

yes

Request to be heard?

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Organisation: Friends of Edithvale-Seaford Wetlands Incorporated
Affected property: Edithvale Road Edithvale
Attachment 1:
Attachment 1:
Attachment 2: Revised Submission to that of Friends of Edithvale-Seaford Wetlands
Attachment 2: LXRA Submission May 2018 doc
Attachment 3:
Comments:

FRIENDS OF EDITHVALE-SEAFORD WETLANDS INCORPORATED**Association Number****A0017388A ABN 95 886****101 621****Submission on the Edithvale/Bonbeach Environment Effects
Statement****May /June 2018****Reason for Submission**

1. The Friends of Edithvale- Seaford Wetlands Incorporated (FESWI) are making this submission because of our concern about the potential effects of the proposed railway trench on the wetlands at Edithvale in particular, but also the Wannarkladdin wetlands associated with the Bonbeach project. We fear that the flow patterns i.e. direction of flows and quantity of groundwater that underpin the critical habitats at the wetlands may alter, and consequently, have a negative impact on the flora and fauna and possibly on the Ramsar status of the wetlands.

Information on the Friends of Edithvale- Seaford Wetlands Environment Group

2. The Friends of Edithvale-Seaford Wetlands Incorporated was established in 1988 and remains the value holder of the wetlands on behalf of the community. Since its foundation our committed membership has worked in a voluntary capacity in a number of roles to preserve and protect this unique and precious wetlands environment with commitment to a number of roles including

- Hosting a website and Facebook page
- Supervising the Education Centre and the Bird Hide at Edithvale
- Tree planting at Seaford and Edithvale
- Educational tours for schools and other groups
- Organizing and participating in events including the celebration of World Wetlands and Summer by the Sea

3. We are one of the few groups that operate in two local government areas – Kingston and Frankston and are recognized as leaders in the area of wetlands protection advocacy in Victoria.

4. Our bird hide at Edithvale was reopened in August 2016, following an eight year closure, after it was condemned by Melbourne Water due to corrosion of the foundations. Melbourne Water built the Discovery Centre as a replacement, but the viewing is not as good from there. Hence FESWI, through the work of our former President, Philippa Bailey and others, worked to have the bird hide restored by a local builder working at cut-price rates, paid for by grants sourced from Melbourne Water and a Federal Government Stronger Communities grant. The re-establishment of the Hide for public use is an example of our fierce advocacy for the wetlands' value to birdlife and importantly our promotion of this to the wider community.

5. This facility is once more very popular with visitors and in particular bird watching enthusiasts as it provides such a special vantage point for viewing the birdlife. with over 2,000 visitors to the hide in the year to August 2017. We have had visitors from overseas including the Isle of Mull, Europe and Asia. We have also hosted a number of plant nursery groups, retired engineers, walkers, and the Bird Life Australia Photography Group who compiled an extensive list of the bird life on their regular visit. This has led to expanded opening hours and an improved visitor experience.

6. This re-establishment of the Hide for public use is an example of our fierce advocacy for the wetlands' value to birdlife and importantly promotion of this to the wider community. Through the work of our former President, Philippa Bailey and others, we sourced funding for the venture. After successive submissions to Melbourne Water we were granted \$20,000 which was matched by a Federal Government Stronger Communities grant and then a local building company lent support with considerable pro bono work.

7. We work closely with Melbourne Water who are the public land holder and manager of the site and we are represented on several important committees including: -

- Frankston Environmental Friends Network (established over 20 years)
- Kingston Public Spaces and Environment Committee
- Port Phillip Conservation Council
- Melbourne Water Community Liaison Committee for the Edithvale- Seaford Wetlands
- Edithvale/Bonbeach LXRA Community Reference Group

8. We have an active committee that works hard in this quest to fulfill its objectives. Our future plans are to expand our membership, our education program and tree planting activities, and to re- establish a tree planting group at Edithvale.

9. FESWI was awarded the Kingston Community Group of the Year Award in January 2018 in recognition of our achievements and commitment to the Edithvale- Seaford Wetlands.

The Level Crossing Removal Project Edithvale

10. When the State Government announced the project, we invited the LXRA representatives to our Edithvale Bird Hide to discuss the options for the removal of the level crossing at Edithvale. We expressed the view that caution should be taken in assessing the viability of any works that would interfere with the hydrology of the area and in particular of the Edithvale Wetlands.

11. Two options were initially proposed for Edithvale: the construction of a rail bridge and the current proposal for a rail trench grade separation.

12. We would like it noted that a concerted local campaign including, public meetings, petitions, placards affixed to residences and letterbox drops, was launched by the No Skyrail group to turn local residents' attention largely to fears of lowered house values for certain home owners and to what was the imagined visual effects of a rail bridge.

13. Meanwhile there was silence from the government on what this option might actually look like or any design advantages it might offer for scrutiny and comparison, e.g. provision of public open space, retention of vegetation, parking and street parking, public amenity etc. and importantly construction and maintenance requirements.

14. In March 2017, without informed public consultation, the Government announced that the trench option was to go ahead.

