

Coastal Adaptation Strategy (CAS)

COMMUNITY ENGAGEMENT REPORT



Kingston District Council has faced significant coastal challenges over the past few years, and acknowledges that these challenges, as well as inundation risks, will only be exacerbated by climate change scenarios and associated sea level rise in the future.

The coastline within Kingston District Council's area is considered vulnerable, with Council's current known challenges including (but not limited to);

- Coastal erosion at Wyomi Beach and surrounds;
- Coastal erosion at Cape Jaffa;
- Seagrass wrack accumulation and management;
- Sand accumulation and seagrass inundation at Maria Creek and Cape Jaffa; and
- Low lying areas susceptible to flooding and coastal inundation.

Storm induced coastal erosion has seen an extended area of coastline affected, with identified risks to infrastructure, assets and public safety. Council has previously implemented risk management strategies as immediate options, but acknowledged a strategic and forward planning approach is required to effectively manage these risks and balance its priorities.

With the support of the Coast Protection Board (through the Department for Environment and Water), Council was successful in receiving \$27,500 in grant funding in 2019/20 to develop a Coastal Adaptation Strategy (CAS).

The objective of the Strategy was to deliver a holistic and strategic approach to the ongoing management of Council's coastline and associated infrastructure, as well as better understand identified risks to the community through the effects of sea level rise.

After successful execution of the grant funding agreement in December 2019, Council engaged Wavelength Consulting to commence the development of the Kingston District Coastal Adaptation Strategy.

The Strategy covers the coastline between Cape Jaffa and Blackford Drain, including the areas of Cape Jaffa, Wyomi, Pinks Beach, Kingston SE township, Rosetown and Blackford drain area and will assist Council in understanding risks of potential sea level rise (inundation and flooding) and changes in coastal processes (erosion).

A draft Strategy was initially received in June 2019, however based on recommendations and findings, Council prioritised the progression of the Maria Creek Sustainable Infrastructure Project.

The initial findings of the investigations and modelling were presented to Council (via Zoom meeting) by Wavelength at its informal gathering held on 11 August 2020. Council requested further investigations to be undertaken as a result of this presentation.



The final draft of the CAS was received in October 2020, with Council formally considering the matter at its meeting of 20 October 2020 where it resolved the following:

That Council endorse the release of the Kingston District Coastal Adaptation Strategy (dated October 2020 prepared by Wavelength Consulting), in accordance with Council's Public Consultation Policy.

Cr Armfield / Cr Harding CARRIED (2020-152)

Community engagement included targeted engagement with key stakeholders or interested parties, with the community in its entirety being able to comment. The community engagement Strategy and feedback is detailed in this report.



ENGAGEMENT STRATEGY

Following approval of the grant funding to develop the Strategy, Council released a 'Coastal Adaptation Strategy' Fact Sheet in January 2020 which detailed the project and stages involved. This fact sheet was made available at the Council office and on Council's website.

In January 2020, Council distributed a 'Have Your Say' flyer, which included the Coastal Adaptation Strategy and opportunity to book a one-on-one session with Annabel from Wavelength Consulting to discuss the project and provide insight on the area.

The sessions were held on 13 and 14 February 2020 at the Council offices in conjunction with the community engagement on the Maria Creek Sustainable Infrastructure Project, with twenty-two (22) consults held and additional written and verbal submissions received. An overview of the engagement sessions is provided in Section 5 of the CAS.

During the time that Wavelength was working through the technical investigations, Council provided general progress updates to its community. However, given that the project has been developed in parallel with the Maria Creek Sustainable Infrastructure Project, Council was mindful of the timing of the release of the CAS for community comment.

Upon receipt of the final draft and Council's resolution, the Strategy was able to be accessed via Council's website, with hard copies available from the Council office from 21 October 2020.

A number of supporting documents were developed and released to assist the community in interpreting some of the more technical aspects of the CAS. These supporting documents include:

- Fact Sheet 1 – Coastal Adaptation Strategy (January 2020)
- Fact Sheet 2 – Summary of CAS (October 2020)
- Fact Sheet 3 – Coastal Hazard Mapping (October 2020)
- Fact Sheet 4 – Erosion Mapping (October 2020)
- Fact Sheet 5 – Inundation Mapping (October 2020)
- Fact Sheet 6 – Flood Preparedness (October 2020)
- Frequently Asked Questions – Coastal Adaptation Strategy (October 2020)
- Wyomi Beach Sand Nourishment Fact Sheet (May 2020)

Community members were able to submit comments in response to the Strategy through the online form on the project website page), or in writing to the Council office. Feedback for the Coastal Adaptation Strategy was due to conclude on Monday 30 November 2020.

At the conclusion of the initial engagement term, no responses had been received and as a result, feedback was extended to 18 December 2020 and targeted engagement with key stakeholders was undertaken.



Kingston District Council engaged its community through the following:

- **Media Release**
9 December 2019 – “Council Receives Precious Coastline Funding”
- **Have Your Say – One on One with Wavelength**
Flyer distributed to all residents/ratepayers and email database
Sessions held 13 and 14 February 2020 in conjunction with Maria Creek Sustainable Infrastructure Project with outcomes summarized in Coastal Adaptation Strategy
- **Kingston to the Cape Newsletter**
 - Update provided in ‘Kingston to the Cape – eNewsletter 3’ - 21 February 2020
 - Update provided in ‘Kingston to the Cape – eNewsletter 5’ – 28 May 2020
 - Release of CAS for community feedback ‘Kingston to the Cape – eNewsletter 10’ – 29 October 2020
- **Website**
Coastal Adaptation Strategy Project Page <https://www.kingstondc.sa.gov.au/our-services/major-projects/coastal-adaptation-Strategy>
- **Direct Engagement**
 - Department for Infrastructure & Transport
 - Limestone Coast Landscape Board
 - South East Water Conservation and Drainage Board
 - Community members who had provided information in the preparation of the CAS

*Note: Coast Protection Board as a key stakeholder had active involvement in the preparation and review of the Coastal Adaptation Strategy in liaison with Wavelength.

Council originally identified to hold a community forum to engage with the community on the Strategy, however, given the findings of the Strategy and due consideration to COVID-19 this was not considered the most appropriate method of engagement. In the event there was significant feedback or interest, Council considered holding follow up one-on-one sessions with Wavelength for interested community members, however based on the level of feedback provided, this was not progressed.

Future Engagement

It is important to acknowledge that the CAS provides options for future adaptation pathways, with the community not locked into any specific approach. The CAS is starting the conversation and awareness for future planning and where an option is not acceptable to the community, the alternate options provided can be considered further.

As specific triggers are reached and pathways progressed, Council will undertake targeted community engagement, or form focus groups, where required. Given the broad scope and general intention of the Coastal Adaptation Strategy, this is not considered to be required in the initial engagement and release of the CAS.



WRITTEN SUBMISSIONS

Council received formal written submissions from stakeholders and community members. An overview of the feedback received is as follows:

- Limestone Coast Landscape Board, Mr Steve Bourne
- Department for Infrastructure and Transport, Mr Andrew Smith
- Mr James Ferguson
- CR & MM England

OTHER FEEDBACK

Whilst not reflected through written submissions, there was an additional level of interest in the CAS with a number of printed copies provided to community.

In addition, representatives of the Kingston District Council met with representatives of the South Eastern Water Conservation and Drainage Board (Mr Lee Morgan and Mr Mark deJong, Department of Environment and Water). The discussion and engagement was positive, with commendation to the Council for developing the Strategy and broadly supportive of future collaboration for adaptation planning. Future engagement with the SEWCDB as a key stakeholder will be important given the pathway options contained within the CAS. Discussion on a formal written submission was discussed, however has not been received at the time of writing this report.

It is further noted that the Department for Infrastructure and Transport provided the Strategy to the Marine Facilities Team for review and comment, however has not been received at the time of writing this report.



SUBMISSION CONSIDERATION

The responses and submissions received by the Council were provided to Wavelength for consideration. As a result, the final version of the CAS to be adopted by Council incorporates changes where appropriate. The following response and comments are provided:

Limestone Coast Landscape Board

Wavelength Comment:

In response to the Landscape Boards review comments, no changes to the CAS are suggested given (*LCLB comment extract in blue*):

- *"Assessment of drain management options (requiring planning and engineering works), which could mitigate potential flooding arising from periods when high tides/surges occur in tandem with high drain flows"* is recommended to be look into via a separate study, however the outcomes of this would need to fed into future revisions of the CAS.
- *"Is there potential to also review the extent of potential inland flooding resulting from increase sea levels and conditions outlined in the previous dot point?"* Note this was undertaken in the flood mapping of the CAS. And would need to be revisited with proposed changes from the drain management investigation.
- Wording will be changed to include *protection and enhancement of vegetation communities* in Section 6.2 as requested.
- Comment re planning policy is for noting, no action required.
- Recommendation will be made for survey and mapping of the seagrass within Lacepede Bay, to build on the findings of the 2004 report.

Department for Infrastructure & Transport

Extract: In terms of impacts on DIT assets, flooding of the Princes Highway (Section 5) is mentioned in in section 4.2.3 Long Term Scenario of the report however there is no discussion in section 7.12 Results – Section 5 other than Table 17 which discusses the defend/accommodate/do nothing options for DIT managed roads East Terrace / Southern Ports Highway. The "Defend" option in this case which is limited to raising a 130 metre length of road surface is acceptable to DIT.

Wavelength Comment: No edits to report as Princes Hwy is addressed in the discussion in "Areas East of East Tce", and DIT accepting the proposed adaptation pathway.



Mr James Ferguson

Extract: I cannot get out of my head that none of the engineers reports attempt to look at why there is surplus sand being swept along the shore. Some of this does come from the erosion of the sacrificial sand dunes between Cape Jaffa and Kingston but some does come from the death of Tape weed and the consequent increase in areas of bare sand. This sand is easily swept to the shore during storm events.

Wavelength Comment: Agree with James, and the loss of seagrass resulting in more available sand to move onshore is addressed in Section 2.2 and discussed in more detail in the supporting technical note. However it's is good feedback that the message isn't cutting though in the report. Edits have been made to Section 2.2 for KDC's consideration to present this more pointedly.

Extract: The gap in our approach is to attempt to restore the tape weed beds along the coast. In Adelaide the Coast protection Board is reseeding by getting citizens to collect the seed , germinate them at West Beach ,insert the seedlings in sand bags and drop the bags on the edges of sand holes in gulf St Vincent. Why can't we get in on this act? I know this will take a long time to make a difference and all of the present council reps will be long gone and will not be able to claim credit for any change, but someone has to look at our shoreline in the long term. There has been studies done on this in our area and it was found that drifting sand particles shut out sunlight from tape weed and caused more weed death than any nutrients coming from our agricultural drains. I have copies of these reports. As you know these beds are the nurse areas which support small fish so in the long term we have much to lose.

