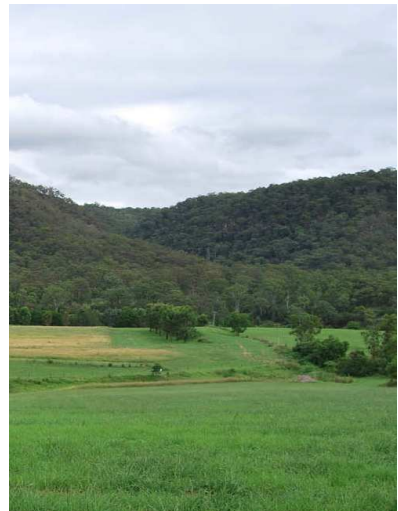


Godden Mackay Logan

Heritage Consultants



Penrith Lakes, Hunts Gully Weir

Non-Indigenous Archaeological Impact Statement

Final Report

Report prepared for Cardno Lawson Treloar
on behalf of Penrith Lakes Development Corporation
May 2010

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Report Register

The following report register documents the development and issue of the report entitled Penrith Lakes, Hunts Gully Weir—Non-Indigenous Archaeological Impact Statement, undertaken by Godden Mackay Logan Pty Ltd in accordance with its quality management system. Godden Mackay Logan operates under a quality management system which has been certified as complying with the Australian/New Zealand Standard for quality management systems AS/NZS ISO 9001:2008.

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1.0 Introduction

1.1 Preamble

Godden Mackay Logan (GML) has been engaged by Cardno Lawson Treloar on behalf of Penrith Lakes Development Corporation (PLDC) to prepare a non-Indigenous Archaeological Impact Statement (AIS) for proposed pipelines and weir works at Penrith Lakes. This work will feed into an Environmental Assessment for the project under Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). This report has been prepared to identify and assess the historical archaeological resources in the area of the proposed Hunts Gully Weir and management recommendations to mitigate any potential impacts. A separate AIS report has been prepared to address historical archaeology in response to the proposed pipelines.

1.2 Background

As part of the rehabilitation of the Penrith Lakes quarry land, two lakes have been proposed. These lakes will be known as Wildlife Lake in the northern area of PLDC, and the much larger Main Lake in the south of the PLDC area. Three pieces of infrastructure are proposed to facilitate water management and flood mitigation at Penrith Lakes: a set of pipelines to connect Wildlife Lake with the Nepean River; a set of pipelines to connect Main Lake with the Nepean River; and a weir along the northern boundary of Wildlife Lake at Hunts Gully Creek to mitigate flooding events. This AIS addresses the impact on historical archaeological from the proposed Hunts Gully Weir only.

1.3 The Site

The PLDC area lies within the historic Castlereagh district, and is approximately 55 kilometres west of Sydney, bounded by New Castlereagh Road on the east, rural properties to the north and the Nepean River to the west and south (Figures 1.1 and 1.2). The area proposed for the weir is at Hunts Gully in the north west of the Penrith Lakes Scheme area. The PLDC area has been historically used for agricultural purposes but also quarrying for the extraction of sand and gravel was undertaken. The study area is located within the larger Castlereagh cultural landscape that dates back to the earliest European occupation of the area starting in c1800. Figure 1.3 shows the location of the proposed Hunts Gully Weir.

1.4 Methodology

This report has been undertaken in accordance with the principles of *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 1999*. It is consistent with the methodology outlined in 'Heritage Assessments and Statements of Heritage Impact' contained in the *NSW Heritage Manual* (prepared by the NSW Heritage Office and the Department of Urban Affairs and Planning, 1996) and is subject to the limitations identified below.

1.5 Limitations

This report does not address Aboriginal cultural heritage, which is being addressed by another consultant. This report does not address built heritage values, landscape values or visual impacts. This report does not assess potential future impacts of erosion, floods or energy dissipation on heritage that may result from the construction of the proposed weir and pipelines infrastructure. It is understood that the impact from inundation on archaeological sites following the creation of the weir will be covered in another report.

1.6 Author Identification

This AIS has been prepared by Lyndon Patterson, Heritage Consultant and Archaeologist. Historic research was undertaken by Michelle Richmond, Senior Consultant and Historian. Specialist advice has been provided by Geoff Ashley, Senior Associate, Sharon Veale, Senior Associate and Jyoti Somerville, Associate. This report has been reviewed by Sheridan Burke, Partner of GML.

1.7 Definitions

The term conservation zone referred to in this report refers to an area set aside by PLDC as a non quarry zone for either cultural and/or environmental values. These zones have no legal standing.

