

FLAG MEETING NOTES: 13 February 2015

Purpose:	Waimea Plains Freshwater and Land Advisory Group (FLAG) – Meeting 7
Date:	13 February 2015
Time:	9.30am-3.30pm
Venue:	TDC Council Chambers
Present:	<p>FLAG members: Nick Patterson (Chair) Matt Hippolite (iwi representative on FLAG) (Deputy Chair) Philip Woollaston Gavin O'Donnell Pierre Garguilo Lawson Davey (had to leave meeting at 12.30pm) Dean Rainham (co-opted member)</p> <p>Staff: Mary-Anne Baker (Senior Environmental Policy Planner) Lisa McGlinchey (Environmental Policy Planner) Joseph Thomas (Resource Scientist – Water) Glenn Stevens (Resource Scientist - Water & Land) Trevor James (Resource Scientist – Environmental Quality)</p> <p>Guest presenters: Chris Wratt (Ravensdown) Andrew Fenemor (Landcare Research)</p>
Apologies:	Andrew Kinnimoth (resigned), Heather Arnold, Martin Rutledge, Mirka Langford, Zane Mirfin
Notes taken by:	Lisa McGlinchey (supplemented by other staff)
Definitions and Abbreviations	FLAG=Freshwater and Land Advisory Group NPSFM= National Policy Statement for Freshwater Management 2014 NOF= National Objectives Framework TRMP = Tasman Resource Management Plan SOE = State of the Environment Unconfined aquifer = are those where permeable strata are open to the ground surface. Surface water (rainfall and/or river flow) is able to seep from the ground surface directly to the aquifer. Confined aquifer = are those where permeable groundwater bearing strata are separated from the land's surface by an impermeable layer (such as silt or clay) that prevents surface water from directly seeping into the aquifer. Groundwater migrates to confined aquifers from an unconfined recharge area located elsewhere. AGUA= Appleby Gravel Unconfined Aquifer UCA=Upper Confined Aquifer LCA= Lower Confined Aquifer
<i>Note: records of discussion points have been grouped into similar topics and are not necessarily in the order discussed at the meeting.</i>	
FLAG MEMBERS PLEASE NOTE: If you have any questions or need anything between meetings, then please contact Mary-Anne Baker by email: marya@tasman.govt.nz or by phone ddi 03 543 8486.	

Session 1 – Issues arising from previous meeting

FLAG Membership

Andrew Kinnimoth has resigned from the group due to time pressures and the FLAG will seek to replace him from the original list of nominations for the group.

Action: MAB/NP to approach appropriate nominees to seek their interest in joining the group

Matters since previous meeting

Meeting 6 meeting notes accepted by the FLAG group as an accurate reflection of the meeting.

Meeting held in 26 January 2015 with some FLAG members attending (Andrew K, Pierre G, Philip W, Dean R) to confirm the assumptions behind the modelling – there was some confusion over the modelling work as there are two models which could be used - this will be reviewed later in today's meeting.

Matt Hippolite – Iwi considerations

Matt requested time to give the FLAG an overview of the maori world view of water, environment and environmental management practices.

Matt gave his mihi (greeting) and highlighted the importance to maori of their links to their whakapapa (ancestors) and their associated links to their environment.

He outlined the maori view of world creation and highlighted that this was where maori values and beliefs came from.

Key points:

Important maori terms:

Mauri and Wairua

Mauri is a life force or life sustaining force – Matt likened it to being part of *natural capital*.

The mauri is the physical element and the wairua is the spiritual. Mauri is important to maori. Mauri is the measure of the ability of something to give to other things. Water has mauri.

Maori offer karakia (prayer) to elements in the environment to bring wairua to that being.

Mana is an inward flowing force – people's perception of something – as opposed to mauri which is an outward flowing force.

Kaitiakitanga – is the act of guardianship and seeks to protect mauri and in doing so increases mana. For example someone being able to produce good food from their garden and being able to provide this to guests gives them mana in the eyes of their visitors.

Maori as kaitiaki (guardians) have an inter-generational obligation to look after the environment and natural resources.

Rahui – is a temporary stoppage of use or closure of an area. For example, temporarily banning collection of food from an area to protect its productive capacity.

Wholistic approach to water management

Maori can't compartmentalise parts of a river in considering management, as both the upstream and downstream aspects must also be considered – maori therefore take a wholistic view from the mountains to the sea.

If we consider waterbodies as legal entities – this means it has rights and we can't take from it or do things that harm it. This has been done in Whanganui where the Whanganui River has recently been given legal entity status.

Matt referred to the iwi management plan lodged with NCC and that there is a joint one in development with TDC. It is a statement of principles around environmental management.

Under the RMA system – maori can request a cultural impact assessment for activities that they believe may impact on something of value. As part of this process iwi use cultural health indicators including the cultural health index which looks at a range of aspects including how water bodies or places *feel* to those assessing them.

Matt also tabled the document Nga Matapono Ki Te Tai (the mountains to the sea) developed by the Iwi Leaders Group.