Wavelength Comment:

- This approach was assessed for the Southend CAS, the research at the time (via SARDI) was the success rate was extremely low and the techniques used at the time were expensive therefore was not pursued as a viable option (dismissed at first pass). However I spoke with Jason Tanner this morning who is running the West Beach trials and quite a bit has changed since then:
 - o Ongoing research has led to changes in the techniques which means divers are no longer needed for planting and therefore campaigns can be much cheaper, however the monitoring would still need to be undertaken with the use of divers.
 - o Whilst they haven't had success with the larger scale campaign they have on a small scale (10m² over 12 years) and are more hopeful for the next large scale trial as ongoing R&D has provided insight into what has been going wrong.
 - o *Amphibious* (Wireweed) is predominately at West Beach, whilst its *Posidonia* (Strapweed) that is found in Lacepede Bay. As noted in the Maria Creek report - *Posidonia* generally requires stable, non-mobile sediments on which to grow and establish dense meadows. However Jason thinks the same technique could still be applied for Lacepede Bay.
 - o Whilst this might need some up front support /education from SARDI the process could be run and undertaken by a Citizen Science community group – there is some great information on ozfish.org.au, I understand there is a Coorong Chapter which may be interested in being involved.
- Notwithstanding the above, without addressing the cause of the loss of seagrass (run off from the drains and storm surge during winter months) there is limited chance for success.
- All things considered, given the risk and cost is low and the potential benefit is high, to trial replanting away from the drains is a valid idea which could be undertaken concurrently with other adaptation pathways. This is a gap in the CAS and a great example of why community input is beneficial. I have included updated discussion in Section 7.1, 7.3 and the recommendations (8.2) for KDC's consideration. We are also aware of seagrass planting trails in Cockburn Sounds (WA) at the moment, we have reached out to our networks to get a sense of how successful this has been.



CR & MM England

Comment provided in response to overview submission (refer to full submission):

Wavelength Comment: The historical anecdotal discussion is really interesting and Rob has made some really valid and accurate points re to the potential flooding risk via the drains, the constraints of defend structures (seawalls) and the need for ongoing sand nourishment, the impact the loss of seagrass has had and the complexities of the potential impact of SLR for private landowners - it is Wavelength sense that all of these sentiments have been captured well within the report.

However, the discussion re Maria Creek and the proposed upstream 'control' would not in fact prevent sand and seagrass entering Maria Creek, however would allow sand and seagrass to settle out within Maria Creek up to the 'control' itself. I understand this has been discussed at length within the Maria Creek Community Focus Group sessions and addressed adequately in the Maria Creek report and is therefore not included in duplication in the CAS.

Reference: Feb Cor_06-OUT

22 February 2021

Ms Natalie Traeger
Chief Executive Officer
Kingston District Council
PO Box 321
KINGSTON SE SA 5275

**Limestone Coast
Landscape Board**
11 Helen Street
Mount Gambier SA 5290
PO Box 1046
Mount Gambier SA 5290
Tel 08 8735 1177
Fax 08 08 8735 1135
lc.landscapeboard@sa.gov.au
www.landscape.sa.gov.au/lc

Email: ceo@kingstondc.sa.gov.au

Dear Ms Traeger,

Re: Kingston District Coastal Adaptation Strategy

The Limestone Coast Landscape Board (the board) commends Council engagement in this process in order to plan for better outcomes in the future as well as provide good information for community to better understand the risks and treatment options council has opted to follow.

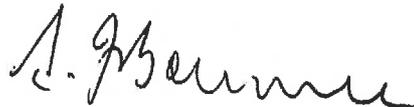
The board has the following comments to make:

- Item 6.2. Protection of existing vegetation communities:
Protection and enhancement of existing vegetation is supported, particularly as many landholders on the foreshore are actively managing (removing) vegetation and replacing with weedy species – generally weedy grasses which don't obscure their view and provide easy multiple access.
- Working with the South Eastern Water Conservation and Drainage Board in the early stages is supported, particularly as there may be some drain management options (requiring planning and engineering works), which could mitigate potential flooding arising from periods when high tides/surges occur in tandem with high drain flows.
- Is there potential to also review the extent of potential inland flooding resulting from increase sea levels and conditions outlined in the previous dot point?

- Linking to planning policies in relation to site level and floor level requirements is very proactive and supported. Reviewing future coastal development generally to prevent ongoing issues in relation to property protection and access would be proactive.

The board will take the plan into consideration in our current planning process.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'S. Bourne', written in a cursive style.

Steve Bourne
General Manager
Limestone Coast Landscape Board

Cc: Chelsea Burns, Team Leader Sustainability and Projects

Chelsea Burns

From: Smith, Andrew (DIT) <Andrew.Smith3@sa.gov.au>
Sent: Wednesday, 13 January 2021 3:29 PM
To: Chelsea Burns
Subject: FW: INCOMING #16390363 - Kingston Coastal Adaptation Strategy (Cape Jaffa to Blackford Drain)

Chelsea,

The DIT stormwater group have reviewed the Kingston District Coastal Adaption Strategy as requested below.

In terms of impacts on DIT assets, flooding of the Princes Highway (Section 5) is mentioned in in section 4.2.3 Long Term Scenario of the report however there is no discussion in section 7.12 Results – Section 5 other than Table 17 which discusses the defend/accommodate/do nothing options for DIT managed roads East Terrace / Southern Ports Highway. The “Defend” option in this case which is limited to raising a 130 metre length of road surface is acceptable to DIT.

Other impacted DIT assets such as the Cape Jaffa DIT Reserve and waste oil station (Section 1) and Kingston Jetty access pathway (Section 5) will be reviewed by DIT Marine Facilities area.

Andrew Smith

Principal Stormwater & Hydrology Engineer
Transport Planning and Program Development
Department for Infrastructure and Transport
T 8343 2275 (22275) • M 0468 531 306 • E Andrew.Smith3@sa.gov.au
Level 5, 77 Grenfell Street, Adelaide 5000 • GPO Box 1533 Adelaide SA 5001 • DX 171 • www.dit.sa.gov.au



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From: DIT:Zone 2
Sent: Thursday, 31 December 2020 9:56 AM
To: Triantafillou, Chrys (DIT) <Chrys.Triantafillou@sa.gov.au>; Dimas, Spiros (DIT) <Spiros.Dimas@sa.gov.au>; Smith, Andrew (DIT) <Andrew.Smith3@sa.gov.au>
Subject: INCOMING #16390363 - Kingston Coastal Adaptation Strategy (Cape Jaffa to Blackford Drain)

Good morning,

Please find below correspondence from the Kingston District Council providing a copy of the draft Coastal Adaptation Strategy and seeking feedback from the department.

Road Network Maintenance has requested that this correspondence be forwarded to Marine and Technical Services for information / comment.

Forwarding for information / comment and direct response to Kingston District Council if required.

Regards

Joanne Schulz
Road Network Maintenance – Zone 2
Department for Infrastructure and Transport
T 08 7223 6097 (Internal 26097) • E DIT.Zone2@sa.gov.au
121-129 Thomas Street, Murray Bridge SA 5253 • DX 171 • www.dit.sa.gov.au

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We acknowledge and respect Aboriginal peoples as South Australia's first peoples and nations, we recognise Aboriginal peoples as traditional owners and occupants of land and waters in South Australia and that their spiritual, social, cultural and economic practices come from their traditional lands and waters; and they maintain their cultural and heritage beliefs, languages and laws which are of ongoing importance; We pay our respects to their ancestors and to their Elders.

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From: Wilson, Tim (DIT)
Sent: Thursday, 3 December 2020 9:56 AM
To: Chelsea Burns <cburns@kingstondc.sa.gov.au>
Cc: Ling, Victor (DIT) <Victor.Ling@sa.gov.au>; DIT:Zone 2 <DIT.Zone2@sa.gov.au>
Subject: RE: Kingston Coastal Adaptation Strategy

Hi Chelsea

Thank you for forwarding councils draft Coastal Adaptation Strategy (CAS) for the Kingston area (Cape Jaffa to Blackford Drain).

The report has been formally logged and will be distributed within this department to the required managers and various sections for their information.

Should any additional information, questions or feedback be required then the department will contact council.

Regards

Tim Wilson
Senior Technical Officer, Rural.
Road Assets
Road and Marine Services Division.
Department for Infrastructure and Transport
T 08 7223 6079 (26079) • M 0408 855 397 • E tim.wilson@sa.gov.au
14 Butler Terrace, Naracoorte. SA. 5271 • www.dpti.sa.gov.au

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We acknowledge and respect Aboriginal peoples as South Australia's first peoples and nations, we recognise Aboriginal peoples as traditional owners and occupants of land and waters in South Australia and that their spiritual, social, cultural and economic practices come from their traditional lands and waters; and they maintain their cultural and heritage beliefs, languages and laws which are of ongoing importance; We pay our respects to their ancestors and to their Elders.

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From: Chelsea Burns [<mailto:cburns@kingstondc.sa.gov.au>]
Sent: Monday, 30 November 2020 5:14 PM
To: DIT:Zone 2 <DIT.Zone2@sa.gov.au>
Subject: Kingston Coastal Adaptation Strategy

Hi Sarena,

Hope this email finds you well, albeit very busy I have no doubt.

As you may be aware, Council received funding to develop a Coastal Adaptation Strategy (CAS) for the Kingston area (Cape Jaffa to Blackford Drain).

The strategy has been released for community engagement, which has now closed.

Given that the CAS involves a number of relevant DIT risks and adaptation pathways (such as levees and road raising), the Executive Summary includes the following recommendation:

Early planning discussion with key stakeholders such as DPTI/Drainage Board regarding assets at risk and proposed adaptation pathways

Whilst there will be further engagement with DIT as the CAS is progressed, we wanted to provide the draft CAS to you (even if only received for information).

We would encourage any feedback DIT may have on the strategy.

Unfortunately, the CAS document is too large to send as an email attachment, but can be accessed on Council's website:

<https://www.kingstondc.sa.gov.au/our-services/major-projects/coastal-adaptation-strategy>

There are also a number of supporting fact sheets for key aspects of the CAS.

Please let me know if you require anything further, or wish to chat through any key items within the strategy.

Kind regards,

Chelsea Burns
Team Leader
Sustainability & Projects



KINGSTON DISTRICT COUNCIL

Kingston District Council

- 29 Holland Street, Kingston SE SA 5275
- 08 8767 2033
- info@kingstondc.sa.gov.au
- www.kingstondc.sa.gov.au
- @KingstonDistrictCouncil
- @KingstonDistrictCouncil

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Chelsea Burns

From: James A Ferguson <jamesaferguson@bigpond.com>
Sent: Wednesday, 20 January 2021 4:05 PM
To: Chelsea Burns
Subject: RE: Coastal Adaptation Strategy

Hi Chelsea

Thank you for your note

I apologise for not responding but at the time all of my efforts were directed to my main task in life , that of caring for Wendy.

