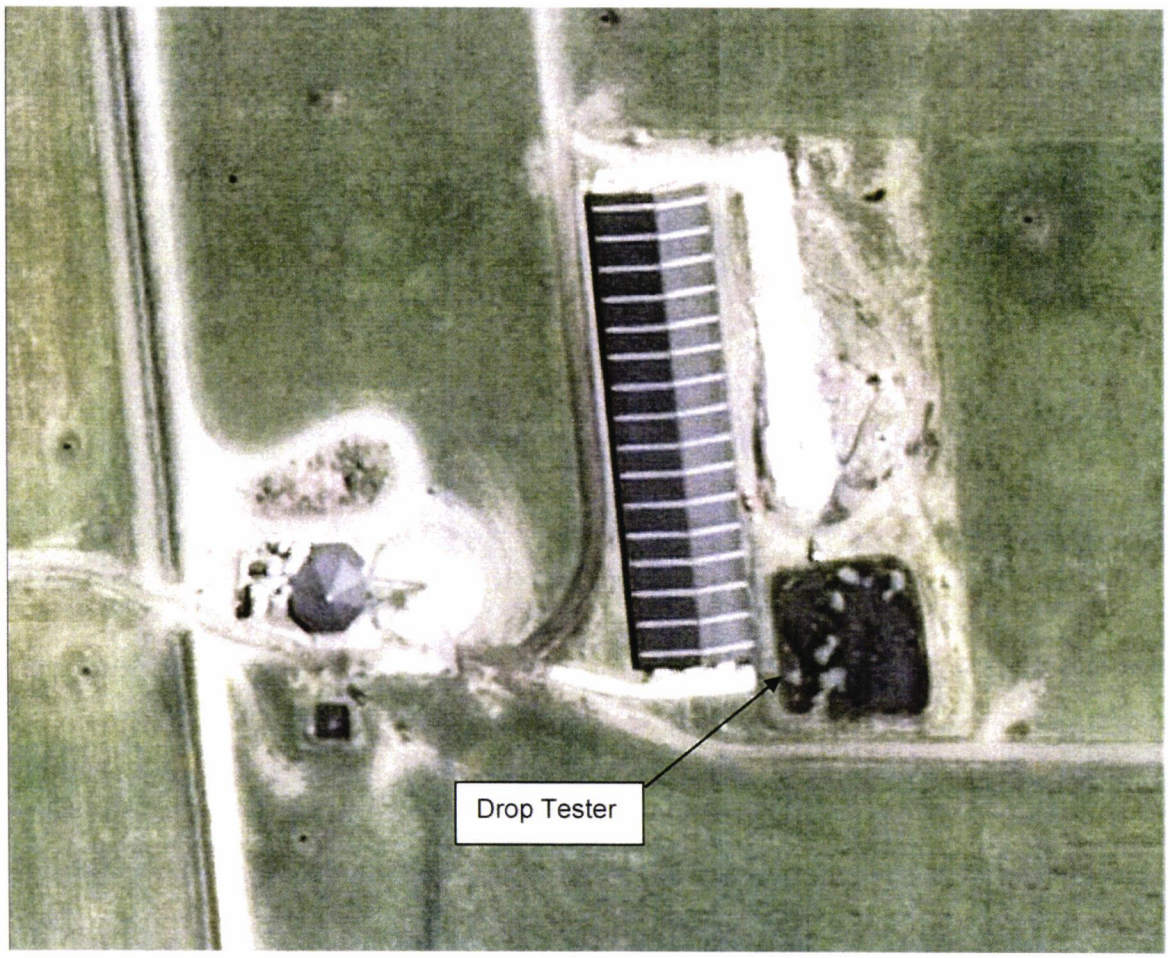
10 Kinloch Street, PO Box 5003, Waikiwi, Invercargill 9843
Phone 03 215 4381, Fax 03 215 4391
Email: scandrettrural@xtra.co.nz

North 38.0m
East 42.0m
South 37.6m
West 38.2m

The total pond catchment area was 9% greater than the wetted area during the test.

The maximum depth for the pond is 3.2m, this includes 0.5m of freeboard. At the time of the test the liquid level was 1.0m below design height, i.e.81% full.

Below is an aerial photo that shows the pond and dairy shed. The laser drop test unit was installed at the west side of the pond, as marked.



3. Test Methodology

You were notified when the test was to be run and confirmation was received that there would be no liquid inflow or outflow during the test period.
The monitoring equipment was set up at the pond by Evan Sanderson, as described below. The NIWA Neon website was checked to confirm that data was being recorded and sent to the website.

10 Kinloch Street, PO Box 5003, Waikiwi, Invercargill 9843
Phone 03 215 4381, Fax 03 215 4391
Email: scandrettrural@xtra.co.nz

3.1. Water Level Monitoring Unit

A laser distance measuring unit was set up vertically over the pond surface. A reflective disc was placed on the pond surface to ensure constant, repeatable readings.
The laser was set up within a PVC pipe which acts as a stilling well.
Distance readings to the pond surface were taken at 10 second time intervals and sent to NIWA's Neon logging system.

3.2. Meteorological Station

A Vaisala weather station orientated to the North was also set up and the data it collected sent to NIWA's Neon system at 10 second intervals. It measured:

- Air Temperature
- Wind speed
- Wind direction
- Rainfall

3.3 Evaporation Loss Monitoring

A 10 litre bucket (evaporation pan) with a diameter of 250mm was installed on the pond bank to measure evaporation. The bucket was rinsed and then accurately filled with 9 litres of effluent and the volume monitored to determine evaporation.
To record evaporation in real time a second bucket was installed suspended from a strain gauge with 9.0L of effluent in it, on the pond bank.

