

**Wednesday 16<sup>th</sup> July 2014**

**Submission and further evidence presented to Commissioners by Ruth Shaw.**

The Save Manapouri campaign galvanised New Zealanders from one end of the country to the other. A petition delivered to parliament in 1970, which opposed the raising of the lakes, contained some 265,000 signatures. The campaign catch cry "*Save Manapouri*" that rallied public opinion, took on politicians and senior bureaucrats, and won.

Here we are, 44 years later and campaigning again. This time it is on a much smaller scale, but our catch cry is still "*Save Manapouri.*"

My name is Ruth Shaw, and I am speaking to expand on two submissions: The Royal Forest and Bird Society, Southland Branch, and Lance and Ruth Shaw, Manapouri. I have lived in Manapouri for 30 years.

My background is Social and Community Development having studied Sociology at the University of New England, New South Wales. I am a committed environmentalist, and have been involved in many conservation issues over a period of 40 years. Lance and I not only consider Manapouri to be our physical home, but Fiordland as our place of spiritual restoration.

**Introduction:**

Since Thomas Crapper (yes that is his correct name) invented the water closet, many sanitation experts have come to the view that it is one of the most stupid technologies of all time. In an effort to make '*things*' invisible, it mixes pathogen-bearing faeces with about 100 times its volume in pure drinking water, and then mixes this with industrial toxins, thus turning it into a slurry which has a disposal problem.

Since most people in developed countries already use flush toilets, the more favourable economics of smaller scale sewage treatments are leading to a re-thinking of the sewage treatment process. This includes measures like switching from chemical engineering to biological techniques that already offer striking ecological and economic advantages. Wastewater is not, as most engineers assume, mere litres of H<sub>2</sub>O to be taken away as quickly and secretly as possible in plastic or concrete pipes.

Water is habitat, Water is life! This is clearly supported in the Resource Management Act and the Cultural Health Index, An Iwi Perspective on Freshwater and its Management.

Therefore we must address wastewater disposal by seeking out the best technology, approaching the situation with open minds, ensuring the environment, the cultural values and the welfare of people, are in the forefront of decision making.

My submission is founded on these fundamentals.

## **1 Health issues**

### **Regional Plan**

Objective 4.1.3 and Policy 4.2.6

*Seek to safeguard human and animal health from adverse effects of effluent discharges and measures to avoid, remedy or mitigate the adverse effects on human and animal health.*

We are very concerned that no-one on the Council is seriously taking into account the risk of spreading disease with droplet spraying of human wastewater, also referred to as faecal sludge.

(The term 'sludge' or 'bio solids' refers to human waste products in any form: solid, semi solid or liquid residue).

Simon Springford East confirmed that they will not be looking for specific viruses.

Many common, but potentially severe illnesses are spread through faeces and sometimes urine. These organisms are commonly found in streams and ground water throughout New Zealand and we have regular outbreaks of disease which are waterborne.

Rota virus and Noro virus are tiny, and could easily be present in droplets, both can be fatal in children and the elderly. Leptospira are common in urine of animals such as rodents, pigs, cattle, and deer, all found within the Te Anau basin.

Viruses like Hepatitis A are very common and are passed in faeces, this virus could then be inhaled through fine droplets and spray. Cryptosporidium from calves commonly infects humans and is excreted into sewerage and ground water.

Salmonella and Shigella are more devastating organisms found in birds and their droppings which are passed in the faeces of infected individuals.

As tourism from Asia increases the possibility of cholera being in effluent increases. This will have devastating consequences.

Almost any virus can be spread by spraying, but not clever ones like HIV. These organisms, once sprayed onto agricultural land, will infect not only livestock, but also possums, rodents and feral deer, and of course humans. The continuous cycles of infection and dispersal have caused major problems all over the world, not only through leaching into important waterways but dispersal by droplets. New Zealand already has an embarrassingly high incidence of these diseases for a developed country.

