



ENVIRONMENT PROTECTION AUTHORITY

Your ref : 08_0194
Our reference: : FIL06/2036; DOC11/53362
Contact : Jon Keats 0266402501

Ms Heather Warton
Director Metropolitan and Regional Projects North
Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Attention: Brent Devine

Dear Ms Warton

RE: Proposed Stage 1 development of Kings Forest, Tweed Shire Council LGA, MP08_0194

I refer to correspondence and documentation provided in relation to the above proposal, received by the Environment Protection Authority (EPA) on 21 November 2011. I also refer to subsequent telephone discussions with your staff in which an extension of time was granted for lodging a submission.

The EPA has reviewed the information provided and has determined that it is able to support the proposal, subject to the Department of Planning and Infrastructure (DoPI) addressing the issues identified in Attachment 1.

The EPA notes that a number of aspects of the current proposal differ from the Concept Plan application and do not appear to be consistent with the Concept Plan Approval. In the EPA's view the proposed development requires some significant amendments in relation to biodiversity management and these amendments are important for the EPA's ongoing support of the proposal.

Attachment 2 contains the EPA's recommended conditions of approval, should an approval be issued by your Department. Attachment 3 contains the EPA's detailed assessment of the proposal, including justification for recommended amendments, which would ensure the protection, maintenance and enhancement of biodiversity values of the site and to Aboriginal cultural heritage.

The EPA would appreciate an opportunity to review the draft Director-General's Environmental Assessment Report for this proposal. Should you have any inquiries regarding the EPA's submission please contact Adrian Deville on (02) 6640 2583 in the first instance.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Brett Nudd', written over a horizontal line.

BRETT NUDD
Manager North Coast Region
Environment Protection Authority

6 - FEB 2012

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ATTACHMENT 1: RECOMMENDED AMENDMENTS TO THE PROPOSAL

The EPA recommends that the following issues be resolved prior to determination of the proposal. (Further detailed analysis of these issues is provided in Attachment 3)

Ecological Buffer Zones

1. The proposal should be revised to preserve the purpose and integrity of the ecological buffer zones (EPZs) required under the concept plan approval (CPA). All infrastructure including bushfire asset protection zones (see also Attachment 2 for recommended conditions of approval relating to the Bushfire Management Plan), roads and footpaths should be located within the approved development footprint and outside of the EPZ, unless there are compelling ecological reasons presented otherwise.
2. The proposal and related management plans should be revised to avoid the loss of Littoral Rainforest endangered ecological community (EEC) in Precinct 1.
3. If approval is to be granted allowing the use of EPZs for the provision for development related infrastructure, the proposal should demonstrate that losses of other existing native vegetation communities are unavoidable, and demonstrate a commitment to appropriate offsetting of any such losses on a like-for like basis.
4. If approval is to be granted allowing the use of EPZs for the provision for development related infrastructure, the applicant should provide further information regarding the significance of earth works and changed hydrology upon existing and potential habitat values of the environmental buffer and environmental protection zones across the site.

Koala Plan of Management

5. The Koala Plan of Management (KPOM) should be revised to the satisfaction of EPA. Key points (see Attachment 3 for details) which need to be amended include:
 - objectives, performance criteria, timelines, monitoring and reporting issues;
 - clarifications of commitments to contingency plans/adaptive management;
 - the design, alignment, maintenance and ownership of the proposed fence; and
 - links and consistency with other studies, advisory groups and the KPOM being finalised by the Tweed Coast Koala Advisory Group.

East-West Corridor

6. Condition B4 of the Concept Plan Approval (CPA) sought to establish an east west wildlife corridor of up to 100 metres wide (with a minimum of 50 metres at any one point) "to provide for habitat and the movement of threatened native fauna that inhabit the site". The proposed development layout should be amended to comply with this CPA Condition.

Impacts on Acid Frog Species

7. The Acid Frog Compensatory Habitat Plan should be revised to the satisfaction of EPA (see Attachment 3 for details).

ATTACHMENT 2: RECOMMENDED CONDITIONS OF APPROVAL

Should approval for the proposal be issued, it is recommended that the following conditions are included. It should be noted that these conditions are important for the EPA's ongoing support for the proposal.

Nature Reserve Impacts and Management

A range of matters concerning impacts upon Cudgen Nature Reserve and lands proposed for dedication to NPWS need to be addressed. Key points include (see Attachment 3 for details) which must be addressed to the satisfaction of NPWS:

- Temporary signage and fencing to be erected prior to works adjacent Cudgen Nature Reserve; and
- Planning and infrastructure in relation to the proposed electricity substation.

Vegetation Management Plan

The Vegetation Management Plan (VMP) must be revised to the satisfaction of EPA. Key points which need to be amended (see Attachment 3 for details) include:

- The aim of the VMP is to rehabilitate the pre-cleared vegetation extents;
- The VMP should provide detailed plans for each work area; and
- The timing and terms of the rehabilitation needs to be clarified.

Bushfire Risk Management Plan

The Bushfire Risk Management Plan (BRMP) must be revised to the satisfaction of EPA. Key points which need to be amended (see Attachment 3 for details) include:

- To ensure that NPWS is acknowledged as a key neighbour with legislative responsibilities in respect of fire management;
- To accurately assess and describe vegetation communities east of Precinct 5;
- To ensure consistency among various plans forming this proposal; and
- To avoid indiscriminate use of the ecological buffer zone for the provision of APZs.

Drainage Management Plan

The Drainage Maintenance Management Plan and associated Drainage Maintenance Impact Assessment must be revised to provide greater detail regarding management of potential impacts of proposed vegetation removal and dredging measures, as detailed in Attachment 3. This must include incorporating consideration of the impacts of the proposed maintenance program in terms of *Key Threatening Processes* and species listed under the *Threatened Species Conservation Act*.

Stormwater Management

The Stormwater Water Management Plan must be revised to assess the impact of stormwater discharges on Blacks Creek, SEPP 14 Wetlands, EECs and the Cudgen Nature Reserve and demonstrate that the treatment system will deliver an appropriate level of protection.

Aboriginal Cultural Heritage Issues

1. The proponent must continue to consult with and involve all the registered local Aboriginal representatives for the project, in the ongoing management of the Aboriginal cultural heritage values. Evidence of this consultation must be collated and provided to the consent authority upon request.
2. The proponent is to provide fair and reasonable opportunities for the registered Aboriginal stakeholders to monitor any initial ground disturbance activities associated with the areas identified as the '*Monitoring Areas*' in the '*Kings Forest Aboriginal Monitoring Plan*' (undated). In the event that additional Aboriginal

objects are uncovered during the monitoring program, the objects are to be recorded and managed in accordance with the requirements of sections 85A and 89A of the *National Parks and Wildlife Act 1974*.