Treaty Settlement

Top of the south iwi are recognised in two groups (those that arrived earlier and those that arrived later). The recent treaty settlement for the area includes Statutory Acknowledgements. Each iwi was allowed up to six of the main waterways within their Statutory Acknowledgements which identifies those iwi as being interested parties for any activity affecting these areas.

Action: staff to provide link to statutory acknowledgement web pages.

[The Tau Ihu Statutory Acknowledgments can be accessed from TDC's website at: <http://www.tasman.govt.nz/policy/plans/statutory-acknowledgements/>]

Under the settlement iwi also have the ability to establish a fresh water advisory committee – this will become the consulting group for dealing with freshwater issues.

What is the timeframe for the Freshwater Advisory Committee to be established?

It was only progressed at the last meeting, so it is still a work in progress.

Will this be extended to cover more than freshwater? –

The treaty settlement legislation refers specifically to rivers and freshwater

Does the Statutory Acknowledgement specific groundwater?

They are considered one and the same – it includes the water body tributaries – whether they are surface or ground water related.

What capacity will the Freshwater Advisory Committee have?

There will be one representative from each of the iwi – these are people who have a good understanding of issues (two of them are RMA commissioners).

Matt advised the FLAG he would like to see the FLAG objectives go before the iwi Freshwater Advisory Committee before it goes out to the public and ideally before they go back to Council, however the timeframe for the group initiation is unclear.

Matt recommend the FLAG suggest to all the iwi groups that the iwi Freshwater Advisory Committee be mandated by iwi to provide comment on the objectives on their behalf.

Matt also tabled the Land and Water Forum (LAWF) first report (September 2010) which reviewed the LAWF process including recommendations on how to consult with iwi.

Action: staff to send a link to the LAWF document to FLAG and add key documents to the FLAG bibliography.

The Land and Water Forum reports are all on this website; <http://www.landandwater.org.nz/Site/Resources.aspx>

The FLAG is relying on Matt to assist FLAG to achieve good progress before we go to the iwi Freshwater Advisory Committee.

Detailed information can be difficult to collate across all iwi as for example, some wahi tapu and wai tapu information is held within hapu, not at a pan-iwi level. Information is publically

withheld to avoid vandalism and theft. For those sites that are listed on maps, sometimes the site may not be specifically on the dot and some tapu sites are large areas.

Iwi also own land where they have leased forests and their leasees will be wanting to harvest with potential for sediment released to waterways. Salt ingress into the aquifer is also a concern for iwi.

While the FLAG has so far been focused on the Waimea Plains, the FLAG mandate is wider than this and includes the mountain to the sea approach.

Whatever the Waimea FLAG does – also has potential impacts on wider management in the Tasman area.

The final draft for the values descriptions and objects can be changed in the future and are intended to be put in front of iwi soon.

The TDC doesn't have an iwi group or liaison like the NCC do

TDC has previously relied on Tiakina te Taiao, but this only represents four iwi. Since the deed of settlement other iwi have been included in statutory acknowledgements for local water bodies

In the short term would it be helpful to put out a feeler to the iwi groups who will be part of the Freshwater Advisory Committee to let them know we are at this stage and we would like to involve them – perhaps this would provide an impetus for the group to get started?

General agreement this is a good idea – Matt suggested that the FLAG approach Te Waka o Maui chairs who meet bi-monthly, as this was a good way to capture all eight iwi – he recommended the best approach would be an email to each of the chairs of the trust.

Action: Staff to draft email in conjunction with Matt H to send to Te Waka o Maui chairs.

Session 2: Values Descriptions and Management Objectives

Presentation 1 – Values Descriptions and Management Objectives

Lisa McGlinchey (Environmental Policy Planner) went over the final draft of the FLAG value descriptions and management objectives for discussion.

The current version has been developed from discussions at previous meetings, existing text within TRMP Schedule 30B and work done by the Takaka FLAG group in developing the value descriptions. There are some gaps still to address.

Discussions and key changes requested by FLAG are outlined below under each respective value:

Cultural/Spiritual Value

There are currently no wai tapu sites/areas identified – but there may be some that need to be added following discussions with iwi.

What kind of aspect would make a site wai tapu?

MH – wai tapu can be temporary or permanent. For example if a drowning has occurred a temporary wai tapu may be placed as mixing of living and dead is tapu. A tapu might be temporary to deal with issue or problem. A permanent wai tapu may apply to a particularly good resource for harvesting, where there is especially clean water. The tapu is used to protect or acknowledge a past event.

FLAG discussion on how to approach wai tapu and new objective agreed.

Action: amend to add objective “Wai tapu sites are acknowledged and protected.”

Mauri – but not wairua is mentioned in the objectives – I would like to see this included.

Action: Include in second point to refer to “The wairua of water for cultural and spiritual....

“Natural capital’ is the new jargon, but already included in the concept of ‘mauri’

FLAG discussion on what restoration of mauri might entail.

Objective seen as needing to be in context of time, effort, current state, etc and consistent with FLAG work.

Clear that pristine not necessarily the outcome – needs for community to decide what is appropriate.

Action: “Enhanced” (not Restored) “over time” as part of second sentence under the first objective – with the second sentence separated out to its own bullet point.

