



To the Members of the Upper Waitaki Zone Water Management Committee

MEMBERSHIP

Claire Barlow
Mathew Bayliss
Simon Cameron
Bill Chisholm
Craig Dawson
Mandy Home
Shane Te Maiharoa

Mike Neilson
Barry Shepherd
Peter Skelton
Anne Steven
Wayne Tipa
John Wilkie

Notice is given of the Meeting of the Upper Waitaki Water Zone Management Committee to be held on Thursday 19 January 2012 at 12.00 pm

VENUE: Mackenzie Country Inn, Twizel

BUSINESS: As per Agenda attached

**GLEN INNES
CHIEF EXECUTIVE OFFICER, MACKENZIE DISTRICT COUNCIL**

**MICHAEL ROSS
CHIEF EXECUTIVE OFFICER, WAITAKI DISTRICT COUNCIL
21 December 2011**

AGENDA 19 JANUARY 2012

1. Karakia, Welcome and Introductions
2. Apology
3. Declarations of Interest
4. Minutes
Confirm and adopt as the correct record the Minutes of the Meeting held on 1 December 2011
5. General Business
 - a) Matters Arising
 - b) Correspondence
 - c) Other
6. Draft Zone Implementation Programme
7. Next Meeting

Time Table

12.00 pm	Lunch
12.20 pm	Opening of Zone Committee Meeting, Karakia, Welcome and Introductions
2.05 pm	Minutes of Previous Meeting
2.15 pm	General Business: <ul style="list-style-type: none"> - Matters Arising - Correspondence - Other
2.30 pm	Zone Implementation Programme
3.00 pm	Afternoon Tea
3.30 pm	Zone Implementation Programme
5.45 pm	Work Plan and Next Meeting Date
6.00 pm	Meeting Closure

ENVIRONMENT CANTERBURY MACKENZIE AND WAITAKI DISTRICT COUNCILS

**MINUTES OF THE MEETING OF THE UPPER WAITAKI ZONE WATER
MANAGEMENT COMMITTEE, HELD IN THE MACKENZIE COUNTRY INN,
TWIZEL, ON THURSDAY 1 DECEMBER 2011 AT 2.00 PM.**

PRESENT:

Barry Shepherd (Chairman)
Mathew Bayliss
Simon Cameron
Bill Chisholm
Mike Neilson
Peter Skelton
Anne Steven
Wayne Tipa
John Wilkie
Claire Barlow (Mayor, Mackenzie District Council)
Craig Dawson (Waitaki District Councillor)

IN ATTENDANCE

Meri Gibson (Facilitator)
Melanie Schauer (Facilitator)
Barbara Nicholas (Environment Canterbury)
Rob Gerard (Environment Canterbury)
Peter Te Rangihiroa Ramsden (Tangata Whenua Facilitator for the Canterbury Water
Management Strategy)
4 members of public

I KARAKIA AND WELCOME:

The Chairman welcomed the Committee members and members of the public and led the introductions.

Peter Te Rangihiroa Ramsden shared a karakia to open the meeting.

II APOLOGY:

Resolved that an apology be received from Shane Te Maiharoa

Barry Shepherd/Craig Dawson

III DECLARATIONS OF INTEREST:

There were no further Declarations of Interest.

IV **MINUTES:**

Resolved that the Minutes of the meeting held on 10 November 2011 be confirmed and adopted as the correct record of the meeting.

Simon Cameron/Craig Dawson

V **GENERAL BUSINESS:**

a) **MATTER ARISING FROM THE MINUTES:**

Nil

b) **CORRESPONDENCE:**

Nil

c) **OTHER:**

1. **Groundwater Hydrology and Water Quality**

The Chairman considered the Committee would benefit from more and better scientific information on groundwater hydrology and water quality and suggested a workshop be held in February 2012 to assist with the understanding of the issues.

2. **Regional Land Use Water Quality Project Working Group**

Bill Chisholm said that unfortunately he was unable to provide any further information about the deliberations of the Working Group in the meantime.

3. **Monitoring**

Anne Steven requested that the results of all water monitoring carried out in the Basin, including that undertaken by Environment Canterbury, the salmon farms, Meridian and individual consent holders, be collated and made available to the Zone Committee. The Facilitator undertook to pursue the issue.

4. **Representation**

Craig Dawson referred to the perceived lack of representation on the Zone Committee from the Lake Tekapo area.

Motion:

That Mark Urquhart be co-opted as a member of the Upper Waitaki Zone Water Management Committee.

Craig Dawson

Peter Skelton explained that Mr Urquhart could be co-opted only if the Zone Committee wished to obtain his advice on a specific issue.

Mr Dawson withdrew the motion.

The meeting was adjourned at 3.00 pm.

