Office of Water

PCU026420

Major Projects Assessment
Department of Planning and Infrastructure
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SYDNEY NSW 2001

22 September 2011

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Our ref : ER20520
Your ref: MP 09_0019

Attention: Diana Marder

Dear Ms Marder

Riverside Tourist Cabins (MP 09_0019), South West Rocks - Kempsey Shire Council
Exhibition of Environmental Assessment

I refer to your letter received by the NSW Office of Water (NOW) on the 1 August 2011 and advise that the NOW has reviewed the Environmental Assessment for the Riverside Tourist Cabins and provides the following comments (**Attachment A)** and recommended conditions of approval (**Attachment B**) for your consideration.

If you require any further information please contact Brett McCulloch, A/Planning and Assessment Coordinator on (02) 6676 7381 at the Murwillumbah Office.

Yours sincerely

Mark Mignanelli
Manager Major Projects, Mines and Assessment

Office of Water

Attachment A

MP 09_0019 Riverside Tourist Cabins Environmental Assessment Review

1. Project site description.

The project proposal as described in the Environmental Assessment (EA) is for a tourist facility to construct nine fully self-contained tourist cabins and associated infrastructure works on Lot 4 DP 1022342 (total area 22.58 Ha) which fronts the Macleay River approximately 3 km from South West Rocks (Attachment C). The project site has very low relief and is within the Macleay River floodplain. The only existing structure on the project site is a tavern which is located 600 m north of the New Entrance Rd/Marlin Dr corner of the site.

The soil type on the project site is a silty loam top soil to approximately 0.5 m which overly course grain sands. The soil landscape on the land to be developed is coastal alluvial plains which consist of Holocene fluvial sediments dominated by clay/loams and fine sands. The majority of the project site is an estuarine landscape characterised by tidal flats in the estuarine reaches of the alluvial plain comprising of unconsolidated Holocene estuarine sediments consisting of sand, silt, clay and stratified shell layers in mud (*Eddie 2000).

The site is mapped as high risk ASS as shown on Attachment C. As a result of the level plains (extremely low relief) there is usually no erosion but extensive drainage works will expose potential ASS (PASS) which will result in acid runoff into waterways. To prevent the acid runoff into waterways the soils should not be drained below the depth of PASS. The area to be developed is not suitable for urban development because of regular flooding, waterlogging and the PASS risk and foundation hazards from the low wet bearing strength of the soil profile.

The land is not suitable for the construction of dams, because of the potential of the spoil to produce acid leachate and water in the storage will possibly become acidic, saline and/or have toxic levels of aluminium (Eddie 2000). A SEPP 14 Coastal Wetland covers the majority of the land area within the boundary of the project site which comprises of a mix of mangroves, swamp oak, swamp forest, salt marsh and land formerly of pasture. A number of SEPP 14 Coastal Wetlands occur within a 10 km radius of the project site (Attachment C). The following is a review of the EA with respect to the applicant addressing Director General's Environmental Assessment Requirements (DGR) for the proposal which is currently under exhibition.

2. Water balance and water licensing requirements.

The project site is not subject to a Water Sharing Plan (WSP) under the *Water Management Act 2000* (WMA) for both ground and surface water sources; therefore, all licensing requirements will be administered under the *Water Act 1912* (WA). The EA states in s.2.8 and Appendix H that 3 bores holes were sunk but there is no evidence of the bores being licensed for monitoring purposes or any bores authorised within the project site (Attachment C). The applicant must contact the Licensing Branch at the NOW's Grafton office on (02) 6641 6642 to authorise the bore holes under Part 5 of the WA if the bores are to remain or otherwise they must be decommissioned. Nevertheless, NOWs 'Form A' for all bores must also be forwarded to the Licensing Branch and the hydrogeologist based in the Grafton office for review in the context of proposed development. If a Form A has not been completed the applicant must provide to NOW

all the details required in completing a 'Form A' which is located at http://www.water.nsw.gov.au/Water-licensing/Applications/default.aspx.