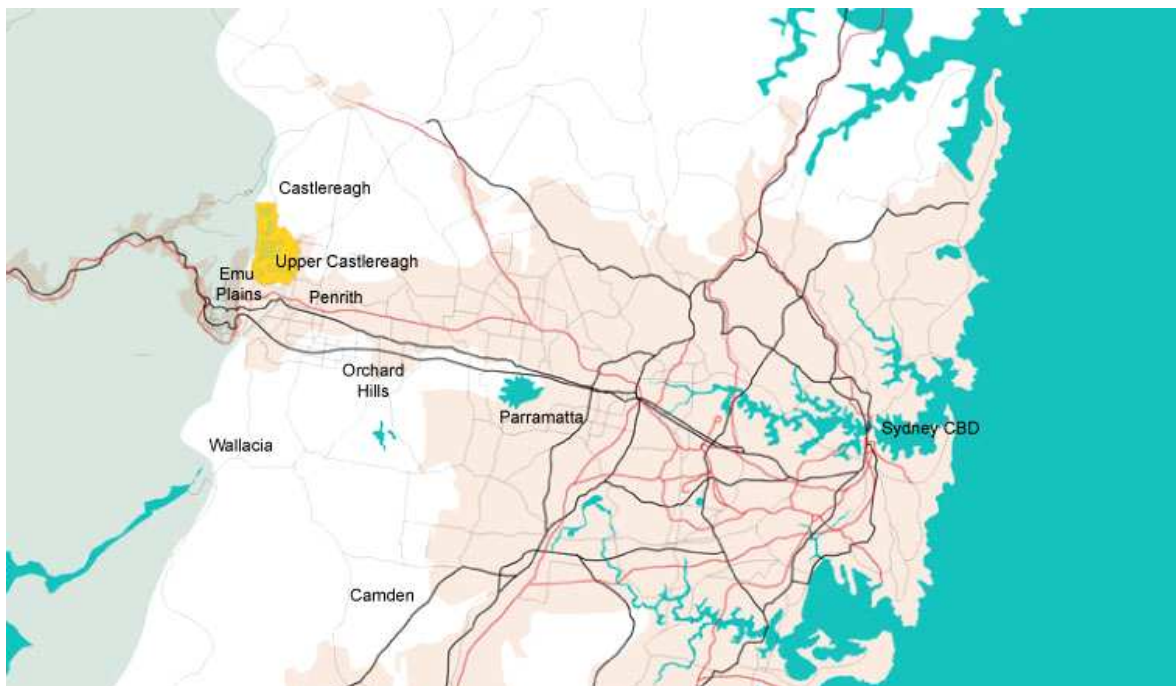


Figure 1.1 Area plan showing the location of the Penrith Lakes Scheme (highlighted) within the Sydney Metropolitan Area. (Source: Penrith Lakes Development Corporation)

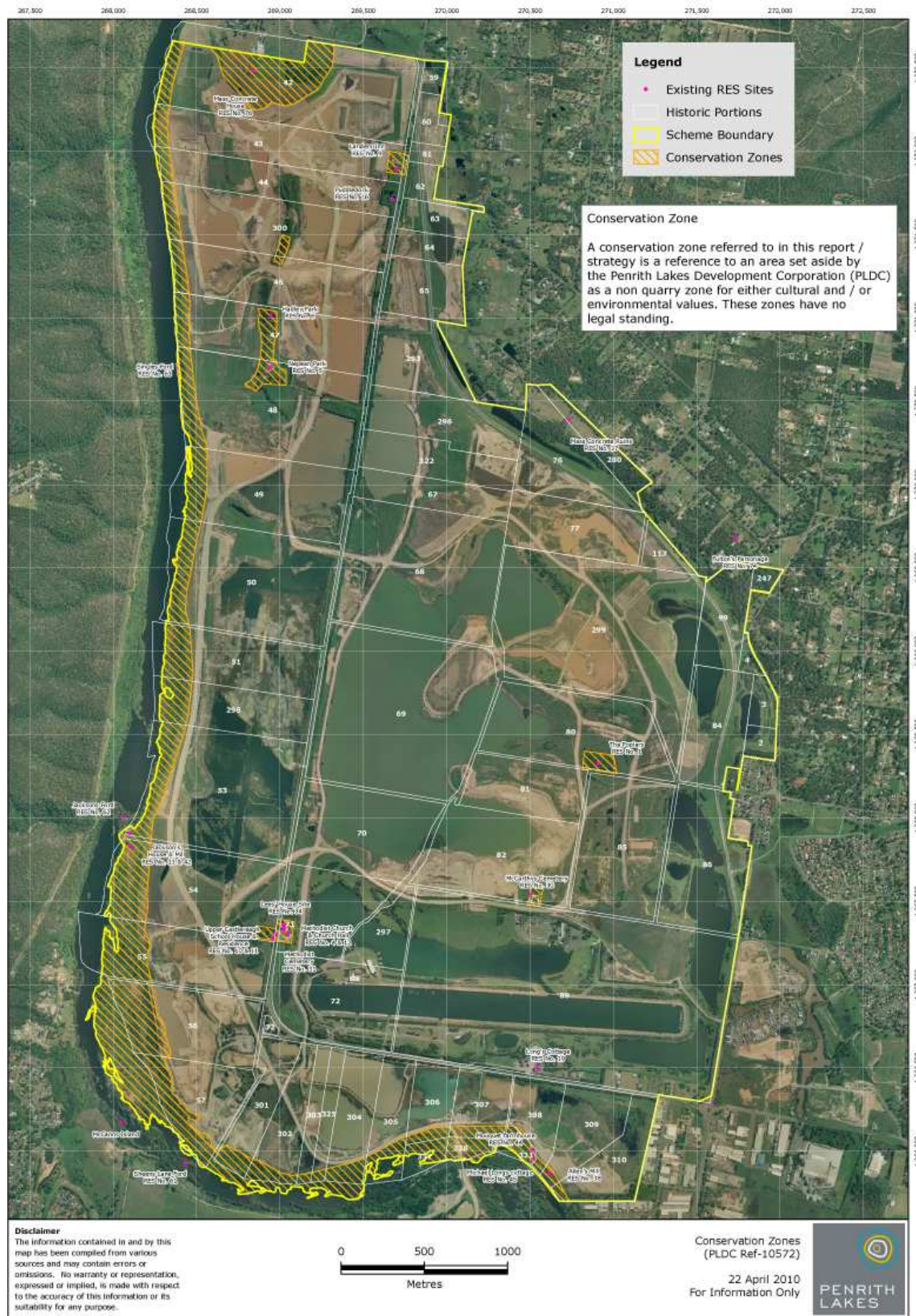


Figure 1.2 Map of the Penrith Lakes Scheme area showing the scheme boundary and the location of heritage items and conservation zones within the scheme area. (Source: PLDC April 2010)