PRESENTATION ON DAIRYING PROPOSAL

The Chairman welcomed Southdown Holdings director, Richard Peacocke, whom he had invited to present information about the proposal for a large “closed loop dairy farm” for 6 x 1,200 cows over time using “Loose Stall Barns” and robots for milking of cows

Mr Peacocke first showed the 45 South Television programme *Till the Cows Come Home* about a large, robotic dairy farm operated by the van Leeuwen family at Waimate.

He then provided information on the ‘closed loop dairy farm’ proposal developed by consultants for his property at Glen Eyrie Downs south of Lake Ohau.

A copy of the proposal and the barn layout are attached to this record as Appendices A and B.

VI DRAFT ZONE IMPLEMENTATION PROGRAMME VERSION 2:

It was agreed that planning advice be available at upcoming Zone Committee meetings.

The Facilitator led the review of the Version 2 of the Zone Implementation Programme. She highlighted the changes which had been made and noted further amendments suggested by the members.

She commended the members of the good progress which had been made with the Zone Implementation Programme and reminded them to forward all comments and suggestions to her.

VII PROPOSED MEETING SCHEDULE FOR 2012:

The proposed meeting schedule for 2012 was considered.

It was agreed that the first meeting be held on Thursday 19 January 2012 in Twizel, from 12.00 pm until 6.00 pm.

The second meeting is to be held on Thursday 9 February 2012 in Twizel from 3.00 pm until 8.00 pm.

The facilitator undertook to check the Environment Canterbury Commissioners’ meeting dates in an effort to avoid clashes.

**THERE BEING NO FURTHER BUSINESS THE
CHAIRMAN DECLARED THE MEETING CLOSED AT 6.10 PM**

CHAIRMAN: _____

DATE: _____

Southdown Holdings Ltd

24 September 2011

Closed Loop Dairy Farm

Southdown believes that a major change to the NZ dairy farming grazing and effluent management system could provide significant increase in production, enhanced environmental solutions and dramatically improve water quality for those areas of New Zealand that are presently experiencing waterways and lake degradation

In order to achieve this vision Southdown has engaged consultants to develop a closed loop dairy system for our property Glen Eyrie Downs - 2,135 hectares.

Brief:

- 1] Design a state of the art “closed loop dairy farm” for 6 x 1,200 cows over time using “Loose Stall Barns” and Robots for milking of cows
GEA Farm Technology – Germany - www.gea-farmtechnologies.com/nz/en/
- 2] Provide total control of effluent discharge with liquid effluent being broken in to its various components with the intent that only treated, nutrient free water be discharged from the system
ISD Intelligent Engineering Ltd - Whangarei/Matamata - www.fusecreative.co.nz/sites/isd/index.html
- 3] Extract solids from raw effluent and consume them via gasifier process, turning the solids into energy and provide for all on farm heat, electricity and operational requirements. Design a system to capture CO₂ and Methane emissions from the ceiling of the stables as additional fuel to the gasifier to minimise discharge and assist comply with ETS (if possible).
Page & Macrae Engineers - Tauranga - page-macrae.co.nz
- 4] The Residual nutrient enriched wet ash to be mixed with humates and spread back on land during late spring summer early autumn. Develop an organic fertiliser regime for farm to be self-sustaining in organic fertiliser once operational
Abron Living Soils Solution – Matamata - www.abron.co.nz
- 5] Plan for grain to be grown locally and converted to dairy meal to be feed through self-milking robots as the only off farm import.
Seales Winslow – Ashburton/Matamata - www.sealeswinslow.co.nz
- 6] Engage nutritional and veterinary expertise for overarching management advice
Adrian Campbell – www.vetlife.co.nz

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The system (or parts) is widely used in Europe, USA, by Fonterra in China and increasingly by farmers in Southland and South Canterbury but no farmers in NZ are presently providing a total effluent solution as is proposed by Southdown.

1] Loose Stall Barns with Robotics – GEA Germany

- a) Stable plan – a 1,200 cow loose stall barn that will contain 8 herds of 150 cows with 1 robotic milker per 50 cows.
- b) A training area for heifers to be incorporated including a small herringbone milking plant for special needs cows
- c) Cows will calve throughout the year so as to enable 1,200 cows to be milked 365 days per year. An additional barn for 240 dry cows will be attached to the milking barn providing room for 20 sick cows, 160 dry cows, 60 special needs and fresh cows
- d) Number of Barns – it is proposed there will eventually be 6 x 1,200 cow barns at Glen Eyrie Downs
- e) 24 robotic milkers per stable

2] Dairy Effluent Management – ISD Intelligent Engineering Ltd

- a) ISD Press Separator - the raw effluent is pumped from the barn to a press separating most undigested grass/food matter at approximately 30% moisture content
- b) ISD Centrifier - a second stage filter removes fine particles at approximately 50% moisture content
- c) ISD Purafier – removes most colour, bacteria, reduces macro nutrients (NPK) fully automated
- d) Forsi Filtration – removes - odour, colour, all nutrients (NPK and salts) – fully closed loop
- e) Result – 3 stage filtration - treated water with nutrient level meeting discharge standard used in stable or discharged to ground – (independent confirmation of NPK levels due end Sept 2011)
- f) Solids available for gasification

