Background information: West Culburra

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1. Protecting local waterways

Flaws in the developer meeting the Nil or Beneficial Effect (NorBE) consent criteria.

Culburra Beach is bounded by two highly environmentally sensitive and important bodies of water - Lake Wollumboola and the Crookhaven Estuary. The impact of this proposed development on local waterways is a crucial issue in the approval process. Yet, the only water quality monitoring surveys being considered are those commissioned by the developer.

According to objective experts, the water management solutions and testing processes proposed by the developer are flawed. Until this aspect of consent is reviewed and dealt with, no DAs for the project should be approved.

Master's-qualified and Chartered Coastal Engineer

A local, independent coastal engineer advises that the developer's use of non-local rainfall datasets, uncalibrated hydrological and water-quality models, and outdated calculation methods results in underestimated peak flows and pollutant loads. This will result in inundation of the site during extreme weather, with runoff into Curley's Bay and pollutants overflowing into all nearby waterways.

The developer's models fail to account for catchment-specific tidal interactions, groundwater–surface water exchange, and extreme-event variability, significantly increasing the risk of on-site inundation, uncontrolled stormwater discharge into Curley's Bay, and exceedances of water-quality thresholds in adjacent estuarine systems.

On the modified development footprint, the stormwater ponds are now positioned above the 1% annual flood height, but only just, which simply does not reflect the nature of flooding in this coastal area. That is, floods in this area usually coincide with heavy rainfall and tidal pressure, such as high tides or king tides. This means the 1% annual flood height figure is not sufficient to protect the area from flooding and stormwater inundation when it happens.

Importantly, the developer's calculations also do not take into account the significantly increased runoff after development, which will further increase flood impacts.

Key problems with the developer's modelling, which have led to this unacceptable situation, include:

1. **The model hasn't been properly calibrated.**

   The developer admits they didn't calibrate the model because no local streamflow data was available. But, without calibration, the results can't be trusted and there is no proof that the proposed solutions will work.

2. **The climate data used is outdated and incomplete.**

   The developer used just eight years of rainfall data, from 1965–1973 (despite a complete set of data being available for the period 1993 – 1997). The data used was from Nowra (21 km inland from the development site).

   For a development of this scale, at least 20 years of recent data from a coastal site (like Jervis Bay or Culburra Beach) should be used. Using old, short-term inland data doesn't reflect current or future rainfall patterns at the development site, especially when climate change is taken into consideration.

3. **The pollution results don't make sense.**

   The developer's model claims the development will actually *reduce* pollution loads caused by runoff by 33%, compared to the current natural bushland. This is unrealistic. The site is currently bushland, which naturally absorbs water and filters pollutants; unlike housing estates, which cause runoff and pollution.

So in summary, the height the developer plans to make the stormwater treatment ponds is based on modelling using outdated flood mapping information from Shoalhaven City Council and rainfall predictions based on data over 50 years old, for a location 21km inland of Culburra Beach. By correcting this data to use Council's most recent flood mapping information, the developer's proposed treatment ponds will overflow during wet weather events, spilling pollution into the waterways.

The potential consequence of not verifying and correcting these inconsistencies and issues is irreversible damage to Lake Wollumboola and the Crookhaven River.

Read more about water management issues related to this development here: Masters Qualified and Chartered, Coastal Engineer, MPhil (Civil and Environmental Engineering) and BE (Civil), LEC hearing objection submission, 2021

Joy Pegler, Ornithologist

Independent Ornithologist Joy Pegler studied birdlife at Lake Wollumboola monthly between 1992 and 2016 and knows the Lake, its surrounds, its composition and its history intimately. Ms Pegler identifies through study of various water studies in the area that Lake Wollumboola is particularly susceptible to pollution via groundwater flow:

- Lake Wollumboola is a shallow coastal water body that intermittently opens and closes. It is a 'perched' lake - ie the floor is seated on rock strata, the Wandrawandian Flintstone, which also underpins Culburra and the Crookhaven River.

- Behaviour observed over many years of Black Swans at the Lake, scraping away sandy substrate at the water's edge to access fresh drinking water, indicates the presence of a groundwater source.

- NSW Office of Environment & Heritage (OEH) investigation confirmed the presence of large inputs of water into the Lake from a groundwater source (Baiada et al 2016). The survey confirmed that groundwater was entering the lake at numerous sites, including on the north side near where the Black Swan scraping behaviour was observed. As a result of this discovery, OEH designated the lake as a 'back-dune lagoon' (back-dune lagoons typically have small catchments and large inputs from groundwater) and concluded Lake Wollumboola would be particularly susceptible to pollution via that groundwater flow.

- The developer's Baseline Water Quality Monitoring Methodology Plan makes the assumption that the direction of flow of the groundwater at the

development site is primarily towards the Crookhaven River, based on the site's topography starting at the high point of Culburra Road and sloping down towards the Crookhaven River.

