

12/2/14

Hi Steve

My corrections are below in red.

I have copied you and Pim into my correspondence with Counsellors in the hope that they will direct you to follow my lead and to promote the least costly and most beneficial reintroduction of original Kaituna River flow through Maketu Estuary.

Kindest regards

Don Paterson  
President HbT SRF SNTR  
NZ Registered Natural Therapies Practitioner NT1634

Manufacturer DONZ Natural OPC® Super Antioxidant  
Natural Therapies 28 Jellicoe Street Te Puke 3119  
Ph 07 573 5533 fax 07 573 9363  
[www.naturaltherapiesnz.com](http://www.naturaltherapiesnz.com)

From: Steve Everitt [mailto:steve.everitt@xtra.co.nz]  
Sent: Tuesday, 4 February 2014 4:30 p.m.  
To: Don Paterson  
Subject: Discussion record

Hi Don,

I am keeping track of what we discussed and any promises made. Does this adequately reflect what we discussed.

I am going to talk to our modellers tomorrow to see if they can run a morphological model of the spit, floodtide delta area that might help our understandings.

Regards, Steve Everitt

WaterLine  
[www.waterline.net.nz](http://www.waterline.net.nz)

As at 28th January 2014

Don Paterson Consultation record

Date Correspondence  
Fri 17 Jan 2014

I emailed Don describing my understanding of his proposal; asking him if this was correct and seeking clarification on details

Mon 20 Jan 2014

I rang his home number – no response.

I rang his office and left message with a lady for him to call me.

Tue 21 Jan 2014

I rang Don at work. We had a discussion (about 30 minutes) in which we went through the details of his proposal as I had emailed. It is generally correct but he clarified that:

i) Don wants the system to be left to behave as it did prior to the mole construction (1950s) – i.e. continue to flow as it did in its old route, constrained initially by creating the preferential flow path down Papahikahawai Channel so as to erode the **spit toe and lower Maketu Estuary while** allowing it to breach at Te Tumu for flood relief. As time allows the spit toe to erode **and the lower Maketu Estuary to deepen as the flow path returns to the south-eastern side of the lower Maketu Estuary and so mirrors the lower Whakatane River estuary, then place culverts under the 1971 rock protection to better allow access for spawning Kaituna River galaxius to find maritime marsh re-established in the upper Maketu Estuary.**

ii) The weir across Te Tumu needs to be triangular in shape so that when it overtops it always overtops in the same location to clear any sand on the sea side in order to initiate scour during flood. **See my detailed description and clarification in my letter to Jane Nees dated 12/2/14.**

iii) The top of the weir is set between mid and high tide to primarily prevent saltwater entering from the ocean into the **lower Kaituna River**. To achieve this objective we agreed that we should try at RL0.5m (After our phone call I checked tide-river levels. On April 4th highest water level in the river was RL1.04m @ 13:15pm and mid-tide was RL0.35m @ 16:30pm. So the weir should have a level closer to RL0.9m but in order to be sure water still flows out over it on the outgoing tide I assume a level of RL0.75m. At this level water would flow out to sea over its top for a period of about 2 hours). **It may need to be lower so as to attract significant outflow on each high tide to maintain beach scour in readiness for Kaituna River flood protection and so this needs to be modelled.**

iv) We discussed the effect of the weir on day-to-day **Kaituna River** levels and potential for rise to prevent drainage scheme operation. We agreed this might be mitigated by the additional capacity provided down through Papahikahawai Channel **and down through Ford's Twin Cuts**. (After our phone call I checked Phil's earlier modelling of Option H which assumed full blockage at Te Tumu and openings into the estuary at the Papahikahawai Channel. He predicted 600mm to 800mm rises in day-to-day water levels).

v) For flood relief, the weir would extend across no more than the width of the existing channel. In this way any large flood could scour from the permanent channel **over the weir** and around each **side** of the **weir**. I pointed out that the existing mole would prevent this design on the true right, without major work of course, but on the true left we could assume scour ability. **Don replied that the overtopping weir could perhaps replace the mole.** I also said the existing mouth scours both laterally and vertically to allow flood passage, which the weir would prevent. **Don wonders how Steve knows that the existing Kaituna River mouth scours vertically. If it did wouldn't the bar therefore move upstream and it does not do so. There is also continuous outward flow on all tides at the mole which would suggest to Don that the bar height does not in fact scour vertically at all and that a difference in flow rate at Te Tumu is relative to tidal variance of ocean height and so salt water**

wedge and wave action under the fresh water that is exiting at Te Tumu. Don proposed that left and right lateral scour could be provided if the mole was removed and replaced by an overtopping weir. Furthermore extra flood relief is provided through Papahikahawai Channel and through Fords Twin Cuts.

