NSW GOVERNMENT | Environment & Heritage

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Dear Kim

I refer to your request for comments on the Applicants Response to Submissions relating to the Concept Plan for a proposed mixed use subdivision at West Culburra.

In general, the Office and Environment and Heritage (OEH) position has not changed from the letter of 21 June 2013. This advice was based on the South Coast Region Strategy directions for the site which OEH are fully supportive of, and reflect the way forward for resolution of the environmental issues for the project.

The main points are summarised as follows:

- The s117 planning parameters and the South Coast Regional Strategy guiding development of the site is very clear that land within the catchment of Lake Wollumboola is considered unsuitable for urban development. Also it provides clear direction that any offsetting should occur dedicating the land in the Lake Wollumboola catchment for conservation purposes, including the site as a potential biobanking site. This point on the unsuitability of the Lake Wollumboola catchment for urban development has been further reinforced in recent times with the preparation of OEH Scanes Report 2013 update on the water quality sensitivity of the lake catchment provided to the Department of Planning and Infrastructure and the applicant.

- Confining the West Culburra project to the area outside the Lake Wollumboola catchment was always the sticking point from the previous subdivision design submitted from the 2007 and 2009 proposals. OEH did acknowledge that the February 2013 concept design was modified significantly to largely exclude development from the Lake Wollumboola catchment in line with the regional statutory planning requirements. The latest plan seems that it is going in the opposite direction again, with expansion of the development on the southern side of Culburra Road and increasing the size of the sports oval.

OEH comments on Aboriginal cultural heritage, flora and fauna, offsets and water quality matters raised in the Applicants Response to Submissions report are as follows:

Aboriginal Cultural Heritage

As raised in OEH's 21 June 2013 letter, while the majority of issues have been addressed there is still a need to fulfil further survey and investigation recommended in the applicants consultant archaeologist's report (Kuskie 2012) and supported by OEH. Namely, Recommendation 2 that further archaeological investigation of the high archaeological potential zone (see Kuskie, 2012:55, Fig. 10) within 200m of the south bank of the Crookhaven is undertaken to determine the extent of land required for adequate

conservation of a representative sample of the Aboriginal cultural heritage within and adjacent to the proposed development. This has not been undertaken and could prove a significant factor in the subdivision design, as a section of this area is proposed for development in the Concept Plan. Also Recommendation 5 of the Kuskie report should be addressed, particularly now the proposed Leisure Hub near Cactus Point was not something that was assessed by Kuskie.

Flora and Fauna

The June 2013 comments on flora and fauna with provisos are summarised as follows:

"In conclusion, OEH is satisfied that development is unlikely to have a significant impact on threatened species and their habitats. This is based on reviewing the information presented in the West Culburra Ecological & Riparian Issues & Assessment Report SLR March 2013 and on-site inspections by OEH ecologists. This is subject to removal of development and clearing from the Environment Protection foreshore zone. The land proposed to be cleared in the residential/industrial parts of the project are lowland coastal forest in moderate to good condition which have considerable environmental values. The development should only proceed if suitable offsets can be located and secured to ensure overall biodiversity values are maintained".

Biodiversity Offsets

The biodiversity offset proposal of 300ha at One Tree Bay is not acceptable to OEH and it is not in accordance with any accredited method of calculating offsets.

It is OEH's position that any offset parcel should be located in the Lake Wollumboola catchments in accordance with regional strategy requirements. The South Coast Regional Strategy (2007) for Realty Realization Culburra lands specifically states the wider Lake Wollumboola catchment lands should be considered as an addition to the National Park E1 zone and biobanking be the tool to achieve these.

Section 9.4 of the DGR's issued for the project by Department of Planning 8 July 2010 specifically required the environmental assessment to outline measures for conservation of existing wildlife corridor values (particularly the north/south linkage) on the site. This had been a recommendation from the South Coast Sensitive Urban Lands Review 2006 which identified not only the future development opportunities but the Realty Realization land that needed to be retained for conservation in the broader Culburra area.

It is noted that no north/south linkage is being retained onsite in the current design. OEH's position on this has always been that as the site adjoins potential offset lands, this provided an opportunity to create more ecological viable linkages in Culburra on a landscape scale so these did not have to be within the development site. If the retained conservation lands are not to be within the immediate locality, the design should be revisited to accommodate the recommended north/south linkage.