3) Gasifier - Page & Macrae Engineers - Tauranga

The gasifier system is designed to consume pressed cow dung and produces:

- Milk shed Milk chilling
- Hot water
- Electricity
- Ash (P,K content to be determined)

Process avoids or reduces the following costs:

- Spreading solid dung onto the fields
- Greenhouse gas equivalent – 2,171kg CO₂ /cow/pa¹

General description

1. The pressed dung solids will be fed into the gasifier by a conveyor (automatic)
2. The gasifier will produce gas that will fire a standard unattended boiler (fully automatic).
3. The boiler will supply steam to two unattended steam turbine generators (fully automatic)
4. Chilled water will be a by-product available for milk cooling.
5. Hot water will be a by-product. Enormous quantities of free hot water are available if necessary (if heating was paid for this would cost around \$3M per annum)

¹ Land Care Research

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Proposal Financial Study ²

Item	Capital Cost (\$000)	Annual Income (\$000)	Product
Conveyor from press to gasifier	100	-	-
Gasifier	600	367	Carbon tax 2.1T/cow ***
Boiler	250 ³	-	-
Machine shed, and installation	525	-	150 sm
Generator 1	400	470 ⁴	2.35 Million kWhr
Generator 2	400	350	1.7 Million kWhr
Chiller	80	112 ⁵	Milk cooling Capacity 110kW cooling
Hot water Exchanger	50	295 ⁶	Hot water (Almost unlimited)
Design, Certification Testing and Commissioning	255	-	-
Annual boiler survey		(20)	-
Contingency	350	(20)	-
Total	3,010	1,554	

*** subject to gaining credits and conveying gasses to gasifier

Next Step

The key components as priced in this have already been sourced and prices quoted. The fuel and energy quantities and qualities used for this study have been estimated from existing information. This information is generalised so we need a detailed check of the data specific to the proposed farm.

Items that are still required to confirm the feasibility include:

- Verify the quantity and quality of fuel available
- Verify the ash fusion temperature of the dung ash
- Verify the forecasted farm energy uses, alternate energy sources, and potential for energy load smoothing over the 24 hours.

² Based on barns contained herds of 6 * 1,200 dairy cows

³ Based on available fully reconditioned boiler

⁴ Based on \$0.18 per kWhr

⁵ \$0.0292 /cow/day K Hartman – Massey university - Increased due to higher milk yield

⁶ \$0.03 /cow/day K Hartman – Massey university – Increased for barn cleaning

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CO₂ and Methane Emissions to be captured

It is proposed to extract air from inside the ceiling of barns and feed direct to Gasifier so reducing likelihood of Methane being emitted to the atmosphere. This is not possible under a traditional dairy farming system. (subject to developing appropriate extraction management system)

Note: Page and Macrae Ltd have built, owned and operated a gasifier for 6 years in Tauranga at Carter Holt's Plywood Factory

4] Residual Ash & Nutrient used as organic Fertiliser - Abron Living Soils Solution – Matamata

These products will be mixed with humates and spread as solid fertiliser on land during growing season when soil moisture is in deficit so minimising or removing the requirement for artificial fertiliser

Proposal

Southdown owns Glen Eyrie Downs 2,135 hectares on Quailburn Rd, 16km nor/west of Omarama in the Upper Waitaki Catchment.

In 2003/5 34 applications were lodged with Environment Canterbury to take water from the catchment to irrigate 17,500 hectares.

Decisions on the water applications are expected in late November 2011

It is proposed by Southdown to build one 1,200 cow loose stall barn as proof of concept in 2012 and gradually increase production to eventually milk 7,000 cows (3.5 per ha) 365 days per annum utilising irrigation to grow grass and lucerne that is expected to yield 18-20 tonne of dry matter per hectare (based on existing local experience under irrigation)

The fodder will be harvested in a cut and carry operation to feed to animals in the barns.

It is budgeted to feed meal at the rate of 1 tonne (barley/wheat grown locally) per cow per annum

Financial Model for 345-hectare farm – 1,440 cows required

Total cost of establishment excluding cost of land, stock and shares is approximately \$40,000 per ha and the base model farm of 345 hectares capable of milking 1,200 cows 365 days per annum will produce approximately 720,000 kgs of milk solids.

Each stable will employ 4 full time staff plus casuals.

A nutritionist will be retained to assist monitor and control/balance feed input with daily requirements.

All grass cut and carry operations will be done by additional staff who will also be responsible for feed delivery into barns

Conclusion

In time, it is anticipated 36 - 40 fulltime staff will be employed on Glen Eyrie Downs with significant resultant economic benefit for the region and it is intended the Carbon emissions from our farm will be neutral unlike any other dairy farm in NZ

END

Southdown Holdings Ltd

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