WW Governance Group Workshop

AGENDA

WHEN	10 November 2016
WHERE	Meeting Room 1, Shed 39
FILE NUMBER	WWUP-7-494

Item 1	**Welcome and apologies**	
Item 2	**Interests register**	
Item 3	**Confirmation of meeting minutes**	
Item 4	Project Director's report	Michael Bassett-Foss
Item 5	Finance report	Vera Li
Item 6	Feasibility update	Bruce Geden
Item 7	Verbal update on Ruamahanga Whaitua process	Alastair Smaill
Item 8	Comms and engagement update	Walt Dickson
Item 9	Proposed GG & SAG meeting dates 2017	Michael Bassett-Foss

Interests register (as at October 2016)

Name	Involvement in other organisations/interests
Bob Francis	• Chair Heartland Wairarapa • Chair Aratoi Foundation • Chair Pukaha Mount Bruce, National Wildlife Centre • Chair Wings over Wairarapa • Member Wairarapa Development Group • Chair Wairarapa Healthy Homes • Member Wairarapa Irrigation Trust 2002 – Present • Member WWUP Working Group • Trustee Wairarapa Arts Festival, Kokomai • Chair of the Te Kāuru Upper Ruamahanga River Floodplain Management Plan subcommittee
Bob Tosswill	• Inaugural and current chair of Wairarapa Regional Irrigation Trust (since 2007) which has lead the case for irrigation development in the Wairarapa • WRIT representative on Leadership Group and Stakeholders Advisory Group and part of WWUP Working Group • Formed Wairarapa Water User's group for existing irrigators • Member of Environmental Defence Society and have attended some key conferences esp. leading to establishment of Land & Water Forum • Member of various local rural groups • Note: has a water race through his property in the Wairarapa • Farms in an area likely to be in the command area for the possible Waiohine River investigation which has recently been confirmed as being considered for on-farm storage.
Mandy Armstrong	• Involved with Wairarapa community networks: organic farming, environmental advocacy with Sustainable Wairarapa • Greater Wellington Regional Council's Wairarapa Water Use Project (http://www.wairarapawater.org.nz) – Member of Leadership (Governance) Team as the representative for the environment

Name	Involvement in other organisations/interests
	and recreation consortium. • Leave No Trace NZ (http://www.leavenotrace.org.nz) – advisor.
Jim Lynch	• Owns a 47ha farm in the Carterton District. • Farm is adjacent to a section of the Ruamahanga River which would be used to convey water if the Project proceeded with Tividale. • Jim Lynch has a small farm in the indicative irrigable area, potentially served by the Tividale and Black Creek schemes.
Jason Kerehi	• Rangitane Settlement Negotiations Trust – Lead negotiator • Rangitane Tu Mai Ra – Trustee • Wairarapa DHB – Director Maori Health
Nelson Rangi	• Chair, Kahungunu ki Wairarapa iwi authority • Ara Tahi - iwi/GWRC partnership • Wairarapa Moana Wetlands Group • Masterton District Council – Iwi Governance Group • Wairarapa Police – Maori Advisory Board
John Booth	• Mayor of Carterton District Council • Owner of a 160ha farm in Dakins Road, Carterton • Chair of Carterton District Water Race Committee • Have Taratahi water race on property • Member of Carterton District Council Wastewater Committee • Director of Emquip NZ (heavy machinery import and exporting) • Existing irrigation consent holder and user
Chris Laidlaw	• Chair, Greater Wellington Regional Council • Chair, Te Upoko Taiao Natural Resources Committee • Deputy Chair, Wellington Water Committee • Member, Wellington Regional Strategy Committee • Deputy Chair, Wellington Regional Transport Committee • Member Nauranga to Airport Transport Governance Group • Member, CDEM Committee • Member Ruamahanga Whaitua Committee

Name	Involvement in other organisations/interests
	• Member of Mayoral Forum • Trustee, Leadership New Zealand, • Board Member, Capital and Coast DHB • Ratepayer, South Wairarapa District Council

WW Governance Group

MINUTES

WHEN	6 October 2016
WHERE/TIME	Meeting Room 1, Shed 39
ATTENDEES	
Members	Bob Francis (Chair), Chris Laidlaw, Nelson Rangi, Jason Kerehi, Mandy Armstrong, Bob Tosswill, Mandy Armstrong,
Officers	Michael Bassett-Foss, Chris Maggs, Elsie Diederichsen, Greg Campbell, Bruce Geden, Lian Butcher, Alastair Smaill
In Attendance	Cr Nigel Wilson
FILE NUMBER	WWUP-7-485

1. Welcome/apologies

Apologies: Jim Lynch, John Booth, Nigel Corry and Walt Dickson

2. Conflict of interest declarations

Mandy Armstrong's interest register was changed from: "Leave No Trace NZ board member" to "Leave No Trace NZ advisor".