On the calculation of the size of a suitable offset the applicant's consultant deriving his own scoring system of credits against broad objectives is unacceptable. It does not fulfil the DG Requirements for the project that the Offset Strategy be prepared to ensure the loss of biodiversity/vegetation for the project is offset by the dedication of an appropriate area of other land. As stated previously in the June 2013 letter, OEH has reviewed the preliminary biobanking statement prepared on behalf of the applicant by Cumberland Ecology for the site and generally agrees with its finding and it provides a more a sound calculation to base offset requirements on.

As previously raised directly with applicant's consultants and by OEH letter 24 May 2010, the Commonwealth Department of Environment may have an interest in the offsets proposed as well for the site. The Commonwealth representatives at Culburra Planning Focus on 4 May 2010 for the project stressed the need for avoid, mitigate and offset for the impact of the development.

Water Quality and Management of Foreshore Area

In reviewing the most recent Toon Report (2013) it remains unclear as to whether adequate consideration has been given to the issues raised in the previous advice, with particular regard to the protection of the environmental foreshore zone. Whilst the associated Martens and Associates Pty Ltd contends compliance with the NSW Coastal Policy (1997) and ecologically sustainable development, it is not apparent that either water quality or ecological integrity can be achieved with the proposed clearing of the foreshore zone for "vistas", stormwater infrastructure, cycleway/footpath and public amenities including a public reserve.

Again, it is recommended that development and clearing not be located in and ideally setback from the environmental foreshore zone in order to:

- Protect the Swamp Oak Floodplain forest and Swamp Sclerophyll forest Endangered Ecological Communities.
- Maintain the ecological function of the riparian corridor at environmentally sensitive locations.
- Provide a landward opportunity for EECs to migrate with increasing sea level and reduce asset inundation frequency and potential maintenance related liabilities.

Further, due to the significant environmental impact of a boat ramp at Cactus Point, it is recommended that access and the structure be designed and limited to a small launching pad for canoes and kayaks only, reducing expectation that powered watercraft can use this facility post development.

OEH commends the revision of the Water Quality Monitoring Plan but contends that adequate consideration has not been given to contingencies related to the performance of stormwater infrastructure and larger design events should environmental triggers be exceeded. It is recommended that a risk management approach be developed in line with current engineering best practice to minimise impacts on the environmentally sensitive receiving waters.

OEH supports NSW Fisheries comments on the need to protect the water quality of Curleys Bay and the oyster leases located there and in particular that adequate measures are in place in the construction phase.

The detailed comments on the water quality are in included in Attachment 1.

Please do not hesitate to contact Calvin Houlison, Conservation Planning Officer on 4224 4179 or calvin.houlison@environment.nsw.gov.au should you have any queries.

Yours sincerely

9. May. 2014

CHRIS PAGE
A/ Regional Manager (Illawarra), South Branch

cc: Miles Boak – Conservation Planning Officer

Attachment 1 OEH detailed comments on update West Culburra Water Quality Reports

1 Water quality assessment

Two water quality objectives are provided in the *Water Cycle Management Report* (p24). Given the site is currently forested, the NorBE test would more than achieve the draft DCP load reduction objectives, and therefore the role of the DCP objectives is not clear.

OEH requests that the proponent clarify the water quality objectives for this proposal.

The MUSIC modelling informing this assessment indicates that water quality leaving the site will improve compared to the pre-development situation. In practice, it is unlikely urban development could improve the runoff quality from this largely forested catchment. The modelled pollutant removal rates exceed what is normally achieved by implementing water sensitive design for an urban development.

The water quality models are un-calibrated and un-validated and the results are not supported by current scientific literature. There is no indication that local data has been used to inform model parameter selection. Therefore, the model outcomes should be viewed as predictions that need testing.