15. We note expert planning evidence for the Kingston Residents' Association which includes the view that the former option (rail bridge) is both less expensive and less disruptive to localized hydrology (and hence environmental effects). In our submission that opinion should be given serious consideration and weight. Despite impacts on the local views, a rail bridge design avoids many of the potentially adverse environmental effects associated with the current design. We believe the current proposal should be suspended in anticipation of the alternative design option being assessed for its environmental effects.

16. Given the potentially perverse outcomes for the Edithvale area of the current trench proposal and considering improved accessibility to Station St, due to the construction of the new Patterson River bridge and a second less challenged trenched crossing at Bonbeach Station, we

believe there remains a question as the necessity of a grade separation at all, if the long overdue issue of safety for pedestrians were to be finally addressed. This Trench Option was a political decision and not one developed through a co-design process with the community.

17. Alternatively, based on our submissions below, FESWI's view is that environmental performance requirements for the project, and any aligned conditions on permits or approvals, should be more precisely and strictly drafted in order to insist on an appropriate degree of precaution and responsiveness to potential harm to the Edithvale wetlands.

The Edithvale wetlands: ecology and hydrology

18. The Edithvale Wetlands have both permanent and ephemeral wetland elements characterised by two seasons, wet and dry, this being typical of the nature of seasonal wetlands. The panel has heard evidence of the ecological values of the wetlands from the proponent's experts. This material is mainly derived from public documentation and records and in particular the Ramsar Management Plan for the Edithvale Seaford Wetlands.

19. There is no dispute as to the very high environmental values of the Edithvale Wetlands' site, which our members view and study regularly. These values are described extensively in Ramsar management documents, which we will return to.

20. It is also common ground that issues of ecology and hydrogeology (groundwater systems) are intimately connected and central to any effects of the project on the Edithvale wetland complex.

21. FESWI make two principal submissions in relation to the effects of the proposal on the Edithvale wetlands

22. *Ecohydrological sensitivity.* The integrated ecology and hydrological (eco-hydrological) character of the Edithvale wetlands is extremely sensitive to change. The parameters of risk associated with the project's interference with ecohydrological systems should be set accordingly and consequently a very high degree of precaution is required. This is under-appreciated in the expert evidence for the proponent and hence in the proponent's case. Those risk parameters and very narrow margins of error are not accounted for in the EES.

23. *Strategic importance.* The Edithvale Wetlands' values need to be considered in terms of the regional significance of the site within a wider wetland and habitat complex. The values of the Edithvale site to protected bird species (the basis for EPBC Act protection in implementation of the Ramsar Convention and bilateral migratory bird treaties) includes its situation as one key habitat site among others and also as a refuge site in drought. This strategic importance of the

site compounds its ecological sensitivity. This appears to be under-appreciated, if not absent, from the proponent's case and from the evidence of their experts

Ecohydrological processes

24. The site is unique in its seasonal watering and food production (primary and secondary production) that supports such high numbers of visiting bird numbers. This characteristic is sustained only by the unique local ground and surface water interactions in a variety of bathymetries at the site and importantly the underlying groundwater patterns. It is critical that we ensure these natural cycles and processes are protected and preserved from adverse impacts and the risk of such impacts.