The EA mentions a proposed excavation for a constructed wetland which will be supplied by surface water runoff from the majority of the site, predominantly from constructed swales. In s.6.4.2.5 the applicant mentions that the proposed constructed wetland will be used as a sediment retention basin during the construction phase of the project.

NOW does not consider the excavation an *"excluded work"* on a *"minor stream"* as defined in the Water Management (General) Regulation 2011 (WMR) and as a consequence a licence under Part 2 of the WA may be required for the following reasons. The constructed wetland will act as a buffer for increases in potential stormwater runoff from the proposed site providing a sediment and filtration system prior to discharge into the SEPP 14 wetland via drainage channels (refer to Illustration 4.1 & 4.6 of EA). NOW considers the constructed wetland has a strong hydrologic connection with the SEPP 14 wetland as the excavation will benefit from the proposed restoration of tidal flow and inundation from floods, especially when catchment runoff exceeds the capacity of the main river channel of the Macleay River. In schedule 2 of the NSW Government Gazette No.37 (24 March 2006, pg 1500) a *"river"* in section 5(1) of the WA for the purposes of Part 2 of the WA is defined as any stream or part of a stream which at any time carries flows emanating from a third, fourth or higher order stream (e.g. Macleay River).

The constructed wetland is not considered to be on a *"minor stream"* and accordingly is not within a constituted Harvestable Rights Area under section 54 of the WMA (NSW Government Gazette No.40, 31 March 2006, pg 1628). Therefore, the applicant must make application for a surface water licence under Part 2 of the WA to authorise the excavation for conservation of water for environmental purposes. Notwithstanding the above, the NOW recommends that a licence under Part 5 of the WA is required for the excavation if the predominant source of water supplying the excavation is groundwater; this will supersede the requirement for a licence under Part 2 of WA. The NOW recommends the applicant contact the Licensing Branch in the NOW Grafton office to discuss the licensing arrangement for the excavation.

In the event that a groundwater or surface water licence is required under the WA for the excavation or any other major works that intercept groundwater or capture surface water runoff (e.g. other stormwater detention basins), it is a standard practice within the NOW that a security deposit (Bond or Bank Guarantee) be sought from the applicant prior to the commencement of such a project to remediate any potential or unforseen impact(s) to the surface and/or groundwater source to a value of $250,000. Any additional requirements for a security deposit (above the $250,000 already indicated) to remediate other potential impacts for this project will be determined during the licensing process.

The EA discusses in s.4.9.2 that domestic water supply will be provided from rainwater tanks at each individual cabin and connection with the Macleay Water reticulation system will also be provided for back-up when there is insufficient rainwater. In addition, water supply to other users in the complex will be supplied by the Macleay Water reticulation system. The MUSIC model was used to assess the overall water balance for the site in s.6.4.2.3 which NOW considers an appropriate tool for such an evaluation. Notwithstanding the above, the NOW advocates whilst there is provision in the WMA to allow for limited growth in town water supplies this could still impact subsequently on other users.

The EA needs to further address the issue of a sustainable water supply for the project. NOW recommends the applicant prepare Groundwater and Surface Water Management Plans (GWMP and SWMP) that incorporate a detailed description of a sustainable and efficient water

supply which can be sourced and implemented with minimal reliance on accessing valuable surface and groundwater resources. The SWMP and/or GWMP should include an assessment of the overall water balance through the implementation of Building Sustainability Index (BASIX), Integrated Water Cycle Management and Water Sensitive Urban Design.