4. Results Recording

Recording of results was carried out to comply with the Appendix P of the Environment Southland Land and Water Plan, recording details are summarised below:

- The minimum test period has to be 48 hours.
- Readings are to be taken every 10 seconds.
- For maximum accuracy the wind velocity has to be less than 1.0m/sec. This limit has been set because wind at the test site has been observed to have two affects, the first being to cause waves and the second to push water to one side of the pond from the other, (a seiche effect). The accuracy of the laser distance recorder is such it will detect changes as small as 0.2mm. To accurately determine the true pond level requires calm conditions at the start and end of the test period.

10 Kinloch Street, PO Box 5003, Waikiwi, Invercargill 9843
Phone 03 215 4381, Fax 03 215 4391
Email: scandrettrural@xtra.co.nz

- Rainfall and the evaporation bucket liquid volume was measured at the start and end of the test period, the measurement cylinder was rinsed prior to the volume being measured.

- When a period of 48 hours or more has elapsed the information is down loaded and the results interpreted.

- The GPS location of the pond and equipment setup is recorded. For this test the equipment was located at **E**1225159, **N**4889662, at the west side of the pond.

Laser at the west side of the pond.

5. Results Summary

The results for the test are summarised in Table 1 and discussed below.

The plot of wind speed and pond height shows that at times wind caused waves on the pond surface, particularly during the day time of the 18th and again during the day time of 19th November.

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Phone 03 215 4381, Fax 03 215 4391
Email: scandrettrural@xtra.co.nz

However a period was identified at the start and end of the test period when the pond surface was stable and accurate height readings were established.

The start time was assumed to be at 21:07:50 hours on the 17 November 2017.
The distance from the laser to the reflective disc on the pond surface was 233.1mm and the wind speed 0.6m/sec.

The finish time was assumed to be at 23:31:20 hours on the 19 November 2017.
The distance reading was 235.5mm and the wind speed 0.6m/sec.

The total time elapsed was 50 hours and 23 minutes, 30 seconds.

The laser measured a change in distance to the pond surface of a 2.4mm increase. Therefore the pond surface fell 2.4mm over the test period.

There was no rainfall during the test. The evaporation bucket was calculated to lose 9.3mm depth during the test period.

Theoretically the pond should have mimicked the evaporation bucket result, except evaporation from the pond will be much reduced because of the surface crust. It can be concluded the pond should have potentially fallen 9.3mm due to evaporation. The change in pond height was a fall of 2.4mm. This is not surprising and does not reflect a problem with the pond. The pond banks are constructed above ground level and the liquid level during the test was above the surrounding ground level. Groundwater could not have entered the pond during the test period. Rather it is a case of reduced evaporation resulting in the difference between the evaporation bucket and the pond level change.

TABLE 1 : DROP TEST RESULTS SUMMARY, Woldwide Two

Start Time	17 November, 21:07:50
Finish Time	19 November, 23:31:20
Total Time	50hrs, 23 minutes, 30 seconds
Start Depth (mm)	233.1
Finish depth (mm)	235.5
Change in depth (mm)	-2.4
Rainfall (mm)	0
Evaporation (mm)	-9.3
Net Change in Depth After	
Rain and Evaporation (mm)	+6.9
Net Change per 24 Hours (mm)	+3.3
Pond Level, % of Design Depth	81%
Net Change if Pond at 75% of	
Design Height. (mm/24hrs)	

10 Kinloch Street, PO Box 5003, Waikiwi, Invercargill 9843
Phone 03 215 4381, Fax 03 215 4391
Email: scandrettrural@xtra.co.nz

6. Conclusion

The pond complies with the requirement of the Environment Southland Land and Water Regional Plan for effluent discharge (Rule 35 b. iii.), with a leakage rate of less than 2mm/day. The pond is suitable for storing effluent as the infiltration rate from the pond is less than 2mm per 24 hours.