3. Confirmation of minutes of meeting 1 September 2016

The Group confirmed the minutes of the meeting of 1 September 2016.

Moved: Jason / Bob T

4. Project Director's report

Michael's report was taken as read.
The current phase of work focusses on the following:

- Financial modelling – validation of the assumptions
- Future land use scenarios for the Whaitua modelling process
- Council work programme, including BERL's socio-economic implications report

A collection of tables was handed out ("Days irrigators face restrictions or cease orders" - attached), which showed the days that irrigators in certain areas of the catchment face water restrictions or cease orders. It listed the number days in an irrigation season (October – March) in which farmers faced restrictions or cease takes. The point of this is to show that there is a group that want increased water for reliability i.e. from a reliable source.

The scheme water could also be conveyed by the Ruamāhanga River, so it is possible to increase the command area without having to increase the distribution network (and therefore the construction costs) by putting more water in the Ruamāhanga. Analysis on piping costs doesn't take into account urban water. Part of the council work programme is to collect more information on this.

Moved: Bob T / Jason

5. Finance

The finance figures for August were provided at the last Governance Group meeting.

6. Feasibility update

A supplementary Feasibility update was tabled (attached). Bruce's report was taken as read. He spoke to his report:
The main areas of discussion were:

- The definitions of a drought
- Local Wairarapa drought years compared with local rainfall data
- The concept of Growing Degree Days

Information on these points has been provided in this meeting's paper, along with further information on:

- The correlation between rainfall and drought in the Wairarapa
- Latest climate change predictions from Professors James Renwick and Tim Naish (VUW)
- The hydrology of the Tauweru hydrology.
    - Pictures of low summer and high winter flow at four of the gauging sites on the Tauweru were shown and discussed. The primary issues that are being looked at are potential erosion the banks of the river, the ability of the Tauweru to convey water, and a flat-lining of the stream flows. The main point of the discussion was to see the scale of the natural 'flood' flows compared with releases from the Tividale dam. In reality, they were generally smaller, so flat-lining and abnormal erosion did not appear to be of significance
    - This data has been sent to T+T for further work. They're now going to put together a model which will say what will happen to the flows in the dam scenario (i.e. how much water will flow down the Tauweru how much might be lost on the way)

Moved: Jason / Nelson

7. Future Land Use Scenarios

A summarised version of the Future Land Use Scenarios report has been produced. Both this and the full versions have been given to the Whaitua.

This information will be presented when the project team meet with the new councils. The Councils will play an important role in spreading this information to the public. Some of the content will also be included in a newsletter.

Moved: Nelson/Chris L

8. Comms and Engagement update

An updated paper was handed out to replace the original version (attached).

Moved: Bob T / Jason

9. Ruamāhanga Whaitua Update

Alastair Smaill gave a verbal update to the Governance Group. His main points were:

- Scenario development (management options) is nearly completed and is due to be ready by next Monday
- Modelling will provide insights on impacts of the scenarios
- The options will be finalised by 25 October
- Both regulatory and non-regulatory responses will be considered in the implementation of management options
- BAU scenario doesn't include increase in irrigation or the dam
- Gold, silver and bronze mitigation scenarios will be modelled in addition to BAU
- Additional scenarios including a dam scenario, together with on-farm mitigation measures and changes to hydrology, a managed aquifer recharge scenario and a 're-plumbing' Lake Wairarapa scenario in which some of the Ruamāhanga River flow is redirected back into Lake Wairarapa.
- The results of scenario testing should be available in March/April 2017
- Generally land use will be assumed to stay the same, apart from the potential scheme's, because it is too difficult to predict what might happen in the rest of the catchment

10. Collaborative modelling update

Lian Butcher gave a verbal update to the Governance Group. Her main points were:

- Modelling is being used to show what will happen in potential futures within the constraints of the current Proposed Natural Resource Plan.
- The status quo, which aims to predict the current situation, is being modelled in order to show what will change with the other scenarios. The Collaborative Modelling Project is nearing the point in which the model can be validated.
- The results will show:

- How scenarios influence/change water flow and nutrients, E.coli and sediment, and how these changes will affect the ecological system.
- What the response of certain ecological species will be.
- Social components. Social scientist(s) will take the information and make predictions about: changes to social demographics, jobs, types of jobs, housing.
- Economists will look at potential economic implications of different mitigations.
- There will be a mana whenua aspect to the modelling architecture, a "lense" which can give information about cultural implications.