Modified hydrology

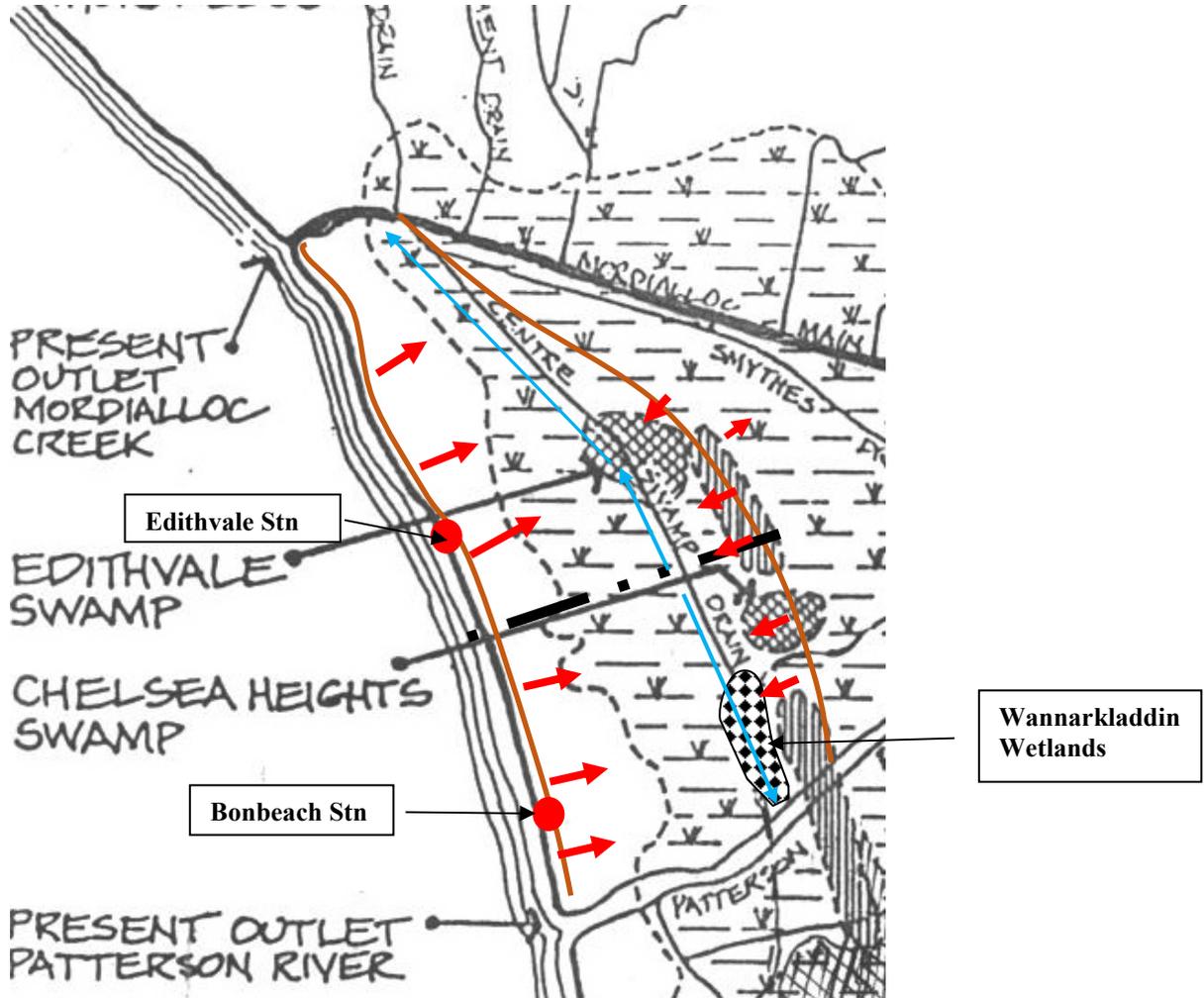
Ecohydrological processes occur within a modified system.

25. Our understanding of the hydrology is based on a four year period of groundwater studies undertaken by the Department of Environment, Land, Water and Planning (DELWP) and Melbourne Water in the period of 1990- 1994 (*Groundwater Interactions with the Edithvale, Chelsea Heights and Seaford Swamp Wetlands*, HydroTechnology., 1994). Our understanding is similar to that presented in the technical documentation developed for the project, but with some subtle and important differences. The Edithvale Wetlands are not well connected to the wider regional groundwater network but are more locally confined.

26. The key areas of the Carrum Lowlands wetlands are bounded by the Isles of Wannarkladdin to the east and the current coastal dune system to the west, with the Centre Swamp Drain being the key drainage focus. Rainfall on the catchment divide points and hinterlands drain towards the Centre Swamp Drain in the sandy clay silty substrate that overlies the deeper Pleistocene clays. The shallow (Quaternary) groundwater level in this area is controlled by the drainage system of the Centre Swamp Drain as it drains to the northern end at Mordialloc (in the case of Edithvale Wetlands) and or southern end just north of Patterson River at Bonbeach/ Chelsea (for the Wannarkladdin Wetlands). The high point in that system coincides with Thames Promenade. The important thing that helps maintain the groundwater under the wetlands is the rainfall falling over the area between those sand dune ridge points. The eastern falls have far lower salinity than those from the west.

27. The Centre Swamp Drain has a diversion pump that can be activated to ensure that the drought refuge pools' water levels are sustained in the Edithvale South wetlands in times of drought/low rainfall. This maintains an appropriate level of water for the birds – waders and

other birds to thrive in a protected fenced environment where they spend the breeding or wintering season.



Diag 1 – A Simplistic description of two-dimensional shallow (Quaternary) local groundwater flows for Edithvale and Wannarkladdin Wetlands

28. As we have seen from the technical presentations, groundwater flows on the current dune system flow in two directions, part to the Bay and then part inland, whereby rainfall falling on the lands inland of the current dunal system contribute to the groundwater within the Carrum Lowlands. Similarly, the groundwater flows from the older dunes (The Isles of Wannarkladdin). The groundwater flows, in the Carrum Lowlands, flow towards the Centre Swamp Drain that runs north towards Mordialloc Creek Pumping Station from Thames Promenade. The subsurface piped drain now controls the groundwater level for the Edithvale Wetlands site. The ground water level does vary seasonally as does the freshwater pondages on the surface.

29. Freshwater flows generated from impervious surface runoff off from the immediate catchments are also transmitted to the wetlands via a number of drains and there are limited connections between these and Carrum Lowland Drain. The drains coming from the west are very poor quality drains built in the 1950s and have a high leakage rate and interaction with the groundwater. None of the western drains have any direct connection to the wetlands but they do have connection to the groundwater system.