3. In the event that surface disturbance identifies a new Aboriginal object, all works must halt in the immediate area to prevent any further impacts to the object(s). A suitably qualified archaeologist and the registered Aboriginal representatives must be contacted to determine the significance of the object(s). The site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) (managed by the EPA) and the management outcome for the site included in the information provided to the AHIMS. The proponent will consult with the Aboriginal community representatives the archaeologist and the EPA to develop and implement management strategies for all objects/sites.
4. If human remains are located in the event that surface disturbance occurs, all works must halt in the immediate area to prevent any further impacts to the remains. The NSW Police must be contacted immediately. No action is to be undertaken until police provide written notification to the proponent. If the skeletal remains are identified as Aboriginal, the proponent must contact the EPA's Enviroline on 131555 and representatives of the local Aboriginal community. No works are to continue until OEH provide written notification to the proponent.
5. All reasonable efforts must be made to avoid impacts to Aboriginal cultural heritage at all stages of the development works. If impacts are unavoidable, mitigation measures are to be negotiated with the local Aboriginal community and undertaken in accordance with the approved Cultural Heritage Management Plan (CHMP). All sites impacted must have an Aboriginal Site Impact Recording (ASIR) form completed and be submitted to the AHIMS Registrar within 3 months of completion of these works.
6. An Aboriginal Cultural Education Program must be developed for the induction of all personnel and contractors involved in the construction activities on site. Records are to be kept of which staff/contractors were inducted and when for the duration of the project. The program should be developed and implemented in collaboration with the local Aboriginal community.

ATTACHMENT 3: ASSESSMENT OF PROPOSAL

1. BIODIVERSITY ISSUES

Introduction

Support by EPA for this application is contingent on Stage 1 development proposal being consistent with the concept plan approval. While the Environmental Assessment (EA) indicates that the proposal is generally consistent with the Concept Plan Approval (CPA), the EPA considers that this proposal contains a significant number of changes, including to some of the conditions of approval, that result in this proposal being inconsistent with the intent of the CPA. In particular, the EPA does not agree with the EA's claim (xiii) that there are no "new or additional adverse impacts on the ecological values of the site" beyond those authorized by the CPA. These and other concerns with the proposal are discussed in detail below.

Use of Ecological Buffers for Development

A key issue is the proposed use of ecological buffer zones (EBZs) for development related purposes, particularly as much of the buffer is adjoining Cudgen Nature Reserve and proposed additions to the nature reserve. This key issue is discussed below prior to examining other components of the proposal which are also generally connected to the uses of the EBZs.

A fundamental condition of the CPA was the provision of 50 metre wide ecological buffer zones, designed to protect and buffer significant environmental values on and adjacent to the site. This buffering requirement is consistent with EPA policy on buffering, and with the policy of a range of other government agencies. The CPA makes it clear under Condition B3 that such buffers were to be regenerated largely as heath "for the full 50 metre width of the ecological buffer". Further, this condition stipulates that the heathland is to be "provided with long-term protection" through a mechanism such as land use zoning, to the satisfaction of the Director-General prior to determination of Stage 1" (Condition B3).

The current proposal, however, seeks to divide the 50 metre buffer zone into two distinct zones: an *inner* 30 metre and an *outer* 20 metre buffer zone. The Buffer Management Plan (BMP) depicts a 'landscaped drainage corridor' (Figure 13B) being part of the vegetated inner 30 metre ecological buffer, while the same plan indicates that all vegetation would be removed from the outer 20 metre ecological buffer along with approximately 10 metres of the 30 metre inner buffer zone (3.3 and Figures 14, 14A and 14B). While it is acknowledged that the CPA provides for the use of *some* areas of the buffer for infrastructure and clearing, *subject to approval* in each case, the current proposal is not considered consistent with the CPA and does not provide adequate protection for the adjacent ecological values.

The proposed use of the outer 20 metre zone *entirely* for development purposes such as roads, footpaths, APZs for fire and placement of a Koala fence on the eastern edge of the swale through the Precinct 5 buffer (and elsewhere) is regarded as being equivalent to the broad scale reduction of the buffer from 50 metres to 30 metres. In the case of the Koala fence, the EPA notes that it would require cleared breaks for physical separation to Koalas, as well as for monitoring and maintenance. Should a further six metre APZ be provided under the *Rural Fires Act* to protect this asset (discussed below in relation to Koala plan of management), the inner buffer would be reduced to 24 metres of vegetation for the majority of Precincts 1 and 5.

Given the proposal to further reduce the inner buffer area to 20 metres in relation to the placement of the bio-retention swale (more detail below), the buffer at the eastern edge of Precinct 5 adjacent to Cudgen Nature Reserve would be effectively and practically be reduced from 50metres to approximately 15 metres.

EPA submits that the current proposal and design of APZ, roads, footpaths, bio-retention swales and koala fencing are largely inconsistent with the intent and purpose of the 50 metre EPZ. The proposed buffer for Precinct 5 adjoins ecologically significant lands including Nature Reserve, SEPP 14 wetlands and Endangered Ecological Communities (EECs). If approved in its current form the current proposal would also create a concerning undermining precedent for future development within ecological buffers of this kind.

In addition to this general impact on the buffering capacity of the ecological buffer zones, the EPA is concerned about the detail of some of the impacts arising from vegetation removal and bulk earthworks in the EPZs.

In Precinct 1, 0.42 hectares (Ha) of native vegetation in the outer buffer areas is to be removed, including some patches of EECs as follows:

- broad-leaved paperbark forest (.06 Ha) and
- littoral rainforest (0.11 Ha).

The EPA does not support the proposed removal of Littoral Rainforest. It is recommended that the proposal and related management plans are revised to avoid the loss of this state and nationally listed ecological community.

In Precinct 5, 1.2 Ha of native vegetation (mostly heath) in the outer buffer area is to be removed, including some patches of EECs as follows:

- Swamp sclerophyll floodplain forest (0.04 Ha) and
- Freshwater wetland (0.03 Ha)

While these losses may be relatively minor, EPA has been unable to find further commentary on these losses of EECs, including any proposal to offset such losses if they are deemed unavoidable. The EPA recommends that the proponent be required to demonstrate that losses of existing native vegetation communities are unavoidable, and demonstrate commitment to offsetting any such unavoidable losses on a like-for like basis.

There is some discussion and quantification of the relative gains and losses of heath in the remaining inner buffer areas (section 3.4, p18), but the EPA is unable to find reference in this discussion to the need to offset the significant amount of heath that was *expected* to be regenerated under Condition B3.

In summary, compared with the concept plan approval, there are significant losses of vegetation in the required environmental buffers and these losses (if unavoidable) are not offset elsewhere. Nor are remaining 'inner' buffers suitably protected, other than by reference to dedication of the buffer "from and including the Koala fence" to NPWS "as additions to Cudgen Nature Reserve" (p43) which as discussed below, remains problematic as NPWS will not accept responsibility or liability for infrastructure including APZs, swale treatment systems or Koala fencing.

Use of the EBZs for development is presented as justified on the basis of the "contribution of the swales to groundwater recharge in the Cudgen Nature Reserve" (p85) and other purported gains in the buffers in regard to heath regeneration and Koala Food trees/shelter areas. These 'gains', however, are in the EPA's view already required or expected under the existing CPA, and/or could be achieved by other design layouts that would achieve development related purposes from within the approved development footprint. Unless other such layouts are explored and compared, it is not plausible that the proposal provides an *enhanced* capability in meeting the intended purposes of the required ecological buffer zones. Further, justifications presented for widespread reductions of ecological buffers based on concepts of 'practicability' and economic 'viability' are irrelevant in terms of the intended purposes of such buffers.