Moved: Mandy/Chris

Meeting ended 14:50

Attachments:
Days Irrigators face restrictions or cease orders
Land Use Area Changes
Feasibility update (supplementary report)
Comms and engagement update
Water Uptake Curve Graph

WW Governance Group Workshop

DATE 10 November 2016

AUTHOR Michael Bassett-Foss

SUBJECT Item 4: Project Director's report

FILE NUMBER WWUP-7-496

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1. Introduction

The focus of work for the project team since the 6 October Governance Group meeting has been on the following three themes, which are discussed further in this paper.

- Validation of the financial modelling assumptions involving water reliability and demand
- Progressing the Councils work programme involving regional socio economic report, scoping community infrastructure items and independent commercial advice
- Supporting the Whaitua process of future scenario work

Provided elsewhere with these papers are the following topics:

- **Finances** – to end of October illustrate costs for the first four months of the 2016/17 financial year (*this paper will be tabled*);
- **Feasibility work programme** – an update is provided on the peer review of scheme reliability by Aqualinc, hydrological scenario developed by T&T for the Whaitua process, flow gauging update and NIWA climate change proposed work;
- **Communications and engagement** – provides an update on activity related to communications/engagement and provides a summary of the farmer value proposition.

2. Financial modelling

Validation of the assumption set that underpins the financial modelling exercise is largely complete. It is being compiled into a package of information for delivery to Crown Irrigation Investments Limited (CIIL) in early November.

The package of information includes a review of scheme reliability provided by Aqualinc, which is discussed in the Item 6, Feasibility Update.

The package also includes analysis undertaken by the project team of the farmer database, containing information from farmer interviews. This assists in validating water demand and command area assumptions used in the financial model.

3. Councils work programme

The Councils work programme involves three areas of work as outlined below, which are being progressed in time to discuss with Council Chief Executives in late November.

- Regional socio economic report:
  The Wellington Regional Strategy (WRS) office has commissioned Berl to develop a regional economic model, which models regional GDP and employment growth based on different land use assumptions. They have also undertaken a literary review of the social and economic benefits reported by other schemes in New Zealand, Australia and United States. With this information they will develop a paper describing the social changes that Water Wairarapa might provide. The paper will be completed to a draft stage by the end of November.

- Independent commercial advice:
  The Wairarapa Councils have asked that independent commercial advice be commissioned to identify the options, opportunities and risks for TLA involvement in Water Wairarapa.

- Community infrastructure:
  High level description/scoping documents are being developed with input from Councils for items such as Water Wairarapa integration with urban water supply, water race augmentation and environmental improvement initiatives. They will be presented for Governance Group discussion at a future meeting.

4. Whaitua programme

Water Wairarapa presented its view of future land use mix and hydrological scenarios offered by the scheme to the Whaitua committee on 19 September. The future land use scenario was presented to the Governance Group at the last meeting. The hydrological scenario is discussed in Item 6, Feasibility update.

5. Farmer value proposition

Lewis Tucker has developed a discussion document that describes the value proposition offered by secure water storage for farmers, which was presented to the Governance Group at a previous meeting.

Secure water supply enables farmers to realise many benefits over and above productivity improvements, such as options for succession and reduced business risk. The value proposition attempts to describe these less tangible benefits.

The discussion paper provides a basis for discussions with farm advisors and farmers, to assist their understanding of the value that irrigation can provide. These discussions will underpin a future farmer engagement programme.

Initial discussions were held on 28 October in Masterton with several agri-bank advisors and the Farmer Group. Feedback from the discussions will be incorporated in the discussion paper, and further meetings are planned during November and December.

6. Stakeholder Advisory Group

The last meeting of the Stakeholder Advisory Group planned for 20 October was cancelled.