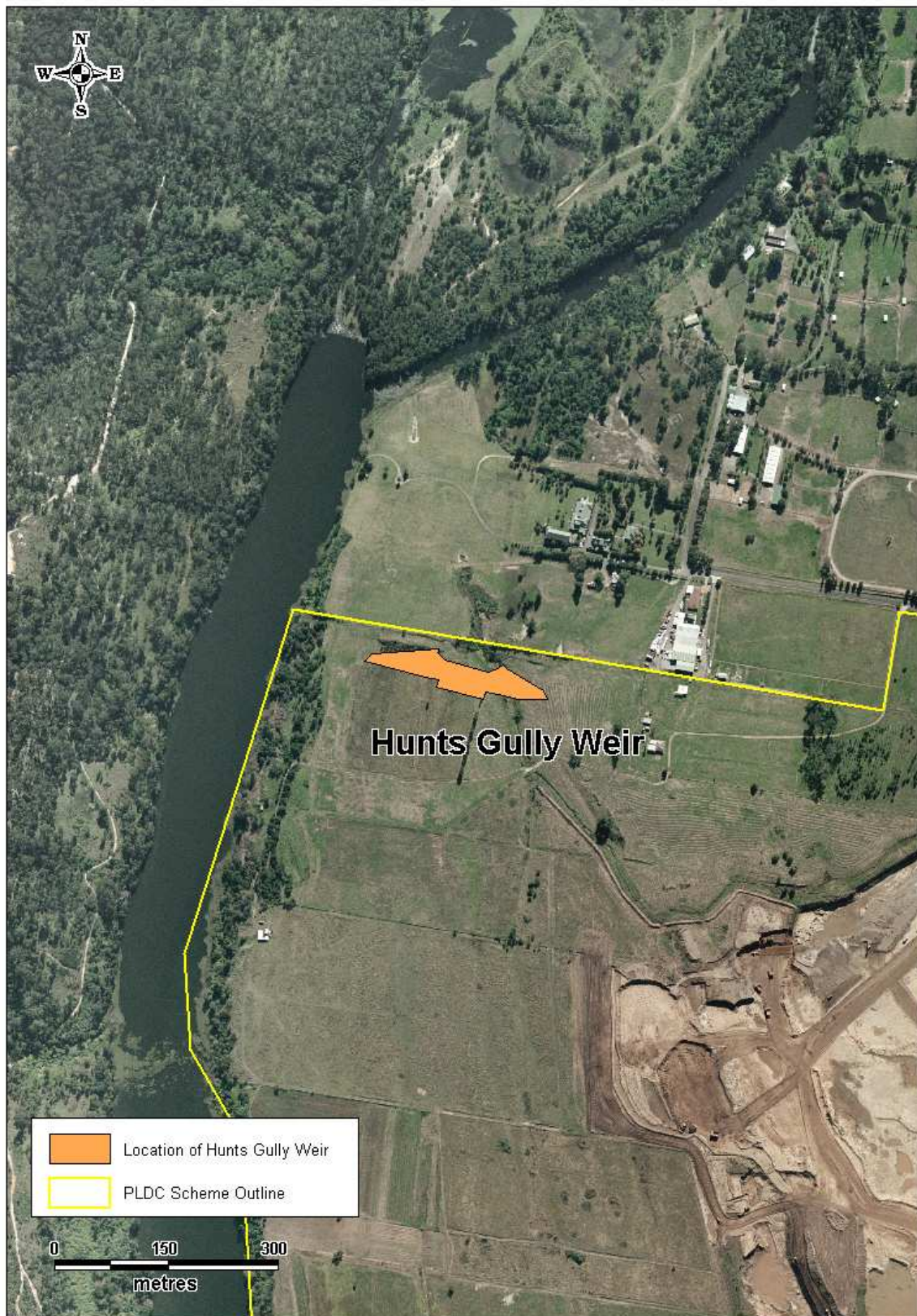


Figure 1.3 Aerial photograph showing the location of the proposed Hunts Gully Weir. (Source: Cardno, May 2010)

2.0 Statutory Context and Heritage Listings

2.1 Introduction

In terms of historical archaeology, Penrith Lakes is affected by a number of statutory controls which must be taken in account prior to any proposed development of the site. Those relevant for the current investigation include:

- *Environmental Planning and Assessment Act 1979* (NSW);
- *Heritage Act 1977* (NSW);
- *Sydney Regional Environmental Plan 11* (SREP 11);
- *Penrith Local Environmental Plan 1991* (Environmental Heritage Conservation); and
- *Draft Penrith Local Environmental Plan 2008*.

