21 January 2011

Ms Dianne Leeson
Director, Major Projects Coordination
NSW Department of Premier & Cabinet
Level 39
Governor Macquarie Tower
1 Farrar Place
Sydney, NSW 2000

Dear Ms Leeson

**RE: Wildlife Lake Precinct**
**Response to Submissions on DA4 Modifications 4 & 5**

We have received five submissions to our applications to modify DA4 to allow the construction of the Wildlife Lake Weir, Flood Outlet Pipe (items of infrastructure) and amendments to the Lake configuration. Four of the submissions were from Government Agencies and one from an adjoining property neighbour.

We note that the majority of the matters raised in the submissions received relate to the Flood Study for the overall Scheme design (submitted as supporting information). As these two pieces of infrastructure can be considered relatively independently of the entire scheme, we propose to deal with overall scheme issues outside of this approval process (although we have addressed these matters in our response).

In addition, and as discussed in December, we are also awaiting approval of the Two Year Plans submitted 3 November 2010. These plans also include the design of Weir 6 and the Weir 6 pipeline. These important items of additional infrastructure are also necessary for the completion of the Wildlife Lake to allow quarrying to continue. A commitment was made by the Department of Planning to have these plans approved before they are deemed refused, which will occur on 2 February 2011.

Following are our responses to the comments raised including a response from Cardno concerning the technical matters (see attached letter).

**Penrith City Council (PCC)** – Received 14 January 2011

Penrith Lakes has had a long history of working with PCC on the design of the infrastructure required to manage the scheme. As part of this process we have spent a considerable amount of time since 2008, assisting PCC to calibrate their flood model correctly. All of this has been done in good faith and at PLDC expense.

Importantly, DECCW and PCC representatives attended a meeting at PLDC Offices on 27 October 2009 where the SOBEK Flood Model, used for the purpose of assessing the hydraulic impacts of works planned as part of the Scheme, was accepted and agreed for use (meeting minutes can be made available upon request). Subsequently, PLDC have designed the Flood Scheme Infrastructure, using the model, in accordance with this agreement.

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During the refinement of the flood infrastructure design, it became apparent that the Scheme has a significant flood mitigation benefit to the Penrith LGA. PLDC has sought to maximise the benefit and has managed, through the Scheme design, to remove approximately 360 houses within the wider study area from the 100 year flood event and has almost halved the estimated damage to buildings from $118 million to $61 million in such an event.

PLDC has worked with PCC and they have been informed of the current Scheme design, which has not changed, in principle, from that in the presentation given to them on 10 December 2008. It is also worth noting that PCC requested, and has had, access to the flood infrastructure report, as presented in the S75W application, since 23 June 2010 (email correspondence between PLDC, DECCW and PCC can be made available to confirm the availability of the Design Report to PCC). This provided ample time for them to comprehensively review and comment on the proposal.

On a further note with regards to a comment raised by PCC on urban development, PLDC wish to reaffirm that there is as yet no commitment to proceed with such development. Approval of the flood scheme as presented will not affect future decisions on this matter.

**Department of Environment and Climate Change and Water (DECCW)** – Received 14 January 2011

DECCW's submission raises the key issues of Aboriginal cultural heritage, flooding, water quality, erosion and sediment control. Flooding, water quality, erosion and sediment control has generally been addressed by Cardno's letter (see attached).

With regards to Aboriginal matters, Penrith Lakes can confirm we are in the process of submitting an application for an Aboriginal Heritage Impact Permit (AHIP) for the Wildlife Lake as a entire site with specific projects requiring investigation and approval by DECCW. PLDC in partnership with EMGA|Mitchell McLennan have already undertaken a community consultation process with the registered community parties. This consultation is in line with the DECCW consultation guidelines, timeframes and linking the current AHIP application to previous archaeological works conducted under permit. PLDC as part of the consultation process has received submissions and confirmation from Aboriginal groups on the proposed research design and completion of DA4 cultural heritage outcomes which directly relate to this project. PLDC has engaged with DECCW officers, Margrit Koetig and Lou Ewings over a pathway for regularising existing approvals and aligning the works required to complete the Scheme with the recent changes to the Omnibus.