30. Also, of significance is the fact that the Edithvale Wetlands are essentially at sea level. Freshwater flows into the wetlands either evaporate or gradually pass through the aquitard of ES1 and EN 1 to the groundwater below. The groundwater flows from higher elevations to the east, west and south and underpin the perched fresher pondages. Any interference in the existing groundwater flow regime has the potential to alter that hydrological regime and consequently alter the water balance (including water level and/or salinity balance) within the wetlands. There is the risk that the current project design could alter this balance. This appears to be confirmed in EES Technical Report A – Groundwater at pp 152-155 including Figures 59-60. Simply on the basis of modelling for this site there will be ‘minor’ changes in groundwater levels. This does not appear to fully account for unique stratigraphy characteristics at different cells of the Edithvale Wetlands or impacts on or consideration of salinity balance. As we note below, even minor changes present a potential or significant risk to the ecohydrology of the wetlands, given the degree of sensitivity to change discussed.

Productivity of the Wetlands

31. The eastern storm water drains, drain surface runoff to the wetlands and allow for seasonal ponding of key habitats in spring and early summer and the creation of extraordinary algal and invertebrate blooms that feed the birds. This is primarily in ES1 And EN1 but also applies to EN2 and EN3 to a lesser extent

32. The groundwater levels do fluctuate seasonally, with the highest levels attained in the winter and spring and lower levels in late summer and autumn in a fairly dynamic way. This seasonal variation in the groundwater and the associated ponding of surface runoff above creates the various habitat types that are used by a large diversity of species and high numbers. The interactions between surface and groundwater is complex and is modified by the aquitard liner of very old peats (Holocene period) and silty clays above the sandy substrate at depth. The surface deposits also include some Pleistocene deposits

33. The Edithvale Wetland cells operate differently to each other. ES1 and EN1 are established over the deeper peats of the original swamp morphology, whilst EN2, 3, 4 and 5 are excavated ponds into former dunal deposits that had no peat layers and limited clay/silt deposits. ES1 and EN1 are filled with surface runoff that is retained above the groundwater through the aquitard of the Peat and Pleistocene clay layers. The normal operative levels for these cells is at mean sea level of 0.00AHD. The other cells which also receive surface runoff are more directly connected to the groundwater and have a variant operative level of between -0.6m AHD and -1.0M AHD. These cells have strong variability in salinity from brackish to strongly saline and are therefore less productive. These deeper water habitats are none the less important for diving species and also for Australasian Bitterns.

Cell	Geological or geomorphological considerations	Hydrological considerations	Ecological considerations
ES1	Old swamp morphology with Natural Aquitards Operates at 0.00 AHD	Seasonal Fresh/brackish water overlaying saline groundwater; complex seasonal connection of surface water and groundwater;	Site of major algal and invertebrate blooms; migratory wader food sources; high sensitivity to water level and salinity level changes s.
EN1	Old swamp morphology with Natural Aquitard Operates at 0.00 AHD	Seasonal Fresh/brackish water overlaying saline groundwater; complex seasonal connection of surface water and groundwater;	Site of major algal and invertebrate blooms; migratory wader food sources; high sensitivity to water level and salinity level changes s.
EN2	Excavated ponds – No peat or clay silt liner; Operate at -0.6 to -1.2m AHD	Directly open to the groundwater – strong brackish to saline over evaporative season	Limited productivity due to higher salinity – still important habitat for some species
EN3/4/5	Excavated ponds No peat or clay silt liner; Operate at -0.6 to -1.2m AHD	Directly open to the groundwater – strong brackish to saline over evaporative season	Limited productivity due to higher salinity – still important habitat for some species



Diagram 2 – ES1 and EN1 – Old swamp morphology – peats aquatard
Source Appendix Ecological Character Description Addendum – Ramsar Management Plan



Diagram 3 -Edithvale North Wetlands EN 2and EN3/4/5 – Direct Groundwater Interface

34. Part of the seasonal ponding cycle is the promotion of the growth of the aquatic plant *Bolboschoenus caldwelli* that is the plant that when it lies down and dies in autumn, becomes the continuation of peat formation that is the key carbon source for the later primary and secondary productivity that the large numbers of birds' gorge on. This ecohydrological dynamic is crucial to this cycle within the Edithvale Wetlands and hence it underpins their ecological value.

35. Avian visitors include migratory birds that fly from the Northern Hemisphere to the Edithvale- Seaford Wetlands each year along the East Asia/ Australasia Flyway and then fly back, returning the following year. They have been doing this for thousands of years, and it is amazing how they achieve this.

Assessment of Impacts on the Edithvale Wetlands

36. The Ramsar nomination of the Edithvale Wetlands was achieved based on the presence and use of the site by International migratory waders such as the Sharp tailed sandpiper and Curlew Sandpiper Plus, also by threatened local species such as the Australasian Bittern.

37. The railway crossing removal project has the potential to alter the flow patterns and the relative quantities flowing in either direction. The GHD/AECOM reports reviewed the groundwater system and re-established an understanding of the contemporary groundwater system through conceptual modelling.