Pertinent for the current investigation, there are also contractual obligations between PLDC and the NSW State Government. These include:

- the Penrith Lakes Scheme 1980;
- the Deed of Agreement 1987; and
- Penrith Lakes Scheme - Development Application No. 4 (DA 4).

In addition, there are non-statutory listings for the Penrith Lakes Scheme area including the Register of the National Estate and the National Trust of Australia (NSW).

2.2 Part 3A of the Environmental Planning and Assessment Act 1979

Under Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act), the Minister for Planning may determine that the provisions of the Heritage Act are suspended. In such a case, an Excavation Permit (or Exemption or Exception) would not be required for works that may disturb or destroy archaeological relics. The Minister would generally provide Concept Approval or Project Approval subject to conditions that respond to the potential archaeology of a site. The management provisions in this Archaeological Impact Statement would form an appropriate basis for such a condition of approval.

2.3 Heritage Act 1977 (NSW)

The *Heritage Act 1977* (NSW) provides a number of mechanisms by which items and places of heritage significance may be protected. The Heritage Act is designed to protect both known heritage items of State significance (such as standing structures) and heritage items that may not be immediately obvious to the eye (such as potential archaeological remains). Different parts of the Heritage Act deal with these different situations.

'Relics' are defined by the Heritage Act to mean:

Any deposit, artefact, object or material evidence that:

(a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and

(b) is of State or local heritage significance.

An Excavation Permit must be obtained to disturb or destroy 'relics' *unless* they are covered by a gazetted 'Exception' or the works are undertaken pursuant to Part 3A of the EP&A Act. In either case, a research design would need to be prepared to guide how 'relics' would be managed, conserved and interpreted, should approval to remove or disturb the 'relics' be granted.

Any application for works would need to be accompanied by a Heritage Impact Statement.

Section 57(2) of the Heritage Act provides for a number of Exemptions to Section 57(1) approval requirements. Exempted development does not require prior Heritage Council of NSW approval.

Applications for Specific Exemptions may be made to the Heritage Council of NSW for particular works or activities in certain areas of the site and/or for some or all of the works specified in a Management Plan which has been endorsed by the Heritage Council of NSW.

An exemption may be appropriate where it can be demonstrated that the ground disturbance will have only a minor impact on archaeological relics.

2.3.1 Sites on the State Heritage Register (SHR)

The SHR is established under Section 22 of the Heritage Act and, pursuant to Section 57(1) of the Act, the approval of the Heritage Council of NSW is required for any proposed development within the site, including subdivision, works to the grounds or structures, or disturbance of archaeological 'relics'. There is one site listed on the SHR within the PLDC area:

- Upper Castlereagh School and Residence (listing number 00339).

This site is located in Upper Castlereagh Village, approximately five kilometres south of the proposed Hunts Gully Weir and thus well outside the area currently being investigated as part of this assessment (Figure 1.2).

2.4 The Sydney Regional Environmental Plan 11 (SREP 11)

The aims and objectives of the *Sydney Regional Environmental Plan 11* (SREP 11) are to permit the implementation of the Penrith Lakes Scheme. Part 3 of the SREP 11 includes provisions for the protection of environmental heritage within the Penrith Lakes Scheme area. Clause 6 states:

The consent authority for the purposes of this Plan is the council of the area in which the development is carried out, except as provided by the Act.

As such, Penrith City Council is the consent authority for development outside of extraction, rehabilitation or lake formation, or outside areas under existing quarrying consents.

14 Items of the environmental heritage

(1) A person shall not, in respect of a building, work, relic or place that is an item of the environmental heritage:

- (a) demolish, renovate or extend the building or work,*
- (b) damage or despoil the relic or place, or any part of the relic or place,*
- (c) excavate any land for the purpose of exposing or removing the relic, or*
- (d) erect a building on the land on which the building, work or relic is situated, or the land that comprises that place,*

except with development consent.

(2) *The consent authority shall not grant consent as referred to in subclause (1) unless an assessment has been made of:*

- (a) the significance of the item as an item of the environmental heritage,*
- (b) the extent to which the carrying out of development in accordance with the consent would affect the historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance of the item and its site,*
- (c) whether the setting of the item, and in particular whether any stylistic, horticultural or architectural features of the setting, should be retained, and*
- (d) whether the item constitutes a danger to the users or occupiers of the item or to the public.*

15 *Development in the vicinity of an item of the environmental heritage*

The consent authority shall not consent to the carrying out of development in the vicinity of an item of the environmental heritage unless an assessment has been made of the effect that the development will have on the historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance of the item and its setting.¹

Schedule 3 of SREP 11 includes the following heritage items:

- Hadley Park (Lots 1 and 2, MPOS (OS) 8807);
- Nepean Park (Portion 48);
- McCarthy's Cemetery (part Portion 82);
- Upper Castlereagh Methodist Church and Hall (part Portion 71);
- Upper Castlereagh School and Residence (part Portion 54); and
- Methodist Cemetery (part Portion 71).

The locations of these sites are shown in Figure 1.2. None of these sites are located within the vicinity of the proposed pipeline or weir works.

2.5 Penrith Local Environmental Plan 1991 (Environmental Heritage Conservation)

The aim of the *Penrith Local Environmental Plan 1991* (Environmental Heritage Conservation) is to assist in the conservation and enhancement of the heritage items and heritage conservation areas of the City of Penrith.