Yours faithfully

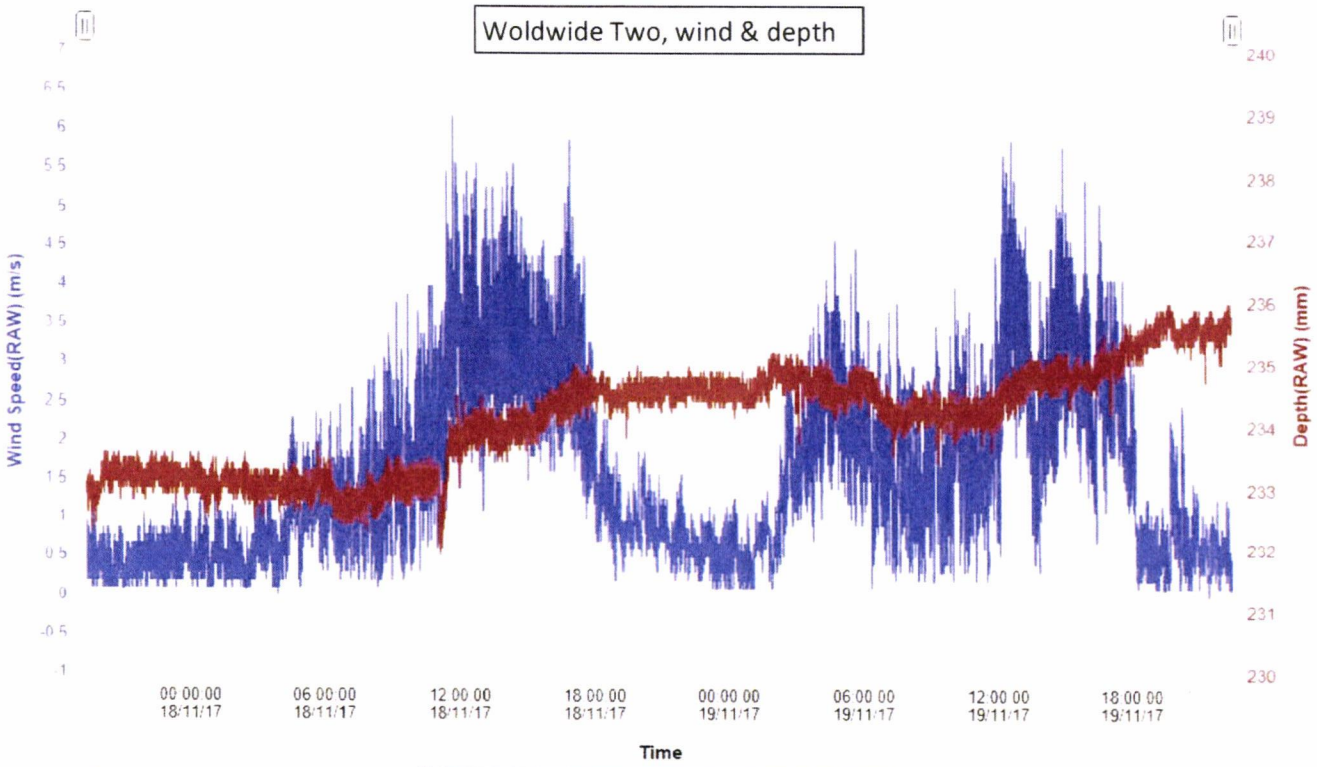
John Scandrett

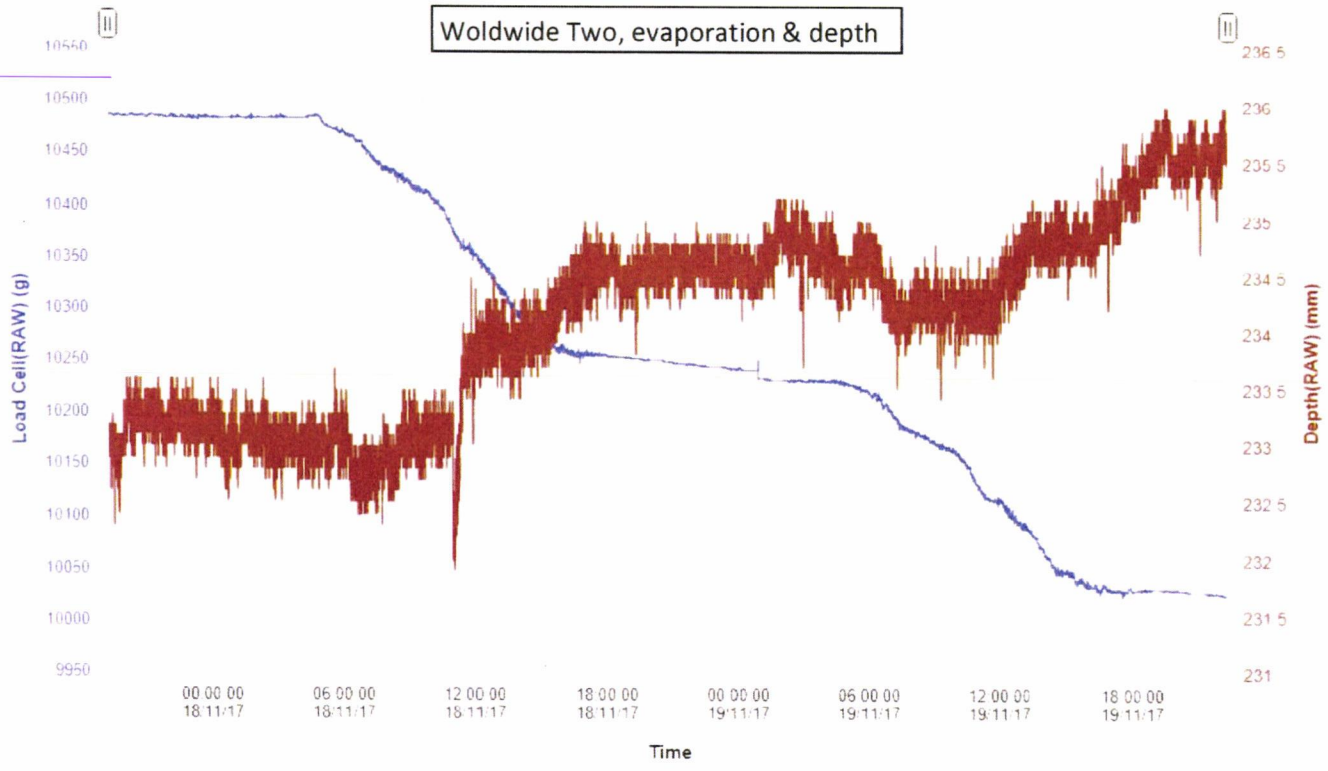
JOHN SCANDRETT
Agricultural & Engineering Consultant