Some Iwi/English words are followed by their translation and others are not, some are the opposite way around.

Action: Keep iwi language words and English translation in consistent format throughout. [note: after further post-meeting consideration of this, staff are recommending the original order of terms be retained, as as some concepts have come from a largely maori perspective (eg mauri) while others are from an all-cultures perspective (eg rituals). Changing the order may lead to reader confusion as to whether these terms are discussing solely maori concepts or being used in all cultures/all spiritualities sense. Further discussion may be needed on this topic.]

Municipal and Domestic water supply

Flag discussion on use of the terms “ease and affordability of treatment” - could we remove easily/affordable? – should be good enough so treatment is affordable. Eg bacteria treatment ok, but cost of treatment for nitrates is prohibitive. Group discussion determined to leave wording as is for now.

FLAG discussion on nitrate with respect to drinking water and drinking water standards.

FLAG concern that the nitrate objective may prove to be unachievable. May need to revisit likelihood of achieving this after considering modelling results and consequences.

JT – queried meaning of intake in secure bore note at bottom.

Action: amend secure bore note at bottom of objectives page to “bore intake screen”.

Action: Add reference to “used for drinking” in groundwater objective. Add Hope aquifers to ‘applies to’ list as these are used for drinking water.

Salt water may affect wells close to sea under sea level rises - but that would result in wells not being used for drinking water. Sea level rise is adapted to, not prevented.

Ecosystem Health

Does “aquatic organisms” include stygofauna?

Yes, but this could also be specifically stated if needed for clarity.

Why are the urban creeks included, can FLAG do anything about their quality?

Urban creeks are included as they are within the FLAGs management area and they can affect the quality of the estuary. However other council projects such as the Catchment Management Plans may be the vehicle by which these waterways are managed – rather than rules in a plan change.

There seems to be overlap in terms of points 2 and 3 – some lack of clarity?

FLAG discussion on intent of each objective. LD noted recent deterioration and need to meet needs of aquatic organisms. MH queried if reference to organisms is too narrow. Waimea Estuary is also known for its bird life so reference should include their needs also.

Action: reword objective point 3 to: Water quality maintains and enhances the needs of aquatic ecosystems in the Waimea Inlet.

Is the reference to the estuary too narrow -should this be Tasman Bay?

The inlet is the first place of impact – flow on effect.

If levels are controlled for the estuary they will be controlled for Tasman Bay.

Why is bank shape included in the list for objective point four?

TJ confirmed that bank shape is an important component for aquatic ecosystem health.

Connection with flood plain is also important.

Action: reword to add “floodplain connectivity” to objective point four.

Fishing and Food Gathering

FLAG discussion on meaning of value – general concern that references to fish species too limiting as other resources were also gathered.

Action: Amend: first sentence to read “Fishing and gathering of freshwater and coastal food and resources,...”. Amend third sentence to read “...support food species and resources allowed to be gathered and eaten.” and amend four sentence to “...gather food and resources at traditional...”

Action: Change first objective to “harvesting [and consumption] of food and gathering of resources”. Amend ‘applies to’ text to delete whitebaiting locations, but amend beginning to read “Surface waters, including: Waimea...”.

Action: move reference to rationing exclusion from ‘objective’ to ‘applies to’ text after Waimea. Do this for all instances in all objectives where the rationing exclusion applies.

FLAG discussion on intent and need for second objective point. Should this cover just shellfish or include fish as well? FLAG decided that second bullet point was already covered by the first objective.

Action: delete second objective, but ensure first includes shellfish. Refer to consumption, not just harvesting in first objective.

Livelihood and economic

FLAG discussion on meaning of value – comments made on scope to also refer to food production and human consumption which also had economic implications.

Action: Insert ‘food production’ after irrigation, amend first sentence to read “...important for human consumption, farming, horticulture....”.

Action: amend first objective to be consistent with previous changes to meaning of value – amend to include human consumption – food production already mentioned.

Action: Include hope aquifer in list of ground waters.

Should these objectives promote highest or best use?

This is an allocation issue, rather than water quality.

Should reference then be made to efficient use – isn’t this quantity related?

This could also relate to water quality in respect of nutrient management. General agreement this reference should be retained.

FLAG discussion on obligations to future generations in terms of water quality.

Action: amend second objective to read “Water is used efficiently and water quality is maintained or enhanced to meet the needs of future generations”.

The costs of getting cleaner water would need to be spread.

Yes, but this will be something to consider when looking at management methods.

Recreation

FLAG discussion on meaning of value.

Action: amend first sentence to read “Recreation activities in the Waimea catchments include swimming,..” and delete end of sentence after ‘boating’.

The last statement doesn’t belong.

Action: delete all after “important social activity.”

Action: amend objective/applies to text regarding Waimea rationing note as discussed before.

FLAG discussion on types of recreation considered. Agreement to only refer to swimming for surface water as providing for this provides for other uses also.

Action: delete last bullet point and delete entire ‘recreation types and location’ slide.

Session 3: Attributes and Grades

Updated key attribute spreadsheet circulated.