Part 2 of the LEP lists special provisions in dealing with heritage items:

8 Heritage items

(1) *A person must not, in respect of a building, work, tree, relic or place that is a heritage item:*

- (a) demolish or alter the building or work,*
- (b) damage or move the relic,*

- (c) *excavate for the purpose of exposing the relic,*
 - (d) *damage or despoil the place or tree,*
 - (e) *erect a building on, or subdivide, land on which the building, work or relic is situated or that comprises the place, or*
 - (f) *damage any tree on land on which the building, work or relic is situated or on the land which comprises the place,*
- except with the consent of the Council.*

(2) *An applicant for consent required by this clause must lodge with the Council a statement which includes reference to the following matters:*

- (a) *the significance of the item as a heritage item,*
- (b) *the extent to which the proposal would affect the heritage significance of the item and its site,*
- (c) *whether any stylistic, horticultural or archaeological features of the item or its site should be retained,*
- (d) *whether the item constitutes a danger to the users or occupiers of that item or to the public,*
- (e) *whether the permanent conservation of the building or work is considered necessary,*
- (f) *the probability of the building or work being incapable of reasonable or economic use.*

(3) *The Council must, in determining an application required by this clause, take into consideration the matters listed in subclause (2).*

9 Development in the vicinity of heritage items

The Council must not grant consent to an application to carry out development on land in the vicinity of a heritage item unless it has made an assessment of the effect the carrying out of that development will have on the heritage significance of the item and its setting.²

Note: The website of the Heritage Branch of the Department of Planning has publications that provide guidance on assessing the impact of proposed development on the heritage significance of items (for example, Statements of Heritage Impact).

Schedule 2 of the LEP lists the following heritage items:

- Ruin of stone stables associated with Landers Inn, part Portion 43, Castlereagh Road (C6);
- Slab cottage (also known as Puddledock), Lot 1 DP 120872, Castlereagh Road (C7);
- Farmhouse, garden planting and natural vegetation, Lot 1, DP 574481, Church Lane (C10);
- Ruins of pise house, Portion 280, Church Lane (C13);
- Site of Fulton's Church School, Church Street, Portions 287 and 288 (C15);
- McCarthy's Farm, tree and archaeological remains, Portion 82, McCarthys Lane (CR9);
- The Poplars; old slab cottage, pise house and garden, Lot 2, DP 229462, Wrights Lane (CR 8); and
- Upper Castlereagh war memorial, Lot 1, DP 735602, Castlereagh Road (UC 4).

None of these sites are located in the vicinity of the proposed pipeline or weir works.

2.6 Draft Penrith Local Environmental Plan 2008

The Draft LEP 2008 represents the initial stage of a city-wide plan for rural and industrial areas (excluding residential or other commercial areas). Clause 5.10 of the Draft LEP 2008 applies to all heritage items listed in Schedule 5, including heritage items, conservation areas and archaeological sites and sets out heritage objectives and controls. The Draft Penrith LEP 2008 has been exhibited and is expected to be in place by 2011.

Schedule 5 of the Draft LEP 2008 lists heritage items including archaeological sites, none of which are in the vicinity of the current project.

2.7 The Penrith Lakes Scheme, 1980

The Scheme was established in 1980 with the aim of co-ordinating the extraction of sand and gravel on the Castlereagh floodplain. In 1979, three independent companies—Boral Limited, Hanson International Limited and Rinker Limited—combined their landholdings and operations to undertake the extraction and rehabilitation works within the Scheme area. These companies joined to form PLDC, which began operations in 1980. In 1981, the Department of Planning and Environment (the Department) completed a Regional Environmental Study which recommended a large lakes area (both wildlife and recreational) as the preferred rehabilitation option for the Scheme area.

2.8 The Deed of Agreement 1987

In 1987 the NSW State Government and the PLDC entered into a formal deed of agreement (the Deed) to implement the Scheme. The Deed specifies processes to be adopted by both parties to achieve a planned extraction of sand and gravel to meet Sydney's medium-term needs and to provide major water-orientated facilities for western Sydney. The Deed was amended in 1989 to make provision for the construction of the Sydney International Regatta Centre and Penrith Whitewater Stadium for the 2000 Olympic Games. The following heritage items are identified within the Penrith Lakes Scheme:

- Hadley Park (Lots 1 and 2, MPOS (OS) 8807);
- Nepean Park (Portion 48);
- McCarthy's Cemetery (part Portion 82);
- Upper Castlereagh Methodist Church and Hall (part Portion 71);
- Upper Castlereagh School and Residence (part Portion 54); and
- Methodist Cemetery (part Portion 71).³

2.9 Penrith Lakes Scheme - Development Application No. 4 (DA 4)

DA 4 allows for the extraction of sand and gravel from the northern and western parks of the Penrith Lakes Scheme. In regards to Non-Indigenous heritage, the conditions of consent for DA 4 require the retention of a number of heritage items.

The DA 4 states retention / reinstatement of a range of heritage items and curtilages in the PLDC area refer to Clause 40 in Appendix A. These items are not within the current project study area.