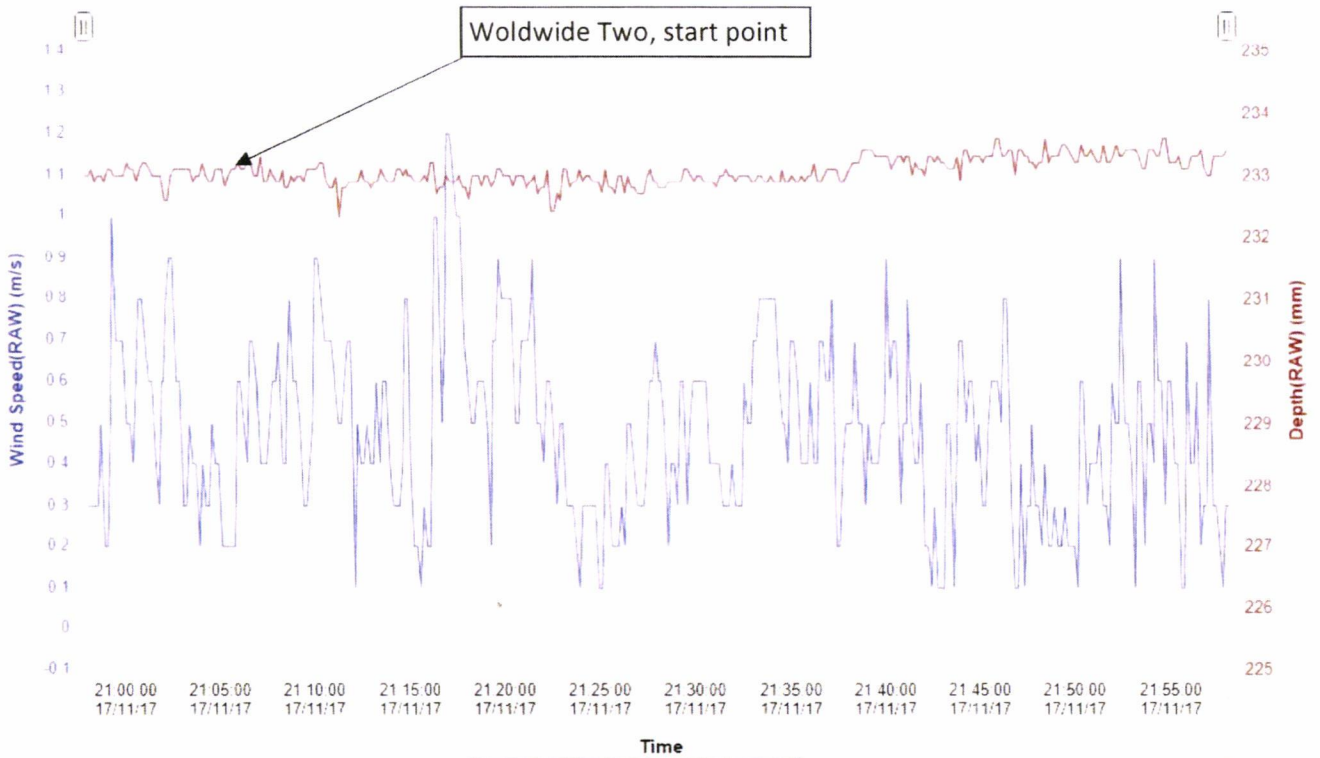
Appended

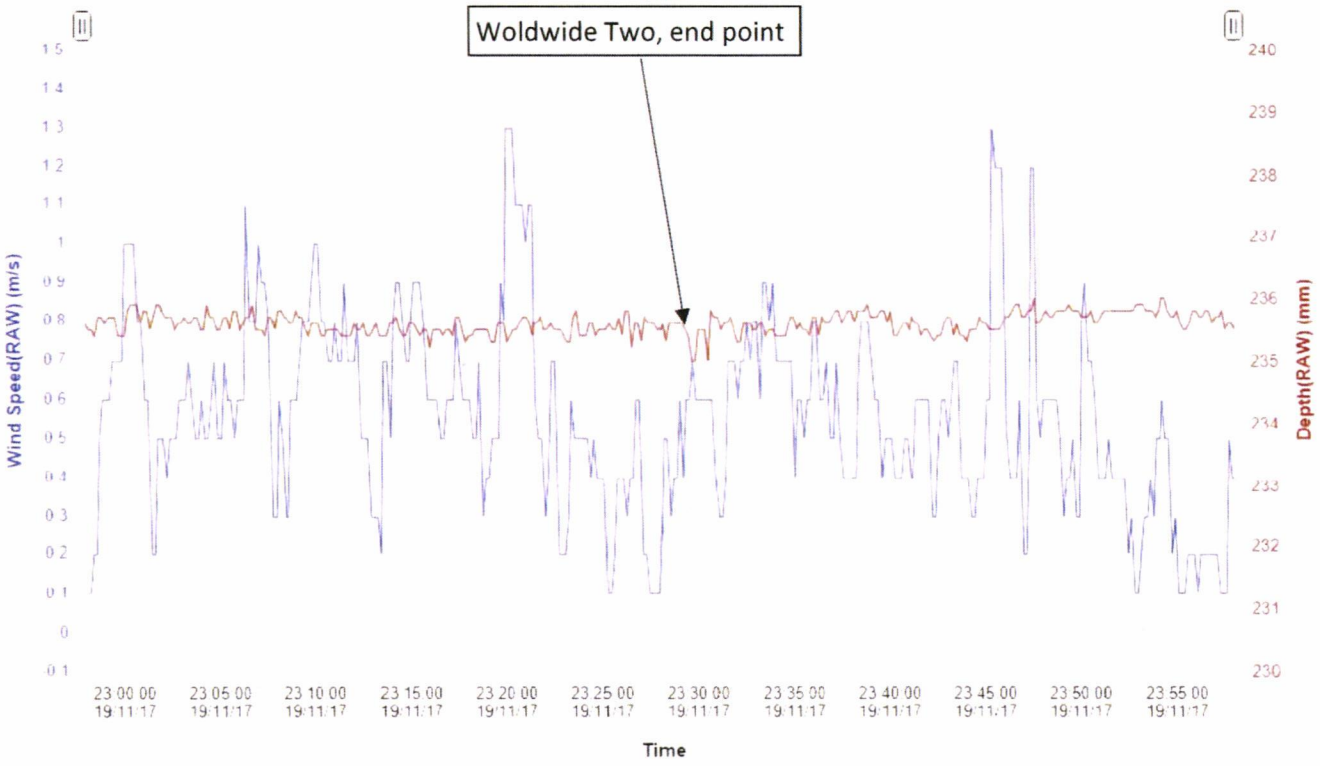
Depth and wind speed graph for the test period.
Depth and evaporation graph for the test period.
Depth and wind speed for the start of the test period.
Depth and wind speed for the end of the test period.