38. They then applied the proposed piled trench in an unmitigated form to the model to see what the initial impact on the groundwater systems would be. The impact was startling, as shown in Figure 24 (Technical Report B – Ecological Impact Assessment), with a significant shift in the western catchment groundwater mound towards the wetlands, away from its current position just slightly east of the crest of the current dune system.

39. This initial model suggested that a lot of water would be redirected towards the wetlands and away from the coast. The post insertion modelling analysis showed that this groundwater management approach also had an impact on the seaward side flows of the insertion, with a further unacceptable decrease in the groundwater level on that side of the enclosure.

40. This necessitated the insertion of an additional passive porous drain around the outside of the piling to lower the increased head on the east side and re-establish the relative groundwater profile. Without this insertion, this would, in our submission, have had a deleterious effect on the seasonal patterns of groundwater flows incident to the wetlands thus potentially affecting the seasonal levels so important to sustaining the critical habitats.

41. Our concern is that, given the sensitivity of the Edithvale wetland to changes in ecohydrology, there should be NO variance in the existing patterns of groundwater that impact on the delicate balance of the habitats and associated food webs. The risk assessment in the GHD/Aecom report (EES Technical Report A, Feb 2018 pp126) appraised the likelihood of risk as too high and consequently and would have had a potentially serious impact on areas of housing, as well as some risk on the value of the wetlands for species such as Australasian Bittern and Sharp tailed or Curlew Sandpiper, possibly jeopardizing the Ramsar listing.

42. Consideration of risk to the Edithvale Wetland, specifically its delicate ecohydrological balance, has not accounted for all of the factors noted here. For instance, considerations of risk have not included risks of interference with the fine scale seasonal water levels in the different cells and consequential risks to food and habitat values for protected bird species and/or Ramsar values, or they have not done so correctly or adequately.

43. Mitigation of the impacts for the Edithvale Station site proposed in the documentation is through the insertion of the ring drain around the 'tanked' pile enclosure to depth of 20 metres. The net outcome of the proposed groundwater management approach was depicted in Figure 25 of Report (Technical Report B – Ecological Impact Assessment) showing a reduced impact on the inland groundwater.

44. Whilst there is an independent review of the groundwater modelling and the mitigation measures proposed, FESWI remains very skeptical of the overall predicted outcome. Significant reliance is placed on the long-term efficacy and performance of this drain – which is yet to be designed.

45. We also make the point that a significant degree of reliance is being put upon conceptual modelling without the detailed design and a thorough analysis of the potential failure mechanisms and provision of any redundancy. We think that there are still significant potential risks associated with the design approach. The Panel has heard that the decision is yet to be made as to how the ring main is to be fabricated and the potential risk of blockage due to particulates and or chemical deposit fouling is undetermined.

46. FESWI's concern is simple, there can be NO measurable change to the groundwater system that underpins the seasonal ponding of the wetland habitats. The documentation does not give us an acceptable degree of comfort that the modelling is confirmed as being correct due to the short time frame of the monitoring to truth the model. There are inherent uncertainties with the design of the ring main and its long-term efficacy which could give rise to potential impacts.

Further we are concerned as to how the groundwater levels will be monitored from the coast to the wetlands over time to confirm the establishment of the proposed regime and by whom. We don't see in the EPR's any answers to the following issues

- What redundancy measures are to be provided in the case that the porous ring fails?
- What are the triggers in the groundwater and/or ecological monitoring that would necessitate intervention in environmental management and the nature of remediation required?
- What are the types of remediation measures to be undertaken if an adverse regime or a worst case scenario is established that threatens the groundwater system for all sites?
- Who is the respondent agency to undertake measures and who funds those? This of concern because failure may be in a few years' time and accountabilities will have shifted.
- Who is accountable for the undertaking of any remedial actions if required, given that LXRA will be dissolved within a few years and Vic Track will only have management of its reserves? For example, in what body will obligations of monitoring, response, and/or remedial action to eco-hydrology of the Edithvale wetland vest?
- Who conducts and funds the monitoring? We strongly believe that this must be done by a single agency with transparent reporting to the public
- Is the risk analysis comprehensive enough? Given that the mode of construction is to be with a two-stage piling operation and there is potential for imperfect sealing of the trench, there is a risk that acid sulphate pore water and other contaminants may enter the trench and be pumped to the stormwater drain system that we know has a high connection to the local groundwater system. The destination of this water is not stated. Is it coastal or is inland and to a poorly sealed stormwater drain system?

Statutory considerations: EPBC Act

47. There is a material risk that, as a consequence of any potential effects on hydrological regimes, the project will have an impact on the ecological character of a wetland of international importance (Edithvale-Seaford Wetlands). In implementing the Ramsar Convention, Environmental Protection and Biodiversity Conservation Act 1999 protection of the ecological character of this site arise through the prohibition and approval requirement provisions under Part 3 of that Act. The granting of environmental approvals under the Act must be consistent with Australia's Ramsar obligations as well as principles of ecologically sustainable development. Given those considerations, it is our submission that, not only is a precautionary approach required to the design and execution of the project, but protection of the ecological character of the Edithvale wetland complex must be approached with a very high degree of precaution:

48. There is still a threat of serious or and potentially unmitigable harm to the ecological character of the wetlands, namely in association with what has been described in the technical reports as ‘minor’ impacts on hydrology. The threat (risk) in our submission is still plausible and it relates to harm (disruption to feeding and habitat ecology) that can be characterized as both serious and of long term effect.