As such, the EPA does not agree that the documents demonstrate (under C20) that clauses 7 or 8 of Schedule 3 of the *State Environmental Planning Policy (Major Development) 2005* have been adequately addressed. The EPA recommends that all bushfire APZs and roads, for example, be provided for from within the approved development footprint, unless there are compelling ecological reasons presented otherwise.

Other specific uses of the EPZ sought under condition C20, and their impacts on the function of the buffers, are discussed in detail below.

Bio-Retention Swale in the Ecological Buffer Zone

In the concept plan approval (CPA), two conditions were established to ensure adequate stormwater management and water quality monitoring (C11) and the provision of constructed lakes/wetlands to manage potential water quality impacts (C12).

The current application offers a markedly different approach to the management of stormwater involving a bio-retention swale system located wholly within the ecological buffer zone. The EPA and NPWS have concerns with this approach and have recommended above that any such development related infrastructure and earthworks not be permitted in the EPZ. Further, and consistent with the intent of the original concept approval conditions, EPA recommends that the Stormwater Water Management Plan be revised to assess the impact of stormwater discharges on Blacks Creek, SEPP 14 Wetlands, EECs and the Cudgen Nature Reserve and demonstrate that the treatment system will deliver an appropriate level of protection.

Koala Plan of Management

Overview

The Koala Plan of Management (KPOM) prepared by James Warren and Associates (2011) introduces a significantly different approach to the management of Koala populations within and adjacent to Kings Forest than was agreed to under the Concept Plan Approval (prepared by Carrick (2008)). The document makes a case for departing from the previous approach and does offer some potential for improving the outcomes for Koala management than previously envisaged, provided the suggested measures can indeed be realistically implemented and maintained over time. In particular, the proposed use of a fence that would effectively separate Koalas from a number of threats the development may pose has probable merit in regard to the reduction of incidents of vehicular strike and dog attack. However, as outlined below, there are a number of outstanding problems and inconsistencies with the proposed new KPOM which EPA and NPWS regard as significant.

Overall, the proposed KPOM does not appear to acknowledge the Tweed Coast Koala Advisory Group, which includes representatives of Tweed Shire Council and the EPA/OEH. This group is presently finalising a comprehensive plan of management (CKPOM) for the Tweed Coast, which is mentioned in passing. However, there is very limited consideration of the need for the Kings Forest KPOM to be complementary to, or consistent with that plan. Brief mention is made regarding the Tweed Coast Koala Habitat Study (Phillips 2011) underpinning the broader part shire wide CKPOM, but this study is not adequately considered in contextualising the Kings Forest KPOM. Inadequate attention is given also to ensuring that the revised KPOM:

- articulates with the findings of the broader habitat study, particularly the threat of fire;
- identifies the precarious state of the Tweed coast koala population and the role that Kings Forest KPOM can play in contributing to management and recovery of this population;
- makes use of the knowledge and expertise of the advisory group (and community groups such as Friends of the Koala); and,
- is consistent with the future part shire wide CKPOM.

The Koala population on Kings Forest is part of and adjacent to one of the larger areas of primary koala habitat. Given the importance of this population and this broader ecological, planning and management context, EPA regards the document provided as inadequate. It is recommended that the KPOM as a whole be revised to address these deficiencies. It is also recommended that the revised KPOM should be reviewed in detail by the Tweed Coast Koala Advisory Group to ensure efficacy of the range of mitigation measures it proposes and consistency with the part shire wide CKPOM for the Tweed Coast.

More specific comments about the proposed KPOM are discussed below:

KPOM Performance Criteria and Objectives

There is little by way of indications of timing in the table of objectives and KPIs provided (p33), which is particularly important in respect of corridor/connectivity maintenance and improvement measures, including the construction of proposed underpasses, grids, fences and signs, and embellishment of corridor patch plantings. It is recommended that the KPOM KPIs be revised to include timelines and guarantees for completion of works.

A key objective of the KPOM is to ensure that activities generated because of the development (traffic, dogs) do not significantly impact on the Koala population (pp34-5), and in accordance with the Concept Plan Approval (B2), the proponent is required to provide baseline monitoring data (ie as part of the Flora and Fauna Monitoring Report requirements) within 12 months of the concept plan approval (ie by December 2011) that would provide accurate data by which to address this objective and which would inform and update the KPOM and its implementation. The EPA notes, however, that in relation to the Annual Koala Monitoring Report (13.4, p37), the intent is to commence baseline monitoring from the date of commencement of construction. The EPA is not aware of any justification for this delay in commencement of baseline monitoring, which should be collected to as part of the broader commitment to preparing relevant plans of management based on best available information.

In addition to the submission of monitoring reports to various agencies and general commitments to 'adaptive management', it is recommended that there is further requirement for the proponent to provide for adequate and transparent monitoring and reporting processes that will ensure:

- plan revision and update, should monitoring indicate adverse outcomes arising; and,
- a commitment to implementation of contingency plans that would arrest and reverse such adverse outcomes caused by this development, should they be detected.

The EPA notes that monitoring of population size and health is critical in this regard, and that declines in either may be direct, or indirect and cumulative. Since any population health impacts upon Koalas arising from this development will most likely to be in the medium to long term, the EPA recommends that proponent should be required to advise on the extent to which they will participate in the long term management of relevant infrastructure (fences, grids, underpasses, signage) and monitoring (as per above). As discussed below, NPWS will not accept any expectation to bear the costs of key infrastructure such as the Koala fence and its ongoing repair and maintenance.

Consistency of Commitments

The complex set of documents relating to Koala management is difficult to read in an integrated fashion, relying upon actions contained in numerous separate management plans. It is therefore difficult to comprehend the full scale and adequacy of the revised KPOM proposal. The documentation as a whole appears to contain a number of inconsistencies, examples of which include:

- The KPOM in conjunction with the Vegetation Management Plan (VMP) proposes Koala habitat embellishments through revegetation of parts of ecological buffer areas with Koala food tree species. This appears to be in some contradiction with the requirement to provide for natural and assisted heath

regeneration under Condition B3, and the intention to provide for bushfire asset protection and maintenance tracks (Figure 20 App N and Plan 4 App X).

- The revised KPOM suggests there is need for active bushfire management to protect Koalas, but provides no guidance on this matter, referring to the Bushfire Management Plan (BFMP). The BFMP acknowledges that fire management is a key issue in terms of Koala survival, however, it also does not address this important issue in any detailed manner. Fire has been recognised as one of the major threats to the Tweed coast Koala population and requires significant and timely action to manage wildfire. This will require all landholders and stakeholders to work in a cooperative way to minimise the potential for wildfire and work towards fire frequencies and intensities that do not impact on the koala population.
- The Buffer Management Plan for Precincts 1 and 5 (pp13-15) proposes the loss within ecological buffers of around 1,300 square metres of native vegetation, comprising in part of Koala food tree species (paperbark and Scribbly gum). This is inconsistent with the statement in the KPOM that "the scope of works does not require the removal of any identified Koala food trees within adjacent ecological buffers", p23).