Key points on amended sheet:

- Attributes limited to key indicators for each value and sites where these are potentially important indicators have been identified – some are specific sites, some apply over the whole management area.
- There are no specific cultural health indicators identified – instead indicators from ecosystem health, fishing and food gathering and recreation have been used as proxy cultural/spiritual indicators.
- Blue shaded attributes where ones Council already had data for. For orange shaded attributes there is no readily available data, however for some of these data collection was in progress (refer comments column).

Cultural/Spiritual indicators

Staff asked FLAG is using proxy indicators from the other social related values an appropriate approach for indicating cultural/spiritual health?

It doesn’t really cover the spiritual side very well – the ‘gut feeling’ aspects. Suggest a cultural health indicator be included as well.

Cultural Health indicator information is already available for some Waimea locations and may be useful in terms of cultural /spiritual values.

Action: Staff to collate existing CHI information and report back to FLAG.

Cultural health indicator process – perhaps look at doing the CHI in the areas with issues?

Yes – we have Borck and Reservoir CHI assessments, but it would be good to have more.

Can anyone be trained to do cultural health assessments?

Suggest FLAG use the framework developed by Gail Tipa and that those doing it should be from those in the statutory acknowledgement area.

What one iwi holds for greater value may be different to another. This is perhaps a conversation to be had with the iwi groups.

TJ – the methodology is well established as being used in the Motueka .

If we are looking at being effective with time and money perhaps we need to look further at by whom and how this is done.

Nitrate attribute

Staff showed the FLAG a draft attribute grading example for nitrate to show how the grading of attributes for different values might work in setting relevant grades.

TJ: the ANZECC guidelines are just guidelines and trigger values, not standards.

If drinking water is the main driving value then we shouldn't need to worry about irrigation needs. We can't justify requiring tougher limits if the water is drinkable.

Irrigation nitrate limits are difficult to ascertain as they are variable for different crops (some crops like the extra nitrogen).

Data gaps also – World Health is adding to the information that qualifies what number is appropriate for drinking water, with bacterial contamination being a significant issue in association with nitrate rather than nitrate levels alone.– Need information from elsewhere to support what number we use to guide limit setting.

E.coli attribute

What areas are used locally for water cress gathering?

Water cress gathering varies from time to time – likely to be close to urban areas. Knowledge about locations held at family level.

What about management of other invasive organisms – didymo, hornwort, carp?

It's more of an ecosystem management issue and not really a water quality issue.

It is important from an ecosystem health point of view, but the FLAG will need to decide how far they go into managing non-water quality related aspects of ecosystem health.

Glenn Stevens and Trevor James then gave the FLAG an overview of the current surface and groundwater data held for the key attributes identified and showed the FLAG mapped results from the TDC State of the Environment (SOE) monitoring programme.

Presentation 2 – Glenn Stevens – overview of groundwater data

- We have new nitrate data from TDC monitoring plus monitoring down by landowner David Easton. Data is continuing to show the plume and issues remaining in the lower catchment areas. The plume is largely the same.
- There is difficulty in selecting 'representative sites' for the aquifers – do we choose the worst case areas or a range of sites? Some parts of the aquifers have problems, while other parts are fine. Currently the core SOE sites are the sites used for comparison.
- We need to find a site on the plains that is influenced by market gardening, but not influenced by the existing nitrate plume – still yet to find a suitable site. We also need to be confident that the market gardening use will stay there for some time so that the groundwater quality monitoring unambiguously reflects that land use. There are areas where market gardening alternates with other land uses over time.

NP: Our site (WWD802), which is located in an orchard but is near market gardening, has relatively low nitrogen levels which are below average – does the plume move sideways?

Presentation 3 – Trevor James – overview of surface water data

- Macro-invertebrate indices – some poor and very poor sites in Borck and Redwood Valley.

- National standards have been used for most attributes to determine grading used in SOE reports
- Water clarity – some unsatisfactory sites in the lower catchments – smaller creeks – mostly urban.
- E.coli – poor quality in Redwood Valley, Borck, Reservoir Creeks.
- Flood flow data excluded for swimming – but is sampled in the days following events, once the waterways are physically suitable for swimming.
- Nitrate – all the spring fed creeks show issues with respect to ecosystem health levels
- Phosphorus issues at Hiwipango where it exits native forest (unknown source – possibly something to do with geology) – also issue at Redwood Valley
- Cyanobacteria (phormidium) – monitoring site at Waimea [upstream of Appleby Bridge]– also some issue at Wai-iti, but we only have a short data record so not yet able to say that data is representative yet.
- Filamentous green algae – at some swimming sites in the riffles, but not in the pools where people swim. Issues in lower coastal streams – Redwood, Borck, Reservoir largely due to stable flows and high nutrients.
- Fish, fine sediment and dissolved oxygen also monitored in the SOE programme. Fine sediment only a 3 year data record so far.

JT - More work is needed to refine the grading bands for nitrate toxicity in spring-fed streams where the spring water is coming from groundwater and has a higher hardness so eco-toxicity of nitrate is lower and there may be more 'green' on the SOE pie charts as a result.

We need to work with what we have so far until further information is obtained.