Since then I have time to think of other factors.

In reading the reams of data on the web site, one cannot help but come to the conclusion that council is guided by experts who have professional qualifications.

Thus I do not have much faith in my ideas counting for much.

As well as this, I cannot get out of my head that none of the engineers reports attempt to look at why there is surplus sand being swept along the shore. Some of this does come from the erosion of the sacrificial sand dunes between Cape Jaffa and Kingston but some does come from the death of Tape weed and the consequent increase in areas of bare sand. This sand is easily swept to the shore during storm events.

The gap in our approach is to attempt to restore the tape weed beds along the coast

In Adelaide the Coast protection Board is reseeded by getting citizens to collect the seed , germinate them at West Beach ,insert the seedlings in sand bags and drop the bags on the edges of sand holes in gulf St Vincent. Why can't we get in on this act?

I know this will take a long time to make a difference and all of the present council reps will be long gone and will not be able to claim credit for any change, but someone has to look at our shoreline in the long term

There has been studies done on this in our area and it was found that drifting sand particles shut out sunlight from tape weed and caused more weed death than any nutrients coming from our agricultural drains. I have copies of these reports.

As you know these beds are the nurse areas which support small fish so in the long term we have much to lose.

We do have a profound interest in our coast and have attended many of the coast conferences but they have become so expensive that we can no longer afford to attend.

Hope this may be of interest to you

Kind regards

James Ferguson

From: Chelsea Burns [mailto:cburns@kingstondc.sa.gov.au]
Sent: Monday, 14 December 2020 4:38 PM
To: James A Ferguson
Subject: Coastal Adaptation Strategy

Hi James,

Hope this email finds you well, albeit very busy I have no doubt.

As you have previously provided feedback and input, just wanted to touch base with you on the Kingston District Coastal Adaptation Strategy (CAS).

The draft was received by Council and has been released for community engagement since 20 October 2020, with feedback due to close this Friday 18th December 2020.

Whilst there will be further engagement as the CAS is progressed, we wanted to provide the draft CAS to you (even if only received for information).

We would encourage any feedback you may have on the strategy and would accept any comments after this Friday.

Unfortunately, the CAS document is too large to send as an email attachment, but can be accessed on Council's website:

<https://www.kingstondc.sa.gov.au/our-services/major-projects/coastal-adaptation-strategy>

There are also a number of supporting fact sheets for key aspects of the CAS.

If you would prefer a printed copy of the documents, they are available from the Council office.

Please let me know if you require anything further, or wish to chat through any key items within the strategy.

Kind regards,

Chelsea Burns

Team Leader

Sustainability & Projects



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Chelsea Burns

From: CR & MM England <crandmmengland@gmail.com>
Sent: Tuesday, 15 December 2020 12:38 PM
To: Chelsea Burns
Subject: Emailing: Kingston Coast and Sea Grass.docx
Attachments: Kingston Coast and Sea Grass.docx

Hello Chelsea,

Thankyou for the invitation to respond to the CAS, which is in the attached file.

Kingston Coast and Sea Grass.docx

I will also send you - under separate cover - another file relating to the most probable cause of the sea grass death and changes in erosion patterns along the shoreline, to be included with the CAS submission/comments.

Cheers for now

Rob England

15/12/2020
Hello Chelsea

Thank you for your invitation to me to comment on the the Kingston District Coastal Adaptation Strategy (CAS).

Even if the rate of Climate Change hadn't been dramatically increased by Industrial Pollution, it should have always been obvious to forward thinking planners that the sea has been constantly eroding most of the world shore lines, and the sand for dune formation – which Kingston is sited on – comes from the erosion of the cliffs and stacks of past shorelines. The run of Dune and Swale formations to the east of Kingston, and the eroding reefs and remnants of those to the west are proof that shore-lines are never permanent, and Spriggs "Geology of the South East" indicate that the shore line was at the Reedy Creek/ Blacford Range only 6,000 years ago, after having been much further to the west for a period of time prior to this, and in staged movements, had retreated to the current shore line. It could be argued that it may have moved in either direction in future years – except for the fact that it has been starting to move back in since the formation of Young Husband Peninsula.

I have recently found irrefutable proof that much less of the flood waters of the SE were discharged to the sea through the Maria Creek at Kingston than previously thought, and most went via the sequence of inland flow paths, and particularly along the Tilley Swamp Water Course via Salt Creek, and that of the Ephemeral Lagoons, with their combining flows discharging through the Coorong Lagoons and the Murray Mouth. The volumes and directions of these flows has been changed relatively recently, with the construction of the Kingston Drain through the rock bar at the current bridge into the Maria Creek in 1864, and the increased flows to the sea with the construction of the Butchers Gap outlet, Kingston Main Drain extension, and Blackford drain prior to 1960. It is undoubtedly a coupling of both the volume and quality of these inflows at this section of the Kingston coast, plus the effects of removal of the sea grass wrack, which is resulting in the death of the sea-grass beds in Lacepede Bay.

I will send a separate attachment of a paper detailing this Historic flow path information on another E-mail.

Since little consideration has been given to my past observations and predictions which have proven to be correct, and nor the content of subsequent comments, I won't spend too much time on this response, but make the following dot points followed by my earlier submissions.

- Little ever seems to be learnt from History.
- The first bridge built over the Maria Creek at Kingston was the Screw Pile structure joining Kingston to Bullocky Town, with the Adelaide road coming along the base of the eastern side of the Coastal Dune.
- The abundant sea grass regularly blocked the outlet of the Maria Creek, and in 1851 Commissioner Milne recorded in Hansard of "travelling through not less than ten inches of water all the way from Salt Creek to Mount Benson."
- Your older residents would recall in the 1950s and earlier, the depth of water in the swamps to the east of Kingston, and on occasions, combinations of Storm tides and inland run-off flooding the main street table drains up to the Crown Inn.
- They would also recall the huge piles of sea grass which rose and fell along the coast on winter storms and high tides, and which also provided the automatic coastal protection system for the town, and packaging material for boxes of live cray fish

(lobster) sent to Adelaide by train. This material earned Kingston the name of "Sea Weed City," and a substantial effort was made in the 80's to remove it and create the aesthetic sea-scape we now enjoy.

- The Groynes were built for the boat ramp and to keep an open outlet for the Kingston Main Drain flows to prevent flooding of the town by surplus winter run off from the inland areas. All further seagrass wrack has been continuously removed, and no consideration was ever given to the effects that the creation of wave action "run up and run back currents" could possibly have on the sea grass beds, instead of the waves either simply stopping, or breaking while still in quite deep water and throwing the spray up onto the high stacks of sea grass.
- "Beautification removal" of the sea grass also removed this automatic coastal protection system, and allowed sand movements to begin to the north.
- Coastal changes have begun, and continued since then.

Predicted effects of actions mooted in the plan.

- If a control is not placed in the channel upstream of the boat ramp, tidal inflows filling the Maria Creek and Kingston Main drain sump will continue to carry sand and sea-grass wrack into the channel, further blocking it up.
- It beggars my belief that removal of a section of the existing groyne is being considered when it has obviously stabilised and retained a large section of beach front, and repeated construction of these groynes along the beach front is the logical way of protecting the town assets.
- Utilisation of Sea Walls will fail, as in the longer term there will never be enough ability to replenish the sand remove by constant wave action as sea levels rise, and the walls will be undercut and collapse, resulting in drastic and dramatic loss of property.
- There will also be the requirement of construction and maintenance of retaining walls on the inland inundation side of town as this occurs
- Mooted removal of a section of the groyne will allow the mobilisation of the sand and sea grass wrack, and this will further fill the channel, and replenish sand to the north of the groyne. This will make it more difficult/ impossible to maintain an easily opened outlet for winter drainage out-flows.
- Failure to install regulators to prevent inflows via the Butchers Gap and Groyne channel as sea levels rise, will allow greater depths of flooding with sea-water into the inland basins. This salt load will kill all fringing vegetation and pastures, and lead to progressive lake edge erosion as the inland pool levels rise.



-
- Failure to prevent the inflow of sea water will also lead to ever increasing volumes of water ponding inland, and needing to be discharged from the system before the winter/spring inland drainage flows can be discharged.
- This will lead to flooding at greater heights, more wind fetch and wave on the inland water height, and this will lead to inundating roads, housing, and pasture assets, while mitigation and legal costs will rise, and rate revenue will decline.
- If future predictions of sea level rise are accurate – and this will become obvious as time passes - there is no possible case of arguing for council to compensate any asset owners as their land is taken by the rising sea based on current knowledge. **HOWEVER** – should council allow future developments to proceed in areas where strong predictions indicate that inundation will occur, while they won't be able to afford compensation, their legal position is dire.

Yours sincerely

Rob England

Hello Annabell from Wavelength Consulting,

Unfortunately – due to prior commitments – I am not able to attend any of your One On One consultations, but would like to re-submit a proposal that I put to Council in 2013, and which I feel will still largely solve the sand and weed issues in the vicinity of the Boat Ramp. You may note that my prediction of sea-ward sand deposits in the area of the jetty have proven to be correct, and my long term experience with other sea outlets along our coast should give credence to the content of my submission.

From: cr & mm england [mailto:crandmmengland@activ8.net.au]
Rob England
"Shepherds Hill"
PMB 47
Kingston 5275

To: Mr Nick Brown and Councillors
Kingston District Council
Holland St
Kingston 5275

Subject: Maria Creek/Boat Ramp Sand and Sea Weed

Dear Nick and Councillors,

I noticed an article on "Seaweed Solution" in the Oct 23rd 2013 issue of the Leader and feel I have the experience to make worthwhile comments on the topic.

I am a long time resident (69yrs) and landholder in the Kingston district – "Shepherds Hill" – and served on the SE Water Conservation and Drainage Board for 16 years, and also the Upper SE Dryland Salinity Project, having designed the concept for the "Floodway/Catch drain system" that allows the transmission of major flood flows while still affecting drainage from adjacent land, and which has been implemented in a major part of the USE Scheme.

During this time, the SEWCDB had problems with the outlet at Beachport from Lake George to the sea, with a build up of sand in the channel coming in on storm tides and during periods of rough weather and low outflows. Numerous site inspections showed that the sand was stirred up by wave action, and the suspended material carried into the channel and lake with the large amount of inflowing water that results at high tide as the sea water fills the channel and lake basin. The sand settled out prior to the reversal of the tide, and remained in the channel once settled, despite the velocity of the following outflow of water at the next low tide, because there was no action within the lake and channel to agitate the sand into suspension to facilitate the reverse action. Estimates and rough survey indicate up to 3million tonnes of sand may have lodged close to the Lake George outlet, and out into the lake. Further sand inflows have been prevented by the operation of the control weir in the channel, and the water levels in the Lake are also manipulated successfully.