The next meeting is on 1 December. The agenda is likely to include an update on the regional economic review, project timeline, future hydrology scenario, community infrastructure, NIWA climate change proposal, Tauweru River gauging and an update on the Whaitua/science modelling work.

7. Recommendation

That the WW Governance Group:

1. ***Receives** the report.*

2. ***Notes** the contents.*

Report prepared by:

Michael Bassett-Foss
Project Director

WW Governance Group Workshop

DATE 10 November 2016

AUTHOR Bruce Geden

SUBJECT Item 6: Feasibility update

FILE NUMBER WWUP-7-498

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1. Introduction

This report provides information and updates the committee on the following:

1. Water reliability
2. Hydrology scenario
3. Flow gauging update (modelling possibly)
4. Climate change research proposal

2. Water reliability

This report reviews the work conducted on the Wakamoekau Scheme's reliability as a standalone water storage and distribution scheme; for the purposes of this assessment, it's not associated with the Black Scheme or a staged version of it.

Appendix 1 provides in further detail (but still a summary) of the factors that were considered in reviewing the scheme's reliability.

2.1 Review Scope

As part of CIIL's review of the financial model, a non-technical explanation was sought to clarify the scheme's stated reliability of 96%, as doubts were expressed that this figure was in the correct 'ballpark'. For the purposes of selling water, relaibility is a critical factor in generating revenue.

As a result, Aqualinc (specialist irrigation consultants) was engagaed as independent professional to thoroughly test Tonkin & Taylor's (engineers) work to date to satisfy CIIL that:

1. The reliability estimates were technically correct
2. They measured the right aspect of reliability i.e. supplied versus ordered water
3. The explanation underlying the estimates were logical and was able to be understood

2.2 Ordered water - *the water a farmer would like*

To date, the project's technical reports have expressed reliability from the perspective of how it can meet demand in the command area i.e. how much water is ordered. The volume of water ordered assumes that there are no restrictions, whereas in reality there might be i.e. the stored water starts running out. This of course has implications for production and econosmic impacts on farm.

2.3 Supplied water – *the water a farmer would actually get*

In terms of the financial viability of a scheme, CIIL is interested in how much water is available to be supplied i.e. the volume of a farmer water receives and therfore has to pay for.

This reflects the reliability/probability with which a particular contracted volume of water can be supplied, nominating the maximum annual volume supplied during the modelled period (28.9 Mm3) as the contracted volume. This is a key decision. Because of its commercial focus, the CIIL is more focussed on implications for contractual arrangements to buy water.

2.4 Stored Water Advantages

The stated reliability for WW doesn't take into account or reflect:

a) The scheme's ability to manage stored water over the season – essentially it assumes for these purposes that the water is used until the dam runs out. That's obviously quite different from what happens in practice where it can be spread out depending on what crop is being watered, summer rainfall top-up events etc.

b) that one of the advantages of stored water is you know how much water's available from the start of the season, as opposed to run of river as per most South Island schemes. In addition to knowing how full the dam is at the season's start, additional flow events may top the storage up as the summer proceeds.

2.3 Aqualinc's Conclusion

In its report, Aqualinc concluded that:

"Based on a maximum contracted volume of 28.9 million m3, the proposed Wakamoekau Scheme is able to supply 96% of the volume of water ordered. In most years, reliability will be 100% or close to it."

Aqualinc's review therefore confirmed Tonkin & Taylor's estimated water reliability of 96% or more. This is certainly within the acceptable range of what modern water storage schemes try to achieve.

Examples of NZ irrigation scheme reliability are:

- Waimakariri – mid 80's% (effectively a larger buffer pond)
- Central Plains – mid - high 90's%
- Sheffield – 94% (upper separate stage of CPW)
- Waitaki – 100% (uses a hydro dam to store its water so full all the time)