Action: Staff to obtain information on hardness and nitrate toxicity to informing grading for spring-fed streams.

Summary of forward planning for values and attributes work:

Action: Staff to redraft values descriptions and objectives and send out to the FLAG.

Action: Staff to continue with work on defining grading bands, etc for attributes and report back to FLAG.

How does the Waimea FLAG work compare with the Takaka FLAG – is it fairly consistent?

Yes, the Takaka group is at much the same place – the Takaka FLAG will be looking to put their agreed value descriptions and management objectives to the community for feedback soon.

Session 4: Modelling and Bench Marking

There are two models are being looked at for modelling nutrient losses in the Waimea area – SPASMO and OVERSEER. Staff invited Andrew Fenemor and Chris Wratt to give the FLAG an overview of these two models.

Presentation 4 – Modelling nutrient losses using SPASMO and GIS aggregation in the Waimea Basin (Andrew Fenemor and Joseph Thomas)

Andrew Fenemor from Landcare Research and Joseph Thomas gave an overview of the SPASMO model. Andrew is undertaking work that builds on previous work in Waimea which looked at water allocation questions with various soil and crop combinations.

Key points from presentation:

- SPASMO was developed by Steve Green and is a 'physical model' meaning it represents the biophysical processes going on in the soil, and uses actual data collected 'on the ground'
- It works out what leaches (nutrients etc) out of the bottom of the soil profile (not what the groundwater or spring consequences will be, as there are other processes such

as attenuation involved) – the leaching losses can be aggregated in GIS to look at an entire area to determine volume leached per area

- SPASMO also works out irrigation demands from rain and evapotranspiration inputs
- It considers climate, soil, stock and crop types.
- It can be used at both paddock and farm scale (OVERSEER is more specific to farm scale); both can be scaled up to catchment scale by combining outputs from specified climate-soil-stock/crop combinations
- SPASMO can be used to explore different scenarios, including economic impacts – eg EBITD consequences of changes to irrigation allocations.
- The Waimea SPASMO model would use:
 - one climate type for Waimea area – recommended this continue
 - four soils groups – from really gravelly ones to really heavy ones.
 - five farm systems (grapes, pipfruit, dairy, outdoor vege, other pasture)
- Land cover data is currently being collected to provide more accuracy for modelling current state

There is potential to use previous work and look at differing scenarios using rationing rules within the TRMP with the aim to answer the question: What are the leaching consequences of these scenarios?

Questions and topics of discussion arising from presentation:

What are the limitations of SPASMO?

As it is proprietary software, getting hold of Steve Green to run the model can be difficult. There is also no version control and while the model is regularly being improved, it can be difficult to compare results over time between different model versions.

What are the data inputs required for SPASMO?

The soil parameters require good data – the soils data is split into 10cm deep layers of soil. It also needs an ‘average’ farm system – and for market gardening this can be difficult to determine as different growers grow so many different crops with varied management regimes.

SPASMO also uses daily time steps e.g. daily rain and ET rather than longer term averages which reduce accuracy of model outputs.

How does SPASMO account for surface runoff losses?

It uses the USLE (Universal Soil Loss Equation) which is fairly rough – but as the plains are flat, there is not much surface runoff.

How does SPASMO allow for evaporation of water?

The water modelled as entering the soil is effectively the rainfall minus the evapotranspiration from that specific crop

How does SPASMO allow for irrigation method?

It doesn't account for losses of water caused by the varied efficiency of different irrigation systems, so we may need to consider this following the model outputs.

Is there a variety of irrigations methods in the areas identified?

Apples and grapes tend to use similar methods. Mostly point application for pip fruit. Market gardening uses pipe sprinkler, boom irrigator or gun irrigators and each irrigate very differently.

We have a groundwater model for Waimea, but not a comparative water quality model. The expectation is that not much de-nitrification occurs in the aquifers.

Further work is required to join the dots between the nitrate levels coming out of the bottom of the soil profile and what ends up in water bodies. Expert judgement is proposed given the budget limitations

Some work has been done on this, but it is a mix of judgement calls on what will happen.

The existing Nitrate concentrations in spring-fed Neimann and Pearl Creeks are variable – they are all over the place and could be coming from quite local sources.

Work in Canterbury (between bottom of soil profile and top of aquifer) shows there is very little breakdown of contaminants such as nutrients occurring in this area as there is very little organic material.

Presentation 5 – Modelling nutrient losses using OVERSEER (Chris Wratt and Dean Rainham)

Chris Wratt from Ravensdown and Dean Rainham gave an overview of the OVERSEER model.