To help ensure that there are not inconsistencies between management plans that would conflict with the overall KPOM objectives, zonings or other commitments as required in relation to the required ecological buffers and elsewhere, EPA recommends that the document provide a full and detailed listing of all commitments that will be made in respect of Koalas, rather than rely upon reference to specific actions contained in a series of other management plans. A very clear mapping regime should be required as part of this review to help eliminate conflicting objectives.

Koala observations and incidents

The documentation provided (section 9.9) does not clearly identify who will be responsible for the implementation of this KPOM. It is thus not clear whether reporting of compiled 'incidents' during construction phase to EPA or Tweed Shire Council is mandatory or only optional upon request and/or who will be responsible for management actions after construction works are completed.

It is also unclear who will collect observations regarding Koala 'incidents' and to which 'Environmental Officer' such reports should be referred by the public (p26).

The person/s responsible for 'monitoring' of observed Koalas in residential areas during the 'operational phase' (after occupation commences) is not identified and it needs to be clarified who will be responsible for locating and resourcing relevant qualified personnel and for what time period this role is to be filled. There is need for consideration of how transparency is incorporated in the monitoring of incidents involving Koalas, and greater clarity is needed regarding responsibility for any ameliorative actions needed should monitoring demonstrate need for such actions.

The EPA recommends that the KPOM be revised to provide greater clarity in relation to the parties responsible for the implementation of the plan and the compilation and triggers for reporting of observations and incidents. The plan revision should include consideration of the involvement of the local Friends of the Koala group in observation/reporting roles.

Koala fencing

As proposed, the Koala fence seeks to effectively separate Koalas from the developed areas and therefore from vehicle strike and dog attack. The EPA has a number of key concerns in regard to the effectiveness of this concept:

- The number of underpasses between core vegetated areas is very limited and it is unclear what effort has been made to assess whether the proposed Koala fencing will provide significant barriers to movement of other ground dwelling native fauna such as reptiles, small ground dwelling mammals and

possibly amphibians. It is recommended that further consideration needs to be given to these impacts and the design of the fencing/underpasses in this regard.

- It is unclear that the grid system and a 1.2 metre fence will prevent dogs from entering the Koala core habitat (or other environmentally sensitive) areas. In particular, should any grounded Koala be detected by roaming dogs, the extent to which the fence may expose them to increased risk from any dog breed that can scale the fence in order to pursue Koala should be considered.
- Vandalism, fire, accidental damage and deterioration of the fence at any stage could be a point of entry for dogs and people. Dogs entering from other points outside the boundary of Kings Forest may also enclose them within the protection area, further increasing risks to Koala if the fence acts as a net.
- It is claimed that the fence will deter humans from entering ecological protection zones, however, it is unlikely that a fence of 1.2 metres will be capable of this. In this respect, it will be critical that vandal proof signs are provided at appropriate intervals to inform people about the purpose of the fence and the importance of maintaining the fence.
- The location of the fence and its design requires further consultation and must be considered in line of the potential impact for trapping humans and fauna in the event of fire.

The proposed long term ownership and maintenance arrangements for the fencing are unclear, although it is noted that it is proposed that Tweed Shire Council and/or NPWS be dedicated the land upon which the fence is situated. The alignment of the Koala fence along the outer edge of the bio-retention swale treatment system would necessitate further clearing within the 30 metre inner Ecological Buffer Zone. Figures 14, 14A and 14B depict the koala fence alignment well inside the 30 metre inner buffer zone at Longitudinal Section B, C, D and F. Both sides of the proposed koala fence would require slashing to allow practical access for maintenance as well as to provide effective vegetation separation to koalas. The requirement under the *Rural Fires Act* for 6 metre clear access either side of assets such as fencing would also effectively reduce the 50 metre Ecological Buffer to approximately 15 metres of actual vegetation for the majority of Precinct 5 where the bio-retention swale is proposed to be, and to 24 metres elsewhere. If approved, this would represent a significant diminishment of the effectiveness of the ecological buffer zone in terms of buffering capacity and habitat values.

It is unclear who should be responsible for ensuring this APZ maintenance requirement is met, however, NPWS does not support a proposal requiring it to own or maintain the fence or such an APZ. It is therefore recommended that the proponents indicate their intention in respect of the long term ownership and maintenance of the fence and the required APZ for the fence itself, and discuss the implications of this in terms of the viability of their overall proposal and related management plans. In relation to the ongoing maintenance costs of the fence, the EPA suggests that DoPI, Tweed Shire Council and the proponents consider the efficacy of an annual levy upon properties to provide revenue for the ongoing maintenance of such infrastructure in perpetuity, to be administered by Council.

Domestic Dogs

Dogs are known to be a significant factor contributing to declines in Koala populations. Many breeds of dogs are capable of chasing, stressing and attacking Koalas. As well as seeking to separate domestic dogs from Koalas and noting that certain breeds of dogs are a particular threat to Koalas, the revised KPOM does not seek to provide for controls on dogs by owners other than to those already required under the state wide *Companion Animals Act*.

The Kings Forest Koala population is significant in the context of the Tweed coast region, comprising a significant component of the broader disjunct population. Given the abovementioned concerns regarding the efficacy of the proposed Koala fence in respect of dogs and its ownership and ongoing maintenance, the EPA recommends that the entire development be covenanted to prevent the ownership of all domestic dogs. The prohibition of cats and dogs from the development, including during construction phase, would benefit a range of other threatened fauna and may make the Koala fence concept redundant. In conjunction with the abovementioned review of the KPOM, it is recommended that a review of the success

or otherwise of Koala management at Koala Beach development be undertaken, with a view to adopting workable principles from that experience, before committing to placement of a Koala fence.

Koala Food Trees/Habitat Enhancement

The EPA is generally supportive of the intent to maintain and further establish connective patches of vegetated areas comprising preferred Koala food tree species, notwithstanding some of the possible spatial land use and management conflicts mentioned above. It should be noted, however, that there is more recent information that should be used to inform any effort to undertake this task than that which has been cited in the revised KPOM. In particular, the EPA recommends that the KPOM (Section 5) refers to the Tweed Coast Koala Habitat Study for local preferred koala food tree species and to take a more strategic approach to the proposed improvement of connectivity between existing habitat patches.

Removal of East-West corridors

Condition B4 sought to establish an east west wildlife corridor of up to 100 metres wide (with a minimum of 50 metres at any one point) "to provide for habitat and the movement of threatened native fauna that inhabit the site". Further, B4 required that prior to determination of Stage 1, the proponents were to "demonstrate the practicality or need for establishing a further east west 50 metre wide corridor along the southern boundary of the site" and to provide details of the mechanisms by which the corridor(s) would be achieved.

These corridors are argued to be unnecessary by the proponents, largely because they envisage that their proposed alternative Koala Plan of Management would displace the need for that condition, by achieving better consolidation of Koala habitat in other areas and thus improved connectivity. They suggest, however, that advice on the need for one such corridor in the north-western part of the site will be provided at another development application stage (rather than before the current stage, as directed by the condition).