49. There is still a high degree of uncertainty in the threats and impacts, which is associated with reliance on “conceptual’ groundwater modelling and prediction combined with the complexity and sensitivity of the Edithvale Wetlands ecohydrology in particular. I draw you attention to a statement from another case - Hydrogeology is *'an exercise where the relevant data is frequently absent or insufficient and where scientific certainty is frequently unattainable'*: [Castle v Southern Rural Water](#) [2008] VCAT 2440, [48]. Given the evidence of Mr Cauchi – that they only had barely 6 months to truth their model and the above reference we advocate that on these bases, considerable precaution is required.

50. One response to this level of precaution is to abandon a project design that relies on the trench option and to proceed through to design and construction of a rail bridge or total abandonment of the project in favour of only one trench at Bonbeach.

51. Another response is to strengthen EPRs in order to require measures capable of meeting the issues and questions noted above.

52. It is our strong view that notwithstanding the conceptual modelling, it needs to be clear how potential impacts are to be monitored comprehensively and who will be responsible for this work over many years to gauge any impacts on the volume and quality of groundwater across the profile from the Station through to the Edithvale Wetlands.

These are the areas of FESWI’s concern.

53. Conceptual models are always open to variability and have limitations. Hence, there needs to be a higher level of modelling associated with the detailed design and lengthy monitoring at a finer scale to increase the confidence levels and allow for adjustments. Once more confidence is established, then the actual outcome needs to be monitored to verify the modelling.

Assessment of Impacts on the Wannarkladdin Wetlands – Bonbeach Station

54. Our reading of the conceptual modelling of the Bonbeach Station proposal is that the potential impacts on the inland groundwater system are likely to be less than that at Edithvale. It appears the coast side impacts at Bonbeach might be more impacted. The Wannarkladdin Wetlands are not Ramsar listed, but none the less play an important role in the whole of the wetland complex of the former Carrum Carrum Swamp region. Again, any change in the groundwater system dynamics may jeopardize the main wetland elements which have both permanent, seasonal and ephemeral habitats.

55. We have the same lack of surety with regards to the outcomes and the lack of an articulation of a response if the outcome is different to that of the conceptual modelling and preliminary design. We have the same questions as mentioned beforehand. It is noted that the likelihood of acid sulphate pore water at this site is reduced, but not totally absent.

Conclusion

56. FESWI is concerned that a lot of reliance is being put on conceptual modelling without this being taken to a higher level of confidence and being subjected to an independent review as per the design process. We are concerned that the project will get to inevitability without satisfying our concerns

57. There can be **NO** change in the existing groundwater interactions that underpin the values at Edithvale Wetlands and also that at Wannarkladdin Wetlands arising from the proposed projects. If a very high level of confidence can't be established, the project should not proceed.

58. Further, FESWI feels that long term monitoring of the environmental factors by the relevant methods with a view to assessing any changed outcomes that may arise from this project is crucially important

59. We would also like to recommend that the monitoring of groundwater is reported/assessed in a transparent and public manner so that the relevant people and groups are aware of these outcomes. Our expectation is that there will be careful monitoring of the trench option (if it proceeds) and contingency plans in place for unexpected issues and problems that occur in the future.

60. Lastly it is recommended that further groundwater mitigation strategies be explored at the earliest point possible so that options are reviewable and made public prior to the project proceeding.

61. The Edithvale-Seaford Wetlands are one of 11 Ramsar listed wetlands in Victoria and one of the few divided by a main road and in an urban area. They are one of the last remaining examples of the once mighty Carrum Carrum Swamp. It is important in FESWI's view that these be maintained for the enjoyment of future generations and for the bird life/flora and fauna of this important environmental area.

Presentation by Sean Dooley

Presenting on the birdlife of the Edithvale-Seaford Wetlands

1. The Edithvale-Seaford Wetlands were successfully nominated as a Ramsar Wetland of International Significance in 2001, one of only 12 such sites in Victoria and the only one in Australia wholly contained within an urban area.

This makes these wetlands hugely important for both the wildlife that are attracted to the site and for the people that live in the region who have access to a world class nature experience right on their doorstep.

The reasons for listing of the Edithvale-Seaford Wetlands (and continuing status as a Ramsar Wetland of International significance) include:

- * being the last remaining example of the formerly vast Carrum Carrum Swamp and containing the shallow freshwater marsh wetland type that is depleted in the Gippsland Plains Bioregion.

- * supporting populations of the Australasian Bittern, considered of State Significance and listed as Endangered under the Commonwealth EPBC Act.