Key points from presentation:

- OVERSEER developed in 1990
- OVERSEER is owned by MPI, Fertiliser Association and AgResearch, but is free to all users
- It was originally developed to assist fertiliser recommendations
- OVERSEER training is available through Massey University, plus there is an advisory certification program
- HortNZ are also piloting a training program through MPI's Sustainable Farming Fund
- Significant changes between module versions – eg version 5 to 6
- Best practice data standards are provided to get consistency between model users
- Key driver is that it is production based model – to determine the requirements needed to drive production
- Production data has to be very accurate to get a realistic result
- It is a long term average model – uses monthly intervals, but predicts long term annual average results – eg 3-5 year averages – this removes extreme events (different than SPASMO)
- Assumptions made around actual and reasonable inputs, it assumes the system is at equilibrium
- There is less robust data available for the horticulture industry, compared to dairy and sheep/beef
- Not all crops on the Waimea plains are available for selection in OVERSEER – so some assumptions will need to be made
- It can include numerous crop rotations in small block sizes
- Some soils information is less detailed than others

Questions and topics of discussion arising from presentation:

Where are you at with producing meaningful result for crop types grown on the plains?

That depends on the definition of 'meaningful'. We produced a nutrient budget for horticulture crops and are looking to figure out budgets for a typical crop rotation for market gardening to provide a per hectare number that can then be extended across a growing area.

OVERSEER is similar to SPASMO – it models leaching out of the soil profile, but doesn't include soil processes.

We will need to get some real data of what is actually coming out of the soil profile to test the model – especially for market gardening.

Output volumes - are they based on the market or what is actually coming off farm?

What is being produced on farm.

So if crop is not harvested, but ploughed under, is this taken into account?

There is the ability to including putting organic matter into soil, but it does not specifically take into account ploughed in crops.

Chris then showed an online worked example for OVERSEER for royal gala apples.

When you enter a production yield - you are looking at a projected rate for the next year and what fertilizer is required to achieve this?

Yes – it is best to put in an average yield as OVERSEER is a long term average model.

So it doesn't use 10cm soil depths like SPASMO?

There are default settings, but you can add your own detail.

The OVERSEER model works best when irrigation rates are not included and the model assumes there is no water deficit, but also no over-irrigation.

With OVERSEER – can you operate it in reverse – ie target a production level to find out the requirements and see if these fit within allowed limits?

Not really, it looks at maintenance requirements – if you put in high production levels it would identify what was required to maintain soil levels.

Are there mitigations you can put into OVERSEER to reduce the leaching number going to water?

There are some, but not for horticulture. You could put in different scenarios to find out what works to lower numbers, but you would expect production to drop also.

Chris showed an online worked example for OVERSEER for market garden

In terms of crops OVERSEER looks at a 2 year cycle.

There are different input options for market garden compared to apples. Can include 5 crops in a 2 year cycle.

The model assumes best practice (ie good irrigation and nutrient practice).

What are the various crop types?

There are various crops grouped into categories which are: fodder, forage, arable, seed, green vegetables, legume, root, other crops.

Does it include anything for glasshouses?

No because they are generally self contained systems– or are heading that way.

Does it have different inputs for organic vs non-organic?

No this would be represented by the different inputs put into the model.

MAB: OVERSEER has the benefit of being freely available and there is national work to fill in the gaps in the model for market gardening etc.

Is there any difference in the accuracy between the data that comes from OVERSEER vs SPASMO?

Industry is very comfortable with OVERSEER data. If data going in is good quality, industry is comfortable that data coming out will be good too. Though depends which data we're talking about

How many growers would be using OVERSEER for their fertiliser requirements?

None – we are keen to get this out.

What are they using then?

History and soil testing.

What about for Fonterra dairy farmers?

Yes – they do use it.

Do you supply fertiliser requirements without running OVERSEER?

Yes for sheep/beef sometimes we don't – this is the farmer's choice. For dry stock farms the input data can be quite complex and running the model can be a cost decision.

For permanent horticulture crops –getting OVERSEER outputs shouldn't be too hard should it?

No this should be relatively easy. It is more difficult for market garden.

For permanent tree crops fertiliser is being used to manipulate crop growth, not just yield from the crop, which needs to be taken into consideration.

There is assistance for landowners to set up OVERSEER as this is the harder part.

Model use for FLAG outputs

The FLAG discussed the two models and how they might be used in future work.

NP: The FLAG will need to make recommendations on limits – as a group we will be looking at OVERSEER to deliver some models to determine nitrogen levels to achieve limits.

MAB: There are two different ways of doing this (OVERSEER + SPASMO) we won't know if these two will give use different outputs until they are compared.

The work that HortNZ is doing will give us outputs from OVERSEER, the work that Andrew Fenemor is doing will provide some SPASMO work – which may provide a better catchment view for the FLAG, but is not as useful at a property scale.

There is potential to use SPASMO at a catchment scale and OVERSEER at a property scale (whether or not in a regulatory sense).

It seems that the data from SPASMO would help improve the data going into OVERSEER?

Yes potentially.

There was general FLAG agreement that both models are used.

Are {dairy} farms in other areas required to give an audited OVERSEER report every season?

Yes and this is what Fonterra does.

FLAG needs to find more budget to do the further work to include the SPASMO work.

There is still a question about how the nitrates get from the bottom of the soil profile to the water bodies – we need a catchment model – but potentially could look at flow net work done previously for the Waimea Water Augmentation Committee (WWAC).

AF: Spending money on a hydrological/water quality model is probably a waste – we have a reasonably good idea of what is happening without needing a large model for this.

Is there MPI funding available for this?

Unsure.