3. Water cycle and ASS management.

For the type of development under application the NOW's main concerns and recommendations include but are not limited to:

1. the potential to contaminate groundwater through the direct infiltration of stormwater runoff or the construction of stormwater ponds/lagoons/wetlands that intercept the water table which may provide further movement of pollutants down gradient that could discharge to surface waters;
2. ponds/lagoons/wetlands that are constructed below the water table should be lined (clay or geo-fabric) to minimise the hydraulic connection with the surrounding groundwater system or if unlined constructed so that the base of the excavation is 1 m above the water table for most of the time;
3. the potential of ASS to be exposed when constructing ponds/lagoons/wetlands and drains creating acid leachate;
4. potential of eutrophication and algal blooms in constructed ponds/lagoons/wetlands and the possibility of toxic algae being flushed to surface waters and/or natural wetlands;
5. on coastal land of very low relief flooding is an issue especially considering the longer term possibility of sea level rise and increases in the range of inundation depths; and
6. all works that intercept groundwater including constructed ponds/lagoons/wetlands must be licensed under Part 5 WA.

The applicant in s.4.3 of the EA discusses site fill levels and the proposed excavation supplying most of the fill material which will eventually be a wetland. Presumably the soil material used as fill is not PASS. As indicated in the geotechnical assessment (Appendix H) and s.4.3, the varying depth levels of the constructed wetland (0.3 – 0.4 m AHD) are above the level of PASS and groundwater (Appendix J & H of EA). NOW recommends that if any material excavated is low PASS material that the soil used for landfill be treated with lime up to 4 kg/m^3 and/or in accordance with the Acid Sulfate Soil Management Advisory Committee (ASSMAC) Management Guidelines (1998). Furthermore, the NOW request further information with respect to the applicant's proposed actions and mitigation measures relating to the disturbance of ASS and potential offsite sedimentation associated with the project, especially at the construction stages. These provisions must be incorporated in an Acid Sulfate Soil Management Plan (ASSMP) prepared by the applicant. In accordance with standard practice, NOW may require a Security Deposit (Bond or Bank Guarantee) which will enable remediation of any ASS impacts should they occur.

NOW has noted that excavation into the natural soil horizon may occur where pathways and stormwater swales are constructed outside the filled area which is expected to be up to a maximum depth of approximately 0.5 m and will be above actual ASS (AASS) and PASS material which occur greater than 1 m below the natural ground surface (s.6.7.2.3 & Appendix J of EA). Notwithstanding the above, in s.4.9.3 the design details of the swales are discussed but the NOW requires the applicant to provide more detail regarding the design of the bioretention system installed especially at the base of the swales and constructed wetland in a SWMP to ensure stormwater infiltration does not cause contamination of connected groundwater sources and the adjacent SEPP 14 wetland.

The EA mentions (s.4.4) surface drainage of the site will be conveyed by open swales which will discharge into the constructed wetland prior to discharging into the natural wetland area further east. In the Integrated Water Cycle Management (IWCM) section of the EA (s.4.9) it is mentioned that grassed or vegetated swales will provide preliminary treatment of stormwater,

promote infiltration of stormwater to groundwater and convey direct stormwater runoff to the constructed wetland for further treatment prior to discharge into the SEPP 14 wetland. The applicant noted in s.6.4.2.2 of the EA that the MUSIC modelling of stormwater treatment applied suggested predicted pollutant removal (pollutant load reductions) was to the satisfaction of the Council's objectives for suspended solids and nutrients and is an improvement to the current water quality discharge to SEPP14 wetland; however, NOW considers a more comprehensive water quality modelling and monitoring program must be implemented.

In support of NOW's position, the applicant concedes that the MUSIC software applied has limited capabilities and cannot adequately assess all pollutants listed in Council's objectives (e.g. litter, coarse sediment, oil and grease), which NOW considers unsatisfactory. Further, NOW advocates that the proposed bioretention swales must be designed in accordance with the principles of Water Sensitive Urban Design and satisfy Council's objectives for suspended solids and nutrients (i.e. *Kempsey Shire Council Stormwater Management Plan Technical Supplement (2004)*) and compliance must be demonstrated in a SWMP and/or GWMP prepared by the applicant in consultation with NOW.