### **Statement of Evidence Simon Beale**

Page 26 Objective 9B

*“.....On the basis of the evidence of Dr Davoren.... I am confident that adverse effects on the health of the community will be avoided.”*

We are not convinced.

## 2 Water quality issues:

Over the last 4 years our Government has adopted an approach that weakens our National Standards Regulations. (NSR's)

Fish and invertebrates, pathogens, (bacteria that cause disease) sediment and periphyton/cyanobacteria (which are essential for nutrient cycling and driving the oxygen cycle) are **NOT** covered.

**Quote** from the latest changes in legislation (National Policy Statement NPS and National Objectives Framework NOF):

*“Nitrate impacts on rivers, wetlands and aquifers are not known,” and  
“...nitrate levels don't matter,” (up to toxic levels 5mg/l)*

**What does the scientific literature say? -**

Question: *“Can we predict nutrient limitation in streams and rivers?”*

Answer: *“We cannot predict nutrient responses except in extreme cases.”*

Reference: A review of 382 nutrient enrichment studies, Keck and Lepori freshwater Biology 2013.

So what is one example of what excess nitrogen does to freshwater ecosystems?

Show overhead (1)

We have a 'head in the sand' approach to what is happening to our waterways, and fresh water reserves. Water quality is declining right across New Zealand.

New Zealand's environmental reality:

Show overheads (2)

It may well be years before groundwater monitoring identifies an increase in contamination which could effect the soil, the waters of the Upper Waiau River which flows into Lake Manapouri; and on the eastern boundary we have the Kepler Mire which is a Scientific Reserve and part of the South West NZ World Heritage Area.

In response to a question from Commissioner Potts regarding the travel time for water from the irrigation site to the Waiau River, Simon Springford East stated that there is a wide range of times. The travel time could be anything from 1m a day to 50ms a day. In other words with a distance of approximately 3.25 kilometers to travel, (shortest route), it will take between 2 months at 50ms a day, and just over 9.2 years at 1m a day.

I am sure there are many variables to be taken into account and the actual mathematics are nowhere as simple as I have outlined.

By the time the contamination has been identified and changes in water quality have taken place, it is too late, as there are years of build-up still to flow. Commissioners Nugent and Potts inquired about the accumulative effects yesterday, answers were unsatisfactory as far as I was concerned.

Waikato Regional Council's monitoring of Lake Taupo shows rising nitrogen levels in the **bottom** waters of the lake. This could affect the lake's water clarity, and plant and animal life. As it is a large, deep lake (similar to Lake Manapouri, which is significantly deeper) it can take a droplet of water 11.5 years to pass through the lake before it flows out into the Waikato River. This means changes in water quality can take a long time to show up.

This example can be crossed over to the Upper Waiau River, Lake Manapouri and the lower Waiau River.

Therefore I fully support Simon East's request for a more regular and stringent monitoring schedule if this application is granted.

Ian Evans voiced his concerns regarding water quality monitoring in the Waiau River specifically pointing to safety issues. This has been covered by another submitter, confirming that monitoring can take place.

### **Referring to Statement of Evidence of Susan Bennett**

Page 10 ***Effects on Lake Manapouri***

*"The groundwater monitoring bores should be located such that the expected migration time for the plume to reach Lake Manapouri after the detection of the gradient will be greater than 12 months to provide sufficient time to implement the baseline ecological surveys before the plume arrives at Frasers Beach."*

This cannot be done as we do not know what the expected migration time will be.

Sue Bennett also stated that the contaminants will be retained in the soil and the only contaminant going into the river and lake will be nitrates. Because of the significant flow of the river they will not be able to detect the resulting concentrations.

A question arising from this is: "If we can't detect the concentrations in the river, how high will they be when they are finally detected in the lake?"

Commissioner Nugent raised this concern yesterday and I do not believe his question was answered.

I am also concerned that reference regarding cost of monitoring has been raised a number of times by Sue Bennett. Cost should not be a factor.