vi) The opening through the spit from Papahikahawai Channel would be made where it is currently eroding opposite Whakaue Marae because “it is going to go anyway because of introduction of Kaituna River flow through Fords Twin Cuts in isolation from a protective Papahikahawai Channel flow”. After creation opposite Whakaue Marae the Maketu Estuary mouth would migrate back to its existing location, as it has done many times, and would erode the large toe of the spit with it and hence re-create the deep water lower Maketu Estuary channel again. I agreed with the process but did not agree with deliberately breaching the spit – this would fill the estuary with sand in the short-term. Maketu Estuary is already filled with sand because flushing Kaituna River flood flows have been removed from Maketu Estuary. The better way to prevent spit breach is to remove the flood tide delta. This continues to be a point of dis-agreement because the flood tide delta remains on the inside of an estuary channel bend because it is inside that bend and erosion occurs on the outside of a bend. Papahikahawai Channel trajectory would mitigate this effect and would protect the spit from further erosion because it would then be on the inside of the bending toe of the spit. The grossly enlarged toe of Maketu Estuary spit would be flushed out to sea on an outgoing tide using a natural process and the lower Maketu Estuary deep water channel would slowly and steadily move back to the south-eastern side of the lower Maketu Estuary once the mouth had returned to the eastern most point of the Maketu Estuary spit. The larger the Kaituna River flood flows that are allowed through Papahikahawai Channel the greater could be the scour potential in the lower Maketu Estuary.

vii) The 1971 subsidised rock protection would remain in place and possibly with culverts under it for the length of time it took for the toe of the spit to erode and for the lower Maketu Estuary to deepen (Don’s view remains that flow in the Papahikahawai Channel is the only way the back of the spit will re-sand itself and the flood tide delta will dissipate and the toe of Maketu Estuary spit will reform as it originally had been).

viii) Papahikahawai Channel would have to be deeper and wider to provide the capacity needed for the river except that Te Tumu entrance and Fords Twin Cuts would also remain open. Don proposed this might scour itself if the materials would allow and that they be checked for their composition and scour resistance. I stated the model would have to assume the final configuration to check flows and flood levels. I restated my position that I would not support the proposal to put the full flow of the river down Papahikahawai Channel for fear of continual break-out along the spit negating the objectives of the project. Don’s opinion remains that this channel was at times a major flow path based on cyclical course changes of the river from the south to the north of the island and if it had not been then the mouth of the Kaituna River could not have migrated back to Maketu through Papahikahawai Channel after it had broken out at Te Tumu. I contend the main flow has always been to the south of the island, with odd excursions around the north after breaching at Te Tumu, based on both historical survey information and observed typical meander patterns of rivers. Don proposes that any possible but highly unlikely erosion be monitored and corrected with rock lining if it occurs but there is

historic photograph evidence to show that it did not last time that Papahikahawai Channel was carrying significant flow because the spit is inside the bend of Papahikahawai Channel flow.

ix) On the navigation issue Don proposes that the works described above will create the **best possible** navigable channel down Papahikahawai Channel and out through Maketu entrance. I agreed but only that if the works are successful.

I then proposed to meet with Don around a whiteboard to be sure I had his proposal correct.

Tue 28 Jan 2014 Met Don at his office in Te Puke from 5:30pm to 7:15pm. Met Barb.

2014 Purpose of meeting was to be sure I understood Don's physical works proposals but it also developed into reasons why. I use the numbered points **below** to summarise the discussion:

i) Don confirms he wants the system to be left to behave as it did prior to the mole construction (1950s) except for migration of any new entrance that erodes at Te Tumu (**Steve suggested retaining** the mole to prevent this and allow the entrance to re-sand). **Don** is committed to the idea that by re-introducing major **Kaituna River** flow into the Papahikahawai Channel it will then **eventually migrate to** curve southwards against the Marae foreshore and relieve the pressure on the spit **as does Whakatane River estuary**. His desired deliberate spit breach at the eroding location and subsequent entrance migration back to Maketu is necessary to erode the enlarged spit toe **using natural processes**. He opposes any idea to re-introduce major river flow into the channel around the south side of the island and insists his predictions of spit erosion after the DOC culverts were commissioned are proven. I expressed my view that deliberately breaching the spit would reintroduce sand into the estuary; that passing the major flow of the river down Papahikahawai would require major excavation against the island; that the risk of on-going erosion was high. **Maketu Estuary would also be filling with full Kaituna River flow for a number of hours on each tidal cycle and so this would reduce sand intrusion through Maketu Estuary entrance. Any sand introduced would be flushed from Maketu Estuary by the next Kaituna River flood anyway. Previous major flows down Papahikahawai Channel did not require capital works to occur first. Ongoing erosion to Maketu Estuary spit did not use to occur as can be seen in the attached photograph of a previously high and stable Maketu Estuary spit.**

