OVERCOMING CONSENTING CHALLENGES FOR FONTERRA LICHFIELD EXPANSION

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ABSTRACT

In January 2014, Fonterra Ltd made the decision to install a new milk powder dryer at its Lichfield Dairy Manufacturing site, to more than double the site's milk processing capacity. A resource consent application for the site's process wastewater irrigation was lodged with Waikato Regional Council in June 2014, and the consent was granted in December 2014 without a hearing being required. This was a significant achievement, particularly given the challenges of supporting the Vision and Strategy for the Waikato River, which has the objective of restoring and protecting the health and wellbeing of the river. The critical success factors for the consenting project were:

- An early commitment by Fonterra's Lichfield site in supporting the Vision and Strategy by ensuring there is no increase in nutrient inputs into groundwater or surface waters in the short term, and reducing nitrogen discharges into the Waikato River catchment by 10% by 2021.
- Rigorous scientific assessment of the proposal and its effects on the environment, and a holistic approach to management practices to minimise nutrient losses from wastewater irrigation.
- Meaningful consultation by Fonterra with Raukawa Charitable Trust, who have mana whenua for the area, and close liaison with Council's staff throughout the consenting project.

KEYWORDS

Resource consent; wastewater irrigation; modelling; consultation; Mātauranga Maori

1 INTRODUCTION

Fonterra Limited (Fonterra) is a subsidiary of Fonterra Co-operative Group Limited, which is owned by some 10,500 farmer shareholders and is New Zealand's largest company, contributing around 9% of the nation's GDP.

Fonterra operates the Lichfield Dairy Manufacturing site ('the site') located adjacent to State Highway 1, mid-way between Tokoroa and Putaruru (Figures 1 and 2). The Lichfield site currently processes 3.2 million litres of milk into 350 tonnes per day of cheese and 38 tonnes per day of Whey Protein Concentrate. The Lichfield site supplies cheese to both the domestic market and to international markets including Japan, the USA, Mexico and Korea. The site employs approximately 180 people.

Most of the resource consents for the site's activities expired on 30 September 2014. Fonterra engaged the author as Project Manager for the applications for the renewals of those consents in late 2012, and to prepare the Assessment of Effects on the Environment (AEE). This role involved the management of all inputs to the project, including the review of all technical reports. Fonterra personnel led the consultation with affected parties and provided much of the technical input for the consenting project. Other consultants were engaged to prepare other aspects of the technical assessments, and the Resource Management Act 1991 planning assessment (refer to the acknowledgements at the end of this paper).

In early 2014, Fonterra made a decision to install a new 30 tonne per hour milk powder dryer at the site, which by mid-2016 will more than double the site's milk processing capacity. Peak process wastewater volumes will increase by more than 60%, to approximately 10,000 m^3/day.

The consent applications and AEE for the expanded site were lodged with the Waikato Regional Council (WRC) in June 2014[1], seeking a term of 35 years for all consents (Ray, 2014). The consents were granted in December 2014 with consent durations of 35 years, apart from the process wastewater irrigation consent, which has a term of 25 years. Securing the consents within this tight time frame and with relatively long consent durations was a significant achievement given the scale of the site expansion and the need to support the recently enacted 'Vision and Strategy' for the Waikato River.

This paper explores the key issues and critical success factors for the acquisition of the new process wastewater irrigation consent for the expansion, which was the most challenging part of the consenting project.