Sue Bennett stated that monitoring of the Waiau could be carried out by boat but it could be expensive, I disagree.

There has been a lot of discussion re the monitoring and record keeping, but at no stage has the question "what happens when the readings are high?" Have been fully answered. Like Commissioner Yvette Couch-Lewis I am not filled with confidence with the Council's response.

If short term changes to the system do not fix the problem, will the Council shut down the entire system permanently? Keeping in mind we have only 8 days of storage, what then?

### **Solicitor M Garbett Statement of Evidence**

Page 6

Actual and Potential Effects on the Environment.

21 *“The **key positive effect** on the environment of allowing this application is to enable Council to cease the discharge of treated wastewater into the Upukerora.”*

So are we to assume that it is alright to discharge treated wastewater into the Waiau River and Lake Manapouri but not the Upukerora?

Then further on

*“This will be a long term and widespread benefit both to the environment and to people's appreciation of the environment.”*

We need to ask what is the benefit when wastewater is still being discharged into near natural waters, and sprayed onto farm land. How will it increase my appreciation of the environment?

Page 18

68 As the residents of Manapouri do not want this proposal to go ahead the Council cannot presume that *“the advantage of enabling Manapouri wastewater to be disposed of on the Kepler Farm site in the future...”* will automatically be an acceptable proposition.

69 *“It is the Applicant's position that the action of disposal in this area is appropriate, and is the right location and will not have adverse effects on any people off-site, certainly not those located in Manapouri.”*

Many of the residents of Manapouri would disagree. Their fears are based on real risk and not perceived effects.

### **Referring to Statement of Evidence of Simon Springford East**

Page 8

44. *Within pathway C (groundwater discharge to surface water) there are a number of different surface water bodies to which discharge may occur.*

45. *The risk assessment revealed that Pathway 2 was the most likely to occur. In this scenario groundwater at the site flows towards the north west and discharges diffusely along the Waiau River's south west flowing reach.*

And consequently into Lake Manapouri.. (my words).

46 ... *discharge to the Kepler Mire is an impossibility...*

47 .... *groundwater discharge to Home Creek is considered very unlikely...*

Evidence will be shown over the next few days that both of these statements are incorrect.

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95. *“Assuming that contaminated groundwater flow from the irrigation area discharges into the Waiau River or Lake Manapouri we can assume that the full nitrogen load entering groundwater will eventually discharge to surface water.”*

This is not what is happening in Lake Taupo.

96. States: *the annual nitrogen loading to the groundwater system is estimated to be approximately 12,777 kg per year.*

97 States: *if the current surface water discharge to the Upukerora River continued the estimated loading to Lake Manapouri would be approximately 24,256 kg per year.*

We have since learnt that the figure of 24,256 is the top end figure so in fact it is a lot less at this time.

Even so 96 and 97 admits that there will be a nitrogen loading to Lake Manapouri.

But, referring back to **Susan Bennetts Statement of Evidence**

Page 7

42. *the risk of groundwater discharge having any potential adverse effects on Lake Manapouri would be negligible.*

Page 10

43. *Whilst the discharge will contribute to elevated nitrogen concentrations in the underlying groundwater, this will not result in elevated concentrations in the Waiau River (and Lake Manapouri) and hence adverse ecological effects are not expected.*

Who are we to believe? Thank you Commissioner Couch-Lewis for continuing to ask for assurance regarding the monitoring of the discharge and contaminants. We also do not have confidence in the proposal even with the outline of the monitoring conditions.

**Referring to the National Policy Statement for Freshwater Management 2011.**

### **Section C. Integrated Management**

Objective C1

*“To **improve** integrated management of fresh water and the use and development of land in whole catchments, including the interactions between fresh water, land, associated ecosystems and the coastal environment.”*

Policy C1

*“By every regional council managing fresh water and land use and development in catchments in an integrated and sustainable way, so as to avoid, remedy or mitigate adverse effects, including cumulative effects.”*

I believe the above Objective and Policy cover the very issues we are discussing today.