NOW also recommends that the applicant be consistent with the Blue Book - *Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition, 2004 (Landcom)* ("blue book") with respect to an erosion and sediment control plan for the project and evidence of such must be outlined in the GWMP and/or SWMP.

As mentioned earlier, NOW has management concerns regarding stormwater detention basins in relatively flat coastal floodplains with high water tables. In Appendix H of the EA the water table was intercepted at 1.3 m in all three boreholes. The EA in s.4.9.3.2 states that the maximum depth of the constructed wetland is to be 0.4 m. In s.6.4.3.2 the applicant states that the base of the proposed excavation will be 0.6 to 0.8 m above the level of the groundwater and that there will be some infiltration from the constructed wetland to the groundwater. Therefore, NOW recommends the base of the proposed constructed wetland be lined with clay or geo-fabric to minimise the hydraulic connection with the surrounding groundwater system or to construct the wetland so that the base of the excavation is 1 m above the water table. In summary, NOW recommends a 1 m buffer above the highest predicted groundwater table for all excavations, in particular infiltration/detention basins; if the base of the excavation is within this 1 m buffer the applicant will need to implement impermeable liners to prevent direct infiltration to the groundwater and specify this requirement in the GWMP or SWMP.

4. Surface and groundwater quality and quantity monitoring, modelling and management.

The proposed constructed wetland of a surface area of 1000 m^2 and permanent pool volume of 40 m^3 (s.4.9.3.2) will capture partially treated stormwater runoff conveyed by open grassed or vegetated swales. The applicant states in s.4.9.3.2 that the constructed wetland will provide for final treatment of stormwater via enhanced sedimentation, fine filtration and biological uptake processes to remove pollutants. Further, it is envisaged the constructed wetland will provide a wetland buffer between the SEPP 14 wetland and the cabins and associated infrastructure as indicated in s.4.6 of the EA. However, the NOW requires the applicant in addition to what has already been addressed in the EA and Appendix C (Wetland Management Plan), more detail regarding the concept (i.e. methods and/or models for water quality treatment), design (including all bioretention systems), construction (works and machinery), operation and maintenance of the constructed wetland in the SWMP or GWMP.

The applicant proposes in s.4.9.1 that the water quality of surface and groundwater will be protected via an extensive treatment process providing high quality water suitable for discharge to the SEPP 14 wetland. The NOW requires the applicant to provide more detail regarding the extensive water quality treatment process and the water quality and quantity monitoring network and program proposed and to incorporate these details into the GWMP and SWMP. Monitoring

bores should be strategically placed on the site prior to the development to enable proper groundwater quality and quantity investigations and to provide a baseline level of information. The groundwater monitoring bores are required to be appropriately authorised by the NOW before installation. Monitoring must be undertaken prior to and at construction and operational stages of the proposed development. NOW also recommends that surface water quality at all discharge points must be monitored and that the quality of water discharged from the constructed wetland is of similar or better quality than the receiving SEPP 14 wetlands adjacent and outside of the project site prior to development.

NOW recommends baseline monitoring for a minimum of 2 years fortnightly sampling for surface and groundwater quality and/or quantity for all aquifers, watercourses and wetlands within and adjacent to the development site. The range of baseline water quality data for surface and groundwater must include but not is not necessarily limited to the following parameters: turbidity, pH, temperature, electrical conductivity, dissolved oxygen, total suspended solids, nutrients (TP, TN, filtered N & NO_x), oil and grease, cations/anions (Ca, Mg, Na, K/HCO_3, SO_4 and Cl), soluble aluminium, ammonium ion, chlorophyll-a, faecal coliforms, enterococci, algae and blue-green algae.