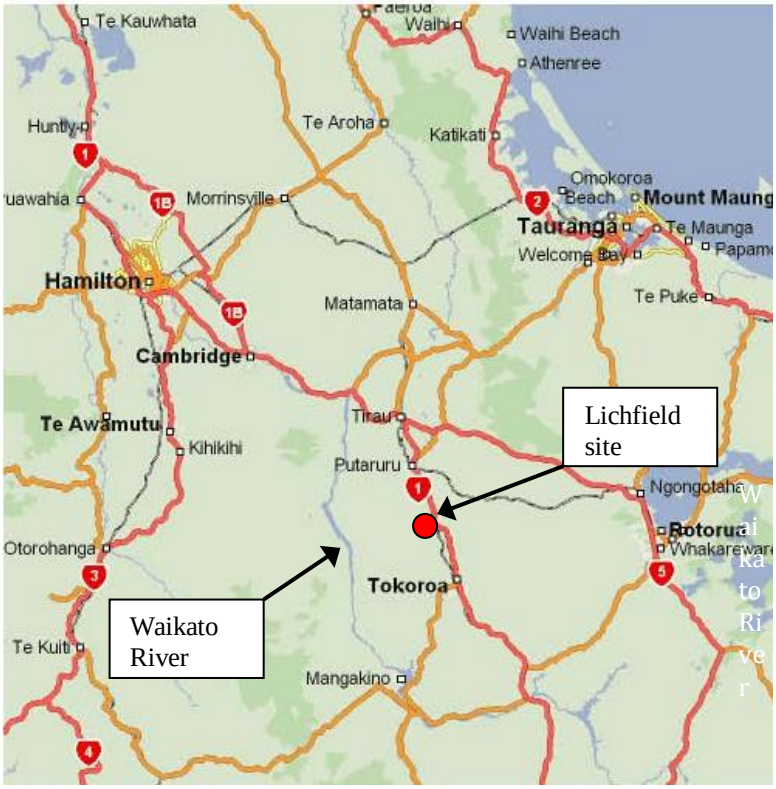

Figure 1: Location of Fonterra Lichfield Site

Figure 2: Fonterra Lichfield, viewed from the west, looking towards State Highway 1, prior to commencement of 2016 expansion works.

2 THE LOCAL ENVIRONMENT

2.1 OVERVIEW OF THE LICHFIELD SITE

The Lichfield site is zoned 'Industrial' in the South Waikato District Plan, while the surrounding area is zoned 'Rural'. Water supply is via groundwater bores located to the south-west of the site. Process wastewater is

[1] A consent application for the site's groundwater take was lodged in March 2014 and granted for a term of 20 years in June 2014. WRC exercised its discretion under s.124 of the Resource Management Act 1991 to allow the site to continue its other consented activities after the consents for those activities expired, until the new consents were determined.

irrigated onto adjacent farmland, discussed in greater detail below. 'Dairy liquids', comprising high COD dairy by-products and other liquids, are disposed of in a variety of ways off-site, with a small proportion spread onto nearby farmland. Low strength wastewater is treated in a constructed wetland before being discharged to land. Sewage generated by the site's toilets, showers and canteen is treated in a package treatment plant before being spray irrigated onto land.

2.2 SURROUNDING LAND USE AND CLIMATE

The land use around the site is primarily dairy farming, although there is a significant exotic forestry plantation that extends more than 7 km to the north-west of the site.

The area surrounding the site is predominantly flat to rolling, and generally falls from the southeast to the northwest. The nearest significant surface waters to the site are the Ngutuwera Stream, about 0.5 km north east of the site, and the Pokaiwhenua Stream, about 1.3 km south of the site (Figure 3). The Ngutuwera Stream is a tributary of the Pokaiwhenua Stream, which in turn is a tributary of the Waikato River (Lake Karapiro).