DECCW's submission does not raise any objections to the proposed infrastructure or lake shape modifications. Potential impacts on the environment can be mitigated by way of conditions of consent as noted in the attached Cardno letter.

**NSW Office of Water (NOW)** – Received 17 December 2010

The submission from NOW raises issues of permeability of lake banks (allowing interaction between lake water and the outside aquifer) and water licence issues. Whilst these are important matters and a response is included in the attached Cardno letter, they do not relate to the matters subject to the application, being to two items of infrastructure and the minor modification to the lake layout.

In fact, with regards to the two pieces of infrastructure PLDC has currently sought approval for, we note that NOW's submission raised no objections to the proposed infrastructure and configuration of the Wildlife Lake:

*"NOW is not aware at this point in time of any other concerns relating to the shape of the Wildlife lake itself or the design and location of the flood control weir and pipeline, that are within the scope of NOW's responsibilities."*

**NSW Heritage Office –** Received 23rd December 2010

Heritage Office raised no objections to the proposed infrastructure works subject to imposition of appropriate conditions of consent.

**Neighbours Submission –** Received 21 December 2010

This submission covered matters of flooding and views particular to the neighbour's property. These matters have been addressed as part of Cardno's letter.

As the submissions in general either raise no objection to the two items of infrastructure or matters have been dealt with in this correspondence, we look forward to the DoP expediently determining our Section 75W Applications and the Two Year Plans lodged in November 2010. This will allow Scheme infrastructure necessary for long term operations and critical to continuance of quarrying to be completed to avoid disruption.

Yours sincerely

Phil Anderson
Chairman

CC: Kane Winwood
Senior Planner
Major projects – Industry and Mining
Department of Planning

## Dates for meetings held with Penrith City Council regarding Flood Model

- 17 Oct 2007 – Council, DECCW, SES
- 24 Aug 2007 – Council
- 3 Apr 2008 – Council, DECCW
- 5 Aug 2008 – Council, DECCW
- 10 Dec 2008 – Council, DECCW
- 26 Feb 2009 – Council, DECCW (Calibration)
- 26 Mar 2009 – Council, DECCW (Calibration)
- 27 Oct 2009 – Council, DECCW (Calibration)
- 5 Oct 2010 – Council, DECCW

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Our Ref LJ2869/L2250 :ERM

Contact Kester Boardman

19 January 2011

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Dear Joe

**PROPOSED WILDLIFE LAKE WEIR AND FLOOD DISCHARGE PIPE DEVELOPMENT APPLICATIONS - PUBLIC EXHIBITION SUBMISSIONS**

On behalf of PLDC, Cardno prepared two applications for DA modifications at Penrith Lakes. The applications were for the following modification works:

- Wildlife Lake Weir; and
- Wildlife Lake Flood Discharge Pipe.

In addition, it is understood that PLDC prepared a supplementary application with these submissions for the modification to the layout of Wildlife Lake.

It is understood that these applications were placed on public exhibition on the 10 December 2010 for a period of 6 weeks. During this period submissions were received from:

- NSW Office of Water (NOW);
- Department of Environment, Climate Change and Water (DECCW);
- Heritage Council of NSW;
- Penrith City Council (PCC); and
- Proximate Neighbour.

This letter has been prepared to respond to the comments provided in the submissions received. The comments received and Cardno's responses are provided in Tables 1 to 5. Tables 1 to 4 address the comments which relate to the modification to Wildlife Lake, the pipe, the weir and both the pipe and weir respectively. Table 5 addresses the comments relating to the overall flood infrastructure scheme. It should be noted that a significant number of the submissions received relate to the scheme as a whole, which is not the subject of the current applications. Whilst responses have been provided to all submissions received any additional liaison or information required with regards to the submissions in Table 5 should not hinder the approvals process.