In addition, Clause 40 of DA 4 details the process if archaeological relics are uncovered during works:

a) If archaeological relics are exposed during the course of development, the application shall notify the Heritage office and obtain any necessary approvals to continue works. The applicant shall comply with any request made by the office to temporarily cease work for the purpose of archaeological recording.⁴

2.10 Non Statutory Listings

2.10.1 Register of the National Estate

The following sites are included on the Register of the National Estate:

- The Castlereagh area, Upper Castlereagh, NSW (place ID 101338)—comprising floodplain, Upper Castlereagh and the township of Castlereagh;
- Nepean Park (place ID 3118); and
- Upper room chapel, hall and cemetery, 1727 Castlereagh Rd, Castlereagh, NSW (place ID 103815).

None of these sites are located within the vicinity of the proposed pipeline or weir works.

2.10.2 Register of the National Trust

The following sites are classified by the National Trust (NSW):

- Methodist church, cemetery and church hall;
- Nepean Park;
- Hadley Park; and
- McCarthy's Roman Catholic cemetery.

None of these sites are located within the vicinity of the proposed pipeline or weir works.

2.11 Endnotes

¹ Sydney Regional Environmental Plan No 11—Penrith Lakes Scheme, NSW Legislation Website <<http://www.legislation.nsw.gov.au/maintop/view/inforce/epi+018+1986+cd+0+N>>, accessed on 15 April 2010.

² Penrith Local Environmental Plan 1991 (Environmental Heritage Conservation), NSW Legislation Website <<http://www.legislation.nsw.gov.au/maintop/view/inforce/epi+674+1991+cd+0+N>>, accessed on 15 April 2010.

³ Penrith Lakes Scheme: Deed of Agreement, 1987.

⁴ Penrith Lakes Scheme – Development Application No. 4, 1998.

3.0 Physical Description

3.1 Introduction

The site inspection was undertaken on 15 March 2010 by Lyndon Patterson, Heritage Consultant and Archaeologist with GML, accompanied by Joe Bevacqua and Matthew Zollinger, from PLDC, and Jillian Comber and Steven Randall, who were undertaking the Aboriginal heritage assessment concurrently. The team inspected the proposed location of the Hunts Gully Weir. The results of the site inspection are presented below.

3.2 Historical Overview

The property at 43 Smith Road was originally part of the 1803 grant of 160 acres to Donald Kennedy, who cleared the land and began agricultural activities. In the late-nineteenth century, orchard cultivation and sandstone mining began on the property. A mass concrete house was constructed on the top of the hill in 1900–1902. In the twentieth century the property was used for a variety of purposes including citrus orchard, market garden, dairy and sandstone supplier. In 1975 the property was sold to Quarries Ptd Ltd.¹

Historical research revealed a photograph taken during a flood in the area in November 1961. This photograph shows a small building on the slope of the hill, just inside the northern boundary fence of the present Penrith Lakes Scheme (Figure 3.3). This small building is also shown on the 1965 aerial photograph of the area (Figure 3.4).

3.3 Site Inspection

The area proposed for the Hunts Gully Weir is located in the northwest corner of the Penrith Lakes Scheme area. The area is low-lying grassy fields with Hunts Gully Creek flowing in a northerly direction to its confluence with the Nepean River. To the east of Hunts Gully Creek, at the top of hill is the Smith Road Residence, located at 43 Smith Road (Figures 3.1 and 3.2). This land is located within the Smith Road Conservation Zone, a non quarry zone (see Figure 1.2).

The property at 43 Smith Road currently comprises the Mass Concrete House, a fibro-cement garage to the northwest of the house, two corrugated-iron sheds northwest of the house, a dairy of besser blocks with a shelter and silage pots northeast of the house, a well, and peppercorn and sheoak trees. All of these buildings and features are located at the top of the hill and away from the area proposed for the weir.

Apart from the Mass Concrete House and outbuildings located at the top of the hill, no historical archaeological sites were noted during the field investigation. There is one potential archaeological site, the remains of the building shown in the photograph of 1961 and the aerial photograph from 1965 (Figures 3.3 and 3.4). There is no building in this area today and it is not known what the building was, but it was possibly a farm shed or outbuilding relating to agricultural activities or a milking shed. It is possible that there are buried archaeological remains including footings or deposits relating to this former building. The location of this former building is well away, upslope, and to the east of the proposed weir location.



Figure 3.1 View looking west of grassy fields with Hunts Gully Creek shown as a dip in the centre of the photograph. The thickly timbered Blue Mountains dominate the background. The PLDC northern boundary fence is marked by a row of trees on the right of the photograph. The proposed Hunts Gully Weir will be located just inside the northern PLDC boundary fence. (Source: GML, 2010)



Figure 3.2 Photograph from Hunts Gully Creek looking east to the Mass Concrete House and Farm located at 43 Smith Road, Castlereagh. Note the steep grassy field. (Source: GML, 2010)