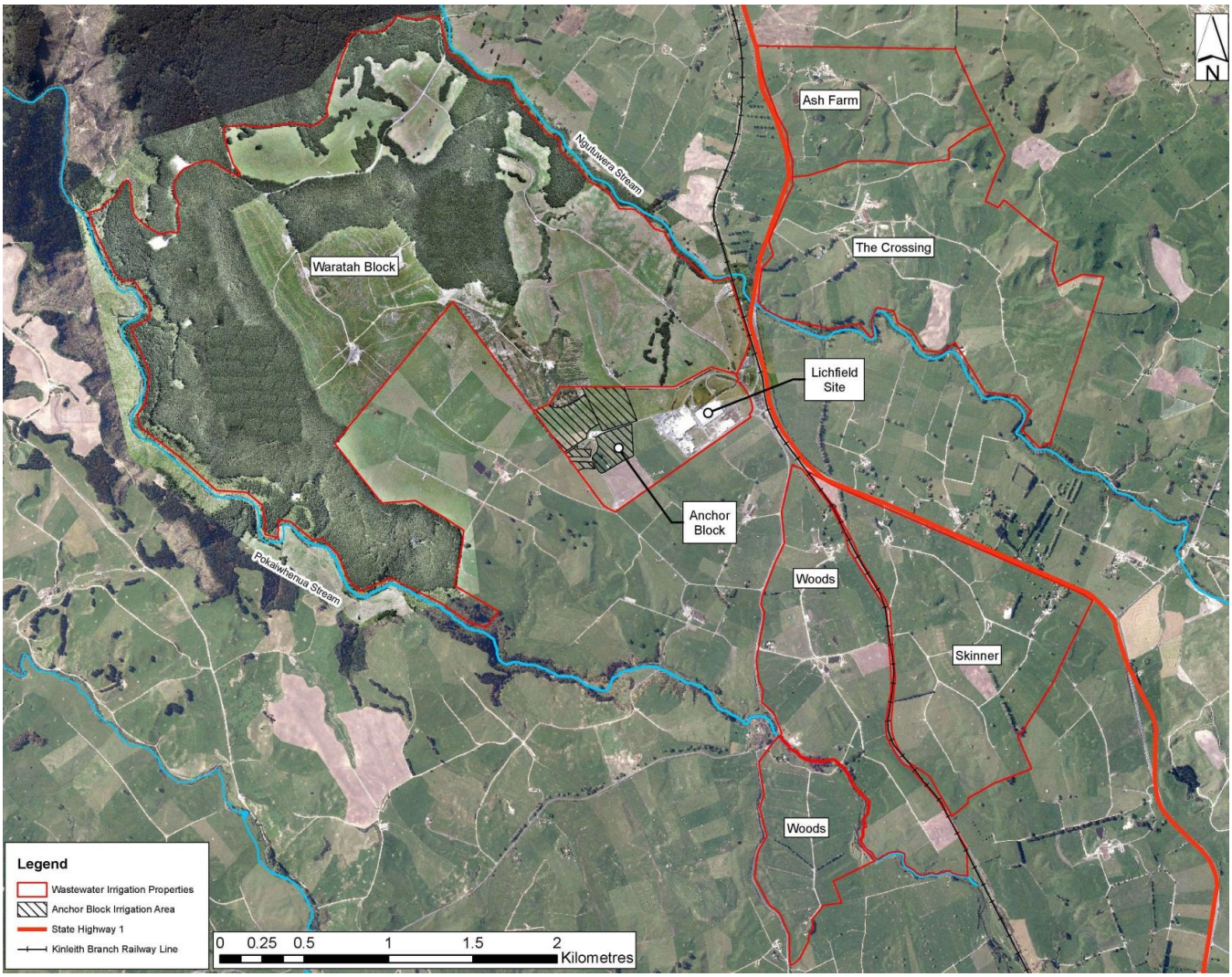

Figure 3: Aerial photo of Fonterra Lichfield site environs, including the Anchor Block, Waratah Block, and Pod Farms (Woods, Skinner, The Crossing and Ash Farm).

The small settlement of Lichfield and the Lichfield School are located 3 km and 3.5 km north of the site, respectively. The nearest marae is the Ngatira marae, approximately 8 km to the east.

Mean rainfall at Lichfield is about 1,400 mm/year. Rainfall is generally higher between the months of May to December.

2.2.1 GEOLOGY AND SOILS

The site and surrounding area is located within the Tokoroa Plateau, formed through a sequence of older ignimbrites. The principal geologic units that form the Tokoroa plateau are the Whakamaru, Waiotapu and Marshall Ignimbrites that increase in age with depth, respectively.

The soils are formed from an ash mantle overlying ignimbrite, and are described as Taupo shallow fine sandy loam and Taupo fine sandy loam. Up to 30 cm of sandy loam topsoil overlies a compact sandy loam subsoil. The topsoil thickness is variable, and can be as little as 10 cm.

2.2.2 GROUNDWATER AND SURFACE WATERS

The main aquifers utilised for groundwater supply are the Waiotapu and Whakamaru Ignimbrites, with aquifer thickness ranging from 20 – 50 m.

Nitrate-nitrogen levels in the Whakamaru Aquifer are highly variable, with an average concentration of between 5 and 7 g/m^3. Nitrate-nitrogen concentrations in the Waiotapu Aquifer are lower and more consistent, with an average of about 2 g/m^3.

Both the Ngutuwera Stream and the Pokaiwhenua Stream have good baseflow due to groundwater inflows to the streams. Up to 90% of the Pokaiwhenua Stream flow is derived from groundwater. The Pokaiwhenua Stream is deeply incised to the west and north of the site, which results in inflows from both the Whakamaru and Waiotapu Aquifers, with most inflow sourced from the Waiotapu Aquifer. On the other hand the groundwater inflows to the shallower Ngutuwera Stream are sourced mainly from the Whakamaru Aquifer.