**Table 1: Submissions Relating to the Modification to Wildlife Lake Layout**

| Submission | Comment Received | Response |
|---|---|---|
| NSW Office of Water | With the proposal to access water from the Nepean River, the Scheme needs to hold adequate licensed volume to reflect the water taken from this water source. I have been advised that the Scheme currently holds a little more than 3GL of water licences. Based on recent hydrologic modelling, this is approximately consistent with the amount of water that will be retained within the overall Scheme. | This is not relevant to this application for Wildlife Lake layout modification.<br>PLDC to liaise with NOW at a later date if additional water supply licences are required. |
| NSW Office of Water | NOW seeks an assessment of the likely groundwater interaction between the Wildlife Lake and the surrounding shallow groundwater (known as the Hawkesbury Alluvials Groundwater Source). Recent discussions with PLDC have indicated that much of the site will in effect be lined to prevent groundwater interaction through the replacement of the sandy/clay material that is superfluous to their sand/gravel mining operations. NOW seeks confirmation that this is the case with the Wildlife Lake, i.e. that there will be no interaction with the shallow Hawkesbury Alluvials Groundwater Source. | The approval for the formation of Wildlife Lake itself has already been granted under DA4. The current supplementary application only relates to the minor adjustments to the configuration of the lake layout. Therefore this NOW comment is not directly related to the submission.<br>However, this comment is noted. PLDC is constructing the lake banks in accordance with the approvals and the technical specifications agreed with government (and incorporated in the deed of agreement). This specification was developed to minimise interaction with the shallow Hawkesbury Alluvials Groundwater Source. |
| NSW Office of Water | If Wildlife Lake is not proposed to be lined, NOW's preliminary groundwater investigation indicates that the likely scenario is ingress into rather than egress of water out of the Lakes. Under the ingress scenario, then NOW's preferred position is to minimise this ingress through some form of clay liner or impermeable barrier to prevent the inflow. If this is not practical, then the water ingress should be licensed. The Hawkesbury Alluvials Groundwater Source is considered fully allocated and subsequently embargoed from new licence applications. Therefore accounting for this inflow will need to be done by acquiring water access licences from the Hawkesbury Alluvials. Quantification of this ingress will be required to determine the appropriate licensed volume. If there is not enough licensed volume available, then the ingress needs to be reduced to the point where it can be appropriately licensed. | As above, this comment does not directly relate to the application submitted for review. See notes above regarding the lake banks and water interaction. |

| Submission | Comment Received | Response |
|---|---|---|
| | If however the assessment indicates that there is likely to be egress from the Lake, a full understanding of the relative water quality between the Lake and the Hawkesbury Alluvials groundwater is important to prevent contamination of the groundwater source. | |
| Heritage Council of NSW | The submission concluded that the proposed works at the weir will not impact upon any identified items of heritage significance. Due to the sensitive nature of the surrounding area, mitigation measures recommended are that the Smith Road site be avoided during works and in the event that archaeological remains are discovered during excavation, an archaeologist will assess the remains and the Heritage Council of NSW would be notified under Section 146 of the Heritage Act.<br>The Heritage Branch supports this recommendation. | Noted. |
| DECCW | Any proposal to include residential development in the scheme would need to carefully consider the regional and local flood evacuation strategy. | Noted. This would be considered if residential development is considered in the future. |

**Table 2: Submissions Relating to the Wildlife Lake Flood Discharge Pipe**

| Submission | Comment Received | Response |
|---|---|---|
| Heritage Council of NSW | The GML report concludes that: 'No items of significance were identified at the sites. Should any archaeological remains be discovered within either of the worksites during construction, works should cease and an archaeologist be called in to assess the finds. In addition the local Aboriginal land council, Heritage Council of NSW and DECCW shall be notified of the find.'<br>Given the early European settlement history of the area (land grants from 1804) the Heritage Branch supports this recommendation. | Noted. |