OEH requests that the proponent provide the following regarding the water quality impact predictions:

- *A sensitivity analysis of key modelling assumptions to help determine likelihood of achieving the expected water quality improvements.*
- *Potential contingency options that could be implemented if on-going monitoring indicates that the expected pollutant reductions are not being achieved. These contingencies should be modelled and assessed as part of this development application, to ensure they are viable options. The design may need to include some flexibility to accommodate potential future modifications to the treatment train.*
- *A commitment to monitor the performance of the SQIDs and the quality of the receiving environments after construction and to use this data to calibrate and test the models post construction. Any differences from the current un-calibrated model predictions and the calibrated model should be used in contingency planning. This is particularly relevant given current research being undertaken by OEH suggests that SQIDs rarely perform to their design specifications (Wright, 2013b).*
- *As assessment of the water quality impact that may arise from the construction and operation of the cycleway within the Zone 7(a). This shall include, but not be limited to, consideration of construction impacts and typical pollutant generating activities such as dog walking and littering.*
- *An assessment of the potential impact of increased freshwater runoff from the site on the values supported by the Crookhaven Estuary is required. This should be based on an accurate understanding of the hydrodynamics. The Crookhaven River and Curleys Bay are very shallow in the vicinity of the proposed development. It is unlikely that there will be stratification, and therefore unlikely that the freshwater plume will float above the seagrass (as suggested on p 36 of the Water Cycle Management Report).*

OEH recommends an independent review of the modelling (including the sensitivity analysis and contingency options modelling) be undertaken as part of the development assessment process. The review, at a minimum, should:

- *assess the appropriateness of the input data and parameters;*

- *assess whether the modelled outcomes are realistic and achievable in practice; and*
- *recommend whether local data should be used to calibrate the MUSIC model.*

Note OEH already recommended the use of local data in the environmental impact assessment requirements in its letter of May 2010.

Lake Wollumboola Catchment

It is acknowledged that only a small portion of the development is in the Lake Wollumboola catchment. However, the unsuitability of this catchment for development is well established in strategic planning framework for the area.

In this regard as recently as last year the need for protection of this catchment was reinforced in OEH report Scanes et al., 2013a and b, p6 which notes:

> *Given the demonstrated ecological significance of the lake, the relative rarity of its biotype and its sensitivity to catastrophic state change we fully support the current recommendation of no development within the lake catchment.*

OEH recommends that the proponent amends the drainage design to ensure no runoff from the development shall discharge towards Lake Wollumboola during construction or operation, including from the retirement village, round-about and oval

2 Groundwater assessment

More detailed groundwater assessment and reporting is required to better identify any impacts on groundwater quality, flow, levels and groundwater/ surface water interactions.

OEH requests that the following issues are included in the revised assessment:

- *Detailed reporting on the groundwater modelling. There is currently insufficient information to assess the reliability of the CLASS-U3M-1D model predictions of recharge. This should include (but not be limited to) justification for parameter selection. For example, the report should explain why the bore log data was not used to specify soil depth and soil type parameters. Also, justification for adopting pasture in the model is required (as this will affect infiltration and evapotranspiration rates).*

- *Impact of the proposed development on groundwater dependent ecosystems. This should include consideration of potential impacts on aquatic ecosystems and aquaculture adjacent to the proposed development.*

  The conclusion that the aquifers beneath the site are of low value to stakeholders (Water Cycle Management Report, p 22) is not based on any modelling or evidence presented in the report.

  The impact of changes to groundwater recharge on groundwater dependent ecosystems should be included in this assessment. The groundwater modelling indicates there will be a 19mm/yr increase in groundwater recharge. The Water Cycle Management Report concludes this is 'minor' (p20). This increase represents 40% of the existing recharge, which Water Quality Team considers to be more than a minor increase, and therefore the impact should be assessed.

- *The direction of groundwater flow and groundwater/surface water interactions.*

  - Section 3.3.5 of the Water Cycle Management Report (p18) concludes there is minimal interaction between the upper unconfined aquifer with surface water, as no water was encountered during monitoring. However, this assessment is based on a limited sample taken during a period of no rainfall.

  - The assessment only provides information on groundwater depth, not hydrology. A more thorough assessment of groundwater flow is required to support any conclusions about impacts on receiving waters, including any impacts on Lake Wollumboola. Justification for the statement that 'flow vectors are expected to generally mimic the surface topography' (p15) should be provided.

  - This information is also required to assess the appropriateness of the design of the groundwater quality monitoring program.

- *Potential impacts on groundwater quality.*

- *Ability for the proposed water quality treatment measures to perform, taking account of groundwater levels.*

- *The Water Cycle Management Report (p14) inconsistently reports the number of boreholes completed as part of the field investigations. This should be clarified.*

OEH recommends an independent review of the adequacy of the groundwater modelling be undertaken as part of the development assessment process. As part of this review the appropriateness of the input data and parameters should be assessed.