WRC records state that surface water quality of the Pokaiwhenua Stream is moderate, with nitrate levels (average of 1.2 g/m^3) already well in excess of levels which might limit benthic algal growth. The water quality of the Ngutuwera Stream is moderately low.

The Waikato Regional Plan Maps identify both the Pokaiwhenua Stream and the Ngutuwera Stream as 'Significant Trout Fisheries and Trout Habitat Class' and 'Significant Indigenous Fisheries and Fish Habitat Class' (Section 3.2.4.5 of the Waikato Regional Plan).

3 THE VISION AND STRATEGY FOR THE WAIKATO RIVER

The resource consent applications are subject to the provisions of the Resource Management Act 1991 (RMA). The key statutory planning documents are the Waikato Regional Policy Statement (WRPS) and Waikato Regional Plan (WRP).

The Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 and the Ngati Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2010 inserted 'Te Ture Whaimana o Te Awa o Waikato' – the 'Vision and Strategy for the Waikato River' – into the WRPS. The central objective of the Vision and Strategy is "the restoration and protection of the health and wellbeing of the Waikato River". Other objectives include recognising and avoiding adverse cumulative effects of activities, recognising that the river is degraded and should not be required to absorb further degradation as a result of human activities, and restoring water quality within the river so that it is safe for people to swim in and take food from along its entire length. The Vision and Strategy also recognises that the strategic importance of the river to New Zealand's social, cultural, environmental and economic wellbeing is subject to the restoration and protection of the health and wellbeing of the river.

There are a number of matters in both the WRPS and WRP that were also important for the Lichfield consent applications, but supporting the Vision and Strategy's objective of restoring the health and wellbeing of the Waikato River was the key challenge for the consenting project.

In the context of the Lichfield site, the Vision and Strategy is most relevant to the site's process wastewater irrigation, as this activity has the potential to affect groundwater nitrogen concentrations. Groundwater flows contribute to the baseflow in the streams and rivers of the Waikato River catchment. Nitrogen levels in the Waikato River are a key factor in the river's water quality, particularly in terms of algal blooms (Vant, 2015).

Technical assessments commissioned by Fonterra (Smith & Potts, 2014; Simpson, 2014) concluded that the contribution of nutrients to surface waters from the site's wastewater irrigation is minor (discussed later in this paper). However, from the outset of the consenting project Fonterra's consents management considered it important for the company to be seen to be doing its part in supporting the Vision and Strategy, and reducing the long-term discharge of nutrients into groundwater and the Waikato River. To achieve this objective, Fonterra made the following commitments as part of its consent applications:

- In the short term, to ensure there is no increase in nutrient inputs into groundwater or surface waters; and

- By 30 April 2021, to reduce nitrogen discharges into the Waikato River catchment by 10%, as estimated through Overseer modelling (discussed below).

The above objectives will be achieved at the same time that Lichfield's milk processing capacity more than doubles.

4 WASTEWATER MANAGEMENT AND EFFECTS

4.1 EXISTING SITUATION

4.1.1 CURRENT WASTEWATER MANAGEMENT

Fonterra Lichfield generates three distinct industrial wastewater streams: low strength wastewater, process wastewater, and dairy liquids. This paper only addresses the management of the process wastewater, which constitutes the majority of the mass load of nutrients that are irrigated onto nearby farmland. The site currently produces a maximum flow of approximately 6,300 m^3/day of process wastewater, which includes:

- Plant rinses and clean in place (CIP) cycles;
- Condensate and reverse osmosis (RO) permeate;
- RO concentrate from the whey plant RO polisher and the evaporator condensate RO plant; and
- Wastewater from floor drains and sumps.

The process wastewater from the milk treatment and cheese plant is primary treated in a dissolved air flotation (DAF) clarifier to remove fat and protein. The combined process wastewater is then irrigated onto two Fonterra-owned farms and four privately owned farms, namely:

- Anchor Block (Fonterra owned; irrigation area 18 ha)
- Waratah Block (Fonterra owned; total area 623 ha; irrigation area currently 260 ha)
- Four privately owned farms, referred to by Fonterra as the 'Pod Farms' (irrigation area 347 ha).