Until the baseline data has been reviewed and evaluated, the default trigger levels for ANZECC and ARMCANZ (2000) guidelines should be applied. Following review and evaluation of the baseline data, consideration can be given to revising the trigger levels in consultation with NOW. The GWMP and SWMP prepared by the applicant must provide the results of the baseline data monitoring already undertaken, proposed future monitoring and reporting programs, including a contingency plan, and forwarded to NOW for review. Following the NOW's review of the baseline water quality data, the applicant may be required to prepare a blue-green algae management plan. NOW may condition the release of the Security Deposit (Bond or Bank Guarantee) based on the results of the water quality monitoring program providing the applicant has demonstrated that the proposal meets water quality requirements including minimal risk from PASS exposure into the longer term.

Notwithstanding the above water quality and quantity monitoring recommendations, NOW does endorse the 900 mm culvert pipe underneath Government Rd with an automative tide floodgate fixture to restore and control tidal flows to the SEPP 14 wetland as discussed by the applicant in s.4.6.1. NOW also supports the water quality monitoring and mitigation measures proposed for AASS in the wetland area in s.4.6.2. However, NOW recommends the water quality monitoring program and reporting protocol for the Government Rd culvert must be provided in the SWMP prepared by the applicant in consultation with NOW. Further, the applicant needs to notify NOW if any activity may impact on surface and groundwater.

5. Riparian and wetland management.

It is noted that part of the area to be developed is within 40 m of the Macleay River (s.2.7 of EA). Further, the EA states (s.4.2) that the proposal will include the construction of a wetland buffer between the cabins and the SEPP 14 wetland for the purpose of filtering stormwater. Although Part 3A Major Projects are exempt from requiring a controlled activity approval (s75U of the *Environmental Planning and Assessment Act 1979*) assessment of the proposal is required to take into account the requirements of relevant water related legislation and NOW's *Guidelines for Controlled Activities*. The guidelines recommend 20 – 40 m minimum Core Riparian Zone (CRZ) widths for both sides of the watercourse for any third order or greater watercourse (including estuaries, wetlands and any parts of rivers influenced by tidal waters – (merit assessment based). Furthermore, part of the reasoning for considering the proposal was on the basis that remediation works will be undertaken to the SEPP 14 wetland, which will need to be identified and addressed in the SWMP. In relation to the management of the SEPP 14 wetland and any other affected wetland within and outside of the project site, the applicant must be consistent with NSW Wetland Management Policy which is available at

http://www.water.nsw.gov.au/Water-Management/Law-and-Policy/Key-policies/default.aspx. The above provisions must be addressed in the SWMP and/or GWMP where relevant by the applicant in consultation with the NOW.