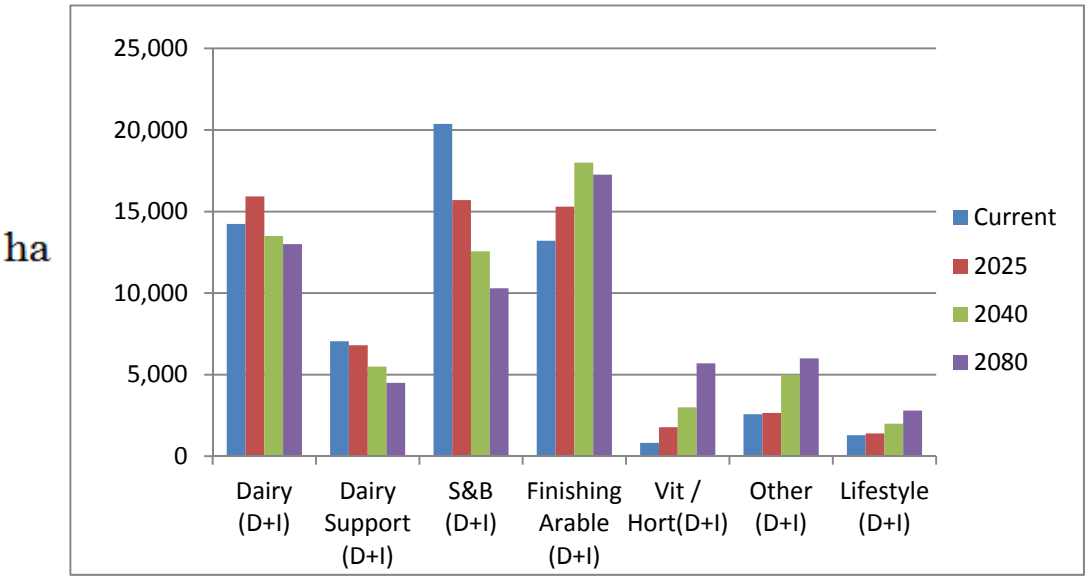
3. Future hydrology scenarios

As part of the WW's contribution to the Collaborative Modelling Project (CPW), it undertook to provide future land use and hydrology scenarios within the command area over various years.

As summarised as a reminder below, the first task was to establish the predicted land uses.

3.1 Future Land Use Scenarios (recap)

At the last Governance Group meeting, the Future Land Use Scenarios report by BakerAg was presented. The main land use changes were summarised as follows:



In summary, the forecast land use changes between 2016 through to 2080 were:

1. **Dairying** decreases slightly, by 9%
2. **Dairy support** nearly halves
3. **Sheep & beef** essentially swaps from dry to irrigated, but decreases by half
4. **Finishing & Arable** increases by 31%
5. **Viticulture & Horticulture** grow considerably – but from a small base

6. '**Other'** or miscellaneous uses more than doubles in area
7. **Lifestyle blocks** also double in area, but no irrigation is assumed

3.2 Future Hydrology Project Brief

Based on the above information, Tonkin & Taylor was asked to determine what effects the two schemes would have on the command area's ground and surface hydrology.

The report presents possible trends affecting stream flows, and likely environmental, social, economic and cultural trends for 2025, 2040 and 2080 horizons, both "with" a scheme and a "without" a scheme scenario.

3.3 Assumptions

Consistent with the future land use scenarios, it was assumed that:

- Stage 1 of the Black Creek Scheme would be operational by 2025
- Black Creek Scheme (Stage 1&2) would be operational in 2040 and 2080
- Tividale Scheme would be operational in 2040 and 2080
- Future land uses would be consistent with the above data/graph
- Climate change effects would be 'minor' in 2025, but from 2040 onwards there would be increasingly evident changes to the severity & frequency of droughts leading to "*changes in quantum and timing of application of water and irrigation return flows*"

In terms of the area under irrigation with or without a water storage scheme, the following was assumed:

Years	Without a WW Scheme	With a WW Scheme
2016 (current)	8,900 ha	8,900 ha
2025	12,600 ha	19,800 ha
2040	12,000 ha	39,000 ha
2080	12,000 ha	39,000 ha

The following aspects are <u>not reflected in the time series</u> developed to date mainly because this information hasn't been developed to sufficient level in terms of the project:

- **Climate change**
- A time series for **flushing flows** regarding their impacts on water quality
- **Ancillary water uses** such as urban water supply, stock water use, rural domestic water use, industrial use, electricity generation, treated municipal wastewater, and / or the existing water races
- Irrigation **return flows** (drainage),
- Offset **mitigation** projects undertaken for the scheme to augment / enhance selected streams, wetlands, groundwater and lakes.

3.4 Outcomes

A 46 page report provided a comprehensive narrative of the nature and scale of the changes that could be expected not just as a result of the scheme itself, but also the predicted climate change implications that will happen with or without the scheme.

A full version Tonkin & Taylor report will be made available if committee members inform Bruce Geden.