This paper focuses on the Waratah Block, as the main changes to the irrigation system for the site expansion were made to this property. The nitrogen applications rates authorised by the existing consents for the Waratah Block varied from 150 to 400 kg/ha/yr, depending on associated land management practices. The Waratah Block is operated as a 'cut and carry' system, which involves harvesting a crop (usually grass silage) to remove nutrients from the irrigated areas. The actual extent of cut and carry has varied from year to year, and the property is also grazed. Fonterra farm management personnel consider that some grazing of the wastewater irrigation properties is beneficial, as it is difficult to manage the properties solely as cropping operations with no grazing. Most of the unirrigated parts of the Waratah Block were in an exotic pine plantation until 2014.

4.1.2 EFFECTS OF HISTORIC WASTEWATER IRRIGATION

The main potential adverse effects of the wastewater irrigation on the Waratah Block were identified as:

- Nitrogen leaching to groundwater, with subsequent effects on surface water quality. This could (potentially) be caused by a combination excessive nitrogen loading rates, and/or excessive hydraulic loading (especially during wet weather).

- Phosphorus build up in the irrigated soils, which could potentially lead to leaching to groundwater and then surface waters, or losses to surface water through erosion.

- Direct phosphorus runoff to surface waters. This could be exacerbated by excessive biochemical oxygen demand (BOD) loading, which can cause clogging of the soil surface and reduction in soil infiltration rates.

The site has not had any problems with odour effects from wastewater irrigation, and odour effects are not considered further in this paper.

The site has an extensive surface water and groundwater monitoring programme that has produced 18 years of data, which was reviewed by Lowe Environmental Impact Ltd (LEI) (Smith & Potts, 2014) and GWS Ltd (Simpson, 2014), respectively. The depth of this historical data and its rigorous analysis by LEI and GWS were critical elements in the success of the consent application process, as they provided a high level of confidence to the consent authority (WRC) and potentially affected parties (discussed later in this paper). In summary:

- Although the soil infiltration rates of the irrigation properties are generally good, the lack of existing wastewater storage facilities can create challenges for wastewater irrigation during extreme wet weather.

- Groundwater monitoring of the shallow Whakamaru Aquifer shows that nitrate levels have been relatively constant in time at about 6 to 7 g/m^3. Monitoring of the underlying Waiotapu Aquifer shows nitrate levels are around 3 g/m^3, which are gradually increasing over time. This gradual increase is considered to be due to wider land use, beyond the Lichfield wastewater irrigation sites (Simpson, 2014).

- Phosphorus loading rates onto the irrigated properties has been high historically, and Olsen P levels are high in the upper 20 cm of all irrigated soils. The soils have good phosphorus retention capacity, and phosphorus concentrations decrease with increasing soil depth, indicating that phosphorus is strongly bound in the upper soil.

- Overall, water quality monitoring results for the Ngutuwera Stream and Pokaiwhenua Stream upstream and downstream of the irrigation areas give no indication of any marked effects of wastewater irrigation on surface water quality. This is consistent with the lack of any marked effects on groundwater quality.

The review of the monitoring data did identify opportunities for further improvements in the monitoring programme, including adding new groundwater monitoring sites 'upstream' from the irrigation areas, and a new site on the Pokaiwhenua Stream downstream of the irrigation areas. This will help with future effects assessments.

4.2 WASTEWATER MANAGEMENT FOR EXPANDED SITE

After completion of the site expansion, peak generation of wastewater volumes will increase by approximately 60%, from 6,300 m^3/day to 10,000 m^3/day. The nitrogen and phosphorus mass loads generated by the plant will increase by similar proportions. This required a complete review of the site's existing wastewater management system.

4.2.1 WASTEWATER TREATMENT PLANT

The wastewater treatment strategy was developed by Fonterra's Environment Technical Group (ETG) to include a new biological wastewater treatment plant (WWTP) to reduce nitrogen and chemical oxygen demand (COD) loads (allowing storage of wastewater without odour being created), and an expanded irrigation system. The WWTP is a two-pond activated sludge system, utilising an anoxic period in the first pond to remove nitrogen, similar to systems already in use at other Fonterra sites.

The WWTP incorporates an approximately 100,000 m^3 storage pond, which will provide about 10-12 days' storage for treated wastewater at peak site production. This will avoid the need to undertake irrigation during extreme wet weather.