In the context of the inconsistencies, uncertainties and recommendations made in respect of biodiversity generally and in regard to the KPOM, and recognising that Condition B4 was not only concerned with providing better movement opportunities for Koala, this proposal to delay or remove Condition B4 represents a potentially significant departure from the intent and purpose of the CPA. It is recommended that this condition be fully satisfied in this broader context before determination of Stage 1.

Acid Frog Compensatory Habitat

Within the Threatened Species Management Plan (TSMP), it is proposed that compensation for the loss of Wallum frog species habitat within the development footprint can be compensated for by the artificial enhancement of areas already proposed to be dedicated to Council and NPWS. This enhancement would involve minor earthworks that would create numerous 'new' depressions in the ground that would remain permanently or be more frequently inundated by rain events and water table ingress, thus providing additional 'core' breeding habitat.

The EPA does not support the proposal to offset impacts on Wallum frog species in this manner for the sake of achieving regulatory offsetting requirements. Even if this relatively experimental proposal was demonstrably effective, the EPA is concerned that the areas in question are already well known as core breeding habitat and that undertaking earthworks within these areas to enhance habitat values for the targeted benefit of one fauna group, is at odds with key offsetting principles in NSW¹, in particular, being underpinned by sound ecological principles. Regeneration and management regimes already required under the CPA, and the tenure/zoning to be secured for these areas will maintain and improve habitat and breeding opportunities for threatened Wallum frog species in those areas, without risking negative impacts associated with widespread earthworks in or near areas of sensitive existing threatened species habitat.

¹ <http://www.environment.nsw.gov.au/biocertification/offsets.htm>

Existing measures should also allow them to flourish in more natural balance with other elements of the ecosystem.

As discussed in the TSMP, it is important to the long term ability of water dependent species such as Wallum Froglets and Wallum Sedge Frogs to survive that the maintenance of suitable hydrology is ensured to protect their habitat. However, it is not clear what the impact of the proposed bio-retention swale system and broader earth works will be on the natural movement of water in relation to their core breeding habitat (constructed or natural).

It is recommended that:

- the applicant be required to provide further information regarding the significance of earth works and changed hydrology upon existing and potential habitat values of the environmental buffer and environmental protection zones across the site; and,
- the acid frog compensatory habitat plan be revised to the satisfaction of EPA

Impacts on Cudgen Nature Reserve and NPWS

Dedication of land to NPWS

It is noted that a Voluntary Planning Agreement (VPA) will be entered into between NPWS and Project 28 for those parts of Kings Forest (approximately 178 Ha) to be dedicated through a separate process to NPWS. It is unclear if/how the project application and supporting reports relate to the proposed VPA in terms of consistency in actions, scheduling and responsibilities. Reports such as the Buffer Management Plan, Threatened Species Management Plan, Weed Management Plan and Vegetation Management Plan do not provide sufficient detail for the terms of a VPA. NPWS submits that dedication of lands for addition to Cudgen Nature Reserve occur as soon as practicable.

Subject to agreement on a range of issues, NPWS is prepared to include areas of the 50 metre Ecological Buffer as addition to Cudgen Nature Reserve but will not, however, accept any maintenance liability relating to infrastructure including APZs, swale treatment systems or koala fencing. NPWS will not accept dedication of the koala fence as the boundary of the nature reserve for the maintenance liability of the fence and associated clearing. It is recommended that the koala fence alignment (if approved) be located within a managed APZ area to reduce further impacts to the Ecological Buffer.

Electricity Sub-station

A Zone Substation is proposed within the north eastern portion of the Kings Forest property (section 4.1.7). It is understood that the final location for the substation is still the subject of Essential Energy requirements and ongoing negotiations. The land being considered for the substation location is within the Environment Protection Area identified as future addition to Cudgen Nature Reserve. The substation will require an adequate and maintained asset protection zone. This should be established and excluded from the lands identified for transfer to NPWS. On this basis NPWS seek involvement in forward negotiations relating to the final location so that issues and potential impacts can be considered and it is recommended that Tweed Shire Council also be included in negotiations so the relevant zoning issues can be considered.

Associated with the zone substation are existing and proposed transmission lines. Current transmission lines run south-west of the proposed substation to the Tweed Coast Road. This existing line runs through Kings Forest property and Cudgen Nature Reserve including areas of SEPP 14 wetland, Endangered Ecological Community (EEC) - Swamp Sclerophyll Forest on Coastal Floodplain, and primary koala habitat areas (Tweed Coast Koala Habitat Study).

The current alignment of transmission lines poses an onerous maintenance liability in terms of bushfire risks along with significant impacts to threatened species, EEC, SEPP 14 and existing and proposed nature reserve. The existing alignment is also within flood prone lands that are routinely inundated.

The proposal for a zone sub-station along with concurrent requirement for additional transmission lines provides an opportunity to review these utilities in conjunction with each other. Essential Energy has indicated that realignment and underground supply options would be considered. NPWS recommends that the proponent liaise with Tweed Shire Council, NPWS and Essential Energy in relation to these issues. In particular an option for realignment and underground routing of existing and proposed transmission lines adjacent the proposed feeder road is recommended.

Precinct 1&5 Vegetation Management Plan (VMP)

It is unclear how the VMP relates to the Voluntary Planning Agreement (VPA) to be entered into between NPWS and Project 28 for those areas to be dedicated as part Cudgen Nature Reserve. In particular the details and timing of rehabilitation, revegetation and monitoring works need to be negotiated and included in the terms of the VPA.

The VMP lacks detail in specific work areas or zones to be protected, regenerated or revegetated. The lack of any detail means that the scale and term of proposed works cannot be adequately assessed. The application of proposed performance criteria also become problematic as there are no definitive proposals.

Detailed plans for each Work Area need to be developed to identify areas simply requiring protection (fencing), areas of assisted regeneration and areas for revegetation. Polygons of each of these treatments can then be used to estimate person hours of bush regeneration required along with person hours required for plantings and maintenance of these plantings. The revegetation polygons in particular can be used to estimate total number of canopy, shrub and groundcovers required. The term of the works also needs to be explicit with a breakdown of bush regeneration, planting and maintenance works proposed for each year of the plan.

As it stands the VMP does not detail specific commitments and therefore the 'completion' as indicated by the performance criteria would be impossible to assess. For Work Areas 2, 12, 13 and 16, proposed for addition to Cudgen Nature Reserve, detailed plans would be required to document specific commitments to satisfy the terms of the VPA.

Cudgen Nature Reserve is identified under Section 2.5 as having significant value, however, no specific measures are identified to protect these values during construction. It is recommended that temporary signage and temporary fencing be erected prior to any works adjacent Cudgen Nature Reserve. Temporary fencing and signage should incorporate all Environment Protection Zones including any of the Ecological Buffer proposed for dedication as part Cudgen Nature Reserve.