This completely overlooks the second factor that determines water flow - permeability of the rock strata. A 2020 study by HGeo, commissioned by Shoalhaven City Council, emphasises that fracturing in the Permian siltstone results in its permeability to groundwater being unpredictable, and points out pollutants could still move from the river catchment to the lake via that siltstone aquifer.

As a result of the developer's assumption about water flow and overlooking factors like permeability of the local rock strata, there are only two groundwater samples on the entire southern boundary of the proposed development site. This is not a scientifically valid method for establishing baseline to monitor or assess nil or beneficial effect of the development on Lake Wollumboola, putting this extraordinary natural heritage site at great risk. By contrast, the HGeo study used 21 sampling bores and still considered that further sampling was needed in order to set up appropriate baselines.

Read Joy Pegler's submission regarding the development modifications here:
Joy Pegler, Ornithologist (Graduate Diploma in Ornithology, Charles Sturt University) Scientific Technical Officer (Retired)

2. Cultural Heritage

The West Culburra development site is on Jerrinja Country and forms an important part of Australia's Indigenous cultural heritage. The Jerrinja people are connected to Culburra through genealogy and continuous occupation over a period of at least 20,000 years, and this site forms an important part of their history.

The Jerrinja Local Aboriginal Land Council continues to oppose the West Culburra development on the grounds that clear-felling the forest will cause permanent environmental and cultural damage to Country.

Read one of many of Jerrinja Local Aboriginal Land Council's objection submissions for further details:
https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SUB-92922718%2120250904T053711.718%20GMT

Another aspect of Australian culture that will be lost by this development is Culburra's beachside village character. The iconic Aussie beach holiday is characterised by the small villages along the coast, and this lifestyle is under threat.

Tacking housing estates onto the outskirts of a beachside village is inconsistent with NSW Illawarra Shoalhaven Regional Plan, which recommends:

> "*The Plan promotes the retention of existing scenic and natural areas, and seeks to protect them through an urban growth boundary. This will be maintained by land use zones that do not permit urban uses or intensive subdivision, and will ensure that existing centres, not identified as growth areas, do not expand into the surrounding, non-urban interlands*."

3. Business arguments

One of the base-level arguments touted by the developer in favour of West Culburra is that it will be good for business owners in Culburra - you know, more people = more customers and more jobs. Of course the reality is a little more involved.

The development plans include increasing the size of the Culburra industrial estate and providing business space in the new residential area. All told, at the end of the development, according to the developer's plans, Culburra's retail/industrial space per head of population will actually increase! The result will, in fact, be greater competition in a slightly worse business-to-population environment for the current Culburra businesses. The only difference will be that our roads will be more congested, the beaches busier, and the carparks fuller.

4. Oyster industry

According to the oyster industry representatives (p2):

The revised Impact report shows some lack of understanding and does not assess the commercial impact on oyster farms:

> *"The report states that nutrient and silt loads may be beneficial to oyster aquaculture. It is common scientific knowledge that increases above the natural levels of nutrient and silt impact negatively on oysters. The current silt and nutrient loads stirred up after adverse weather are enough for oyster health. Oyster eggs and larvae are particularly sensitive to silt. Silt clogs sensitive feeding apparatus in larvae and can lead to infestations of mudworm. (white 2001). Farmers have observed for years the reduced health, increased mortalities and reduced growth during periods of turbid water. This river is a high catch area which farmers depend on for single seed oyster production. The river contains many oyster reefs both natural and manmade which are essential for future crops. Should the mitigation measures fail, what would the sediment and pollution load be in the estuary? Will this impact on oysters and oyster larvae?"*

5. Irresponsible to allow 1,000 more residents given the current infrastructure (Patrice to take photos)

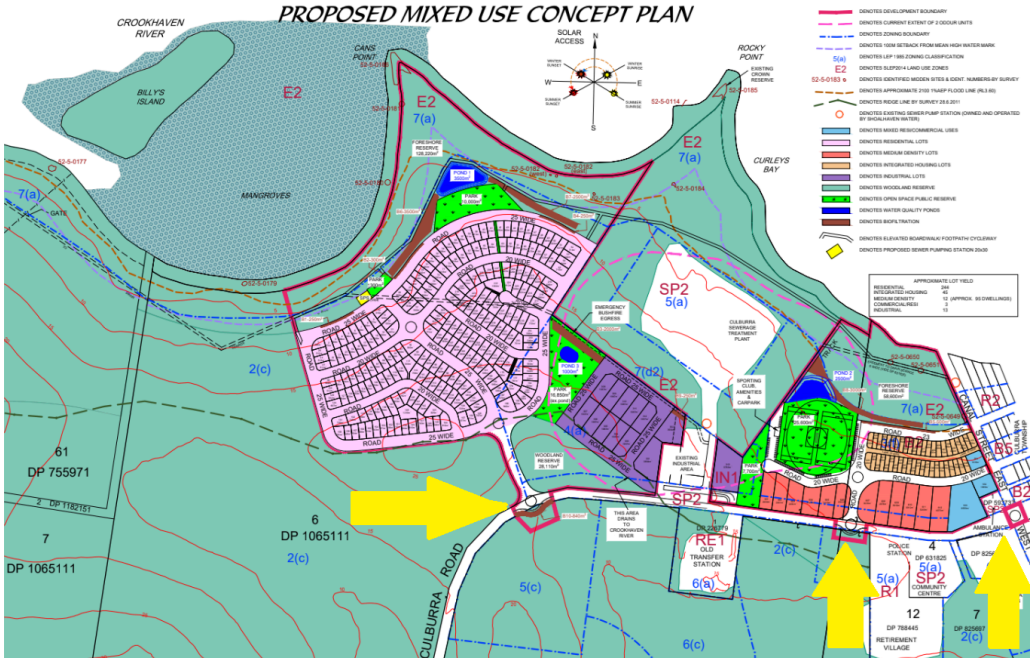
Here are some current examples of the state of our village. Council tells us they don't have the funds to fix. How is this going to improve with the additional wear and tear from a 30% increase in residents? Yes, new residents will bring in additional rates for council … but there will also be more roads, drains, parks and associated infrastructure to be maintained. Adding more residents is not a solution, it's compounding the problem.