- * supporting more than one per cent of the world population of the Sharp-tailed Sandpiper in up to one year in three

- * Supporting species covered in other international Migratory Bird agreements such as Jamba, Cambra.

- * Almost 200 bird species have been recorded with 180 species having been recorded at Edithvale alone since regular monthly monitoring began in 1989. Eighty-five per cent of the waterbird species in the Gippsland Plains Region have been recorded since surveys began in 1989. These include a variety of migratory shorebirds, which in some years have numbered more than 5,000 birds.

Many rarely seen and highly sought-after species have also been recorded including the Curlew Sandpiper (the Australian population listed as Critically Endangered at a Commonwealth level), the Endangered Australian Painted Snipe, Australian Little Bittern, Wood and Pectoral Sandpipers, Baillon's Crake, Lewin's Rail, and the White-bellied Sea-Eagle. While not reaching the one per cent threshold, the Latham's Snipe—a migratory shorebird that breeds in Japan—has been recorded in numbers high enough to make Edithvale one of the top ten sites for the species in Victoria.

Particularly during drought years, Edithvale Wetlands can attract huge congregations of many species of waterbirds, including 15 types of waterfowl, resident shorebirds such as Pied Stilts and Red-kneed Dotterels, wading birds such as Ibis and Spoonbills, as well as reed-swelling small birds such as Little Grassbirds and Australian Reed-Warblers.

The abundance of waterbirds at these times make Edithvale one of the highest areas of native biomass in Australia. For instance, the sighting of over 5,000 Sharp-tailed Sandpipers in January 2005, puts Edithvale into the top 15 sites for this species in Australia (where 91 per cent of Sharp-tailed Sandpipers spend the northern winter after breeding in Siberia). This more of the species than have ever been recorded in the whole of Kakadu, and of the other sites that have had larger flocks congregating, all of them cover far larger areas than Edithvale. Pound for pound, Edithvale can be one of the most productive natural wildlife areas in the country.

Many waterbirds breed at Edithvale including dozens of pairs of Black Swans when conditions are right. (High winter water levels and an abundance of freshwater plants) on which the Swans both use to build their nest platforms and feed from.

2. Birdlife Australia staff and volunteers have been undertaking formal monthly surveys of the birdlife on behalf of the land manager Melbourne Water, on a monthly basis since 1989. This information has been vital for Melbourne Water to manage the wetlands to maintain and enhance the Ramsar values of the site. (Such as slashing reeds in areas that were formerly open bodies of shallow water, resulting in over 3,000 Sharp-tailed Sandpipers visiting the site in the summers of 2014 and 2015 after slashing in the previous season.
3. Since the declaration of the Edithvale-Seaford Ramsar site in 2001, national and international conditions have only got worse for key waterbird species. The Australasian Bittern population crashed leading up to and particularly during the Millennium Drought, with the current population estimate in Australia to be as few as 800 birds. This led to the listing of the species as Critically Endangered at a National level. Numbers at Edithvale have been worryingly low for the past 5-10 years, but if conditions and habitat remain in good condition, Edithvale will be a key site to the species continued survival and recovery.
4. Internationally, populations of migratory shorebirds have suffered catastrophic declines, with populations of some formerly common species such as the Curlew Sandpiper dropping by around 85 per cent over the last 30 years on the East Asian-Australasian Flyway. In 2016, the world population estimate for Sharp-tailed Sandpiper was downgraded to 85,000 which means that Edithvale has now recorded more than one per cent of the world population (850 birds) for the species in 12 of the past 30 years. In several other years, other remaining wetlands of the Carrum Carrum Swamp (Seaford Wetlands, Eastern

Treatment Plant et al) have combined with Edithvale to pass this threshold, clearly demonstrating how vitally important these wetlands are in not just a local, but a global context.

5. The almost 30 years of data collected on the birds of Edithvale by BirdLife Australia for Melbourne Water particularly highlights the importance of the site for birds in drought years. When the majority of inland wetlands such as in the Murray-Darling Basin have dried out and Edithvale retains fresh water into the summer if when we tend to see the largest congregations of waterbirds. The combination of water quality and aquatic vegetation seem to be unique.
6. That these wetlands are adjacent to a large urban population makes them even more precious. I grew up in the area and it was the close proximity of such an abundance of observable wildlife that had such a profound effect on my life. As well as being involved in surveys for Melbourne Water of the wetlands since the mid-90s, I also spent several years volunteering with Friends of Edithvale-Seaford Wetlands to provide expertise to members of the public visiting the Edithvale bird hide. In that time, I interacted with hundreds of mainly local people who were blown away by this urban oasis teeming with life. Edithvale is one of the few publicly accessible bird hides where you can usually see birds! And often birds in plentiful numbers.
7. The reasons for Edithvale Wetlands being so productive for wildlife are due to a unique set of complexes, finely balanced factors of soil, surface hydrology and hydrogeology and water quality. It is not just the water levels at the right time of year that attracts birds from across Australia and the opposite side of the globe, but also the quality of that water and the food. That fine balance has been lost in so many of our remaining local wetlands, that they are either too saline, too laden exposed to acid sulphate soils, too overrun with weedy vegetation or too restricted in their catchments to retain the requisite amount of water to be of significant value to wildlife. Through a combination of luck and more recently, of wise management, Edithvale has survived as a bastion of natural excellence. Any proposals that could potentially impact on this delicate balance need to be investigated and monitored far more thoroughly than has been proposed for this project. As we have seen with wetlands elsewhere, once you break down that balance, their condition can be lost forever, and we are left as a community with a legacy that is not a patch on what it once was.