10 Kinloch Street, PO Box 5003, Waikiwi, Invercargill 9843
Phone 03 215 4381, Fax 03 215 4391
Email: scandrettrural@xtra.co.nz


Woldwide Two, wind & depth
Wind Speed(RAW) (m/s)
Depth(RAW) (mm)
Time


Woldwide Two, evaporation & depth
Load Cell(RAW) (g)
Depth(RAW) (mm)
Time


Woldwide Two, start point
Wind Speed(RAW) (m/s)
Depth(RAW) (mm)
Time


Woldwide Two, end point
Wind Speed(RAW) (m/s)
Depth(RAW) (mm)
Time

GeoSolve Ref: 170417Wolde
13 February 2018

Consents Section
Environment Southland
Private Bag 90116
Invercargill 9840

Effluent Pond Drop Test – A De Wolde
Woldwide Two, 1915 Winton-Wreys Bush Hwy

GeoSolve Ltd have been engaged by Dairy Green Ltd to review a drop test undertaken on 17 - 19 November 2017 at the above effluent pond.

I have reviewed the background information, test procedure, and results as reported by Dairy Green Ltd, together with the data audit provided by NIWA as a party independent from the equipment installer.

A significant crust was present at the time of testing, and therefore this test does not satisfy Appendix P of the Proposed Southland Land and Water Plan in respect of the requirement that "*... there shall be no sludge or crust on the pond surface during the test*". The crust has reduced the pond surface evaporation compared to the bankside measurement, and the pond has therefore fallen by less than predicted. There was no rain and no possibility of other inflows into the pond, and no suggestion of any leakage which would have tended to increase the drop in pond level. Therefore I do not consider that a significant unaccounted factor is present in the analysis, and I consider the results to be valid in terms of the conclusion that leakage rate is within the permitted limit.

In all other respects the test was compliant with relevant requirements of Appendix P.

I consider that the pond has a leakage rate of less than 2.0 mm per 24 hours and is therefore compliant with Rule 35 (b)(iii)(2) of the Proposed Southland Land and Water Plan for a pond of this depth.

This report has been prepared for the benefit of Dairy Green Ltd with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

Yours faithfully,

Hank Stocker
Senior Engineer – Water
CPEng 85136

NIWA
Taihoro Nukurangi

5 February 2018

John Scandrett
Dairy Green Ltd.
10 Kinloch Street
PO Box 5003
Waikiwi
INVERCARGILL

RE: Woldwide 2 Drop Test, November 2017

Dear John

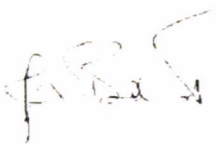
At your request, we have reviewed the data collected for the above test. From this we confirm that:

1. The raw data collected via our Neon data collection system is as you have stated.

2. The only significant complicating factor during this period was the surface crust. Your conclusion that this would significantly reduce the rate of evaporation, compared with a crust-free pond surface, seems reasonable in lieu of a crust-free retest.

3. Your conclusion that leakage from the pond complies with the Council's effluent discharge rule appears to be correct.

Yours faithfully



Jeremy Bulleid
NIWA Instrument Systems

Dairy Green Ltd
Practical Engineering Solutions
Consents, Effluent, Stock water, Irrigation
Design through to Installation
Irrigation NZ Accredited Designer

WOLDWIDE 1&2

EFFLUENT STORAGE AND TREATMENT STRUCTURES VISUAL INSPECTION

October 2018

J SCANDRETT
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Visual Pond and Treatment System Inspection

Introduction

This report shows that the various structures associated with the effluent systems meet the permitted activity status under rule 32 D in the pSWLP. This requires existing agricultural effluent storage facilities to be "certified by a Suitably Qualified Person in accordance with Appendix P within the last three years as: (a), having no visible cracks, holes or defects that would allow effluent to leak from the effluent storage facility".

Methodology

The methodology used for ponds, as follows, will be adapted as appropriate when looking at associated infrastructure. The methodology used is aimed at detecting obvious physical defects that are causing or could cause leakage.

It involves a physical inspection of the lining material above the liquid height, the crest and external batters, if any. It also considers the likely failure mode for the type of containment structure being inspected. If there is a drop test report available, it will be assumed that this report confirms the performance of batters and floor surfaces below liquid level since these surfaces cannot be observed unless the structure is empty.

For clay lined ponds the internal batters will be checked for cracking, erosion and to determine the material that has been used with a view to determine its likely physical properties. The condition of the crest and external batter will be recorded along with any maintenance requirements.

For concrete or concrete block structures checks are made for settlement and cracking and corrosion of the concrete.

A visual inspection cannot record faults that are not observable which could include unsatisfactory material below the liquid level or underneath a synthetic liner or in the core of a pond bank. It does not include an assessment of bank performance in an earthquake scenario or any calculated internal and external batter performance factors of safety under the normal range of operating conditions that a pond may have to perform under, such as rapid drawdown.

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Woldwide One

Dairy Shed

Sand Trap
Effluent is collected in the dairy yard and shed and flows to a concrete block sand trap 0.9 m wide and 6 m long. It is 1.2 m deep with an outlet approximately 0.3 m above floor height.
There was no sign of settlement or differential settlement or cracking. Grouted joins that could be observed appeared to be sound although there was one join in the top course of blocks that had lost some material. This was above the maximum operating height; the surrounding ground would be flooded for this join to be flooded.

The sand trap appeared to meet the criteria of not causing defects that would allow leakage.
Below are photos showing the sand trap lengthwise and looking at the internal concrete block wall.