The report scoped the nature and scale of the changes in respect of:

- economic,
- environmental
- social
- cultural themes

The outcomes associated with each of these measured literally in their hundreds – far too many to summarise here.

4. Flow gauging update

As advised at previous Governance Group meetings, data has been gathered to gauge the stream flow characteristics especially for the Tauweru River.

We are currently planning an assessment of the use of natural stream channels for water conveyance as part of two potential WW schemes. This involves a feasibility level assessment of use of the Tauweru River and Ruamahanga River for conveying scheme flows as part of the shortlisted Tividale and Black Creek schemes.

The Tividale scheme involves release of water for scheme use into the Tauweru River from a dam located just downstream of the confluence with Mangapurupuru Stream. The released water would then be conveyed via the Tauweru River followed by the Ruamahanga River to an intake into the piped distribution network, located on the Ruamahanga River approximately 3 km downstream of the confluence with the Waiohine River.

The desire is to use a hydraulic model to assess the travel time of the release pulse of scheme water; this will likely transformation of the shape of the release pulse with transmission to the intake.

Subject to further discussions, the most cost-effective approach would be for GWRC to extend and modify the existing hydraulic model in-house with a brief from T+T, rather than T+T producing an entirely new model. The existing model is presented in “Te Kauru

Upper Ruamahanga Floodplain Management Plan: Hydraulic Modelling Report – Lower Model".

If GWRC is available to assist use the above model, it is hoped this work will be completed by the end of this year. That will depend on the efficiencies that can be potentially gained as described above, mainly with the use and extension of the existing hydraulic model.

The outputs of this work will assist in determining the feasibility of the Tauweru River (and the Wakamoekau Stream) to convey water as part of the scheme distribution network.

5. NIWA climate change research proposal

As reported at the last Governance Group meeting, funding was being sought from within GWRC for the $35,000 required to undertake a Regional Climate downscaling and environmental impacts project.

The necessary funds were successfully gathered and WW is contributing $10,000 towards the project costs. NIWA, which is proposed to conduct this work, is now compiling a formal proposal so the work can commence this year hopefully. Until the work has been fully scoped, we won't know when it will be produced.

It has so far been agreed that a 5x5km spatial mapping of climate change variables is the best strategy (scientifically sound) to determine the regional variability in climate. The report would provide specific comments on potential impacts such as biodiversity, droughts, flooding, bushfires, etc. This will be to a level of detail never provided before and therefore most useful in planning for water needs (demand) and sources (supply).

It has so far been indicated that the following climate variables will be regionally plotted:

- Mean, max and minimum air temperatures
- Number of >25C days
- Number of frosts
- Growing degree days (5C and 10C base temperatures) –this variable might benefit from a 1km grid, if such a base-map can be produced.
- Average rainfall
- Heavy rainfall totals (in mm)
- Light rainfall days
- Total rainfall days
- Heavy rainfall days
- Annual mean of total PED - PED has already been produced so no extra work is required
- Soil moisture .

- Soil moisture data availability, - will give an indication of changes in number of dry soil days and/or a similar indicator.
- Average wind speed
- Max gusts or high wind speed frequency (e.g. number of windy days)
- Mean relative humidity
- Diurnal temperature range

Case Studies
NIWA has also agreed to provide a couple of short case studies (a few pages each). They have been chosen in order to highlight the most important aspects of climate change across the region, with emphasis on the spatial variability across catchment which could be beneficial for several GW departments and our stakeholders.

Case study 1: Analysis of variability in **rainfall changes over the Tararua ranges**, with zoomed in plots for the Ruamahanga catchment and the model spread distribution averaged for selected "boxes" to the west of the range, over the range and to the east of the range. Uncertainty will be addressed via using different projection scenarios.

Case study 2: Analysis of changes in **Wairarapa drought**, with a zoomed in mapping of changes in PED and specific calculations of changes in drought thresholds and number of days per year with soil moisture deficit (as discussed before).

6. Recommendation

That the WW Governance Group:

1. ***Receives** the report.*

2. ***Notes** the contents.*

Report prepared by:

Bruce Geden
Project Manager

Appendix 1

Wakamoekau Scheme Water Reliability
(Summary report)

18 October 2106

This document clarifies of the Water Wairarapa's (WW) Wakamoekau Scheme's reliability. It summarises the independent advice by Aqualinc (11 October 2016), entitled 'Review of Reliability for Wakamoekau Scheme'. This summary document is intended be more concise and digestible. The 'Wakamoekau Scheme' refers to a standalone water storage and distribution scheme'; for the purposes of this assessment, it's not associated with the Black Scheme or a staged version of it.