| Submission | Comment Received | Response |
|---|---|---|
| NSW Office of Water | Any works located within 40m of the river (e.g. the outlet of the pipeline) are likely to be considered Controlled Activities and therefore an approval may be required for these works, considering the DoP consent is not under Part 3A. | An application for a Controlled Activity Approval was lodged on 24 December 2011 for the proposed flood discharge pipe. |
| Proximate Neighbour | The information lodged by the applicant provides little detail as to how any scouring and instability of the riverbank caused by the outlet pipe is going to be managed. | The EA provided with the application noted that the potential problems of post construction bank stability will be minimised by gentle contouring of the river bank adjacent to the backfilled trench and/or the employment of a soil confinement mat laid over the final surface plus the use of reinforced earth techniques (Section 5.5.3).<br>It may be appropriate to include this in the conditions of consent to this S75W application. |
| DECCW | The *Concept Flood Drainage Design* report states that two proposed 1050mm diameter pipes "would most likely need to be steel to allow the pipes to be bolted together so that they could withstand the hydraulic pressure. Common concrete pipe joining techniques are not considered suitable (page 18)". However, Cardno's S75W application outlines the pipe as one 1350mm diameter pipe and the drawings described that one pipe as a reinforced concrete pressure pipe (Drawing W4826-017). | The item referred to by DECCW on Page 18 of the *Concept Flood Drainage Design* report relates to the diffuser dissipation structure, which was one of the dissipation structures considered in the concept design report. This structure was subsequently not recommended. This DECCW comment does not refer to the pipe connection.<br>On the matter of the pipe connection, the concept design report discusses the use of 1050mm pipes. This was subsequently modified in detailed design to a singular 1350mm pipe, which resulted in similar drawdown periods and outcomes. There are no issues associated with connecting these pipes. |
| DECCW | The report recommends physical model testing of the energy dissipator structure, if the proposed dissipater design has not previously been thoroughly tested for the full range of potential flows. DECCW advises that consideration should be given to the use of more or larger pipes to reduce the pressure and scour levels. In this regard, peak flow velocities within the pipeline should be kept within acceptable limits and appropriate attention should be given to ensuring that the pipeline(s) is adequately anchored. | The proposed dissipator has been tested, and is documented in *Hydraulic Design of Stilling Basins & Energy Dissipators* (USBR, 1984) – refer to Section 4.4.1.<br>Larger pipes would fall outside the range of pipe sizes tested in USBR (1984). Larger pipes would result in a larger dissipator structure at the outlet for each pipe, which may not be feasible to construct and may create greater disturbance to the river during construction.<br>Adequate anchoring and peak flows in the pipes have all been considered in the detailed design. |

| Submission | Comment Received | Response |
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| DECCW | The outlet pipe is to be constructed in a section of the Nepean River which Cardno's modelling predicts to be subject to high flood velocities. Accordingly, it is expected that the anchoring and protection of the outlet structure would also need to consider the impacts of river flood scour. Suitable geotechnical information, including rock levels, would need to be available to ensure that the anchoring and protection design is appropriate. | This fact was noted and considered in the geotechnical assessment and detailed design process that has proceeded since the submission of the S75W application. Appropriate anchoring and protection of the structure has been provided in the design.<br>The structure was also located in a set-back in the riverbank, to provide a natural protection area. |
| DECCW | Under stratified conditions, the water discharges from the Wildlife Lake should be taken from the water surface above the thermocline, to avoid water of lower quality. | During operating conditions, the proposed drop pit inlets will draw-down water inflows from lake operating levels (i.e. at water surface), avoiding potential lower quality water below the thermocline. |

**Table 3: Submissions Relating to the Wildlife Lake Weir**

| Submission | Comment | Response |
|---|---|---|
| Heritage Council of NSW | On the basis of the application documentation there are no heritage objections to the proposed modification of the Wildlife Lake. | Noted. |
| Proximate Neighbour | The proposed weir at Hunts Gully, which is to be located only 20m from the boundary of my property, is shown as being approximately 65m long and 7m high and is topped by concrete steps and a reinforced concrete slab. The documentation submitted by the applicant contains no information about the visual impact of this structure on adjoining properties and given the scale of the proposed weir it will undoubtedly have a significant visual presence. I submit that the applicant should provide detailed information about this impact to adjoining property owners to enable further submissions before the application is assessed. | It is acknowledged that the proposed weir will have some visual impacts on the adjoining property. It is considered that the concrete component of the weir is the portion of the structure most likely to have a visual impact. An analysis of 3D terrain and design information would suggest that only an oblique view of the concrete component of the weir can be seen from most locations on the adjoining property. However, the dominating visual aspect from the property remains the grassed embankments, vegetation surrounding the Wildlife Lake and the Wildlife Lake itself, in addition to the dominating Blue Mountains in the background. It should also be noted that the portion of the land most impacted visually by the weir is the lower portion of the property which lies within the floodplain and is unlikely to be approved for residential development. In addition, the existing view from the property should also be considered, in that the working quarry currently dominates the view to the south of the |