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Pump Sump

The pump sump at the end of the sand trap is formed from a precast 22.5m^3 concrete tank. It has an inlet from the sand trap and one from a pipe crossing a race at a higher level. There were no obvious cracks in the concrete. A small area of concrete had been removed to facilitate the placement of the discharge pipe in a conduit under the race.

The sump appeared to meet the criteria of not causing defects that would allow leakage. It is pictured below with the end of the stone trap in the background.

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Wintering Barn

The wintering barn has a collection sump at the north end where scraped effluent is deposited prior to being pumped into the storage pond. The sump is 1.9m wide and 26m long. It appeared to be in sound order with no obvious corrosion of concrete.

Conclusion

In accordance with Rule 32D of the pSWLP, the ancillary effluent structures at Woldwide One have been assessed by a SQP and are certified as having no visible cracks, holes or defects that would allow effluent to leak.

WW1 POND

The pond was built in April/May 2018 and signed off by a CPEng from Geosolve Ltd. In accordance with PN21 it has a leak detection drain installed around the perimeter of the floor as per CPEng instruction.

From PN21, section 5.10.1. Drainage Control and Leak Detection Systems. "For smaller ponds a ring drain placed at the foot of the batter slope should suffice".

On the 18 October 2018 the water level in the leak detection drain piezo was 1.1m deep. The pond level was into the freeboard space, i.e. full. The piezo pipe is 4.6m long. The water was clear in appearance and would be expected to be groundwater considering the recent rainfall. There was no obvious sign of effluent in the water, such as discoloration or odour, in the piezo.

Woldwide Two

Dairy Shed

Sand Trap
Effluent from the dairy shed and yard flows to a conventional sand trap on the south side of the dairy shed. It is emptied by front end loader. The structure didn't show any visible signs of settling or cracking. There was no cracking of the concrete where tractor tyres enter the trap or along the back wall where the front-end loader bucket may contact the wall.
The sand trap appeared to meet the criteria of not causing defects that would allow leakage.
Below is a photograph of the sand trap.

Pump Sump
The pump sump adjacent to the sand trap is formed from a shotcrete concrete tank in the order of 9.2 m x 9.2 m. It has an inlet from the sand trap. There were no obvious cracks in the concrete for the area of concrete that was visible.

The pump sump appeared to meet the criteria of not having defects that would allow leakage. It is pictured below with a section of the freeboard batter slope exposed in the background and then close up.

Wintering Barn

The wintering barn has a collection sump at the south end where scraped effluent is deposited prior to being pumped into the storage pond. The sump is 1.9 m wide and 30 m long. It had been poured in situ. It appeared to be in sound order with no obvious corrosion of concrete.

Conclusion
In accordance with Rule 32D of the pSWLP, the ancillary effluent structures at Woldwide Two have been assessed by a SQP and are certified as having no visible cracks, holes or defects that would allow effluent to leak.

WTL POND

The pond is close to square with approximate dimensions of 40 m x 38 m at top bank level.
It was tested by a drop test in November 2017 and found to have a leakage rate of less than 2 mm per day. Based on the drop test result of less than 12 months ago it is assumed the pond liner is still performing satisfactorily.

On the 18 October 2018 the pond was found to be full, with the effluent level into the freeboard space.

Soils
Subsoil from the local area was harvested to line the internal batters. This soil isn't dispersive. The banks are largely made of gravel and silt in varying proportions.

Banks
The bank crests were covered in long grass and appeared quite stable.
The bank crests are generally 3.6m wide.

Batters
The internal batters were constructed on a 2H:1V gradient. There was no indication of internal batter slumping at crest level. The external batters are on a 1:1 gradient. They are covered in grass and appeared to be stable.

Photos of each bank crest appear below.

South Bank.

The East Bank

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North Bank

West Bank

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Conclusion
In accordance with Rule 32D of the pSWLP, the effluent storage pond at Woldwide Two has been assessed by a SQP and is certified as having no visible cracks, holes or defects that would allow effluent to leak from the effluent storage facility.

J S Scandrett
Agricultural & Engineering Consultant
Dairy Green Ltd

18 October 2018

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Environment Southland
Corner of North Road and Price Street
Waikiwi
Invercargill 9810
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Telephone (03) 211 5115
Fax (03) 211 5252
Email service@es.govt.nz
Website http://www.es.govt.nz/

environment SOUTHLAND REGIONAL COUNCIL
Te Taiao Tonga

Compliance Monitoring

Form:	Compliance Monitoring
Reference Number:	REF180712284
Completed On:	18/07/2018 14:07
Completed By:	Michelle Te Maro

Authorisation IRIS ID:	AUTH-300626-V2
Inspection Date:	**18/07/2018**
Inspection Time:	**12:05 p.m.**
Observation Type:	**Wintering Pad Inspection**

Overall Performance Rating: **1: Fully compliant**

ObjectTypeREF:	**RegimeActivity**
Person In Charge:	

Discharge Inspection Charges

Standard Fee:	**Wintering Pad Inspection $415**
Work Order:	**W79.12.72**
Generate Invoice:	**Yes**

Additional Charges

Additional Charges:	**No**

Authorisation Conditions

Condition Number:	**1**
Condition Text:	This consent is granted for a period of 10 years and shall commence on the surrender or expiry of Resource Consent 200870 Note: Pursuant to Sections 123 and 124 of the Resource Management Act 1991, a new consent will be required at the expiration of this consent. The application will be considered in accordance with the plans in effect at that time, and the adverse effects of the proposed activity.
Compliance Status:	**Full compliance**