1. Reliability

The reliability of irrigation water is usually determined by comparing the supply of irrigation water with on-farm crop water demand. For clarity, a system is 100% reliable if:

- all water required on-farm can be supplied by a scheme
- no water is needed on-farm, whether or not its available[1]

If there are supply restrictions at the times that water is needed, a scheme is less than 100% reliable. Reliability incorporates:

- Severity – the scale difference between supply and demand.
- Timing – when restrictions occur. e.g. late season restrictions may have less effect than mid-summer.
- Duration – how long restrictions last
- Frequency - whether restrictions occur only once every few years or several times every year

2. Reliability Measures

Reliability can either be measured by the proportion of:

- Days when demand is fully met, say 115 out of 120 days = 96%; or
- Volumetric demand able to be met; the percentage of crop water demand based on depth applied or the volume delivered on-farm

However, neither definition indicates when the restrictions occurred, or how long they lasted. Of the 11,504 days historically modelled, the average annual reliability was 96% by volume. Water supplied would have been restricted for 120 days i.e. 1% of the days in the modelled period.

"Ordered" on-farm irrigation demand is subject to a seasonal volume cap (or consent conditions) as well as irrigation system capacity limits to the unrestricted on-farm irrigation demand.

1 For these purposes, its assumed water is taken from storage until it is empty. In reality, storage management would be optimised such as Opuha over the last couple of years i.e. putting users on restricted takes early on.

"Supplied" irrigation demand is the volume supplied to farm after taking into account the ordered on-farm irrigation demand plus the additional shortfalls in supply when the live storage is empty.

3. Irrigation Demand

Irrigation demand depends on timing, climate (rainfall and evapotranspiration), soil water holding capacity, and crop type. In practice, on-farm supply rates are restricted as it's usually uneconomic for an irrigation system to meet peak demand. The on-farm system capacity (mm/day) takes into account application efficiency and small production losses during hot, dry periods due to a lower supply rate.

4. Water Supply

The length of historical record used for supply modelling was 31 years, from Jan 1981 to June 2012; this gives a good indication of the hydrological variation expected; obviously, the longer the better.

5. Scheme Supply Rate and Volume

A diversity factor, usually, 80-90%, is used to account of the variation in on-farm demand over short timeframes (hours or a day) as it's rare for all offtakes to be taking water at the maximum rate at the same time. WW adopted a diversity factor of 85%, but 90%was suggested; this will be reviewed later.

6. Irrigated area, storage and reliability relationship

The gross storage volume is 19.2 MCM and live storage volume 18.8 MCM. The storage size was based on a preliminary assessment to minimise dam and harvesting costs, taking into account physical site limitations and characteristics. The irrigated area equals the 1 in 5 year drawdown volume of live storage in the dam - this resulted in the overall level of reliability.

7. Supply-demand analysis

The supply-demand analysis found that, based on 31 years of historical climate and flow data, and comparing annual volume of water supplied and annual volume of water "ordered":

- 24 years would have had 100% reliability
- 7 years had some restriction – ranging between 98% and 75% of the ordered volume
- Reliability of the water supplied compared with water ordered over the 31 years was 96%.

8. Summary

Overall, in terms of the amount of water actually supplied compared with unrestricted demand (the water ordered), the reliability is 91% average over the modelled period. However, that understates reliability because it ignores the timing of restrictions, namely the effect on crop yields.

Water supply reliability resulting from supply-demand matching (independent of original assumptions around drawdown volume), means that over the period of analysis, 96% of the volume

required at the dam outflow could be supplied - water supplied compared with water ordered. This calculation is made from daily data and is consistent with other schemes, and within a range of expected values for scheme investigations.

The review, states that the overall (unrestricted) “understated” reliability of 91% should be high enough to provide enough confidence to proceed to further investigation. Further, it recognises that “Further detailed analysis and optimisation is required during the Feasibility Phase, depending on how the investigation is staged, so that the outcomes can be reliably used for detailed engineering design.”

WW Governance Group Workshop

DATE 10 November 2016

AUTHOR Walt Dickson

SUBJECT Item 8: Comms and engagement update

FILE NUMBER WWUP-7-504

1. Landowner Engagement

Landowners in and around the proposed storage sites have been updated on progress with the scheme with a letter sent at the end of October. Included in the correspondence was a copy of the BakerAg land use report summary and an updated indicative feasibility investigations work programme.