A very similar situation exists at Kingston, with both sea grass and sand being the major offending parties, and for brevity, I make the following dot points.

- As a child I played on the huge sea grass banks along the fore-shore, and remember seeing Drainage Board and Council staff manually pitch-forking a hole through to allow the drain to flow, once water started to back-up and threatened to flood the town.
- As a sailing member of the Lacepede Bay Sailing Club for a number of years, and also an occasional boat fisherman from the Kingston facility, I am well aware of the vast area of sea grass growing in the Lacepede Bay, and the amount of detached material these sea-grass beds are capable of generating each year, which inevitably finds its way onto the fore-shore area.

- Having walked out onto the jetty both during and after storms, noticed how much weed and sand is suspended in the sea water, often extending beyond the first landing on the jetty, and this is progressively deposited along the coast.
- Initially the Groynes worked well at keeping the channel fairly open.
- Progressively, since the Groynes were built, a mass of weed and sand has stacked up and reshaped the coastline, largely filling up the area between the jetty and a considerable distance out the Southern Groyne of the Boat Ramp Channel due to the northerly coastal drift.
- As with all Groynes – once they have reached a “steady state condition”, the weed and sand in the water, along with that dislodged from the shore-bound heaps, starts passing around the seaward end of the Groynes,
- During storms and high tides this sand and weed, plus all that which is already suspended in the water, is carried into the Channel and upstream areas by the strong flow created as the sea runs in to fill the large “sump” of the tidal wetlands and drainage channel of the Maria Creek and Kingston Main Drain.
- These flows have been depositing banks and layers of sand and sea weed (later quite odorous) not only in the channel, but also far inland, and lodged in the Kingston Main Drain adjacent to the Mt Gambier road, and along the channel towards Flints Road.
- During periods of such major sea water incursions so far into the wetlands and drainage network during high tide, all outflow of drainage water from the adjacent farm land is prevented, causing flooding and salinity damage to considerable areas – often with a potent shandy of sea-water mixed with the local run-off.
- Drainage of large areas of agricultural land is impeded until the extra inflow of sea- water can be cleared from the system at following low tides.
- During the period of neutral tide, and then initial slow outflows as a storm abates or the tide starts to recede, the sand and weed settles out onto the floor of the channel and waterways.
- By the time the out-flows start to increase in rate due to the tide reversal, most of the weed and sand has settled out, and without any wave action to cause it to be re-suspended, it remains where it settled within the system.
- As successive high tides and storms fill the channel by more weed and sand depositions, less material is brought in, but the rate of drainage is also reduced, and the channel becomes un-useable for boat operators.

I am strongly of the view – despite “the consultant expressing their view that a weir concept wouldn’t be successful” - that a weir concept as variously proposed some time ago by Leigh Von Bertouch, Lynton McInness, John Kuhl and me, is the only realistic solution to keeping the channel open and useable for boat owners, to provide a drainage service, and for environmental and beautification purposes for the Maria Creek Estuary.

Points in Favour of the Establishment of a Weir just prior to the bend upstream from the Boat Ramps.

- A Weir would stop any undesirable sand and weed laden tidal inflows, and hence stop the movement of sea grass and sand into the Groyne Channel, Maria Creek Estuary, Wetlands, and the Kingston Main Drain.
- While the weir is closed during a storm or high tide, inland drainage waters can continue to flow towards the exit of the drainage system, and will slow as the total available pondage fills – but this time it fills with drainage water, not a cocktail of sea water, sea weed and sand, and no sea water is able to flood out onto adjacent lands.
- Better drainage is ensured, as only stored drainage water is discharged quickly through an open channel once the weir is opened again after storms and at lower tides.
- As the current supply of sea grass rots down within the Maria system, the odour will slowly abate.
- A pool level – at a level to be determined - can be maintained within the wetlands and Maria Estuary when not fed by drainage water, by allowing inflows of sea water from high tide events that occur during periods of calm weather so no sand or weed is mobilised. Regular flushing and re-filling could also be effected with weir manipulation during low and high tides. This will greatly improve the visual and environmental appeal of the area for our visitors and adjoining landowners.

- Weir systems are now available that can be operated remotely, automatically, or manually, or a combination of all three systems, and should be seriously considered as a preferred means of a long term solution to the current problem.

While I have not seen the 13 options GHD has proposed, I will comment on why I feel the apparently preferred Options One, Two and Six referred in the front page article in the Leader will eventually fail – again in dot point form for brevity.

Option One - Extending the Southern Groyne into deeper water.

- Extending the Southern Groyne into deeper water will be hugely expensive due to the ever increasing amount of stacked material required for each metre of length gained, but it will give some temporary relief to the problem.
- Eventually the coast line will extend out further along the new Groyne – certainly building the coast out further under the jetty - possibly as far as the first landing, depending on the length of addition to the Groyne.
- There will be dramatic erosion again on the beach and dune to the north of the Channel – more-so than happened when the first Groynes were built - as the natural continuous replenishment northward sand and weed movement will be interrupted until another “steady-state condition” of continuous removal and replacement is established along the shore either side of the new extended Groyne.
- Success will be claimed during this initial period, as only the lesser amounts of sand and weed suspended in the water will be carried up the channel and into the wetlands and drains.
- Once steady state resumes, mobilised sand and large chunks of weed dislodged by storm and tide action will again start to in-fill the channel – ie, an expensive reprieve, but no long term solution.

Option Two - Extending both Groynes into deeper water.

- Twice as expensive as option One, more sand will be deposited south of the Groyne until “steady state” is achieved, and it will only achieve the same temporary benefit, but again, no permanent solution.

Option Six – Reducing the Channel Width at the mouth.

- Also an expensive option – even if just repositioning the materials already present in the current Groynes.
- Any reduction in the area of the opening will have negligible effect on the ingress of sand and sea weed to the channel as an even stronger weed carrying tidal current will pass through a narrower channel “choke” at the sea-ward end, as sea water rushes to fill the large receiving areas of the wetlands, Maria Creek, and Kingston Main drain.
- A narrow channel may have an undercutting scouring and destabilising effect at the base of the groynes.
- A reduced channel width will become a navigation hazard for boats – particularly in windy conditions.

I have had a long held interest in the Maria Creek Estuary beautification process, having drawn up the later plans adopted by the Apex Club and Council, and enjoyed many hours of “working B” involvement with club members and other volunteers to cart in, level and compact the fill, and to install the stone pitching and other facilities in the Apex Park. An affordable and workable weed and water management system for this area and its sea connection would be a great finale to this long term project.

In conclusion, I urge Council to give strong consideration to the points I have made relating to using a weir to alleviate the sand and weed management issue. A weir would also allow better drainage and year round environmental benefits to be enjoyed by our rate payers and visitors, including a permanent access loop walkway across to Rosetown - elements which don't appear to be forthcoming from any of the other options seen (by me) to date.

With regard to this 2020 proposal, I make the following closing remarks.

The current build up of sand along the fore-shore will be of great benefit to the town in future years as sea levels continue to rise, and if a protecting fore-dune is allowed to develop again, it will provide a level of wave energy abatement that has been lost by previous "beatification levelling works." It would be a grave mistake to decided to dismantle a section of the groyne to allow the sand and weed bank to resume its former northward movement, as it is obviously depicted in your aerial photo that it has just reached its steady state stage required to enable longshore drift to resume and continue as it did prior to Groyne construction. Provided infra-structure is constructed in the form of a weir, to ensure that inflow into the creek and drain and wetland basins only occurs during calm periods, the ongoing system should work efficiently. While this weir will also stop sea-grass also being carried into these inland basins, winter storms are probably always going to overtop the sea wall in high seas, and fill the boat channel to the weir, and this will need to be mechanically cleared to allow the boating facility to continue to be used.

I am happy to provide more detail should it be required at a later date, but am not available to attend the one on one discussion sessions..

Yours sincerely

Rob England





Chelsea Burns

From: CR & MM England <crandmmengland@gmail.com>
Sent: Tuesday, 15 December 2020 12:52 PM
To: Chelsea Burns
Subject: FW: Ramsar and the Coorong
Attachments: Coorong Flows.docx

Subject: FW: Ramsar and the Coorong.

Hello again Chelsea,

As you are probably aware, I am a farmer with 5 generations of contact with the history of water flows in the SE of SA, and have campaigned on behalf of the Coorong since 1983. I have amassed a huge data base of anecdotal, Aboriginal, historical writings and records, Hansard and SE Drainage Board papers, etc pointing to an original much fresher Coorong than has ever been the case since flows began to be diverted to the sea through the South East Drainage System.

In 1993 I wrote and self published a small book - "The Cry of the Coorong" – a History of the Water Flows to the Coorong from the SE of SA, and efforts by some parties to disprove the assertions within this publication led to Core sampling of sediments in the Coorong by Dr Chris Von Der Borch from the Flinders University. The analysis of these samples proved what I contended within the book - that the Coorong had been much fresher historically - and the information allowed the cap level of discharges to the Coorong placed on it for the volume of waters from the Upper Dryland Salinity and Flood Management Project to be raised – but never as high as the freshening volumes should have been.

Supposed experts on the Coorong have continued to either misinterpret or deny this information, and have campaigned – and succeeded in getting the current salinity target of 62,000pp,(from memory) for the South Lagoon established – well above its historical levels of fresh to estuarine.

I have just recently found another flow path within the system which presents the undeniable evidence of the magnitude and frequency of the historical flow volumes of water which used to discharge from the SE via the South Lagoon of the Coorong, then to the North Lagoon through the newly discovered flow path at Parnka Point, and then via the Murray mouth to the sea. I have a large number of good quality recent photos providing indisputable support for this statement, with a number of these within the accompanying document.