If FLAG is being asked to make recommendations then work to ensure these recommendations are well founded - should be funded by Council.

The FLAG need to make sure the recommendations are well founded, as they will have profound effects on local industries and the environment.

We shouldn't be rushed into making a decision – particularly without knowing if there will be dam or not.

It is easier to loosen up tight requirements than to claw them back.

Action: Staff to seek funding for addition of SPASMO work.

Presentation 6 – Dean Rainham - Summary on benchmarking survey work

The survey information gathered by Dean has gone to an agriculture economist which will then be put into OVERSEER as part of this benchmarking project by HortNZ to produce results and a report for Waimea.

Key points from presentation:

- Scope of survey: 11 growers, 14 crops (7 vege, 7 fruit), 6 soil types
- Gathering information on practices pertaining to nutrient use and irrigation
- Attempted to establish if growers were implement good vs best practice
- Everyone soil tests every year
- Only ½ monitored soil moisture levels
- ½ testing leaves (for N) particularly for problem areas
- All calibrated equipment and scheduled/planned irrigation
- All the growers are applying good management practise and moving towards best practice.
- Variable fertiliser and irrigation application is possibly one area that could have improvements, but it depends on having the right technology.

Questions and topics of discussion arising from presentation:

Were other things like evaporation included?

Not specifically – although they attempt to irrigate at night where possible, but it is not always possible to get around their entire farm at night and some irrigation must take place during the day.

Surprised that so many were not doing soil moisture monitoring?

Some had real time monitoring and some did it on a weekly basis. Others were not monitoring.

Veg growers don't do soil moisture monitoring as they couldn't keep up with the watering needs – some crops are walked away from because they can't keep up with irrigation needs anyway.

Veg growers tend to use the plants for monitoring, as your root levels are much shorter compared to grapes, etc.

Yes, that is right.

How do we capture natural rain fall effects on leaching rather than applied water?

The systems account for rainfall in calculating irrigation requirements - SPASMO does this on a daily basis.

Growers can control the leaching by stopping irrigation until the soil moisture levels drop, however they can't control runoff or leaching resulting from rainfall once it passes the soil water holding capacity.

The OVERSEER results suggest there is more Nitrogen removed by some crops from the soil than is being added by the grower – how does that work?

We are dealing with a more complex system – we need to consider what was planted before hand – what material was in the soil before planting (eg previous crop residue) that is being

mineralised in the soil and also feeding the crop. A three crop rotation is required to allow for consideration of residue management etc.

So farmers will have a good understanding of what is in the soil before they plant?

Yes, that is where the soil tests come in.

DR: The bench marking survey information has been provided to both SPASMO and OVERSEER providers so FLAG will receive outputs from both models. But this is just one year of bench marking data and there will be some uncertainties and assumptions made for these outputs.

Session 5: Future Scenarios

Staff asked the FLAG - What difference would a dam or no dam make?

In a no-dam scenario:

We would have to lose one third of our productive crop to work with the available water under a no-dam scenario.

What would replace it?

Dry land.

The farmers would farm the land just for the water rights – ie farm stock to get water to use on other land.

Pastoral use is more likely to increase to enable the cropping uses to gain access to more water, rather than for the dry stock use itself.

Some farmers may look to storage.

For grapes we would probably leave vines in, but in a dry year the crop would be down – we would be cutting buds etc – it is very hard to predict.

Outdoor production areas may become winter cropping land only with a cover crop grown in summer - as that is all you could afford to water.

Even berry crops would be affected as although crops are harvested before Christmas they are still growing canes over summer for the next year's crop.

Pip fruit will definitely be affected.

Dairy is likely to move off plains

In a with-dam scenario:

More growth of crops as growers gain confidence that water is there, but unlikely to see lots of land converted to permanent crops over short term – but will occur over time if economic conditions continue.

Would this come at the expense of existing rural lifestyle land?

Yes, probably. There may also be some larger areas without sufficient water currently, which could provide more growth.

Andrew Burton – presented soil and land use maps to the FLAG.

There is approximately 2400 ha of potentially irrigable area - 40% of the plains is still in grass – potentially irrigable so could provide for growth in these areas. Soils are unlikely to be a limiting factor. Climate is driving production on plains, rather than soils.

Soils information will be important for OVERSEER and SPASMO modelling.

What about stocking levels? Will this increase?

Yes, there is the potential for this. Dairying already tends to be irrigated so unlikely to see stock increases on these.

Tasman has not had an increase in dairying as most easily converted land already done. 1.2% growth in stocking units.

The property size on the plain may be a limiting factor to some growth.

Climate is driving where market gardening is occurring – Waimea is good for 12 months of the year – others are only good for 6 months as they are either too cold or too hot or too wet.

Are Councils subdivision rules an impediment to the property size issue?

Not really, more the historic situation of having a high value house lot on land affecting its use. The rules are seeking to promote amalgamation, including allowing people to cut off house blocks if they are going to amalgamate productive land.

MAB: Mirka and Heather don't perceive much change in forestry or dairy in upper catchment.

MH: The iwi forestry leasees have a right of renewal for current leased land, so there is potential for another 30 years.