| Submission | Comment | Response |
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| | | subject property. The proposed Wildlife Lake, including the weir will be a marked improvement to the current view.<br>PLDC have no objection to the inclusion in the approval of the condition of screening to be incorporated into the landscaping on PLDC land (i.e. the use of tall trees along the boundary). However, it should be noted that any such screening is also likely to block the property's favourable view of the Wildlife Lake. |
| DECCW | DECCW will not grant further variation of the AHIP to enable works within the conservation zone. Therefore the EA should provide both an archaeological assessment and a cultural heritage assessment of the land subject to the EA as well as evidence of consultation with Aboriginal stakeholders. | PLDC is currently resolving this issue with DECCW directly. |
| DECCW | Consideration should be given to the possible use of physical modelling to help ensure the adequacy of the future detailed design of the weir structure. | We believe that the modelling and assessments to date are adequate (and are proven acceptable techniques) and do not require physical model testing. The design of the weir has been undertaken based on USBR (1984), which has undertaken significant physical model testing.<br>However, if deemed necessary, PLDC have no objection to a peer review of the design. This should take into consideration both the hydraulics and the structural components of the weir. It may be appropriate to include the requirements of this review as a condition of consent. |
| DECCW | The extent of the impacts on the properties north of Smith Street may need to be clarified. The consent authority will need to determine the acceptability of the 0.18m increase to the flood level in a 200yr ARI flood (and about 0.3m increase in the flood level for a 100yr ARI flood); noting that the affected land is rural rather than residential. | The impact is discussed in the Executive Summary of the *Penrith Lakes Scheme Flood Infrastructure Concept Design* (Cardno, 2010; Section 5 of the submission). It is noted that the impact affects a rural property only. In the majority of cases, the existing structures on-site (horse sheds etc) are already inundated with depths greater than 1 metre in the 100 year ARI event. Therefore, the proposed increases do not affect the ability to develop on this land any further than the current inundation. |
| DECCW | DECCW considers that the proposed diversion of Hunts Creek through the proposed lakes rather than directly to the river is of small consequence. | Noted. |

**Table 4: Submissions Relating to both the Wildlife Lake Pipe and Weir**

| Submission | Comment | Response |
|---|---|---|
| Proximate Neighbour | The information lodged by the applicant in respect to Flood Management suggests that the changes entailed in the Modification Application will result in reduced flood levels on properties outside the Scheme however this is not supported by the Hydraulic Design information which states otherwise particularly in respect to my property. | The flood modelling undertaken by Cardno is reported in *Penrith Lakes Scheme Flood Infrastructure Concept Design* (Cardno, 2010; Section 5 of the submission).<br>The comment referred to in regard to reduced flood levels is a comment that is true for the majority of the floodplain affected. However, the report does also identify areas where flood levels increase (see reference above).<br>The impact on this property is shown in Figure 9.1 and Figure 9.2. The increase is approximately 0.2 metres in a 100 year ARI and in a 200 year ARI event. This is contained within an existing floodplain. It is noted that the area that is impacted is wholly within the existing flood extent, and is typically 2 – 3 metres deep in the 100 year ARI under the pre-quarry conditions. This increase in flood level over the base level is not considered significant. |
| DECCW | The hydraulic modelling peer review recommended sensitivity testing to assess the robustness of the proposed weir and outlet pipe design. DECCW supports these recommendations. It is understood that Cardno have addressed those recommendations which directly relate to the weir and pipe design. | It is noted that the sensitivity testing requested by WMAwater refers to the scheme as a whole, and focuses generally on Weir 1 and Cranebrook Village, both of which are unaffected by the Wildlife Lake Weir and the pipes. The sensitivity testing requested by WMAwater for Weir 1 has been undertaken by Cardno, and provided to WMAwater for review.<br>Any addition sensitivity testing for Cranebrook Village is related to the overall scheme and will be undertaken following discussions with DECCW as part of the development of the overall scheme design. |
| DECCW | To minimise erosion and to control sediments the proponent should submit an Erosion and Sediment Control Plan for the proposed works. These should include the separation of clean and sediment laden run-off, installation of silt fences, silt curtains in the Nepean River during construction, sediment ponds and bunding, as appropriate. | A comprehensive Erosion and Sediment Control Plan would be prepared as part of the detailed design, in accordance with the requirements in the EA (Section 6.1). |