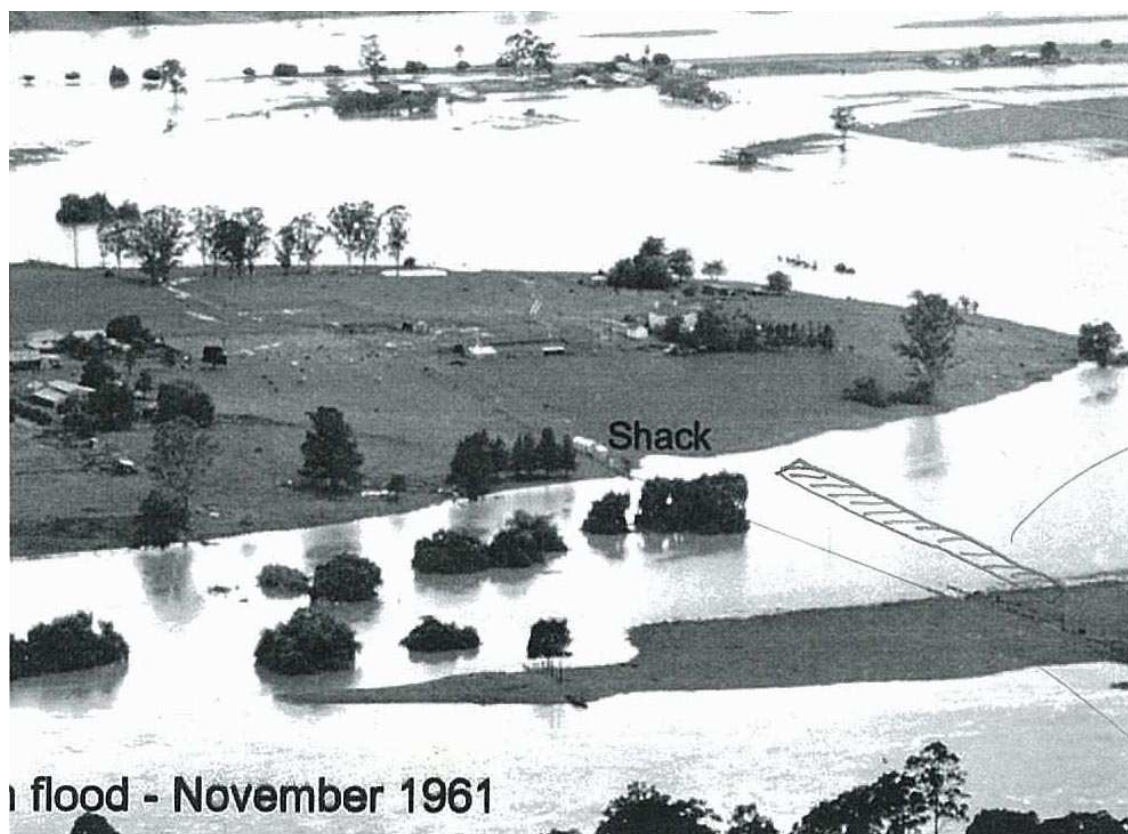


Figure 3.3 Photograph of flooding on the Nepean River and Hunts Gully Creek taken in November 1961, looking east. The Smith Road house and outbuildings are located on the hill in the centre of the image. The approximate location of the proposed Hunts Gully Weir is drawn in on the right of the image. A small building marked 'shack' is located just above the floodwaters. (Source: Stephen Rithenden PLDC, 1961)