### 3 Odour:

#### Regional Air Quality Plan

##### Objective 7.2.1 and Policy 7.3.1

*“promotes the protection of the health and communities from any adverse effects of odour and measures to avoid, remedy or mitigate the health impacts of offensive or objectionable odours.*

I refer to my original submission pages 3 and 4

- As noted in RMA Section 2.1, odourous compounds are chemicals. Therefore, odour is a '**contaminant**' as defined in the RMA.

Resource Consent Application July 2013

- Pg 51 7.5 Odour: *"has the potential to generate odour and spray drift causing potential adverse effects beyond the site boundary."*
- Pg 52 Sensitivity of Receiving Environment to Odour stated as HIGH at the Airport terminal.
- 'Offensive' is defined as *'...giving or meant to give offense... disgusting, foul smelling, nauseous, repulsive...'*. 'Objectionable' is defined as *'open to objection, unpleasant, offensive'*.

Is the odour in question 'offensive' and therefore objectionable?

In his Statement of Evidence, Kevyn James Lockyer agrees that it can be.

Therefore a key consideration is:

*a) Location of an activity and sensitivity of the receiving environment:*

As the irrigation area is located beside the Te Anau Manapouri Airport it is evident that the area is highly sensitive.

- Odour Management under the RMA Technical Background Report 3.4 states: *"The owner/operator of an activity that discharges odours **does not have the right to use neighbouring land that he/she does not own as a mixing zone or buffer distance for dilution and dispersion of the odours**, unless the land is zoned appropriately (such as a buffer zone or designation around a wastewater treatment plant), or consent is given by the owner of that land."*
- There can be confusion if the consent holder meets all the performance standards in the conditions, yet still cannot comply with a 'no offensive or objectionable odour beyond the boundary' condition. The consent holder must *not* see performance standards as giving certainty that the residual odours will be acceptable provided the performance standards are met. All parties must be clear that the *no offensive odour condition* is the overriding one, and that the performance standards reflect a minimum acceptable design condition, rather than a 'You'll be all right as long as you meet these performance standards' condition.

Referring to evidence given by **Kevyn James Lockyer** outlining the treatment options to mitigate the odour risk, he states:

Page 8

43 *“The selected option to mitigate the odour risk comprises a trickling filter, soil bio filter and chemical oxidation stage before discharge to the irrigation field.”*

Page 13

60. *“A well maintained soil-bed bio filter will achieve a performance in excess of 95% odour removal.”*

I would like to bring to the Commissioners attention that a trickling filter system was put forward at a workshop held by the Te Anau Community Board on the 18th October 2006, but it was not even considered as an option. A representative of Biofiltro made a presentation but his proposal was rejected. The Council's proposal of incorporating a biofilter is commendable, but it does raise some issues.

Page 7

38 *“The Te Anau wastewater treatment plant scheme will pump treated water from the existing oxidation ponds to the irrigation block.”*

**On page 71 of Staff Report:**

8 (b) *“The trickling filter system and bio-filter shall be installed before irrigation of treated wastewater authorised by this consent, commences.”*

As this is new information none of the submitters have had the opportunity to make comment.

**Questions arising:**

- 1 Where will the bio filter tank and pumping station be located at the site? Kevyn states that this hasn't been decided but they must have an idea as sites are limited.
- 2 How big is the pumping station?
- 3 What noise is associated with the pump station?
- 4 Will an odour be associated with the tank?
- 5 Will it attract birds?
- 6 What is the cost of the system?
- 7 What chemicals are used “purely to mop up?”
- 8 As this is new information will an additional resource consent have to be applied for?

Kevyn Lockyer states that he was the principal process engineer responsible for a similar project at Ti Tree Bend in Tasmania.

In October 2013 TASWATER announced it would spend \$1.1 million on odour improvement at its Ti Tree Bend sewage treatment plant. The project would see iron salt added to the sewage treatment process to reduce the build-up of odorous gas.