This is recommended given the model has not been calibrated or tested with local data.

3. Comments on Sediment and Erosion Plans

The following additions/changes to the Sediment and Erosion Control Plan and Water Quality Monitoring Plan (that were submitted as part of the Water Quality Monitoring Plan) based on existing, available information.

Formal conditions of consent can be provided based on the requested, revised documentation, if development approval is recommended.

- Construction work should be scheduled to minimise the area of disturbance, including staging the clearing and removal of topsoil to only occur immediately before starting bulk earthworks.

- Stockpile locations and their sediment and erosion controls should be included on the Plan. Stockpile management should be undertaken in accordance with Chapter 4 of the Blue Book (Landcom, 2004).

- Given the sloping nature of the site, slope lengths should be minimised. This can be achieved either through staging work, or though construction of mid-slope berms or other water diversion structures, which discharge to sediment basins.

- Diversion bunds should be constructed upslope of any construction work (unless the ridge top defines the upslope extent of the construction work). These upslope bunds should discharge to a stabilised area in a manner that does not cause scour.

- Sediment and erosion control measures should be provided for construction of the oval, the round-about on Culburra Road, and the proposed small residential development to the south of Culburra Road. These measures should not discharge to the Lake Wollumboola catchment.

- The cycleway should not be constructed within 10 metres of the high tide level of the Crookhaven Estuary and appropriate sediment and erosion controls provided.

- The Plan should include a monitoring program to gauge performance of the sediment and erosion control system. The monitoring regime should include triggers for mitigation and management actions. Monitoring should include sampling overflow from the sediment basins. Where TSS exceeds 50mg/L any obvious causes should be identified and immediately rectified. If there is no obvious cause, flocculation of the basin may be required, in consultation with OEH. The proponent should demonstrate to OEH that flocculants selected have low toxicity. This approach recognises the dispersible characteristics of the soil.

- A commitment to undertake an assessment of groundcover within Zone 7(a) Environmental Protection Zone at least 18 months (or other time period as justified by the proponent as sufficient for plant establishment) prior to construction. The potential to increase groundcover (prior to construction) to 70%, within 10 metres of the high tide level (where this coverage is not already achieved), should be discussed with the relevant authorities. Groundcover will help to maximise the pollutant removal efficiency of the Environment Protection Zone.

Comments on Groundwater Monitoring Plan

- Groundwater monitoring locations should be determined considering groundwater flow direction. Justification for monitoring locations should be documented.

- Groundwater monitoring locations should include as a minimum (in addition to the points identified in the Water Quality Monitoring Plan):
  - Point(s) to monitor any potential impacts on Lake Wollumboola.

  - Point(s) up-gradient of the development (depending on groundwater flow direction), to support identification of potential changes arising from the development.
  - The monitoring plan should include justification for selection of parameters to be monitored.

- The monitoring plan should make a commitment for baseline monitoring of groundwater levels and groundwater quality, to inform impact assessment monitoring.

- The monitoring plan should include actions or mitigation measures that can be applied if baseline levels and quality are exceeded.

- The Water Quality Monitoring Plan (p11) indicates that groundwater monitoring will cease after three years, if the results are 'acceptable'. The term 'acceptable' should be defined.

Comments on Estuary Water Quality Monitoring Plan

- The monitoring plan should include locations of the monitoring sites, clearly justified and mapped. The plan should confirm that monitoring sites WQ1 – WQ4 are in addition to the Council's existing monitoring.

- The monitoring plan should identify the parameters to be monitored, with justification for their selection.
  - The plan should confirm that monitoring of all parameters will be undertaken for all estuary water quality monitoring sites (i.e. WQ1 – WQ4), not just WQ4 (as indicated in Table 2 of the Water Quality Monitoring Plan).
  - All nutrient forms should be analysed, and sent to a certified laboratory.

- The plan should include actions or mitigation measures to be applied if baseline levels are exceeded.

- Sampling should include wet weather events as well as routine monthly sampling. Water Quality Team recommends sampling a minimum of six wet weather events each year.