There is no description or exploration in Section 3.3 of the VMP in regard to possible threats to ecologically significant values. It is difficult to assess mitigation measures without this threat analysis. The development of Precinct 5 would result in a proposed 442 new dwellings into an area where public access has historically been restricted. It is envisaged that this population base would present a range of issues and pressures including incursions by vehicles or persons for a range of purposes. The main mitigation measure proposed is the permanent koala proof fence, which the VMP claims will: *provide permanent protection to the majority of Threatened flora species (3.3.2), EEC's (3.3.3) and SEPP 14 (3.3.4) by preventing pedestrian and vehicular access during the operational phase.* The koala fence should effectively prevent unauthorised vehicle access providing both the fence and associated gates are properly maintained. The fence, however, at only 1.2 metres in height will not prevent (and barely restrict) pedestrian access to these threatened species, EECs and SEPP 14 areas.

It is envisaged that incursions by walkers for access to Cudgen Creek, Cudgen Lake for camping, fishing and other activities will result in multiple tracks being formed and associated damage to vegetation,

increased arson, increased accidental fire ignition and increased use by domestic animals. These tracks will have associated impacts by increasing penetration by feral animals such as foxes and cats and creating barriers to some small mammals.

Other potential significant impacts that should be considered in the VMP, include:

- changes to nutrient loading from stormwater
- changes to hydrology
- urban weed escapes and dumping.

It is recommended that the VMP be revised to adequately assess the full range of potential impacts or mitigation measures that may be required.

Section 4.4.1 outlines a combination of regeneration and revegetation works including:

1. *Assisted natural regeneration where appropriate;*
2. *Planting of preferred Koala trees in accordance with the KPOM (Figure 10);*
3. *Creation of core Acid frog habitat in accordance with the Precinct 1 & 5 TSMP (JWA 2011b); and*
4. *Regeneration/revegetation of heath communities (Figure 10).*

It notes that “there is some overlap in the characteristics and objectives of proposed regeneration/revegetationie Koala food trees will form a canopy with heath species forming the sub-canopy and understorey”. As described, the proposed works are inconsistent rather than overlapping. It is recommended that the vegetation communities proposed should reflect the communities that would naturally occur on each site or designated Work Area. This is generally indicated by the natural regeneration or adjoining vegetation communities. For Work Areas 2, 12 and 13 the adjoining remnant vegetation communities include *Coastal Swamp Mahogany Open Forest to Woodland*, *Coastal Scribbly Gum Open Forest to Woodland*, *Broad-leaved Paperbark Closed Forest to Woodland*, *Broad-leaved Paperbark + Eucalypt spp.* and small areas of *Rainforest*. Heath and shrub communities generally occur further south adjoining in part Work Area 16.

Where regeneration or revegetation proposals have a special purpose, this should be explicitly stated. This could include suitable koala food trees used to enhance corridor and habitat values (see discussion above regarding the KPOM). Where heath communities are proposed for a special purpose this should also be stated and measures required to achieve these outcomes clearly outlined. This may include removal of structural elements (trees) that would be inconsistent with heath proposals. As outlined above, however, it is recommended that proposed regeneration and revegetation communities should reflect the original vegetation using existing natural regeneration, remnant patches and adjoining vegetation to guide the outcome.

It is recommended that the first measure be amended to state:

1. Assisted natural regeneration will be adopted wherever practical;

It is considered that the proposed works currently outlined in the VMP in terms of details and timing of rehabilitation and revegetation works would not meet the requirements of the proposed Voluntary Planning Agreement (VPA) to be entered into between NPWS and Project 28. It is recommended that the VMP be revised to ensure that details and timing of rehabilitation and revegetation works are included in order to facilitate greater articulation between the VMP and the future VPA.

The proposed regeneration/revegetation of heath communities for the majority of disturbed areas (as indicated by Map 10) is considered incongruous and simplistic. The majority of the regeneration and revegetation areas identified in Map 10 of the VMP are proposed additions to Cudgen Nature Reserve. It is

recommended that detailed plans for regeneration of all areas proposed to be dedicated to Cudgen Nature Reserve be developed in cooperation with NPWS.

In Section 4.4.3, treatment of cleared/disturbed areas within the EPZ's and inner 30 metre ecological buffer is described in relation to the creation of core acid frog habitat, in accordance with the Precinct 1 & 5 Threatened Species Management Plan (TSMP) (JWA 2011b). Work Areas 2, 13 and additional work areas are to be revegetated with heath species. The TSMP outlines proposed typical acid frog compensatory habitat layout in Figure 15, however, the proposal for creation of core Acid frog habitat within cleared/disturbed areas of the EPZ's and inner 30 metre ecological buffer is considered too broad (see further discussion below). It is recommended that detailed plans for each of the specific work areas be provided, mapping existing remnant vegetation and identifying specific areas where protection, assisted natural regeneration or revegetation is proposed. Cleared/disturbed areas proposed for revegetation works also need to be identified and mapped, as current mapping (Map10) is too broad and encompasses many sites where assisted bush regeneration would be more appropriate.

The VMP suggests that ground ripping should also be considered where appropriate to encourage heath regeneration. However, it is recommended that ripping be limited to sites with hardened substrate and avoided in sites exhibiting strong natural regeneration.

In terms of methods to be used (section 4.4.4), it is recommended that assisted bush regeneration be applied as a primary strategy at all sites and that detailed site mapping identify proposed actions. Enhancement plantings (section 4.4.4.6) are proposed for those areas not suitable for either Koala food trees or heath regeneration/restoration, however, it is unclear how these determinations would be made and the criteria to be used.

An extensive species list is identified (at section 4.4.5) for revegetation works. Where enhancement plantings are required, NPWS supports the measures outlined regarding an on-site nursery being established to best ensure plantings are restricted to locally sourced seed stock. NPWS supports the requirement for any local nurseries that might supply plants to provide proof of provenance locally occurring propagules.

It is recommended that corflute tree guards be considered in preference to gro-bags as they tend to be more secure and provide better protection from wallaby grazing.

The proposed plant spacing prescriptions are supported and should be prescriptive rather than 'flexible'. In areas proposed for enhancement plantings the prescription should include regeneration species in the cover. For example, in areas where ground covers are established, the planting of shrub and canopy species will occur to prescription, but the species composition of plantings should at all times reflect the vegetation community being regenerated.

'Flexible' planting, including trees at 10 metre spacing within Asset Protection Zones (APZ) is proposed. It is understood that the design and treatment of APZs will comply with RFS requirements. A 15 metre APZ is currently proposed east of Precinct 5 in the Bushfire Risk Management Plan (BRMP) comprising a 15 metre Inner Protection Area. NPWS has concerns that the BRMP has incorrectly assessed the vegetation communities and underestimated the required APZ for Precinct 5. As indicated (4.4.4.5), many of the areas identified for heath regeneration/revegetation would more appropriately be considered for forest or woodland communities, with heath representing a successional stage. This would have implications for the VMP in terms of the proposed buffer layout and plantings (as discussed below).

Bushfire Risk Management Plan (BRMP)

NPWS have reviewed the BRMP and provide the following advice and recommendations.