| Submission | Comment | Response |
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| DECCW | An air quality management plan should be developed for the proposed works to describe proposed mitigation measures and safeguards to control dust generation and to minimise impacts on nearby receptors. | A comprehensive Dust Management Plan (i.e. air quality management plan) would be prepared as part of the detailed design, in accordance with the requirements in the EA (Section 6.1). Air quality is currently controlled by PLDC's Environmental Protection Licence. |
| DECCW | DECCW considers that the proponent should design and construct the infrastructure such that there is no increase in noise levels over those currently being emitted from the premises, when assessed at the most affected sensitive receiver location.<br>The construction hours for the proposed works should be limited to the construction hours currently approved for the quarrying activities at the site. | Although the noise levels associated with the construction activities of the pipeline and weir are unlikely to exceed the existing noise levels associated with the quarrying activities, noise mitigation measures should be included in the Construction Environmental Management Plan (CEMP), in accordance with the requirements in the EA (Section 5.6.6).<br>Construction hours would be limited to the existing quarry operation hours in accordance with the requirements in the EA (Section 5.6.6). Noise is currently controlled by PLDC's EPL. |
| PCC | The Applicant's flooding information does not clarify all of the assumptions made in the flood modelling exercise. For example, the information fails to provide information on land form assumptions, pre-quarrying, and the 'starting conditions' of the Scheme, that is, are the lakes empty, full or partially full | Details of the modelling assumptions are provided in the *Infrastructure Report* and the *Calibration Report*.<br>References to specific sections are as follows:<br>• Land form assumptions – Section 5 of the *Infrastructure Report*.<br>• Pre-Quarry terrain information – Section 5.1 of *Infrastructure Report*.<br>• Starting water levels - assumed that the lakes are at operational water levels - Provided in following locations in *Infrastructure Report* - Section 3.2.1 provides the operational water levels of the lakes. Also demonstrated in results for Table 7.1. Overview figure in Exec Summary. A number of other locations also provide operational water levels. |
| PCC | The Applicant's flood modelling exercise does not incorporate the part of the River system and associated floodplain upstream of Victoria Bridge. In addition, calibration of the flood modelling exercise upstream of Victoria Bridge has not been defined. The consideration of this area is considered critical to the full assessment and understanding of the Proposal/ Outcomes. | The flood model extends to the M4, which is upstream of Victoria Bridge. Details of this are provided in the *Calibration Report* (e.g. Section 4.3 and Figure 4.3) and *infrastructure Report*.<br><br>Calibration of the model was undertaken upstream of Victoria Bridge, and is discussed and demonstrated in numerous sections of the *Calibration Report*. For example, reference |

| Submission | Comment | Response |
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| | | should be made to Figure 5.2. Similarly, Table 6.7 provides a comparison between different models of the water levels upstream and downstream of Victoria Bridge.<br>This was also discussed at several meetings with Council. |
| PCC | The Applicant's flooding information states that the amendments to the current scheme of flood management reduce flood water levels in both Penrith and Emu Plains. However, the information does not state the location or scale of the reductions or how they have been achieved. These matters need to be clarified to allow for the assessment of any impacts on the level of flood risk elsewhere. | The level of flood impact is addressed in the *Infrastructure Report*, including Section 9 (all), Figure 9.1 & 9.2, as well as a summary in the Executive Summary. |