The WWTP will remove more than 95% of the COD and about 80% of the nitrogen in the wastewater.

Excess biomass solids (EBS – sometimes referred to as waste activated sludge) will be generated by the WWTP. Some of the EBS will be mixed with the treated wastewater prior to irrigation, to achieve a targeted nitrogen concentration in the irrigated EBS/wastewater mix. There are a number of advantages of this system, which has been used at other Fonterra sites:

- The irrigated wastewater nitrogen concentration can be kept relatively consistent. This makes consistent nitrogen loading rates onto land more readily achievable.

- The wastewater will contain mainly slow-release nitrogen and phosphorus from the added EBS. This high carbon-type fertiliser will typically release the nitrogen in an ammoniacal form when the soils are warmer, which corresponds with the period when pasture uptake is greatest, resulting in minimal leaching.

- The addition of EBS to the wastewater can be easily increased or decreased, or even stopped. This gives operational flexibility to the nitrogen, phosphorus and BOD loading to better manage loading to match climatic constraints and the soil's ability to treat the wastewater.

- EBS addition to wastewater can be stopped when wastewater is being pumped to the storage pond, which will minimise odour generation from the pond. At these times the EBS will be removed from the site and treated or stored elsewhere.

The remaining EBS not irrigated with the treated wastewater will be spread onto other consented sites further afield, as currently occurs with other dairy liquids from the site.

4.2.2 PROPOSED WASTEWATER IRRIGATION MANAGEMENT

Overseer modelling for nitrogen

Overseer modelling was used to help design the required changes to the wastewater irrigation system for the expanded Lichfield site. Overseer is a decision support model to help users develop nutrient budgets for nitrogen and other nutrients on a block and farm scale. The model was developed by AgResearch specifically for New Zealand conditions. While the model is primarily intended for typical farm use rather than as a wastewater modelling tool, it is regarded by modelling specialists as the best available model to assist with modelling nutrient pathways in the soil profile of farmland irrigated with wastewater, and to assess the concentrations and mass loads of nitrogen leached from the soil (pers. comm. Brown, 2014).

Using Overseer, Fonterra scientists who are certified Overseer practitioners assessed a range of irrigation and land management practices to identify a system that will avoid any increase in the mass load of nitrogen entering groundwater, compared to the existing 'base case' (Brown, 2014). The base case of existing nitrogen leaching losses on the Waratah Block (which will receive almost all of the extra volume of wastewater) was assessed as 23 kg/ha/yr averaged across the whole farm (and 44 kg/ha over the irrigated areas), based on wastewater irrigation over the previous two seasons (2012/13 and 2013/14). It should be noted that about 350 ha of the Waratah Block was in exotic pine plantation during this period, with only 260 ha of the block (the area in pasture) being irrigated with wastewater.

The finally selected practices comprised:

- An increased irrigation area on the Waratah Block – increased from 260 ha to 365 ha – to reduce nitrogen and phosphorus loads on a kg/ha/yr basis;

- A reduction in the maximum nitrogen mass load application from up to 400 kg/ha/year (currently averaging around 330 kg/ha/yr) to a maximum of 250 kg/ha/year;

- Increased 'cut and carry' harvesting of crops, to increase nutrient removal from the soils (a minimum of 5 tonnes dry matter per ha per year).

With these changes, it was predicted that average nitrogen leaching losses across the whole Waratah Block would be 22 kg/ha/yr, essentially the same as the base case. The leaching loss over the irrigated areas would be 30 kg/ha/yr. This compares with about 40 kg/ha/yr for a typical Waikato dairy farm (Brown, 2014).

Improvements to wastewater irrigation system

The existing wastewater irrigation system comprises 'pod' sprayers (sometimes referred as the K-line system), which are commonly used for irrigation throughout New Zealand. While this system is considered good practice, some improvements are proposed, including low application rates and irrigation pulsing (intermittent dosing). This will reduce the risk of ponding or runoff, as the soil will be allowed to partly drain between irrigation pulses.

4.2.3 EFFECTS OF PROPOSED WASTEWATER IRRIGATION

Hydraulic loading

The improvements to the irrigation system and the establishment of the treated wastewater storage pond will allow irrigation management to be improved during wet weather, compared to the existing situation (chiefly by allowing irrigation to be avoided during extreme wet weather, and through the improved pulsed irrigation system).