Condition Number:	**2**

Condition Text:	This consent authorises the discharge of dairy shed and wintering barn effluent onto land, via a land disposal system, as described in the application, on land known as Lot 1 DP 14660, Lot 1 DP 9925, Lot 1 DP 10885, Pt Lot 1 DP 4092, Pt Lot 2 DP 4092, Pt Lot 18 DP 942, Lot 1 DP 5610, Lot 3 DP 5610, Pt Section 417 Taringatura SD, Section 419 Taringatura SD and Lot 1 DP 14661. Note:The effluent disposal area shown in Appendix 1 can be altered and/or extended, subject to the approval of the Director of Environmental Management, if the consent holder submits a new plan showing the new effluent disposal area, and providing the written approval(s) of any person whose property boundary will be closer to that area. In the event that written approval cannot be obtained, the effluent disposal area can only be amended by way of limited notification.
Compliance Status:	**Full compliance**

Condition Number:	**3**
Condition Text:	(a) No dairy shed or wintering barn 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. See Best Practice Notes 1, 2 &3. (b) The land disposal system shall be operated and maintained to ensure that there is no offensive or objectionable odour beyond the property boundary, or any spray drift into or beyond the buffer zones specified in Condition 5. (c) 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 breakdown. See Best Practice Note 4.
Compliance Status:	**Full compliance**

Condition Number:	**4**
Condition Text:	(a) Subject to Condition 3(a), the land disposal system is limited to the following: a maximum depth of application of 10 mm for each individual application; Note: The application depth needs to be less than the soil-water deficit (i.e. the depths above are maximum depths and as soil moisture levels approach field capacity, smaller depths will be necessary to avoid losses of contaminants from the root zone. When soil moisture levels reach field capacity, irrigation will need to cease completely to prevent these losses.) the maximum loading rate of nitrogen onto any land area shall not exceed 150 kg of nitrogen per hectare per year from dairy shed and wintering barn effluent. See Best Practice Note 5. Before this consent is exercised, the consent holder shall measure the application rate of the irrigator as installed to confirm the operating conditions required to ensure compliance with condition 4(a). The consent holder shall notify the Council's Compliance Manager in advance of the measurement; (escompliance@es.govt.nz) The Council may audit the measurement of the application rate to ensure accuracy. The consent holder shall pay the costs of auditing the measurement in accordance with Section 36 of the Resource Management Act. The result of the measurement shall be forwarded to the Council's Compliance Manager; (escompliance@es.govt.nz) within 10 working days of the measurement being completed.
Compliance Status:	**Full compliance**

Condition Number:	**5**

Condition Text:	Effluent may be applied to the land as described in the application and generally as shown in Appendix 1, but the following specific buffers shall be observed: (a) 20 metres of any surface watercourse; (b) 100 metres of any potable water abstraction point; (c) 20 metres of any property boundary (unless the adjoining landowner's consent is obtained to do otherwise); and (d) 100 metres of any residential dwelling other than residential dwellings on the property. Where there is conflict between Appendix 1 and these specified buffers, the latter shall apply.
Compliance Status:	**Full compliance**

Condition Number:	**6**
Condition Text:	(a) The amount of dairy shed effluent disposed of onto land shall not exceed that from 800 cows. (b) The amount of wintering barn effluent disposed of onto land shall not exceed that from 600 cows
Compliance Status:	**Full compliance**

Condition Number:	**7**
Condition Text:	Prior to exercising this consent the consent holder shall provide at least 3,282 m3 of effluent storage for the purpose of: avoiding irrigation of effluent when soils are at or above field capacity – see Best Practice Note 8; providing a contingency measure when the irrigation system is inoperative; and/or for primary treatment when it is necessary for the proper operation of the effluent disposal system. Note:The storage volume is equivalent to 90 days of effluent based on 50 litres/cow/day.
Compliance Status:	**Full compliance**

Condition Number:	**8**
Condition Text:	The consent holder shall notify the Council, by 1 February 2012, of the person who is in charge of the operation of the effluent disposal system. If the person in charge of the effluent system changes during the term of this consent, the consent holder shall notify the Council of the new operator no later than five working days after that person takes responsibility. See Best Practice Note 6 &7. Note:The person identified by condition 8 will be the primary contact for Council staff for monitoring purposes and/or in the event of an incident. Nothing in this condition removes or limits the consent holder's liability to ensure compliance with the consent and its conditions.
Compliance Status:	**Full compliance**

Condition Number:	**9**

Condition Text:	By 31 January 2015 the consent holder shall drill or access a bore (or well) for the purposes of monitoring groundwater quality. Unless otherwise agreed in writing by Environment Southland's Compliance Manager the bore shall conform with the following requirements: (a) the bore shall be located within the south eastern corner of the effluent disposal field, at least 500m from the dairy shed and 200m from the south eastern farm boundary. (b) The depth of the bore shall be between 2 and 4 metres below the static groundwater level, and no more than 12 metres deep in total; (c) The internal diameter of the bore shall be between 50 and 100 mm. (d) The bore is to be used solely for monitoring purposes. This may include abstraction to take samples or to flush the bore prior to sampling, but excludes abstraction of water for domestic or farm supply. Note 1: Construction of a bore will require a separate land use consent. However the land use consent is a controlled activity and should not pose an impediment to the exercise of the discharge permit. A guideline on monitoring bore construction is available Note 2: If a bore cannot be established in accordance with this condition, the consent holder may seek the Compliance Manager's agreement for an alternative monitoring bore, or may seek amendment to the resource consent. Note 3: If it is necessary to draw water supply from the monitoring bore it may be necessary to install a new monitoring bore.
Compliance Status:	**Full compliance**

Condition Number:	**10**
Condition Text:	The Southland Regional Council may serve notice of its intention to review the conditions of this consent, in accordance with the conditions of this resource consent and Sections 128 and 129 of the Resource Management Act 1991, during the period 1 February to 30 September each year, or within two calendar months of the completion of any enforcement action (prosecution or infringement notice), for the purposes of: (a) dealing with any adverse or cumulative effects, including the adverse effects of high stocking rates, on the environment which may arise from the exercise of this consent; (b) considering any changes to information on the effects of land disposal of dairy shed or wintering barn effluent; or (c) complying with the requirements of a regional plan; or (d) amending monitoring requirements; or (e) imposing a notification requirement for potential effects on registered drinking water supplies.
Compliance Status:	**Not Assessed**