What about urban expansion?

We have urban expansion programmed for east and western Richmond, as well as programs looking at the future for Brightwater and Wakefield.

Council should be protecting productive land from any other use.

Council needs assistance from the growing industries to protect productive values, as there is often greater value to the landowner in rezoning land to industrial/urban than looking at the long term value of the productivity.

What about modelling inputs?

It would be useful to have some lines on maps for where the industry thought the market garden could and would go for input into the modelling.

Likewise for any other crop types – pip fruit?

Would more of the same in the same proportions be a reasonable approach rather than a worst case scenario for modelling?

There might be a 20% increase in market garden, but it wouldn't take over the plains.

If there is water allocation to iwi, then they would probably seek to irrigate land that is currently in pasture.

It is likely it would be a combination of the existing crops in similar proportions?

The effects of nutrient limits in conjunction with securing water rights may affect the economics of some uses. Especially pasture uses and their use for gaining water access.

Grapes could expand into Waimea west and around Brightwater.

Apples can go where grapes are, but a bit risky.

Action: Staff and NP to go back to Council to seek funding for further SPASMO work, as well as possibly to fast track progress land use classification and soil mapping.

Session 6: Progress Review

Public engagement and iwi consultation

Are the FLAG happy to share the amended values descriptions and management objectives with the wider community? What is the forum and how do we do it?

Format is up to the FLAG - We could run a meeting, but may not get the interest needed – suggest doing something similar to the Takaka FLAG of releasing it though Newsline and letting people know where to access it and provide avenues for feedback and contacts for discussion.

There was a reluctance to go out publically with the management objectives before they go back to iwi for discussion.

NP - We could start with the values descriptions.

Action: Staff to amend value and descriptions and provide back to FLAG for feedback.

Consideration to be made of issuing Newsline releases for both Takaka and Waimea groups at the same time.

Progress against plan

Need to progress monthly meetings to meet the end of 2015 deadline.

Action: staff to complete gantt chart of plan – and forward to FLAG – and include copy in the agenda mailouts.

Action: Staff to update the invites to the meeting once the agenda is confirmed – with the agenda pasted within the invite so it comes up on attendees computers.

Confirmation of chair

Nick advised that he has taken a position with the Waimea Community Dam Company Limited (WCDL) and now has a different function. While he doesn't see a conflict of issue, he does not think it is in the best interest for the FLAG for him to remain as chair, as it may be perceived externally that there is a conflict of interest influencing the group's decisions.

A new chair will need to be established at the beginning of the next meeting.

Action: Staff to include as item at beginning of next meeting agenda.

Does the group need an interest register?

It was agreed that this was a good idea.

Action: Staff to set up an interest register for the group to fill out.

Agenda Items for Next FLAG Meeting (9 March 2015)

- New chair selection
- Attribute grades
- Benchmarking report?

Subsequent meeting dates and meeting duration

Heather is unable to make Fridays – so will need to be another day of the week.

Next meetings agreed:

- **Monday 9 March 2015**
- **Monday 20 April 2015**

Action Points – Council Staff

No.	What	Who
1	MAB/NP to approach appropriate nominees to seek their interest in joining the group as a replacement for Andrew Kinnimoth.	MAB
2	Staff to provide link to statutory acknowledgement web pages.	LM
3	Staff to send a link to the LAWF document to FLAG and add key documents to the FLAG bibliography.	MAB
4	Staff to draft email in conjunction with Matt H to send to Te Waka o Maui chairs.	MAB
5	Staff to amend values descriptions and management objectives as per changes identified in the notes (refer various action points under Session 2) and send out to FLAG for review.	LM
6	Staff to collate existing Cultural Health Index assessments information and report back to FLAG.	LM/TJ
7	Staff to obtain information on hardness and nitrate toxicity to informing grading for spring-fed streams.	TJ
8	Staff to continue with work on defining grading bands, etc for attributes and report back to FLAG.	LM
9	Staff and NP to go back to Council to seek funding for further SPASMO work, as well as possibly to fast track progress land use classification and soil mapping.	MAB
10	Staff to complete gantt chart of project plan – and forward to FLAG – and include copy in the agenda mail outs.	LM/ MAB
11	Staff to update the invites to the meeting once the agenda is confirmed – with the agenda pasted within the invite so it comes up on attendees computers.	MAB
12	Staff to include new chair selection as item at beginning of next meeting agenda.	MAB
13	Staff to set up an interest register for the group to fill out.	MAB

Action Points – FLAG members

No.	What	Who
1	<i>none</i>	

Next meeting

Date	9 March 2015 (Meeting 8) <i>[meeting subsequently cancelled]</i>
Time	9.30-3.30
Venue	TDC Council chambers
Chair	To be confirmed at meeting start
Draft Agenda Items	<ul style="list-style-type: none"> • New chair • Benchmarking report • Attribute Grades

Subsequent meetings

Date	20 April 2015 (Meeting 9)
Time	9.30-3.30pm
Venue	TDC Council Chambers
Chair	tbc

Information and resource documents identified during meeting

Date	Title	Author/Source
	none	