Nitrogen losses

Simpson (2014) assessed the effects of the proposed wastewater irrigation system on groundwater and surface water quality, mainly in terms of nitrate contamination. A mass balance/mixing model was used, assuming drainage percolates downwards to mix with the shallow Whakamaru Aquifer. As groundwater discharges to the Pokaiwhenua Stream, mixing with groundwater from the underlying Waiotapu Aquifer takes place. It was concluded that both groundwater and surface water quality is expected to show no significant change in nitrate concentrations due to the treated wastewater irrigation.

Phosphorus losses

Unlike nitrogen, phosphorus can be stored in soils long term. Based on estimates of the irrigation soil's phosphorus sorption capacity and existing Olsen P levels, it is estimated that to date only around 14% of the soil's phosphorus sorption capacity has been taken up, after 17 years of wastewater irrigation. This suggests that wastewater can continue to be irrigated for many years without coming close to phosphorus saturation (Smith & Potts, 2014). Nevertheless, in conjunction with its technical advisers, Fonterra considered it prudent to carry out further detailed investigations into potential phosphorus losses and mitigation options as follows:

- Investigations into phosphorus runoff potential, and mitigation options if required.
- Investigations into phosphorus storage in the soils and phosphorus leaching potential, and mitigation measures if required.

Mitigation measures that will be considered in the above investigations will include:

(a) Installation of sediment detention bunds in ephemeral waterways/low areas to capture the first flush and retain sediment and phosphorus;

(b) Further increasing buffer strips and riparian planting, particularly on the downstream side of worked up paddocks; and

(c) Further increasing the cut and carry component of the Waratah Block.

Other measures will also be implemented if required, depending on the outcomes of ongoing site investigations into nutrient loss mechanisms.

This proposed monitoring programme, and the consideration of mitigation options, were other important factors in both WRC and mana whenua supporting the proposal (discussed further below).

4.2.4 FUTURE REDUCTIONS IN NITROGEN INPUTS TO WAIKATO RIVER CATCHMENT

As discussed above, Fonterra Lichfield has a made a commitment to the Vision and Strategy to not only ensure there is no increase in nutrient inputs into the Waikato River catchment, but also in the longer term (by 2021) to reduce nitrogen discharges into the Waikato River catchment by 10%, as estimated through Overseer modelling (noting that this will occur while the Lichfield site milk processing capacity more than doubles). Fonterra has considered a range of options to achieve this objective, including:

- Increasing the area over which wastewater is applied (and thereby further reducing nutrient loading rates).
- Further changing land management practices (e.g. increased cut-and-carry).
- Additional wastewater treatment.
- Use of permanent off-site nitrogen reductions. This would involve reduction in nitrogen loss load on another property in the Waikato River catchment.

Fonterra is currently investigating these and other options, and will implement the selected option by 2021. This timeline is required because of the need to determine the optimal solution(s) and (possibly) secure land and/or legal agreements.

5 CONSULTATION AND LIAISON

Fonterra initiated consultation with Raukawa Charitable Trust (Raukawa), Waikato/Tainui, Waikato District Health Board, the Department of Conservation, and Fish and Game New Zealand about the upcoming renewal of the resource consents in October 2013 (Raukawa has mana whenua for the Lichfield area). In summary, none of these parties raised any concerns with the consent renewals (on the basis of the existing site operations).

Fonterra considered a number of different sites in the Waikato Region for the new 30 t/hr dryer, and did not confirm Lichfield as the preferred site until January 2014. The expansion was required to be kept confidential until Fonterra was in a position to notify the New Zealand Stock Exchange, which occurred in late May 2014. Therefore consultation regarding the expansion could not begin until 28 May 2014, only one month before the consent applications needed to be lodged with WRC to maintain 's.124 cover'[2].

This tight time frame meant that full consultation could not be completed before the consent applications were lodged with WRC at the end of June 2014, and the applications were 'limited notified' by WRC to potentially affected parties, as provided for under s.95 of the RMA. Consultation with some parties, including Raukawa, continued during the submission period. Submissions closed on 12 September 2014. Seven submissions were received, but only two of the submitters asked to be heard at a hearing (Raukawa and Transpower). Transpower's concerns were addressed through an appropriate consent condition.