**Table 5: Submissions Relating to the Overall Scheme**

*Overall scheme information has been supplied as supplementary information only, not an application in itself. These submissions are not directly relevant to the Wildlife Lake S75W applications and consequently should not be allowed to delay the approvals process for these applications.*

| Submission | Comment Received | Response |
|---|---|---|
| DECCW | The adverse flood impacts in a 200 Year Flood at the Cranebrook Village area may need to be mitigated or compensated for in some way such as, by increasing the flow passing from the eastern lakes to the main lakes. | The flood impacts are as a result of the scheme as a whole. The Cranebrook Village area is largely unaffected by the changes to the design of the Wildlife Lake Weir or the pipes. |
| DECCW | The two lake system requires more weir works than the one lake system and so would require greater maintenance costs. | Agreed and noted. This was considered in the development of the one lake scheme. |
| DECCW | PLDC should develop and implement a water quality management plan to monitor and manage the density of algae, including blue green algal species. This plan should include a monitoring program and appropriate treatment of water should an algal bloom occur.<br>During the construction phase discharge from the Wildlife Lake to the Nepean River should not occur when a blue green algal bloom in present. | This primarily relates to water quality management for the existing quarrying and restoration activities.<br>PLDC currently have a comprehensive water quality monitoring program. This program would be reviewed and amended, as appropriate, to include management of discharges with regards to blue green algal blooms. |
| DECCW | Any sediment load in the Wildlife Lake, generated during construction, should be allowed to settle in the lake prior to discharging water to the Nepean River. | This primarily relates to water quality management for the existing quarrying and restoration activities.<br>Noted. Provision for settlement will be provided and suspended |

| Submission | Comment Received | Response |
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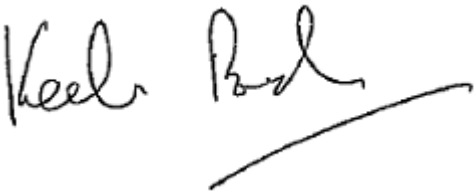
| | | solids would be monitored prior to discharges occurring to ensure compliance with the EPL conditions. |
| DECCW | Any water discharged from Wildlife Lake to the Nepean River during the construction phase should be within 2 degrees Celsius of the temperature of receiving water. Such a limit will be placed in any EPL issued by DECCW. | This primarily relates to water quality management for the existing quarrying and restoration activities.<br>Noted. |
| PCC | Whilst the Applicant's flooding information states that the amendments to the current scheme of flood management will not have adverse effect during a 1% annual probability flood event, it is not confident for the 0.5% annual flood event. This matter needs to be clarified and any deficiencies addressed. | There is no issue with confidence in the 0.5% AEP (200 year ARI) results.<br>Impacts of the 0.5% AEP (200 year ARI) are clearly stated in the executive summary, Section 9 and Figure 9.2 of the *Infrastructure Report*. |
| PCC | The results of the flood modelling provided by the Applicant indicates a significant difference in flood water levels (for a range of events) in a number of locations than the levels generated by Council's flood model. The analysis of these differences is critical to ensuring the scheme appropriately manages the level of flood risk to people and property elsewhere. | Council's model does not currently hold the terrain information for the proposed design. This has been discussed with Council at a number of occasions in the past, including in a meeting between Council and PLDC in October 2010.<br>The results from Council's model are based on a 2006 version of the scheme design, which is the model that was used for verification in the *Calibration Report*. Our results indicate the flood levels in the current design are around 0.4 metres lower in some areas than for the 2006 design. |
| PCC | A recent run of Council's model indicates the possibility of a 'break-out' through the Lambridge Estate (the industrial estate on the corner of the junction of Old Castlereagh Road and Castlereagh Road, Penrith) for a 1% flood event. The Applicant's flood modelling exercise does not indicate a similar extent. | As noted above, Council's model is based on an old Lakes scheme and therefore the results cannot be compared. |

If you require any further information or would like to discuss any of the submissions and replies further, please do not hesitate to contact Emma Maratea or Rhys Thomson on 9496 7700

Yours sincerely



*Kester Boardman*
*Manager - Environment and Sustainability*
*for* **Cardno (NSW/ACT) Pty Ltd**