Condition Number:	**11**

Condition Text:	The consent holder shall pay an annual administration and monitoring charge to the Southland Regional Council, collected in accordance with Section 36 of the Resource Management Act. This charge may include the costs of inspecting the site three times each year (or otherwise as set by the Council's Annual Plan), and: From 1 February 2015 monitoring the effects of the discharge on groundwater by taking representative samples from the monitoring bore or well to be established under Condition 9 once every six months and analysing for: chloride electrical conductivity nitrate nitrogen concentration E. coli concentration Except that the first sample shall also be analysed for Dissolved Iron concentration. (b) monitoring the effects of the discharge on surface water, as follows: monitoring of watercourses may be undertaken up to three times each year; representative samples will be taken from the watercourse near the effluent disposal field, upstream and downstream of the discharge area, at points approved by the Council's Compliance Manager. the samples will be analysed for: pH electrical conductivity ammoniacal nitrogen concentration nitrate nitrogen concentration dissolved reactive phosphorous concentration E. coli concentration
Compliance Status:	**Not Assessed**

Condition Number:	**Best Prac**

Condition Text:	Best Practice and Explanatory Notes 1. Dairy shed or wintering barn effluent should not be discharged onto any land area that has been grazed within the previous 5-10 days. Where there has been significant damage to soil during grazing, it is recommended that effluent not be applied until that damage has been repaired. 2. To avoid contaminating water directly or indirectly, the consent holder should not apply effluent to land when the soils are at or above field capacity. Moisture content is to be determined by either actual monitoring on site or by reference to the appropriate Council monitoring site. The Council's soil moisture monitoring sites can be viewed at http://www.es.govt.nz and following the "Farming", "Dairy Advisor" and "Soil Moisture Map" links. 3. For the purposes of this condition, ponding is the accumulation of effluent on the soil surface resulting from the application of effluent to saturated soils, or the application of effluent inducing saturated soil conditions. It does not refer to the temporary accumulation of effluent on the soil surface resulting from the application of effluent at a rate that exceeds the soil infiltration rate. 4. Where the effluent reticulation system is installed in such a way that effluent can be siphoned when pumping ceases, the consent holder should install and maintain an anti-siphon device in the effluent pipe line. 5. A loading of 150 kg N/ha/year is approximately equivalent to a loading of dairy shed and wintering barn effluent to land of 4 ha/100 cows. However, there are significant benefits to having a larger effluent disposal area in terms of managing potassium. Further, scientific research has highlighted decreased nitrogen use efficiency and increased nitrogen leaching losses at annual nitrogen loading rates (from combined fertiliser and effluent N) greater than 150 kg/N/ha/yr. Extreme caution should therefore be taken when applying nitrogen fertiliser to the effluent disposal area. It is recommended that a nutrient budget is used to check that nitrogen and potassium application rates to the effluent disposal area are not excessive. 6. The consent holder should prepare and comply with a Farm Environmental Management Plan. The plan should: specify and implement a nutrient budgeting system for the property; provide for the management of effluent disposal to avoid applications when soils are at or above field capacity; identify, as far as is practicable, the drains in the effluent disposal area, so that appropriate management procedures can be taken to avoid contamination of the drains by effluent; if relevant, provide for the operation and management of any feedlot and/or wintering pad; include the provision for monitoring application rates to ensure the consent requirements are being met; include the monitoring requirements specified in this consent; and address ancillary matters such as protecting well-head(s) from contamination; preventing leachate from any silage pits entering water, including groundwater; preventing soil damage; controlling runoff from lanes; and preventing stock access to and maintaining the riparian margins of any watercourses on the property. A template may be viewed at: http://www.es.govt.nz/media/4831/dairy-farm-plan-consent-template.pdf 7. The consent holder should display, in a prominent place in the dairy shed, a copy of the resource consent and relevant limits about the operation of the effluent disposal system that must be complied with. The material to be displayed will be provided by the Council on laminated sheets suitable for display purposes. 8. Storage ponds should be operated at low levels when conditions for effluent disposal are suitable in order to maintain storage for wet weather periods. In particular, storage ponds should be emptied in late summer/early autumn to ensure sufficient storage capacity for the following late winter/early spring period. 9. Storage ponds should not, for practical purposes, leak. This resource consent does not authorise the discharge of contaminants due to leaks or failure of the storage ponds. If an existing storage pond is modified (such as by increasing the embankment height to increase storage), the modification will require resource consent.
Compliance Status:	**Not Assessed**

Discharge Inspection – Application Method

Application Method:	**Travelling**
Low Rate On (minutes):	
Low Rate Off (minutes):	
Low Rate Period (hours):	
Travelling (cams):	**2**
Travelling (teeth):	**4**
Travelling (other):	
Automatic Switch Off System:	**Yes**
Nozzles OK:	**Yes**

Discharge Inspection – Disposal System

Effluent Storage:	**Freeboard**
Effluent Storage (%):	**20**
Sump:	**OK**
Stone Trap:	**OK**
Weeping Wall:	

Discharge Inspection – Disposal Area

Currently Disposing:	**No**
Odour Beyond Boundary:	**No**
Sludge Over Application:	**No**
Soil Moisture At Field Capacity:	**No**
Soil Moisture Rating:	**Orange (pulse irrigation)**

Peak Cow Number:	**540**
Comments:	**Not irrigating but rather using storage. Lanes at the approach of the milking platform are being cleaned up. Systems are tidy. No issues on site.**