Is the use of iron salt used in conjunction with the biofilter system?

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## **Staff Report - Suggested Conditions**

Page 72

12. *By the last working day of July each year, the consent holder to provide Council's Compliance Manager with an Annual Odour Monitoring Report.*

Taking into account that this is an entirely new system it would be prudent to provide an Odour Monitoring Report quarterly for the first two years .

## **4 Bird control**

### **Referring to Statement of Evidence of Simon Beale**

Page 7

27. *"The bird strike assessment recommends a range of **passive deterrence methods** which I consider represent the practicable means of managing birds...."*

one of these is:

(d) *use of bird scaring devices such as percussion noise scarers.*

I did not address this issue in my original submissions as this form of deterrent was not raised.

I have the following concerns:

1. Does the device come under Rule 10 - Audible Devices In Rural Zones?
2. If so are the guidelines adhered to?
3. What is the sound level at the boundary?
4. How far will the noise carry?
5. Does the noise interfere with the breeding and nesting patterns of the native birds located in the near by mire? (Some of which are rare).
6. What is the long term effect on the rare fern bird and nationally threatened black billed gull populations long term?

As in my submission I questioned the word **passive?**

Poisoning and shooting birds is not passive.

## **6 Peat Bog**

The presence of a 4.3 ha elongated peat bog extending across and occupying 11.5% of the eastern proposed irrigation circle will create an additional problem with its attraction to certain bird species. Dealing effectively with this peat bog remains a potentially serious issue even though it has been suggested that additional wetland plants will be planted. Base line data regarding the ecological health of the peat bog has not been recorded as far as we know. The bog will be sprayed together with the surrounding area, and therefore (as Tony Daveron says) a new equilibrium will be established. Maybe not for the good in this case.

## **7 Alternative options**

### **Statement of Evidence Simon Beale**

Page 13

51 *“ treatment measures such as bio domes sewage system were discounted as these are new technologies to New Zealand and therefore unproven. More importantly they only deal with treatment of nitrogen and therefore do not provide the complete solution.”*

### **Statement of Evidence Ian Evans**

Page 18

83 *“The key factor in determining suitability of treatment options must be the expected discharge quality of the treated wastewater.”* And further on... *“Unfortunately none of the technologies suggested by submitters could achieve that level of treatment on their own.”*

When giving evidence on Monday, Ian Evans stated that one of the options put forward in some of the submissions couldn't be considered as it was from overseas and the technology hadn't been proven.

When we applied for a Surface Water Consent to operate our charter vessel in Fiordland, we had to comply with conditions regarding the on board treatment and discharge of sewage. We could not find any New Zealand made marine toilet systems, so we had to look overseas. This was 15 years ago. Even today the best technology for marine toilet systems are from overseas. If the marine industry can bring in overseas technology to address a condition of a consent then surely the Southland District Council can.

I have been working with Wastewater Compliance Systems Inc (WCS), for a number of months and forwarded a preliminary proposal to Environment Southland on Friday 4<sup>th</sup> July with a covering letter stating that further information would be tabled today.

The proposal from WCS is now complete, copies attached to my submission.

In response to the concerns expressed above:

#### ***Emailed from Wade Stinson WCS 8<sup>th</sup> July 2014***

*“...units being piloted in Brazil as well as China with as far as we have been told great performance. Also we are currently working with companies in Peru and India to implement systems there.*

*I do not foresee any complications in providing these to New Zealand. If we are not able to produce all the components of the system there we will be able to ship them to you and then assemble them there with minimal problems.”*

### **On the 9<sup>th</sup> July 2014**

“Plain City Utah has a population of 5,900. Plain City has a bio-dome for it's sewer system that works very effectively and is much cheaper than other options.”

11

### **Referring to Page 7 of their proposal:**

The proposed system will allow Te Anau to achieve an effluent quality that meets the expected permit levels based on current information.