In its submission, Raukawa appreciated the consultation efforts made by Fonterra, and the economic benefits that the site expansion would provide to the South Waikato District. However it raised a number of concerns about the proposal. Ongoing discussions between key Fonterra and Raukawa personnel helped facilitate a better understanding of these concerns and ways in which they were being addressed by Fonterra. This culminated in a site visit and hui attended by approximately 20 Raukawa representatives and Fonterra and WRC representatives.

As part of the consultation process, and to help address Raukawa's concerns, Fonterra offered to reduce the term sought for the wastewater consent from 35 years to 25 years. Among other things, Fonterra also proactively offered a consent condition requiring a 'Lichfield Streams Ecological Monitoring Plan' utilising

[2] i.e. for the company to legally be able to continue its existing activities at the site under the RMA after the existing consents expired, until such time as the new consents were determined

both Mātauranga Māori and scientific methods. The methodology of the Mātauranga Māori-based assessment is to be determined following consultation with Raukawa. Mātauranga Māori methods include monitoring methods that incorporate a Maori-world view.

After a final review of the consent conditions proposed by Fonterra, Raukawa withdrew its wish to be heard. Raukawa noted in correspondence to Fonterra and WRC that it was 'pleased to see the 25 year term...comprehensive review and monitoring clauses, the insertion of the Mātauranga Māori into [the conditions] and the commitment to ongoing best practice and technology throughout the life of the consents.' A hearing was therefore avoided, a favourable outcome for the following reasons:

- considerable cost savings for all parties involved;
- shortened consent processing time frames;
- all parties have certainty of what the consent conditions will be, prior to 'signing off' on a hearing not being required (noting that, in the event of a hearing, the hearing commissioners have discretion to change 'agreed' conditions through their deliberations); and
- reduced risk of an appeal on the Council decision.

Another key success factor for the consenting project was close liaison with the consenting authority, WRC. This included a workshop attended by Fonterra and WRC's technical specialists to discuss and agree on key technical matters such as use of the Overseer model, and irrigation management practices. An open approach between the Fonterra consents team and WRC staff also helped expedite the consenting process.

6 CONCLUSIONS

A resource consent for process wastewater irrigation was granted for the Lichfield site expansion within 6 months of the consent application being lodged with WRC (and within 12 months of the Lichfield site being chosen for the expansion), without a hearing being required. This was a significant achievement, particularly given the challenges of supporting the Vision and Strategy for the Waikato River. The critical success factors for the consenting project were:

- An early commitment by Fonterra to supporting the Vision and Strategy in the following way:
    - In the short term, to ensure there is no increase in nutrient inputs into groundwater or surface waters; and
    - By 30 April 2021, to reduce nitrogen discharges into the Waikato River catchment by 10%.
- Rigorous scientific assessment of the proposal and its effects on the environment, using appropriate specialists in the relevant fields of wastewater treatment, irrigation management, nutrient and groundwater modelling, and groundwater and surface water quality effects assessment. The application of 'good science' helped build confidence in the consenting authority and potentially affected parties, particularly Raukawa.
- A holistic approach to management practices to minimise nutrient losses from wastewater irrigation (e.g. wastewater treatment, irrigation methods, and land management methodologies).
- Meaningful consultation with stakeholders and in particular with Raukawa, which involved open dialogue with Raukawa representatives, and a willingness to listen to Raukawa's views and modify the proposal to address Raukawa's concerns (for example by reducing the term sought from 35 to 25 years, and by proactively including both Mātauranga Māori and scientific methods in the Streams Ecological Monitoring Plan for the site).

- Close liaison with WRC staff throughout the consenting project, including engagement with appropriate WRC scientists.

DISCLAIMER

The views expressed in this paper are those of the author, and do not necessarily represent the views of Fonterra Ltd.

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Notwithstanding the above Disclaimer, the information presented in this paper draws on inputs from key members of the resource consents Project Team, including:

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Rob Potts and Sarah Smith of Lowe Environmental Impact Ltd (wastewater irrigation design, phosphorus mitigation measures, effects assessment); Chris Simpson of GWS Ltd (groundwater modelling, effects assessment); Sharon Dines of Enfocus Group Ltd (RMA planning assessment); Bal Matheson of Russell McVeagh (RMA legal advice).

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