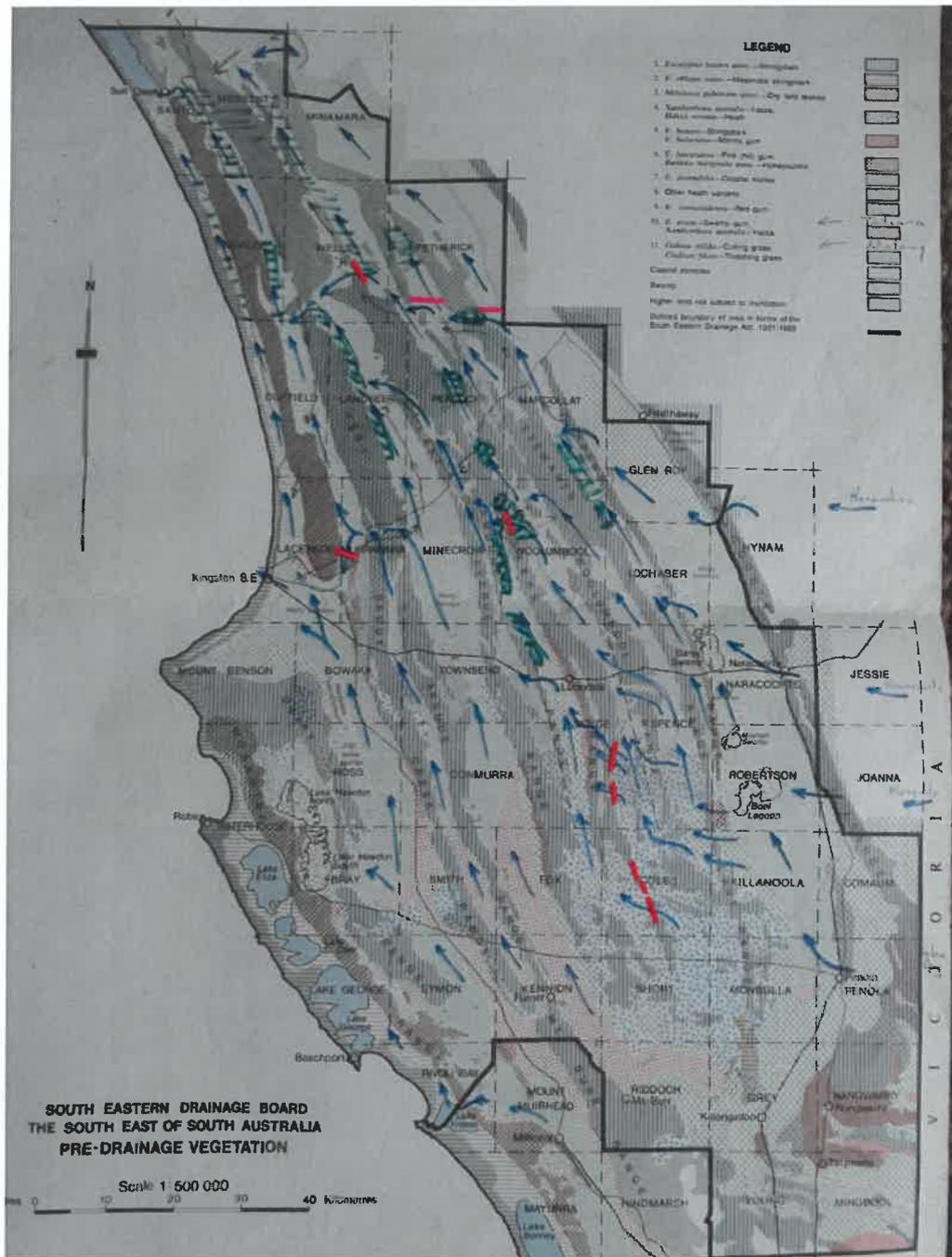
This new flow path information also undoubtedly has a connection to the death of the sea grass in Lacepede Bay, with increased flows going into the sea through the Kingston drain cut into the Maria Creek in 1864, reduced after the building of Goyder's Bank in 1886 which diverted flows to the north, and then dramatically increased with construction of the extension of the Kingston Main Drain and Blackford Drain completed in 1962.

The 21st of November, is the 35th anniversary of the establishment of the Ramsar Agreement on the Coorong – which I have always maintained was established on flawed information.

Yours sincerely

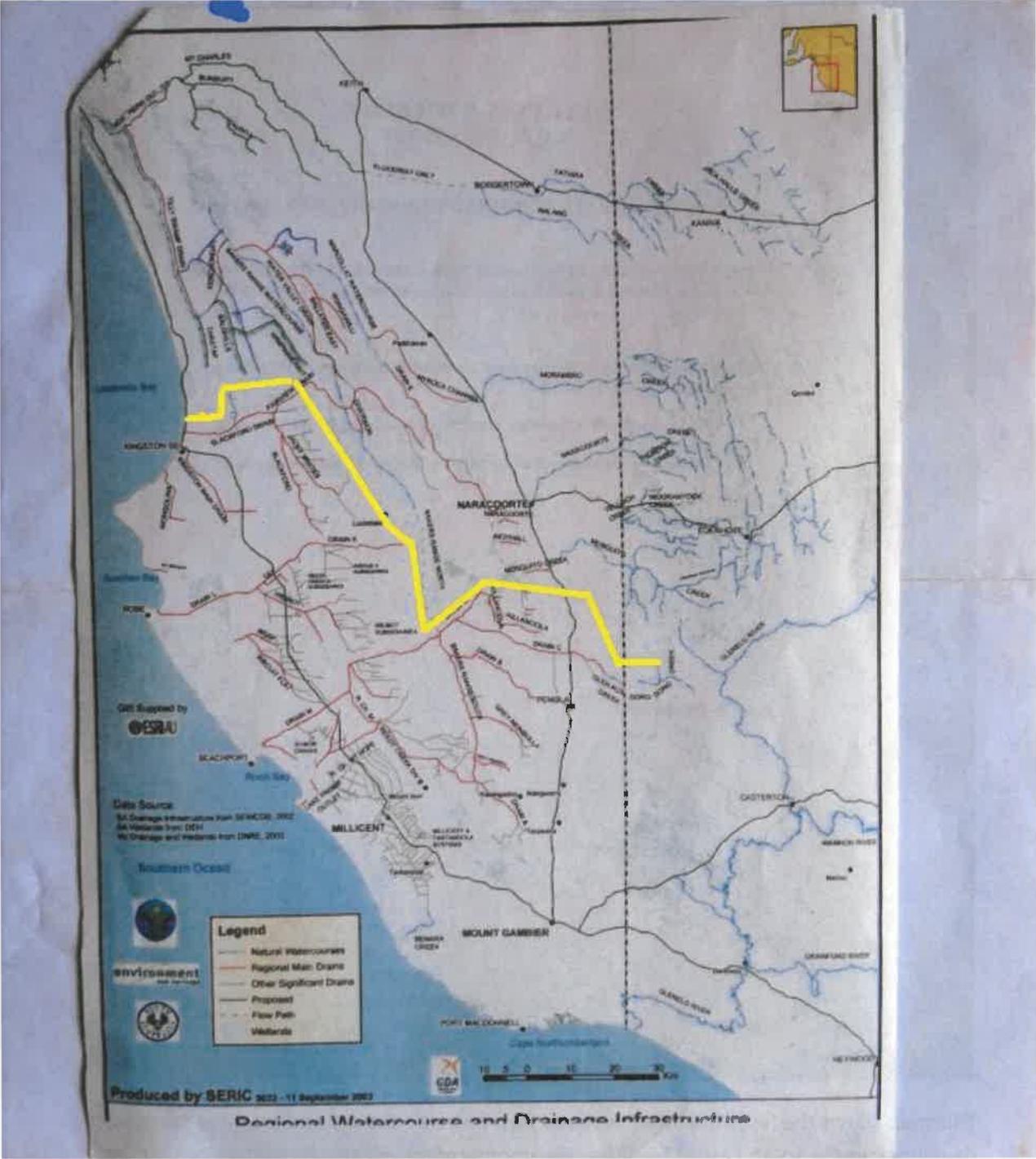
Rob England

HISTORICAL WATER FLOWS TO THE COORONG



This map shows the historical swale wetland flow paths between the dunes and swales which developed in the South East of SA. After the underground volcanic lava intrusions around Mt Gambier, and the folding down warping in the Meningie lakes district slopes developed towards the north. On the swale flats, there is an average fall to the north of 1:10,000, and to the west of 1:5,000. The red marks indicate where “Stop Banks” – earthen banks installed across the dune through flow paths - were established in 1886 and 1912 to make travel through the SE easier by diverted surface water flow to what was regarded as “wastelands” in the East, away from the Coorong and coastal travel routes. The two private (pink) banks constructed in 1957 prevented the SE flows – dramatically reduced by this time due to drain construction - from going to Gum Lagoon

Conservation park and the wetlands east of Messent, and confined flows to the Water Valley Wetlands, Tilley's Swamp, and Alf's Flat in the Messent Conservation Park.



This map shows how the area of influence of the 1600 km of drains - constructed prior to 1962 in the Lower SE - diverted the high rainfall run off area rainfall out to sea by large trunk drains exiting at new coastal outlets at South End, Beachport, Robe, and two at Kingston.



Adjustable radial flow control gates constructed across Drain "M" which control flooding in Drain "M" down-stream of the Bakers Range Drain, and which are now also used to divert water to the Northern Wetlands.



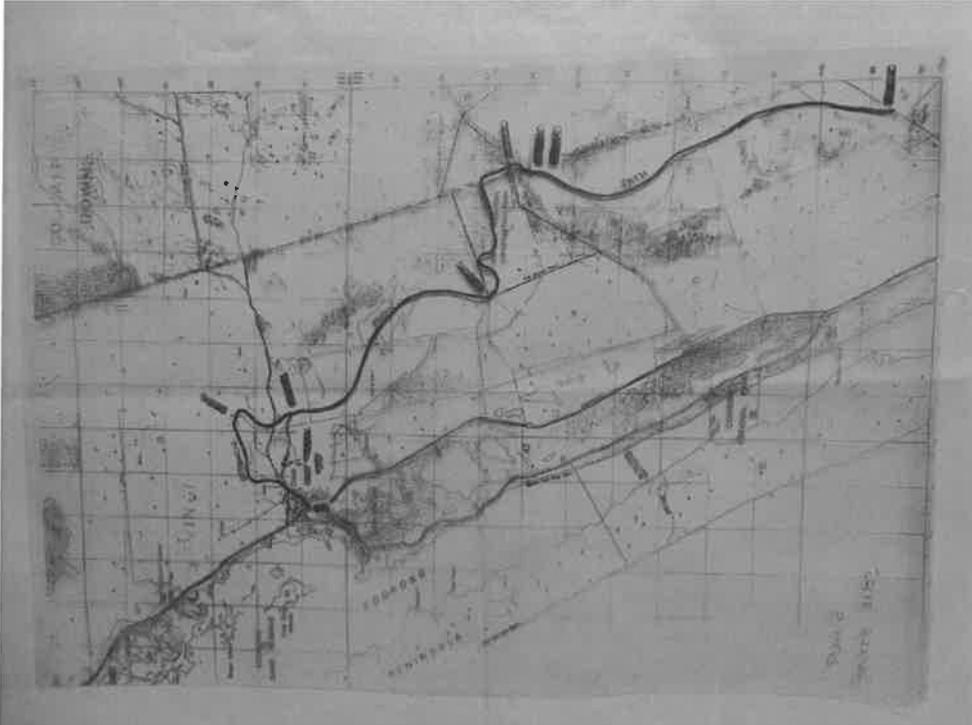
The Blackford Drain showing winter flows running out to the sea at Kingston prior to the construction of the new diversion works along Tilley Swamp WC to Salt Creek. This is one of the major natural outflows where waters ran through the Blackford Range, and onto the Blackford flat,

and then either to the sea via the Maria Creek at Kingston, or along the Coorong Ephemeral Lagoons to the South Lagoon of the Coorong. Goyders Bank was constructed in 1886, and this forced the Blackford flows to the north over the Taratap Ridge and along the Tilley Swamp WC. Murray River Black Fish (bream) lived in the permanent pools in the Blackford and Henry's Creek, and the Ngarindjeri travelled along the fresh Coorong Ephemeral Flow path to Blackford for Corroborees.