I tried to get him to focus on **Steve's** desire (that of reduction of the flood tide delta, rather than how it might be achieved) in the hope we could find a solution. He was not interested **because he feels certain that the flood tide delta will be eroded easily and effortlessly without cost by a Papahikahawai Channel flow.**

ii) The **top of the** weir across Te Tumu needs to be triangular in shape so that **it can deflect high tide storm surge and when Kaituna River flow** overtops it always overtops in the same location to clear any sand on the **seaward** side in order to initiate scour during flood. See point (v) below. **See my 12/2/14 letter to Jane Nees for design recommendation.**

iii) The top of the weir is set between mid and high tide to primarily prevent salt-water entering from the ocean into the lower Kaituna River. The ideal weir height needs to be modelled for all possible Kaituna River flow and ocean high tide storm surge regimes. Agreed great idea if other affects can be managed.

iv) We discussed the effect of the weir on day-to-day Kaituna River levels and a potential for rise to prevent drainage scheme operation. We agreed this might be mitigated by the additional pumping capacity. He insists the predicted rise (600 to 800mm) will be mitigated by capacity through an appropriately sized Papahikahawai Channel with entrance from the Kaituna River adjacent to the overtopping weir at least as wide as is the lower Kaituna River, and as deep as the existing Kaituna River bed at that point, and also over the weir and through Fords Twin Cuts.

v) For flood relief, the weir would extend across no more than the width of the existing channel, tied into the mole on the true right and allowed to scour on the true left or else replacing the mole with the weir with the potential for lateral and vertical scour of the sand dune on both sides of the weir. I expressed my view that this flood relief system was unreliable and I could not support it. Theoretically it could be shown to work but in reality there are too many unknowns e.g. thickness and strength of sand (water moves sand); state of tide preventing full flow (exactly the same as the current situation); breach occurring too late (breach will occur whenever there is Kaituna River flood flow that is higher than the sides of the weir when Maketu Estuary carrying capacity is full).

I proposed that instead of a fixed weir providing the necessary scour initiation Channel, simply fill the entrance with sand and maintain it at a desired height as is done at Whakatane. So no hard structure is built to be maintained (no maintenance is required by a concrete weir, with no ongoing expense and no inconvenience). However, the same operational uncertainty remains. It would operate automatically without cost or human input and without needing to be maintained at all as a concrete weir.

vi) The opening through the spit to the east of Papahikahawai Channel would be made where it is currently eroding opposite the marae because "it is going to go anyway as it had done following Fords Twin Cuts reintroduction in isolation from a protective Papahikahawai Channel flow as I had predicted in the Appeal Court would occur". See point (i) above.

vii) The 1971 rock protection would remain in place for the length of time it took for the toe of the spit to erode and for the lower Maketu Estuary to deepen. Significant culverts under the 1971 subsidised rock protection could eventually replace any need to have Fords Twin Cuts in place and so could allow more room for maritime marsh galaxius spawning habitat. Fords Twin Cuts was an engineering blunder proposed by Ford and designed by Murray. Ref [www.wetlandsnz.com/background/Historical River Changes 1925](http://www.wetlandsnz.com/background/Historical%20River%20Changes%201925). This is a minor point of contention.

viii) Papahikahawai Channel might have to be deeper and wider to provide the capacity needed for 1/3 of Kaituna River high tide and flood flows. Don requires a channel in this location to handle 1/3 of the full flow of the river. I estimated the size of this to be 60m wide by 3m deep. Steve's figures not Don's. The Papahikahawai

Channel is obviously in place and has been used previously by significant Kaituna River flow and so just needs to be checked for scour potential during times of peak flood flow. Don says only over the length between the island and the spit. I contend it has to taper in and out both ends. There is maritime marsh potential galaxius spawning habitat at the eastern end of Papahikahawai Channel that does not need to be destroyed.

ix) Navigation, fishing. Don says they will relocate. Steve agreed.

I pointed out to Don that all these points had been considered, and are still being considered, over the years and the only way all affects could be avoided or mitigated was with a gate structure. I showed Don that this concept was being investigated. This is too expensive and is impractical because it is completely unnecessary as my proposal has already been modelled by its original working form and a weir at Te Tumu would prevent breakouts as had previously occurred.

I agreed to consider what modelling work might provide some value. I stated some natural processes can't be modelled numerically or physically and have to rely on expert assessment and judgement. Steve said that he and Ben Tucky believed that Don's recommendation could not be modelled because of its low trajectory. Don replied that it could be modelled with low tide flows which do determine estuary channel formation. Don clarified that it had already been modelled by its original form before the Kaituna River exit had been forced to remain at Te Tumu. Papahikahawai Channel had previously carried significant Kaituna River flow and Maketu Estuary spit had remained stable and the lower Maketu Estuary had remained deep until the Kaituna River had broken out at Te Tumu following forest clearance and land drainage in the catchment that had increased flood capacity.

Steve said that Don was argumentative which seemed out of line to Don who said that he had been proposing the same solution for 30 years and that it had not yet been fully considered or modelled. Don invited Steve to model his proposal please.