In the event that Te Anau is given a Total Nitrogen limit, air cycling can be introduced into the treatment regime in order to denitrify as well.

If Phosphorous limits are added to the permit, an additional process step such as chemical precipitation or filtration can be added to the process in order to meet the new limit. In both cases, the existing Bio-Dome/Shell system will reduce the overall size of the future expansion. “

Costings are included in the proposal. You will notice that they have costed the project out using three wastewater discharge volumes to cover all scenarios.

I emailed WCS to ask if the existing wetland could be incorporated into the proposal, his response:

***Wednesday, 16 July 2014 4:42 AM, Wade Stinson***

[Ruth.](#)

We have a lot of communities here that also utilize a wetlands to further filter out nutrients. It can help pull some nutrients out for sure, however those units that have been in operation with wetlands are finding that they are not able to pull all the nutrients originally expected, and are now needing further treatment before the wetlands. (Such as lagoons). But from an ecological standpoint, I agree that we need to work with Mother Nature to find solutions to keep our environment as pure as possible.

With your permission I would like to have the opportunity to show you a 4 minute video regarding the use of bio domes.

### **Conclusion**

I have put forward the Bio Dome proposal to prove that there are other very suitable wastewater systems available. Being the first in New Zealand to have such a system should not be a deterrent, it should be seen as an opportunity to work with new technology that is environmentally more acceptable. An entrepreneur would see this as a 'golden opportunity,' given the national and International perception of Fiordland. Where better to implement new technology?

The Southland District Council could in fact be held up as an example to other Councils

as they would be leaders in resolving their wastewater problems.

There are other systems that should also be seriously looked at, one of which is already being trialled in Southland.

On behalf of the Royal Forest and Bird Society, and Lance and myself, I ask that the Commissioners **decline this application in full** and to seriously consider the option of extending the existing discharge permit for up to 5 years. This was also requested by the Te Anau Community Board in their submission:

Quote:

*“We are mindful of our community financial, social and environmental responsibilities., and request consideration be given to extending the existing discharge permit Consent Number 202636, for up to 5 years.....”*

This would give the Council time to consider and research other options which could be less expensive. Also time to research new technology which has been developed since 2006 when this proposal was first put forward, and seriously consider systems that are less harmful to the environment and people.

The Council's six major foundation stones are

People Communities Land Water Heritage Environment.

All of the 6 foundation stones have been challenged by submitters.

The residents of Manapouri have shown that they do not want wastewater discharged on their doorstep through the numbers of submissions asking for this application to be declined. When just on 45% of a towns population stands up and says **“No Thank You”** we think the Southland District Council should sit up and listen.

There has been considerable reference made regarding the Council's relationship with iwi, and the consideration given to their cultural values. The Maori, as a people fought hard and long for this recognition.

Please give us the same recognition and consideration. We stand here as individuals representing a small, but strong community who are proud of the place they call home. We will continue to fight for the health of our lakes and rivers, and for the purity of the air we breath.

We ask that Manapouri is Saved...again. Thank you.

Ruth and Lance Shaw

## Maori perspective Cultural Health Index (CHI)

The overriding goal when developing the CHI was to have a tool grounded in the beliefs, values, and practices of Maori.

### 2.2 The significance of freshwater to Maori.

Specific freshwater sources are valued because of their spiritual status or usage. The CHI responds to these beliefs by enabling Māori to identify those waters of special significance, and to use an assessment tool grounded in their beliefs and values to ensure that cultural data inform management, and that the significance of sites is reflected in resource management decisions.

The CHI responds to these beliefs by enabling Maori to identify those waters of special significance, and to use an assessment tool grounded in their beliefs and values to ensure that cultural data inform management, and that the significance of sites is reflected in resource management decisions.

### 2.3 Participation of iwi in resource management.

The CHI therefore has the potential to reduce or avoid tensions between Māori as kaitiaki, who are often divorced from an active management role, and the resource management agencies that in the absence of cultural data may make decisions that conflict with cultural beliefs and values.