The pools at Henry's Creek, and the obvious fingers of remnant flow paths show where a major part of the SE Flows ran out onto the Tilley's Swamp WC prior to the construction of Stop Bank "H" which

forced the water to the “wastelands” where the water ponded in terminal wetlands further to the



north.

This map shows the flow path of the northern Tilly Swamp WC where the water flowed over the “Martins Washpool ridge” into the Morella swamp, and then around the flow path to the north and then west into the Salt Creek. GW Goyder was un-aware of the controlling effects of the Washpool ridge on Tilly Swamp flows to the South Lagoon, and ordered a drain to be dug along a shorter southern route through the two high ridges to the south of the road into Salt Creek. Note the shape of the bay in the following map where the Salt Creek discharged into the Sth Lagoon prior to inflows ceasing in 1957, and lake shore shoaling commencing.

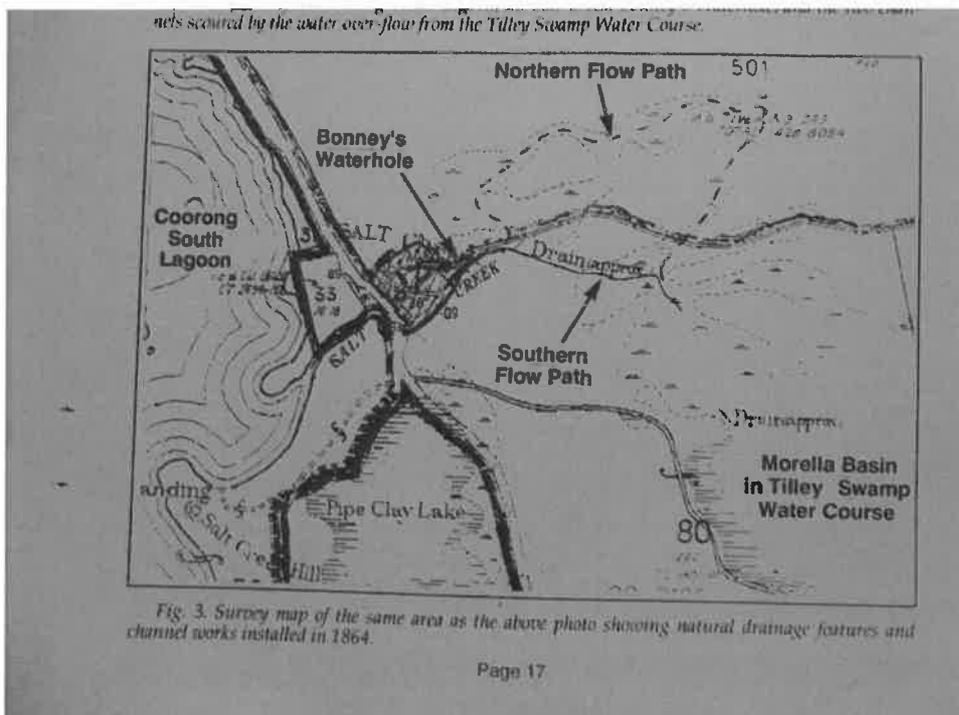
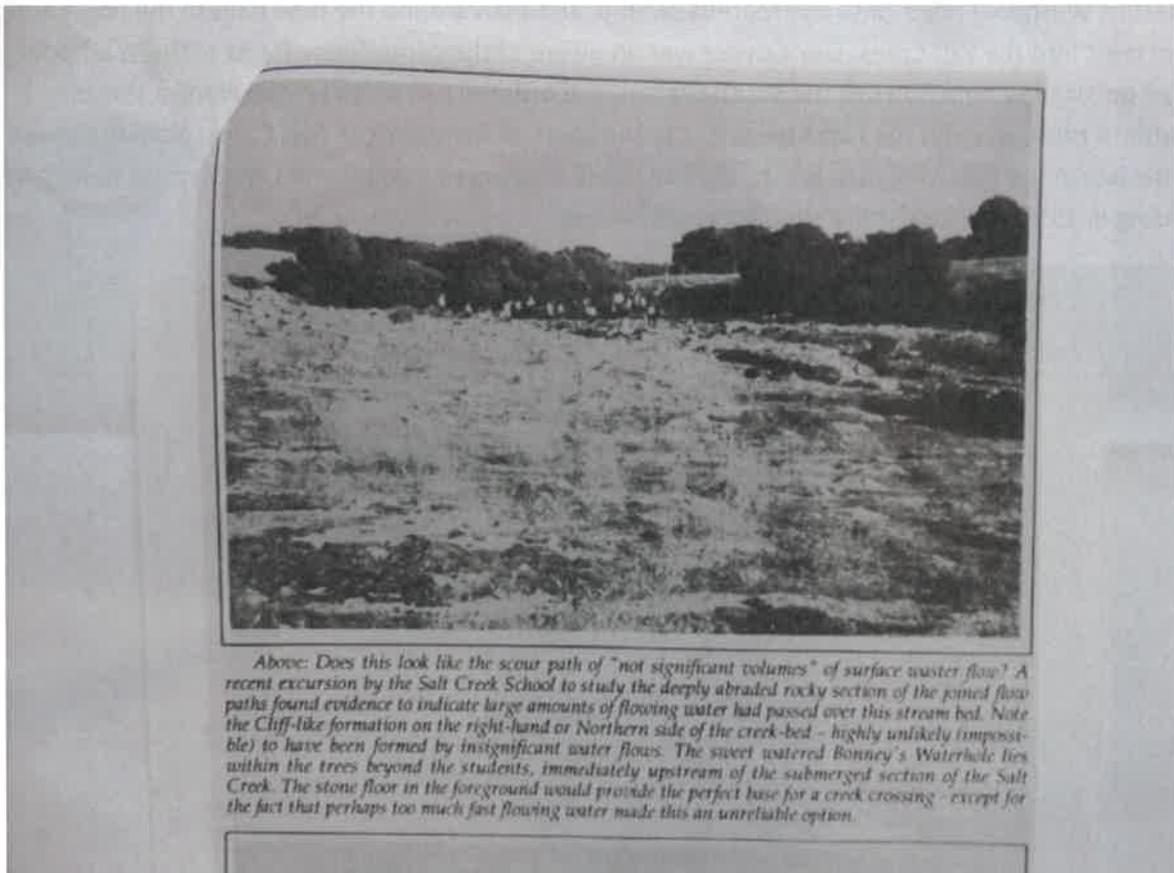




Photo showing the historical flow path (blue dots), the cutting (orange), the abraided flow path in the next two photos, and also the shape of the outflow prior to the no flow period of shoaling (blue).

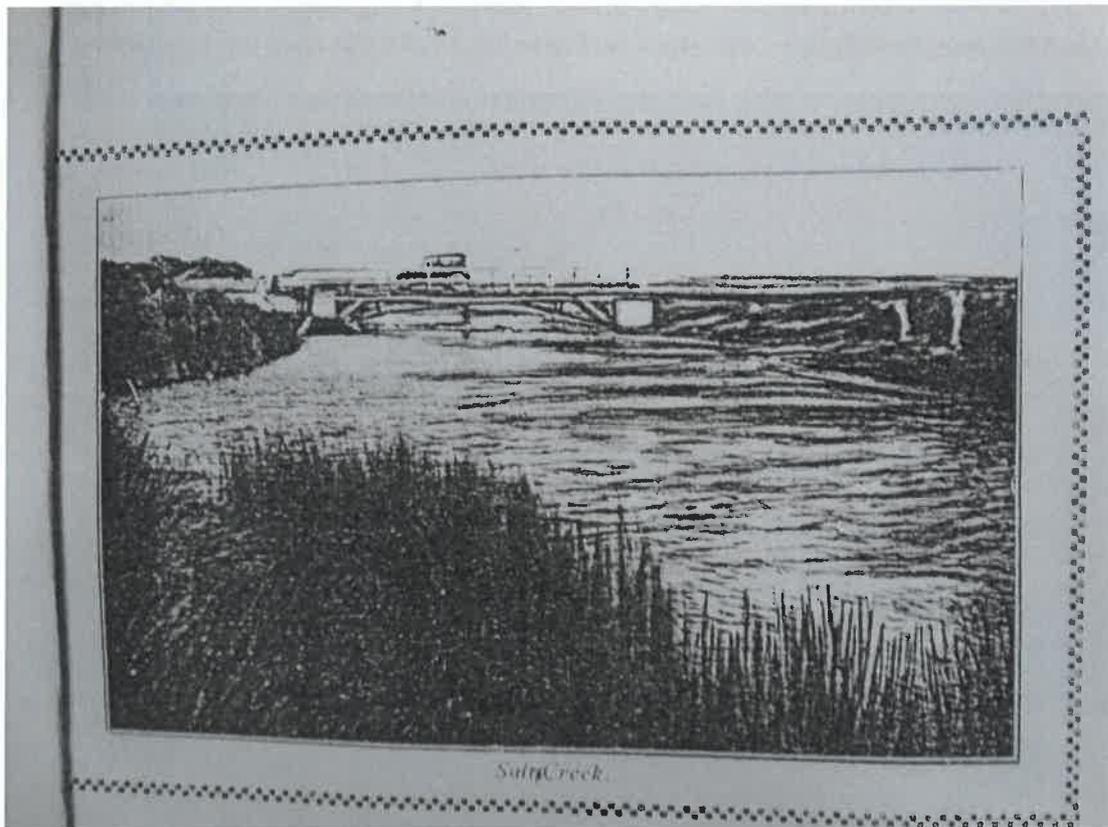


The scoured path upstream of Bonney's Waterhole and the beginning of the flooded section of Salt Creek. The stage coach had difficulty crossing here due to the depth of flowing water 1862,

within the steeply sloping area...
Creek. The stone floor in the foreground would provide the perfect base for a creek crossing - except for the fact that perhaps too much fast flowing water made this an unreliable option.



The same section of the Salt Creek in flood 15/10/1906 (SEDB).



Salt Creek.