- The Water Quality Monitoring Plan (p14) indicates that monitoring will be undertaken for 3 after completion of the development. This should be 3 years. Also, this dot point indicates that after three years the sampling regime should be revised and adapted as required. Any changes should be made in consultation with relevant authorities.

Comments on SQID Management Plan

- All site runoff should be directed through the proposed constructed wetlands (it is not clear from the information provided if this will occur).

- An independent audit of each SQID installation should be undertaken once constructed. This audit should ensure each SQID is installed according to design specifications and is functioning as expected. Appropriate rectification actions should be implemented as required.

- Inspection frequency for SQIDs should be monthly.

- Flow patterns in wetlands should be observed during each inspection to identify any presence of short-circuiting that may inhibit the uniform distribution of inflow.

- Duration of inundation in bio-retention swales and basins should be monitored to assess operating detention times compared with the design parameters.

- Hydraulic conductivity of soil media should be monitored.

- Monitoring of inflow and outflow for the following parameters should be undertaken on a monthly basis, and should capture at least six rainfall events each year. Following each inspection, an assessment of the performance of the device, compared to the design calculations, should be made. The SQID management plan should include contingency actions and mitigation measures that will be implemented if performance is found to be below the design standard.

    - TSS
    - TP
    - TN
    - Flow
    - Rainfall.

    (note: all forms of the nutrients shall be analysed to give an indication of system efficiency)

Comments on Secondary Indicator Monitoring

The Water Quality Monitoring Plan should be revised to include secondary indicator monitoring relevant for both the construction and operation phases of the project.

Many of the inspection points listed on page 18 of the Water Quality Monitoring Plan will not be in place during construction, as they are the final water quality management measures (e.g. bio-retention basins, SQUIDs, wetlands). The secondary indicator monitoring should be adapted to also adequately monitor performance of construction phase measures e.g. sediment basins, diversion bunds, sediment fences, energy dissipaters, stabilised site entry, and site stabilisation and revegetation.

The Water Quality Monitoring Plan should be amended to better monitor the health of the foreshore environments including riparian vegetation, seagrass, mangrove vegetation and SEPP 14 wetlands. The submitted Water Quality Monitoring Plan indicates that only monitoring and mapping of dying or dead vegetation will occur. Indicators of health (prior to plant death) should also be included in accordance with approaches recommended through the NSW Monitoring, Evaluation and Reporting Strategy.

PREVIOUSLY PROVIDED COMMENTS IN RELATION TO DETAILED DESIGN OF THE STORMWATER MANAGEMENT SYSTEM

At the detailed design stage, a design report should be submitted. The report should demonstrate that the stormwater management system is designed in accordance with correspondence received by OEH from Martens Consulting Engineers in August 2013, as follows:

- Flows shall be managed for the range of storms up to the 100 year ARI event (as per Australian Rainfall and Runoff – AR&R - and Australian Runoff Quality).
- Impacts of any backflow on the treatment and stormwater management systems shall be considered.
- Flows that bypass the stormwater treatment systems shall be transferred safely through the development as per AR&R.
- Flows that filter through the system and the slotted pipes shall be considered and designed appropriately to avoid water logging and flooding of the treatment systems.
- Constructed wetlands shall be designed in accordance with the *Constructed Wetlands Manual* (1998). The design drawings and calculations shall demonstrate that suitably sized and designed wetlands can be constructed within the proposed strip of land adjacent to the boundary with Zone 7(a). The wetlands shall be able to convey the design events and the detention time shall be appropriate for the required performance.
- Scour protection and energy dissipation shall be provide, and velocity calculations shall be submitted, where bio-retention swales are proposed on slopes >4%.
- Outlets into the estuary shall include protection works sized in accordance with Landcom (2004) to protect against erosion and scour and to protect estuary environments.

REFERENCES

Scanes P, Ferguson A, Potts J (2013a) *Joint Submission on Environmental Sensitivity of Lake Wollumboola: Input to Considerations of Development Applications for Long Bow Point, Culburra,* NSW Office of Environment and Heritage, Southern Rivers Catchment Management Authority – Agricultural Extension, Fisheries NSW, Sydney, Australia

Wright A, Haine B, Scanes P (2013b) *Determining the effectiveness of urban stormwater constructed wetlands in the Lake Macquarie catchment area,* NSW Office of Environment and Heritage, Sydney, Australia.