Legislative Bushfire Management Responsibilities

Section 2.0 of the Plan does not identify or acknowledge NPWS as having any legislative Bushfire Hazard Management Responsibilities. As primary neighbour and manager of adjoining nature reserve, NPWS are required to manage bushfire fuels and risks as well as ecological fire regimes. This is a significant omission and needs to include the following wording and appropriate heading under Section 2.0:

The NSW National Parks and Wildlife Service (NPWS) is a part of the Office of Environment and Heritage (OEH), formerly The Department of Environment Climate Change and Water. The Department of Environment Climate Change and Water is identified as a Fire Fighting Authority in the Dictionary of the Rural Fires Act 1997.

The NPWS is responsible for bushfire management on Cudgen Nature Reserve, including planning, preparing for and undertaking prescribed bushfire fuel hazard reduction and ecological management burning on Cudgen Nature Reserve and responding to unplanned bushfires on Cudgen Nature Reserve.'

Vegetation classification and assessed bushfire attack category

The BRMP has not adequately assessed and described the vegetation formations east of the proposal and particularly within Cudgen Nature Reserve. Vegetation described as *Community 2 - Tall Heath* in the BRMP is classified in mapping on NPWS GIS as *Coastal Scribbly Gum Open Forest to Woodland* and as Fire Class *Shrubby dry sclerophyll forest*. In the north east of the nature reserve a smaller area is classed as Exotic Plantation with a Fire Class *Agriculture/Plantation*. These classifications are consistent with the Tweed Shire Vegetation Plan and mapping and also Figure 15 within Kings Forest (Stage 1) – Precinct 1 & 5 Buffer Management Plan, which describe the majority of the subject interface as *Community 5 - Dry to Moist Open Forest - 5 (d) Regenerating Scribbly gum open forest to woodland & heathland species*.

The vegetation assessment in Section 6.2 of the BRMP is used in the bushfire risk assessment and the derived Asset Protection Zones. The classification of this vegetation as 'Tall Heath' rather than 'Forest' is critical to the subsequent bushfire risk assessment and design of adequate Asset Protection Zones. In particular, applying 'Forest' to the Planning for Bushfire Protection (RFS 2006) rather than 'Tall Heath' significantly increases the separation requirements. The following separation distances would apply:

| Bushfire Attack category | Tall Heath (Scrub) | Woodland | Forest |
|---------------------------------|---------------------------|-----------------|---------------|
| BAL-FZ | <11 | <13 | <20 |
| BAL-40 | 11-<15 | 13-<17 | 20-<27 |
| BAL-29 | 15-<22 | 17-<25 | 27-<37 |
| BAL-19 | 22-<31 | 25-<35 | 37-<50 |
| BAL-12.5 | 31-100 | 35-100 | 50-100 |

A 'Forest' classification would almost double the separation distance and APZ requirements for the proposal. It is critical that this classification is adequately applied to ensure future fuel management for risk mitigation is not applied to Cudgen Nature Reserve or the remaining vegetated buffer. The EPA and NPWS submit that the proposed APZ does not comply with the requirements of the Planning for Bushfire Protection (RFS 2006). The EPA and NPWS recommend that this deficiency be rectified, with current NPWS and TSC mapping identifying this community as Shrubby Dry Sclerophyll Forest applied in terms of Fire Class, and derived APZs altered accordingly.

Landform assessment

Landform has been assessed in Section 6.4 as 'generally flat' using a clinometer, however, the proposed earthworks will place the entire Precinct 5 upslope >0 - 5° of the fuel risk. This is relevant in the bushfire risk assessment and derived Asset Protection Zone.

Asset Protection Zones

An APZ of 15 metre width has been proposed for the eastern aspect of Precinct 5 based on a "Tall Heath" vegetation class. The NPWS submits that this vegetation and bushfire risk assessment is incorrect and significantly underestimates the required APZ. The associated table indicates that the proposed APZ is compliant with the Planning for Bushfire Protection (FRS 2006) and 'achieved by the proposed perimeter road'. However, the presentation of Plan 1 and 4 of the BRMP depict and describe different site layouts and proposed APZs. As a result, it is unclear as to which plan, if either of Plan 1 and 4, depict the current and correct subdivision plan for Precinct 5. Both plans depict sections of proposed Precinct 5 allotments without either a perimeter roadway or fire trail. Plan 1 shows three proposed fire trails aligned with adjacent allotments while Plan 4 depicts two of the proposed fire trail linkages aligned with the 30 metre Inner Zone Ecological Buffer. Until a compliant fire planning document is produced, consistent with all other plans for the proposal, no firm assessment can be made as to the relevance and accuracy of the information provided.

The proposal does not provide perimeter design for reliable access for fire fighting vehicles for fire suppression or mitigation operations. There is also no linkage in design to the existing Cudgen Nature Reserve – Fire Management Strategy for containment lines including fire trails. The NPWS therefore recommends that the entire Precinct 5 be bound by perimeter roadway and/or fire trail suitable for Category 1 tankers as outlined in Bushfire Coordinating Committee Policy No.2/2007. It is also recommended that the alignment of proposed fire trails be directly adjoining the allotments rather than the higher bushfire fuel hazard within the proposed Ecological Buffer.

Fire Fighting Infrastructure

The BRMP does not address the design and location of water mains and hydrants within the Stage 1 Project Application. The location of hydrants to support bushfire operations at the end of cul-de-sacs and at strategic distances along perimeter roads is recommended.

It is recommended that consideration be given to perimeter sprinkler systems within the APZ to support bushfire operations. The design and location of a sprinkler system should provide for mains system and independent water supply options.

As indicated, it is recommended that a perimeter roadway and/or fire trail suitable for Category 1 tankers bounds the entirety of the allotments in Precinct 5, consistent with Bushfire Coordinating Committee Policy No.2/2007.

Buffer/APZ/Drainage

The 'landscaped drainage corridor' considered to be part of a managed buffer along the eastern perimeter referred to in Section 6.6 of the BRMP is depicted in the Precinct 1 and 5 Buffer Management Plan (BMP) Figure 13B as being part of the *vegetated* inner 30 metre Ecological Buffer. The same plan indicates that all vegetation would be removed from the outer 20 metre Ecological Buffer and approximately 10 metre of the 30 metre inner buffer zone (Section 3.3 and Figures 14, 14A and 14B). In summary, it is recommended that a review of the vegetation and bushfire risk assessment used to derive the APZs for Precinct 5 be undertaken to ensure the Planning for Bushfire Protection (RFS 2006) requirements are appropriately applied and that there is consistency among various plans forming this proposal. As recommended above, the ecological buffer zone should not be used indiscriminately for the provision of APZs.

Maintenance of Existing Drainage Lines (Blacks Creek)

The applicant is seeking consent for ongoing routine maintenance of the main east-west drainage line which should be referred to as Blacks Creek, which is located centrally within SEPP 14 wetland and EEC communities. It is claimed that the creek needs to be periodically maintained to ensure the correct function of the drainage and flooding conveyance regimes at the site. The EPA understands that the proposed maintenance activities would consist of removal of riparian vegetation (by chemical spraying at

approximately two yearly intervals) and sediment (approximately 10 yearly), to reduce channel roughness. The report acknowledges that works proposed “may result in hydrological impacts, disturbance of acid sulfate soils, water quality impacts (short-term turbidity), erosion and sedimentation and impacts to flora and fauna” (p xiii). The report also indicates that such impacts (based on previous studies) are likely to be minor and short term.