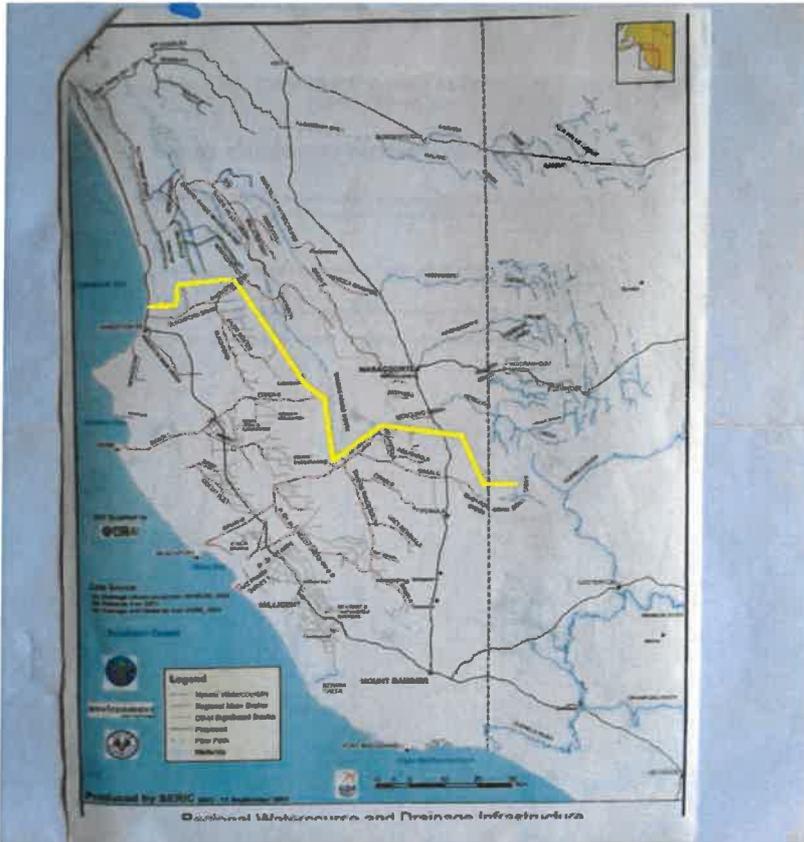
The first 25metre wide wooden bridge over the Salt Creek flow path constructed during the 1800's – another confirmation of the magnitude of the Salt Creek flows in such a steep flow path.



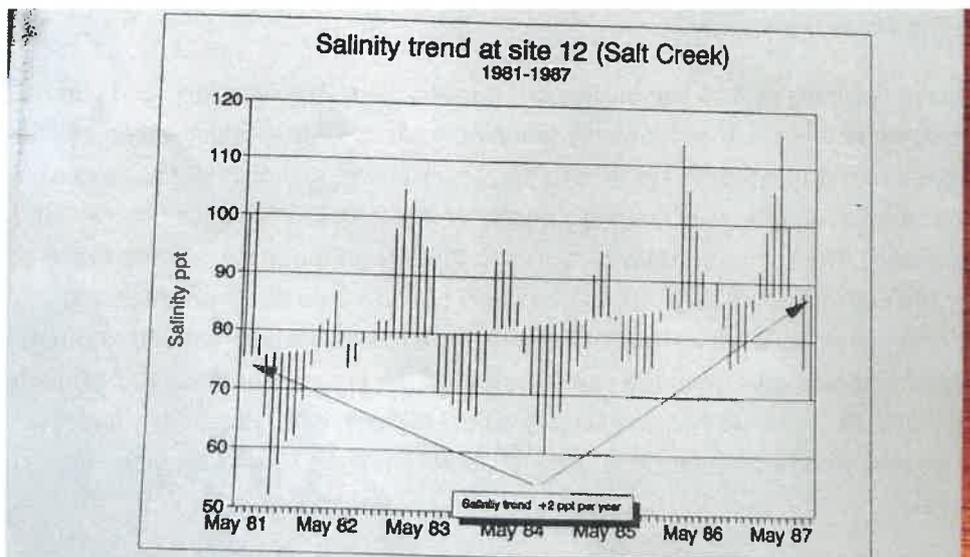
The “Heather,” the sailing boat Gardiners used to cart 3 tonne loads of fresh caught Mullet and Mulloway to Goolwa – initially packed in Coorong swan-weed to keep it fresh. They back-loaded supplies from Goolwa for their Salt Creek store, and later blocks of ice to keep the fish fresher.



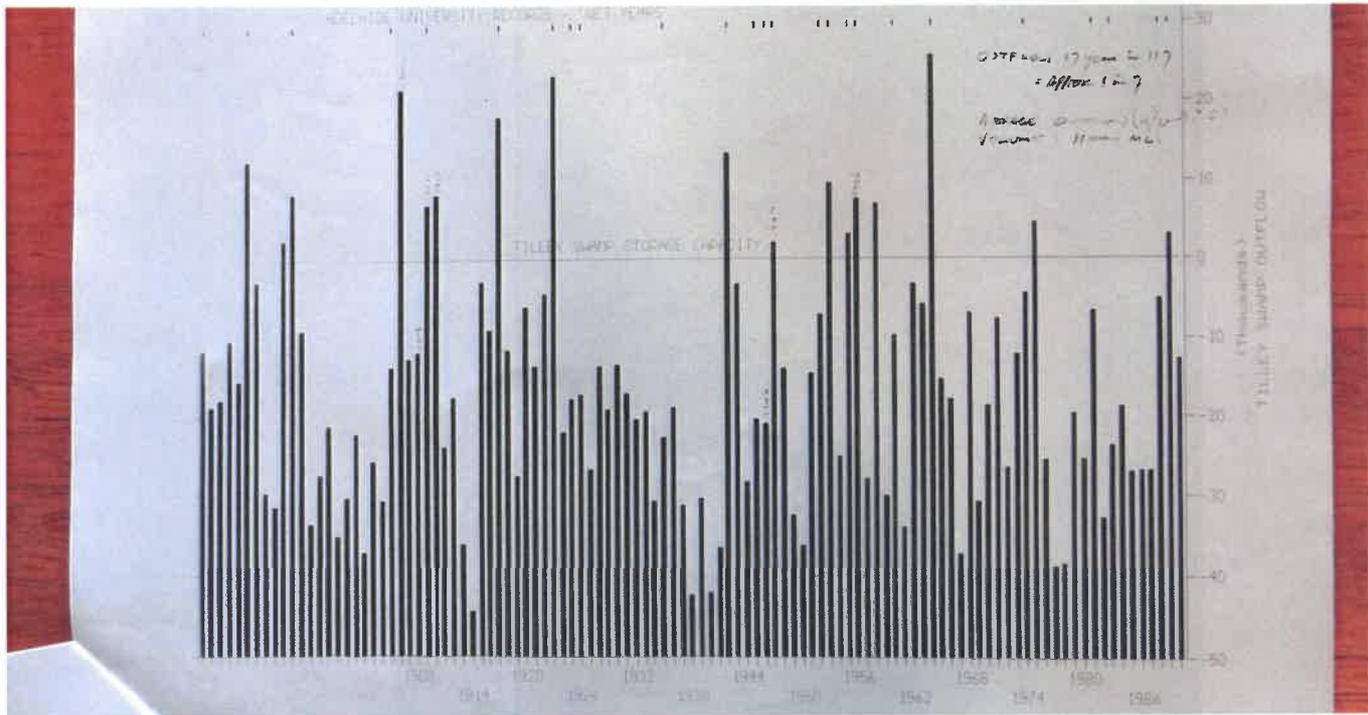
The southern Coorong Ephemeral Lagoons that carried much of the SE winter flood waters to the Coorong.



The yellow line showing the extent of diverted run off from the higher rainfall areas of the SE. Stop Banks forced most of the run-off from the area above the line to go into Eastern Terminal Wetlands, and there were no flows to the Coorong after the small flows during 1956/57.



As there were no large freshening flows into the Coorong after 1947, Gardiners said the salinity levels quickly rose to high levels, and by 1960, they considered it "dead," and they started fishing from the ocean beaches. Only 10 of the former 100 fishers continued fishing in the South Lagoon, and then only in the fresher northern sections. We can see that without inflows, the salinity of the Coorong had already risen to twice that of sea-water by 1985 when this was taken as being the condition to be preserved for the Ramsar Agreement.

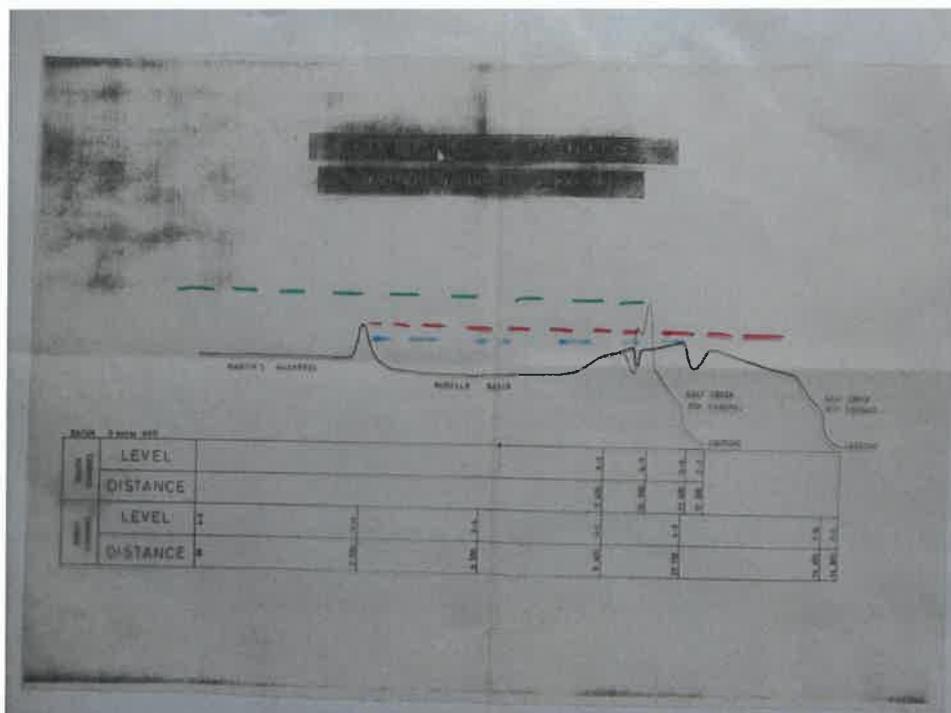


A rainfall and pondage chart compiled by the Adelaide University, shows that prior to drainage, on average, there were fresh flows to the Coorong every 7 years which maintained its fresh to estuarine levels of salinity. It only became a “reverse estuary” after the southern inflows were terminated, and this is a relatively new condition. As the “swan weed” died out due to raised salinities, the Coorong lost its traditional “stink”, and the loss of nesting and food materials drove the hundreds of thousands of waders and water birds away.