2. Farmer Engagement

Farmer engagement has been limited in recent months; however a third newsletter for the year is currently being drafted and will be posted out later in November.

3. Value Proposition

"The Value Proposition of Irrigation to Farmers" discussion document highlights the wide range of opportunities and benefits that the proposed water storage scheme will provide to farmers. A two page summary has been produced, and is attached. The full document will be used to assist discussions with farmers and farm advisors, and continue to evolve during this process. The summary document will be used with key stakeholders.

4. INZ Magazine

The summer edition of the **IrrigationNZ News** quarterly magazine will be getting delivered at the end of this month featuring a four page insert from Water Wairarapa and GWRC's Catchment and Environment Groups. Water Wairarapa's contribution includes a feature article talking to Angus Thomson of Urlar Estate on the potential gains for the wine industry in Wairarapa provided by a region wide irrigation scheme. There is also a piece on changing land use opportunities brought about by the scheme.

5. Media Release

A media release on the BakerAg Land Use Report is currently being drafted and will be distributed to local media following delivery of the Farmer Newsletter later this month.

6. Media Coverage

News media coverage since 6 October is attached.

7. Recommendation

That the WW Governance Group:

1. ***Receives** the report.*

2. ***Notes** the contents.*

Report prepared by:

Walt Dickson
Comms and Stakeholder Engagement

Attachments:
Attachment 1: Value Proposition of Irrigation to Farmers: Summary

Water Wairarapa

The Value Proposition of Irrigation to Farmers: Summary

An opportunity too good to ignore

A multi-purpose irrigation project of the nature Water Wairarapa is proposing is a one-off opportunity to significantly advance the economic, environmental, cultural and social fortunes of the region and its farming community.

If it is to ultimately proceed, it will require informed decision-making and considerable stakeholder education, in particular amongst local farmers. Individual farmers and landowners should not and cannot be expected to make the decision alone. As well, a range of farming-related professionals and bankers will play an important role in the process. All are partners in ensuring that this project becomes a commercial reality.

It's Water Wairarapa's task to demonstrate the benefits of irrigation to ensure potential irrigators are well educated to facilitate robust decision making.

"The Value Proposition of Irrigation to Farmers" is a Water Wairarapa discussion document with input from industry experts. Its purpose is to articulate Water Wairarapa's view of the value proposition it is seeking to offer key stakeholders.

Production

The most obvious benefit of irrigation is the increase in production. In pastoral based farming systems this is not only represented in more kilograms of dry matter per hectare, but a better quality of pasture as superior cultivars can be sown to produce more digestible feed for stock. This increase in pasture utilisation inevitably results in better farm profitability.

Irrigation also gives rise to greater yield for arable farmers and the capability to grow higher value crops. The reliability of that yield allows the opportunity to double crop in the same season, greatly improving returns on investment.

Risk

In addition to increasing a farm's productive capability, irrigation significantly reduces production variability and offers farmers greater confidence in their decision making. It allows for a significant mind-set shift for farmers away from being risk adverse to one of confidently investing into growing their farming business.

Profitability

Irrigation gives farmers the ability to access new markets that previously unreliable production would exclude them from. It opens up opportunities to produce high value crops that can be sold at a premium justified by buyers willing to pay for a reliable supply. These productivity gains underpin future water affordability.

Optionality

Access to sufficient water on a reliable basis creates greater operating flexibility to make decisions based on variables that are outside a farmer's control, such as market prices and climatic constraints. Irrigation also unlocks new market opportunities because of the ability to grow specialist high-value crops and facilitates better utilisation of non-irrigated land.

Opportunities are also created outside of the irrigated area as some existing land use from within shifts outside that invariably leads to higher economic returns to the wider community.

Future proofing

An impact of efficient and effective irrigation on a farming business is significant. It is a change agent that facilitates succession by increasing profitability and future farming optionality. Irrigation, coupled with technology provides farmers greater control over managing their environment. These levers will also allow environmental regulators the opportunity to work with the irrigation value proposition to impose smart, cost-effective regulatory frameworks.

Communities

Rural communities in which water plays a significant part in day-to-day farming practices are generally more vibrant and healthier. This is an important factor in attracting and retaining young people.