Recommended Changes to the Project Environmental Performance Requirements

EPR		Comment	Remedy /changes to the EPR's
CL5	Acid and /or contaminated groundwater (operation)	The management measures plan does not discuss what to do with Acid Sulphate pore water or other contaminated water that may enter the trench after construction. The storage tank pump out destination is ill defined and should not be to any inland stormwater systems as they have strong connectivity to the groundwater system	Insert additional clauses regarding the treatment or handling of acid sulphate pore water or other contaminated during post construction stage that is likely to enter the trench through imperfect walling. It should not be directed to stormwater due to the likelihood that leakage from that will enter the groundwater with undetermined impact
FF8	Groundwater Dependent Ecosystem Monitoring and Mitigation Plan (Edithvale & Wannarkladdin Wetlands)	The establishment of a groundwater monitoring system includes the need for new bores along the west-east transect from the Edithvale station site through to the Wetlands, as well as activating a series of old bores. As the time of reaction in the groundwater is not determined, the monitoring program should be funded for a minimum of 10 years	Insert the need to monitor the whole local groundwater system between the project site and the wetlands Insert a length of time the project will be funded – 10 years Insert – Criteria for levels and quality for groundwater along the groundwater transect from the project site to the wetlands to determine whether a change in in groundwater levels and or quality is attributable to the projects

EPR		Comment	Remedy /changes to the EPR's
		Need similar clause for Wannarkladdin Wetlands Need to establish clear criteria for determining change or triggers for response	(ref EPR – GW2) Expand sub clause d to include impacts on the groundwater along the transect from the project site to the wetland.
GW 1	Rail Trench Design	The lack of appropriate contingency and redundancy for the horizontal drainage pipe which is at depth leaves the project open to the impact potential system failures, be it physical clogging or accumulation of mineral deposits through oxidation. The ability of the proposed system to be maintained or inspected regularly seems limited	Develop a design criteria requirement regarding the provision of observation, inspection and maintenance capability, plus also provision of a redundancy through insertion of a standby system built in at a slightly higher level.
GW2	Groundwater Performance Outcomes	There is a lack of mention in the failure of the trench walls to provide an effective seal and leakages into the trench are realised.	Insert a clause with respect to establishing a remediation program to provide for sealing of the trench wall through appropriate techniques to achieve a “dry trench”
GW3	Groundwater Management and	The lack of certainty regarding who is to manage the Groundwater Management Plan over a minimum	The length of time for the initial monitoring program must be inserted – 10 years

EPR		Comment	Remedy /changes to the EPR's
	Monitoring Plan	<p>of 10 years is a gap. It must be one agency.</p> <p>Who becomes the asset owner of the bore network (including those along the west – east transects) after 10 years?</p> <p>The lack of certainty around triggers and criteria is worrying – who determines the triggers and criteria for intervention. Surely DWELP Kingston Council and MWC must be parties to signing off on those. These must be made public.</p> <p>There is also a lack of a transparent reporting mechanism to the community and agencies on the monitoring program over the long term.</p>	<p>The program must be overseen by one agency – DWELP on behalf of all stakeholders.</p> <p>The monitoring network assets must be assigned to DWELP on project completion.</p> <p>Clear triggers and criteria for action or intervention in groundwater management must be agreed to by DWELP, Kingston Council and MWC including:</p> <p style="padding-left: 40px;">Thresholds at which hydrological changes require investigation, or restraining or positive action</p> <p>On whom obligations to monitor and/or act apply?</p> <p>The insertion of criteria to report every six months on the monitoring outcomes to all stakeholders (including FESWI).</p>
GW4	Independent Peer Review	The independent peer review should be publicly available to all parties responding to this EES	Insert a clause requiring that the peer reviewed detailed design reports be provided to all parties submitting to the

EPR		Comment	Remedy /changes to the EPR's
			EES Panel process and be openly available to the public
SW1	Stormwater management (Construction)	This Criteria is too lax. There needs to be a finite stormwater quality criteria established for offsite discharges. The EPA's guideline document (480) is old and too lax.	Insert a new criterion specifying the discharge quality for all stormwater discharges including criteria for Total Dissolved solids, Suspended Solids, pH, Turbidity as a minimum
SW2	Water Quality Operation	There are real concerns about the ability to exclude all groundwaters from the trench and hence discharge to stormwater systems may have water quality issues.	Insert clause with respect to the quality of discharges to stormwater including criteria for Total Dissolved Solids, Suspended Solids, pH, Turbidity, Iron, and Oil and Grease as a minimum