In 1972, the water hole in the base of Alf’s Flat in Messent Conservation Park went dry, and when adjoining landholders deepened wells, they hit highly saline non-potable water which sheep couldn’t tolerate. They threatened to not pay their lease fees to the Government, and in 1983 the flawed “Interepartmental Report into the Effects of Drainage on the Water tables in Counties Cardwell and Buckingham” was produced. The report starts with words to the effect *“that data relating to the historical condition of the Coorong are sparse, or non-existent, but based on the knowledge and expertise of the Committee members, we conclude the following.”* Hardly a sound basis for a report! They went on *“It is the considered opinion of the committee, that the present condition of freshwater inflows to the Coorong via Salt Creek are not significantly different from re-drainage days. It is concluded that fresh water inflows to the natural Coorong system from the South East were not significant in volume.”*(p45)

These words certainly don’t fit with all the information that you have seen to date, and nor did it fit with the Hansard record of Surveyor General GW Goyder’s 1863 report which states that *“the flow of water, when the swamps of the SE so overflow, is to the north-west, or in other words, into Tilley’s Swamp, from whence they again run, when Tilley’s Swamp Overflows, by the Salt Creek into the Coorong.”*

Nor did this report commentary fit with the words of the Ngarrindgeri Elders who told me that when camped at the Mulburries (6 kms to the north of Salt Creek) they could hear the roar of the inland waters running into the Coorong at Salt Creek over the booming of the surf on the Ocean Beach, and that there were strong inflows to the Coorong running north along the Ephemeral Lagoons – in the same manner as happens in all the other watercourses of the South East of SA .



Levels showing Martin’s Washpool as the controlling sill for flows from Tilley Swamp (red) to the Coorong, and the levels of the ridges the cutting was put through which was incorrectly taken as the level of pondage required to allow flows into the Coorong (green) in the Cardwell/Buckingham report. Flows into the Coorong began when water pondage volumes were less than 25% of those required to fill the Tilley Swamp to the high ridge topping green levels, and flows into the Coorong were obviously much greater than alluded to in the Report. The Engineering and Water Supply Department Engineer, and the Executive Officer of the SE Drainage Board both recanted their support for the Cardwell /Buckingham report after they studied this information, and agreed that large volumes of fresh water regularly ran into the Coorong.

A few weeks ago, I noticed supporting evidence for the Ngarindjerri Elders claims about the historical volumes of water that discharged into the South Lagoon via Salt Creek and the Ephemeral Lagoons. This evidence comes in the form of the extent of the existing flow path at the Narrows, or Parnka Point, and another flow path to the north west of the existing flow path which is shoaling, and infilling with sand drift and vegetation growth, but which obviously carried vast volumes of water on a regular basis in years prior to 1947. Parnka Point is the leg of land pointing towards the viewer in the middle of this following photo.



During one of my regular commuting flights along the Coorong, I noticed how much further the water had cut into the narrow Young Husband Peninsula, opposite Parnka Point, and the early morning light illuminated the evidence of remnants of a high volume water flow path .



A closer look revealed a second scoured flow path cut out by high flows passing around the end of Parnka Point, and passing west of an island between Parnka Point and Young Husband Peninsula.



This scour path tells us with certainty, about the volume and frequency of the water flows originating in the watersheds of Western Victoria and the SE of South Australia, and exiting the district via the Coorong Lagoons and the Murray Mouth. According to R. Spriggs "Geology of the SE of South Australia," following the period of down warp folding and subsidence that occurred in the Meningie area, and volcanic lava intrusions associated with the volcanic eruptions in the Mt Gambier district, the whole region took on a slightly different tilt. During a warmer climatic period, a sea coastline formed along the eastern side of the Coorong and the sea wave action eroded the ranges

that had formed prior to this period. Some of the harder sections resisted erosion, and were left as the islands and peninsulas which extend into what are now the Coorong Lagoons. Parnka point is one of these peninsulas. This new coastline is obvious from Goolwa to “The Granites” 16km north of Kingston, and it then curves away to the east to Reedy Creek, south east of Kingston. Like all of the dune ranges of the South East, water flows kept flow paths to the sea open through this new forming range. There is one opposite Blackford, where Goyders Bank was constructed in 1886, another at Salt Creek, the next where the Tauwitcherie Barrage system connects Pelican Point to Hindmarsh Island, and the last where the River Murray cuts between Hindmarsh Island and Goolwa. During the next Mini Ice Age, the sea retreated to our current standing coastline with natural water flow openings being maintained between the Young Husband Peninsula and Sir Richard Peninsula as the Murray Mouth, and another minor one as the Maria Creek at Kingston.



When we look at the high flow scour path from the ocean side, we can see the evidence of where the huge flows towards the Murray Mouth from Salt Creek and the Ephemeral Lagoons continuously carved out the back of the dune during each flow sequence. These flows occurred regularly – at least every 7 years according to the return period indicated by the Adelaide University data, and also based on anecdotal records passed down by the earliest settlers, the Ngarindjerri, and references in newspapers and Hansard recordings by the later white settlers. The regularity of the flows prevented the initial non vegetated dune drift from filling the flow paths to a depth that ever stopped the water from overtopping it. The scouring process removed large volumes of dune sand, and deposited it in the wider passage within the Coorong North Lagoon, and this explains why the area adjacent to McGrath Flat is so shallow.

The evidence outlined within this document confirms the regularity and size of the freshening flows through the Coorong prior to the establishment of the SE Drainage System which diverted the

surface flows directly to the sea, and confirms – tragically - that the Ramsar listing was based on a newly developing salinity pattern, and not its historical biological values. Most of the subsequent research on the Coorong has also been based on this dramatically changed hydrological situation, with a focus being on inflows from the River Murray, rather than the SE. Some persons purporting to be experts on the Coorong undertook intense lobbying to prevent any more than 40,000 megalitres/year of water from the Upper SE Dryland Salinity and Flood Mitigation project being discharged into the Coorong for fear of lowering the hyper saline salinity levels of the South Lagoon. So strong were the sentiments of the supposed Coorong experts relating to the negative effect that any dilution would have on the system, proposals were costed for piping the USE water directly across the lagoon, and discharge it into the Southern Ocean, or to evapo-concentrate it in shallow wetlands to reduce the volume of water to be introduced into the Southern Lagoon.

The western Parnka Point channel is now being slowly filled with sand drift and decaying vegetable matter due to the reduced flows coming from the SE. While drainage activities have played a major part in stopping the magnitude of the previous flows, ground-water recharge of water extracted by high water use pasture, irrigation extractions for crops and vines, and the high water use of the large forestry estate have all contributed to the reduction in water for the Coorong. Scouring water flows are no-longer available to maintain such a wide flow path between Parnka Point and the back of the still forming Young Husband coastal sand dune, and the portion of the flow path to the west of the island will continue infilling because of this.



Disturbingly, Coral like Bommies and reefs are growing into the Coorong along dune drifts..



....along the shores.....



....and within the main basin, and apart from creating a navigation hazard, these structures also slow the rate of water movements throughout the lagoons.



Much more water from the River Murray environmental flows could be directed to the central and southern portion of the Coorong by construction of a short cut through the Narrung Peninsula near Meningie.

This would have multiple beneficial effects.

- It would create a through- flow outlet for a fresh water flushing system which would lower the salinity levels of Lake Albert using water from Lake Alexandrina delivered via the Narrows at Narrung.
- This new Lake Albert outlet would compensate for the restrictions placed on flows from the Murray to the Coorong after the barrages were built, and allow fresh water flows to be introduced into the North Lagoon well south of the current introduction point through the Tauwitcherie Barrage, and by co-ordination with tidal movement, could push fresh water into the South Lagoon through the Parnka Point flow path, and go a long way towards honouring the evidence given, and the salinity levels spoken of by the Ngarrindjeri Elders.
- Decreases in the salinity levels of the North Lagoon should slow, or stop, the growth of the “bommies” in the Coorong.
- Allow a lowering of the current salinity target for the South Lagoon in the Ramsar Management Plan, and create an ecology capable of supporting a portion of the vast number of waders and water birds that used to use this body of water.
- This initiative could be assisted by directing a greater portion of the water diverted along the Tilley Swamp Water Course from the Blackford drain directly to the Coorong, rather than re-hydration of shallow wetlands along the flow path. There are a number of similar wetlands near-by in the Watervalley Wetland Complex, and only one Coorong.
- These initiatives are possible and achievable, and with good will from the Governments and persons associated with research on the Coorong, could be achieved within one year.

Chelsea Burns

From: Morgan, Lee (DEW) <Lee.Morgan@sa.gov.au>
Sent: Monday, 22 February 2021 9:23 AM
To: Chelsea Burns
Cc: de Jong, Mark (DEW)
Subject: RE: Kingston DC - CAS Feedback [DLM=For-Official-Use-Only]

For Official Use Only

Hi Chelsea,
Thanks for your email.

I will catch up with Mark today, and will get back to you regarding a response.

Lee Morgan

Manager, SE Drainage Operations, on behalf of the South Eastern Water Conservation and Drainage Board

Water Infrastructure and Operations Branch | Water and River Murray Division

Department for Environment and Water

P (08) 8730 3508 | M 0427838471 (or if urgent M: 0419850259)
Cnr Aberle St & Park Tce, Millicent SA 5280
PO Box 531, Millicent SA 5280

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From: Chelsea Burns [mailto:cburns@kingstondc.sa.gov.au]
Sent: Saturday, 20 February 2021 4:30 PM
To: de Jong, Mark (DEW) <Mark.deJong@sa.gov.au>; Morgan, Lee (DEW) <Lee.Morgan@sa.gov.au>
Cc: Worthley, David <dworthley@kingstondc.sa.gov.au>
Subject: Kingston DC - CAS Feedback

Hi Mark and Lee,

Hope all is going well with you.

Just wanted to touch base as we are looking to finalise the Kingston District Coastal Adaptation Strategy in the coming weeks.

Are you still hoping to provide comments or feedback (even if just high level) in response to the CAS? It is noted that the Limestone Coast Landscape Board feedback included support for the early engagement with the SEWCDB, and wanted to check with you as to whether this was provided to incorporate all DEW operations or if you were looking to provide standalone feedback?

There is absolutely no issue if you aren't in a position to provide feedback at this time from the SEWCDB, we can simply note that there was some initial and positive discussion with you both regarding future collaboration for adaptation planning and was broadly supported.

I will be out of the office on Monday/Tuesday but if you wish to discuss, please give Dave a call on 0427 799 371.

Thanks again – look forward to chatting with you soon.

Kind regards,

Chelsea Burns
Team Leader
Sustainability & Projects



KINGSTON DISTRICT COUNCIL

Kingston District Council
29 Holland Street, Kingston SE SA 5275
08 8767 2033
info@kingstondc.sa.gov.au
www.kingstondc.sa.gov.au
@KingstonDistrictCouncil
@KingstonDistrictCouncil

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