The Drainage Maintenance Management Plan (DMMP) and associated Drainage Maintenance Impact Assessment provide few details concerning the scope of proposed works or potential impacts. There is no detail on what constitutes ‘*excessive vegetation growth*’ and how it is to be managed; how sediment spoil is to be disposed of or treated; potential impacts to SEPP 14 or EEC values or potential impacts to the aquatic ecosystem. The requirement for the maintenance of an access road through the centre of the EEC and SEPP 14 is not identified. The impacts of this maintained access are not considered. The EPA recommends that these documents be revised to take these deficiencies into account.

The Impact Assessment includes the following Action within Attachment 1 – Sainty Report (2007):

‘If the cross section of the drain proves insufficient to carry the flow, an investigation should be carried out to determine if a one or two metre wide bench should be constructed inside the drain, the bench to be set at 50cm above the current bed level to eliminate significant ground water movement from the adjacent wetland.’

While it is understood that this action is not part of the Project Application the question of the adequacy of Blacks Creek to mitigate flood flows from the subject lands is critical to the project assessment.

During 2011 unauthorised works occurred within Cudgen Nature Reserve along Blacks Creek to the confluence with Cudgen Creek. These works effectively facilitated efficient drainage and conveyance consistent with works occurring upstream on the Kings Forest site. NPWS plan to rehabilitate the affected section of Blacks Creek including the reinstatement of natural vegetation and flow obstructions (snags etc).

The point of discharge for the King Forest site is the current Cudgen Nature Reserve boundary at Blacks Creek. The Project Application cannot rely on future downstream flood mitigation within Blacks Creek or Cudgen Creek. Note that future dredging, clearing, widening, straightening or other works downstream of this location will not be permitted within Cudgen Nature Reserve.

The EPA is unable to find any reference in regard to drain maintenance impact assessment (main report and Appendix NN) of the likely impacts of proposed works upon the Black Bittern (*Ixobrychus flavicollis*), a threatened species largely dependent on riparian vegetation as habitat, which has been previously recorded at Blacks Creek (NSW Wildlife Atlas, 2004). In section 3.3 of the Threatened Species Management Plan, the discussion of the Black Bittern acknowledges the need to seek to retain and manage riparian vegetation to provide for breeding habitat, although there has been no mention of the potential for conflict with this objective and the need to clear riparian vegetation.

The EPA recommends that drainage maintenance impact assessments be revised to incorporate a broader frame of reference that would consider the impacts of the proposed maintenance program in terms of Key Threatening Processes² and species listed under the Threatened Species Conservation Act.

² Key Threatening Process - Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands,

2. FLOODING AND COASTAL MANAGEMENT ISSUES

The EPA has reviewed the report 'Flooding and Flood Management Assessment - Kings Forest Stage 1' by Gilbert and Sutherland and identified that:

- the proposal will have negligible adverse impact on surrounding peak flood levels for the full range of flood events;
- climate change assessment and the requirement for a 0.5 metre freeboard have resulted in the proposed building pad levels to range from 4.35 metres to 5.0 metres AHD, substantially higher than the proposed level of 3.6 metres AHD in 2009;
- the proposed subdivision roads will remain open to traffic for all events up to and including the 100 year climate change flood; and
- there is sufficient flood warning time to implement an effective evacuation strategy.

In view of these findings, the EPA is satisfied that the proposed development has adequately addressed flooding issues.

However, EPA also notes that recommendations are made elsewhere in this submission concerning the intention to seek approval to undertake regular maintenance of Blacks Creek that may impact on the adequacy of the above modelling.

3. ABORIGINAL CULTURAL HERITAGE ISSUES

Overview

A review of the documentation, including Section 7.20 and Appendix JJ of the Project Application Environmental assessment report (dated November 2011), was undertaken to assess the potential impacts of the project on Aboriginal cultural heritage, in accordance with the EPA's Aboriginal cultural heritage assessment guidelines and the requirements of Part 6 of the *National Parks and Wildlife Act 1974* (NPW Act).

The Aboriginal cultural heritage assessment has been undertaken in accordance with the EPA's assessment guidelines. The results of the Aboriginal cultural heritage assessment for the project area are also acknowledged and the EPA supports the specific recommendations provided to manage all Aboriginal sites located within the project area, including protecting or conserving the most archaeologically significant example of each Aboriginal site type.

Advice is provided below concerning arrangements for a Keeping Place, Aboriginal Site registration and legislative requirements.

Keeping Place

The EPA encourages the proponent to continue to consult with the registered Aboriginal parties in order to finalise an appropriate *Keeping Place* arrangement for all objects recovered/salvaged as part of the development process. The proponent is also reminded that in the interim, if any objects have been already salvaged and stored outside of the project area, it is imperative that a *Care Agreement* issued by the EPA in accordance with the requirements of Section 85A of the *National Parks and Wildlife Act* (NPW Act) is in place to ensure that any temporary storage processes are undertaken lawfully and the objects are tracked. Evidence of support from all registered Aboriginal parties should always accompany a Care Agreement application. Further information about Care Agreements, including the application form, can be found on the EPA's website.³

³ <http://www.environment.nsw.gov.au/licences/CareAgreements.htm>.

The EPA also encourages the proponent to continue to engage with the registered Aboriginal parties in developing and maintaining appropriate cultural heritage outcomes for the proposed development. As a general rule, gaps in the consultation process of six months or more will not constitute a continuous consultation process. Where a proponent envisages a gap of more than six months it is recommended that registered Aboriginal parties are regularly informed of progress.

Evidence of consultation may take the form of records consultation/conversation logs/registrations of interest, copies of all correspondence sent/received for the project, records of personal communications, documented phone calls, copies of agendas, copies of newspapers advertisements, and minutes to any Aboriginal community meetings. Evidence of consultation should be collated and provided to the consent authority in support of the development application.

Aboriginal site registration

The EPA understands that Aboriginal sites 'K1', 'K7', 'K8', 'K11', 'K12' and 'K13' were likely to be impacted by the current development and a salvage program has been undertaken by the proponent. However, a search of EPA's Aboriginal Heritage Information Management System (AHIMS) revealed that Aboriginal Site Impact Recording (ASIR) forms for each of these impacted sites have not yet been submitted to the AHIMS Registrar. The proponent is therefore advised to promptly complete a ASIR form for each site and submit to the EPA, as per the requirements of Section 89A of the NPW Act. Any management outcomes for each site must also be included in the information provided to AHIMS⁴. Please also note that penalties now apply to corporations for failing to fulfil these requirements.

Legislative Requirements

The importance of protecting Aboriginal cultural heritage is reflected in the provisions of the NPW Act. The EPA notes that the requirements of the NPW Act have recently been amended. It is strongly recommended that the proponent familiarises itself with the new requirements during the development and any subsequent assessment/development works processes.

⁴ AHIMS contact details: Phone: (02) 9585 6513 or (02) 9585 6345, address: Lvl 6, 43 Bridge Street, Hurstville, NSW, 2220, e-mail: ahims@environment.nsw.gov.au