6. Road access/speed limit

Never mind about the Culburra road speed limit being reduced from 100 to 80km/h (which, by the way, was a development requirement!). As part of building West Culburra the developer is going to add not one, not two, but THREE roundabouts on the village's entrance road.

Can you imagine the congestion these roundabouts, plus over a thousand new residents, is going to cause for Culburra and Orient Point residents trying to travel between their home and Nowra? And what about access and/or an exit route in an emergency?

In the future, when the developer pushes on with further development West of West Culburra (yes, this IS on the horizon), even more roundabouts will be added to our one-road-in, one-road-out access.



7. Environmental concerns

It is known and accepted as fact that this development will destroy habitat and negatively impact at least five species listed as threatened or endangered under federal law.

- **Greater Glider - endangered and under conservation advice. Recommended for a recovery plan in 2016, but the government is way behind schedule with this.**
  Government conservation advice: Even potential habitat for the Greater Glider should be protected.
  Developer environmental report: the developer acknowledges that 38Ha of the West Culburra action area "is considered habitat critical to the survival of the Greater Glider" (p52).

- **Gang-gang cockatoo – endangered and under conservation advice since 2022.**
  Government conservation advice: "Actions that remove habitat critical to survival would interfere with the recovery of Gang-gang Cockatoos and reduce the area of occupancy of the species, and therefore must be avoided. It is important to retain both breeding and foraging habitats described above."

Developer environmental report: the West Culburra development "would remove 38.14 ha of foraging habitat for the Gang-gang Cockatoo through vegetation clearance" (p32).

- **Glossy Black cockatoo – vulnerable and under conservation advice since 2022. Recommended for a recovery plan in 2022, but this has not yet been delivered.**
  Government conservation advice: "Habitat critical to the survival of the subspecies should not be destroyed or degraded."
  Developer environmental report: the West Culburra development "would remove 8.13 ha of preferred foraging habitat for the South-eastern Glossy Black Cockatoo through vegetation clearing" (p37).

- **Grey-headed flying fox – vulnerable. Recovery plan launched 2021.**
  Government recovery plan advice: "The primary known threat to the survival of the Grey-headed Flying-fox is loss and degradation of foraging and roosting habitat."
  Developer environmental report: the West Culburra development site consists of "46.27 ha of potential foraging habitat in good condition" (p25).

- **Yellow-bellied Glider – vulnerable and under conservation advice since March 2022.**
  Government conservation advice: Known important populations of yellow-bellied gliders include "Shoalhaven populations (severely fire-affected, surveyed)"
  Developer environmental report: the West Culburra subdivision "would remove 38.14 ha of marginal foraging habitat for the Yellow-bellied Glider through vegetation clearance" (p42)

- **Powerful Owl - NSW conservation status: vulnerable**
  Although not covered in the developer's environmental report, the Powerful Owl is known by Culburran locals to inhabit the area. The Owl's preferred habitat is woodland and open sclerophyll forest and the closest woodland to the village of Culburra is the 47Ha to be clear-felled by the developer - making it highly likely that the Powerful Owls seen and heard by locals are using this forest for breeding and hunting.

8. Expert opinion

Expert opinions on the threats posed by West Culburra proposed development:
Jerrinja Local Aboriginal Land Council (objection submission re proposed development modifications, 2025)
Lake Wollumboola Protection Society (objection submission during LEC hearing 2021)

The Australian Plants Society, NSW (objection submission during LEC hearing 2021)
Our Future Shoalhaven (objection submission during LEC hearing 2021)
Shoalhaven Crookhaven Rivers Shellfish Quality Assurances Program (objection submission during LEC hearing 2021)
Joy Pegler, Ornithologist (objection submission to DA25/2276 2025)
Masters-qualified Coastal Engineer (objection submission during LEC hearing 2021)