End of Attachment A
22 September 2011

Attachment B

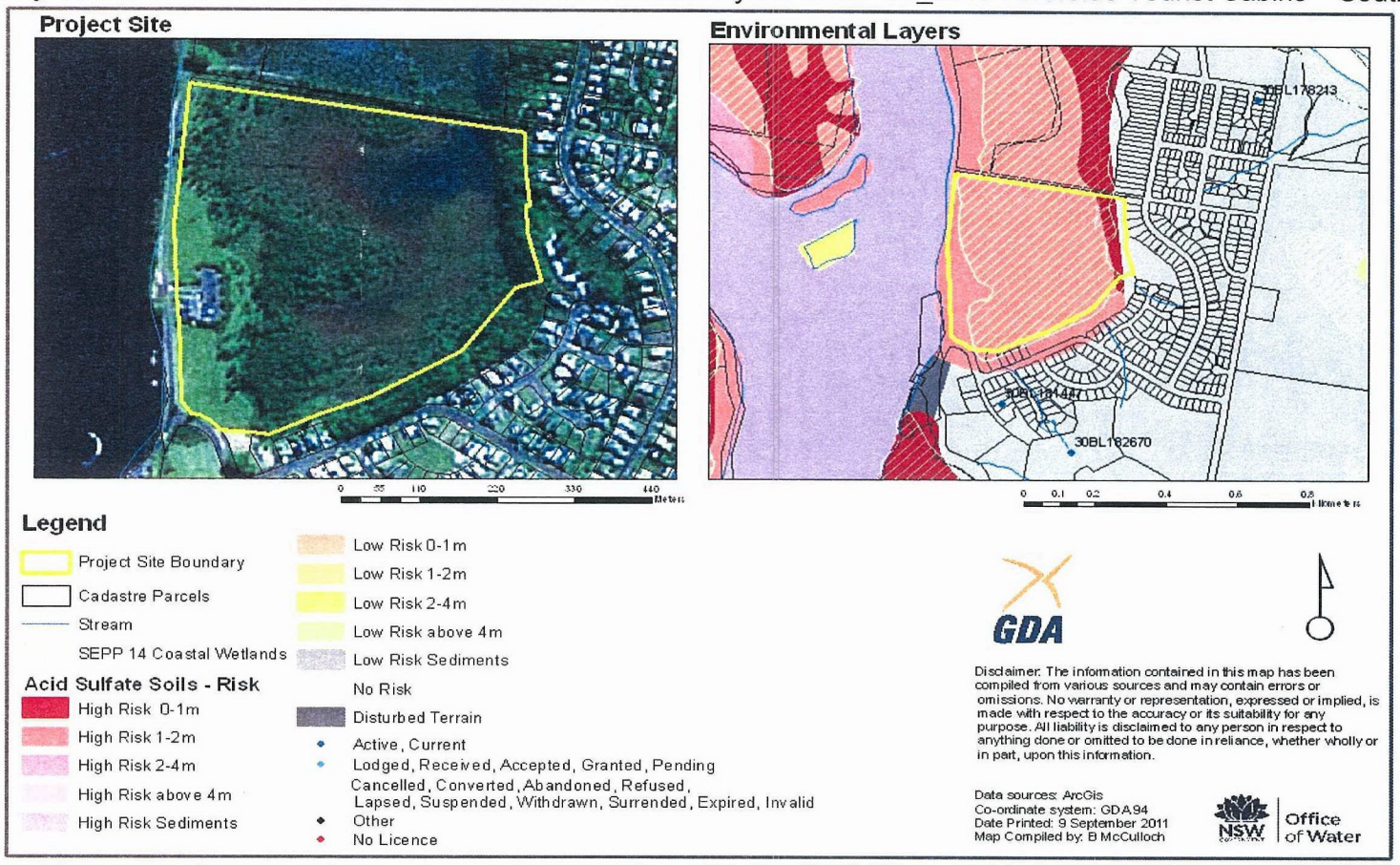
NSW Office of Water's Recommended Conditions of Approval

1. The applicant is to prepare a Surface Water Management Plan in consultation with and to the satisfaction of the NSW Office of Water prior to the commencement of works.
2. The applicant is to prepare a Groundwater Management Plan in consultation with and to the satisfaction of the NSW Office of Water prior to commencement of works.
3. It is recommended that the applicant prepare an Acid Sulfate Soil Management Plan.
4. The applicant may need to prepare a Blue-Green Algae Management Plan following the NSW Office of Water's review of baseline data.
5. The applicant to obtain the relevant licences to the satisfaction of the NSW Office of Water under the *Water Act 1912* and the *Water Management Act 2000* (whichever is relevant at the time application is made) for all activities that intercept or extract groundwater and surface water prior to commencement of these activities.
6. A Security Deposit (Bond or Bank Guarantee) of an amount specified by the NSW Office of Water for the proposed development shall be paid.
7. The applicant must ensure that there are no infiltration or detention basins to be located within a one (1) metre buffer above the highest predicted groundwater table.
8. The applicant must consult with the NOW if there are any future works that intercept subsurface water.
9. The applicant must adhere to the Core Riparian Zone widths on both sides of watercourses and the additional vegetated buffers to allow for edge effects detailed in the NSW Office of Water's *Guidelines for Controlled Activities (2010/2011).*

End of Attachment B
22 September 2011

Office of Water

Attachment C: Project site, water licences and associated environmental layers for MP 09_0019 Riverside Tourist Cabins – South West Rocks.



End of Attachment C
22 September 2011