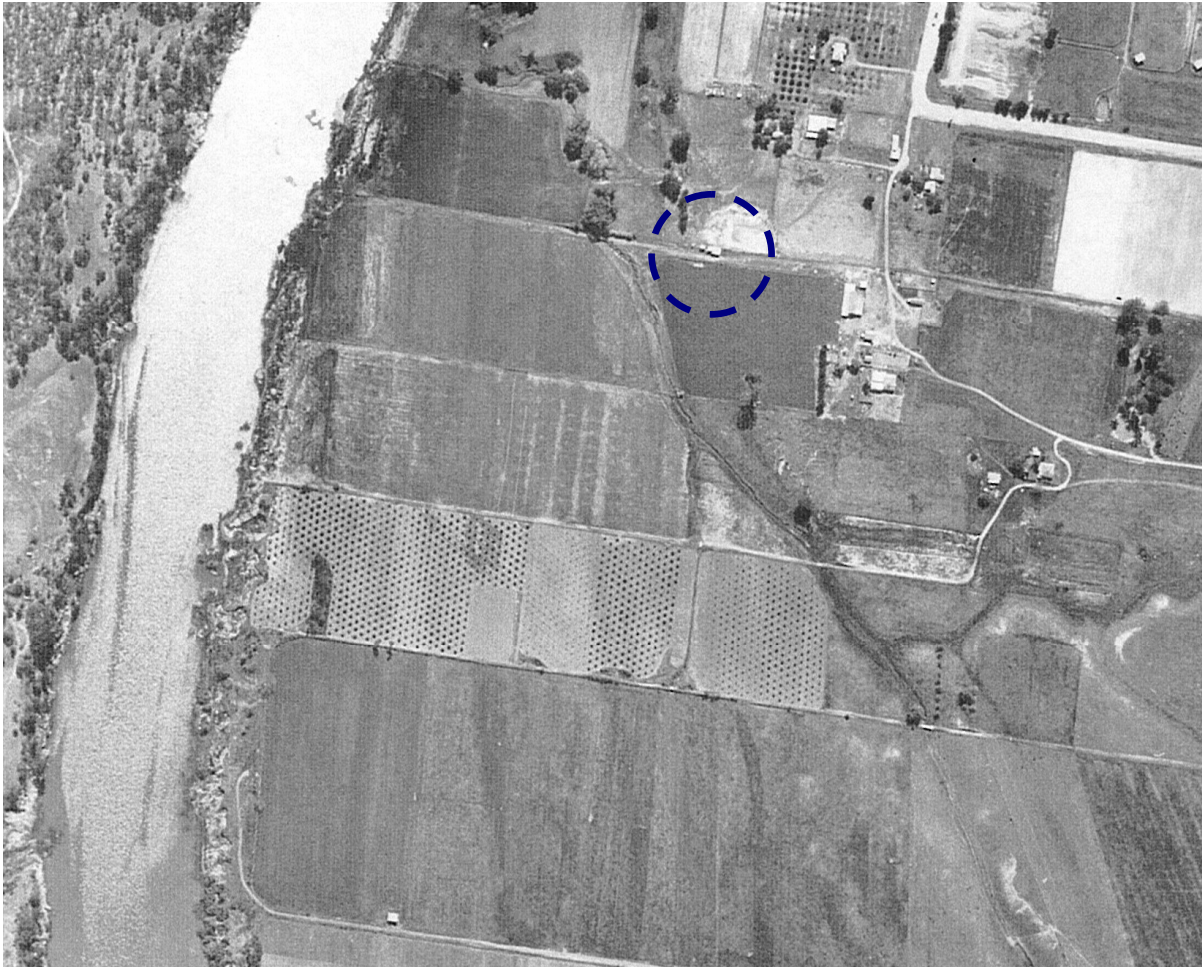


Figure 3.4 Aerial photograph from 1965 showing a small building (circled) corresponding with the location of the building shown in Figure 3.3. (Source: Department of Lands Aerial Photograph 1965)

3.4 Endnotes

- ¹ Godden Mackay Logan, 2008, Penrith Lakes Scheme, Smith Road Residence Archaeology Handbook (Part of Appendix A—Archaeological Management Plan), Draft Report prepared for PLDC, September 2008.

4.0 Heritage Impact Assessment

4.1 Preamble

This section assesses the potential heritage impacts of the proposed Hunts Gully Weir.

4.2 Proposed Development

It has been proposed that several lakes will be constructed as part of the restoration of the quarry sites. The most northern of these lakes will be known as Wildlife Lake. Elsewhere with the Penrith Lakes Site, the eastern bank of the Nepean River is sufficiently high that over-topping and flooding will approximately only occur in 100year ARI events. At Hunts Gully water will naturally flow into the gully from the Nepean River during smaller flood events (i.e. less than a 10 year ARI event). The proposed Hunt's Gully is designed to be overtopped from the Nepean River in 10 year ARI events. As such, the proposed Hunts Gully weir will:

1. Provide the northern boundary to the Wildlife Lake, allowing the retaining of waters within the reservoirs and establishment of ecosystems.
2. Prevent inflow and scour from the Nepean River in less than 10 year ARI river flood events. Under a lower design weir, more frequent flood events would overtop the weir at high flow velocities. This would cause significant scour within the lake as water overtops the weir and drops into the lake. A 10 year ARI level weir would limit flood scour by being both higher (i.e. preventing smaller flood events overtopping) and providing a larger ponding area on the downstream side of the weir which would lower overtopping velocities.
3. Protect properties to the north of the scheme during very large flood events (i.e. flooding proceeding north sourced from Hunts Gully catchment flows or overtopping of other lakes within the Penrith Lakes Scheme by slowing flood velocities.

The concept design incorporates a 65m weir with a crest level of 16mAHD (which is between the 10 year ARI level and the 20 year ARI level). This will therefore prevent flood events of 10 year ARI or less from entering the Wildlife Lake. The abutments ramp up to 18.5mAHD at a grade of 1(V) in 6 (H). The crest level of the abutment is 18.5mAHD. This level then extends until it intersects with the ground surface.¹ Plans for weir are shown in Figures 4.1 – 4.4.

4.3 Heritage Impacts of Proposed Development

An Archaeological Management Plan (AMP) for the Penrith Lakes Scheme is presently in preparation by GML. The draft AMP contains a series of archaeology handbooks with the Smith Road Residence Archaeology Handbook being relevant for the current site. This handbook details six archaeological management zones relating to archaeology and built heritage² (Figure 4.5). The proposed location of the Hunts Gully Weir will not impact the Smith Road Residence management zones. The management zones are all located at the top of hill and away from the area of proposed impact. The staging of machinery and equipment during construction works should also avoid the Smith Road Residence management zones.

The proposed Hunts Gully Weir is close to the location of a former building identified in the 1961 flood photograph located right on the northern boundary fence (Figure 3.3). The area of this former building should be avoided during excavation and construction works and the staging of machinery

and equipment. It is noted that this area is within the 20 metre weir construction buffer zone (Figure 4.2).

The Smith Road Residence management zones and approximate location of the former building are shown in Figure 4.6.

4.4 Alternative Options Considered

A series of four different alternatives were investigated by Cardno, but three of these were not preferred from an engineering perspective, and thus were not assessed for archaeological impacts. However, in general terms of the weir design, the smaller the weir size, the less overall excavation would be required and, as such, the less chance that excavation would disturb historical archaeology such as the potential archaeological remains of the building in the 1961 photograph.



Figure 4.1 Location of the proposed Hunts Gully Weir (shaded in purple) crossing Hunts Gully Creek (in blue). The PLDC area is shaded in Green. (Source: Cardno Lawson Treloar, 2010)



Figure 4.2 Layout of the proposed Hunts Gully Weir, option 1. (Source: Cardno Lawson Treloar, 2010)

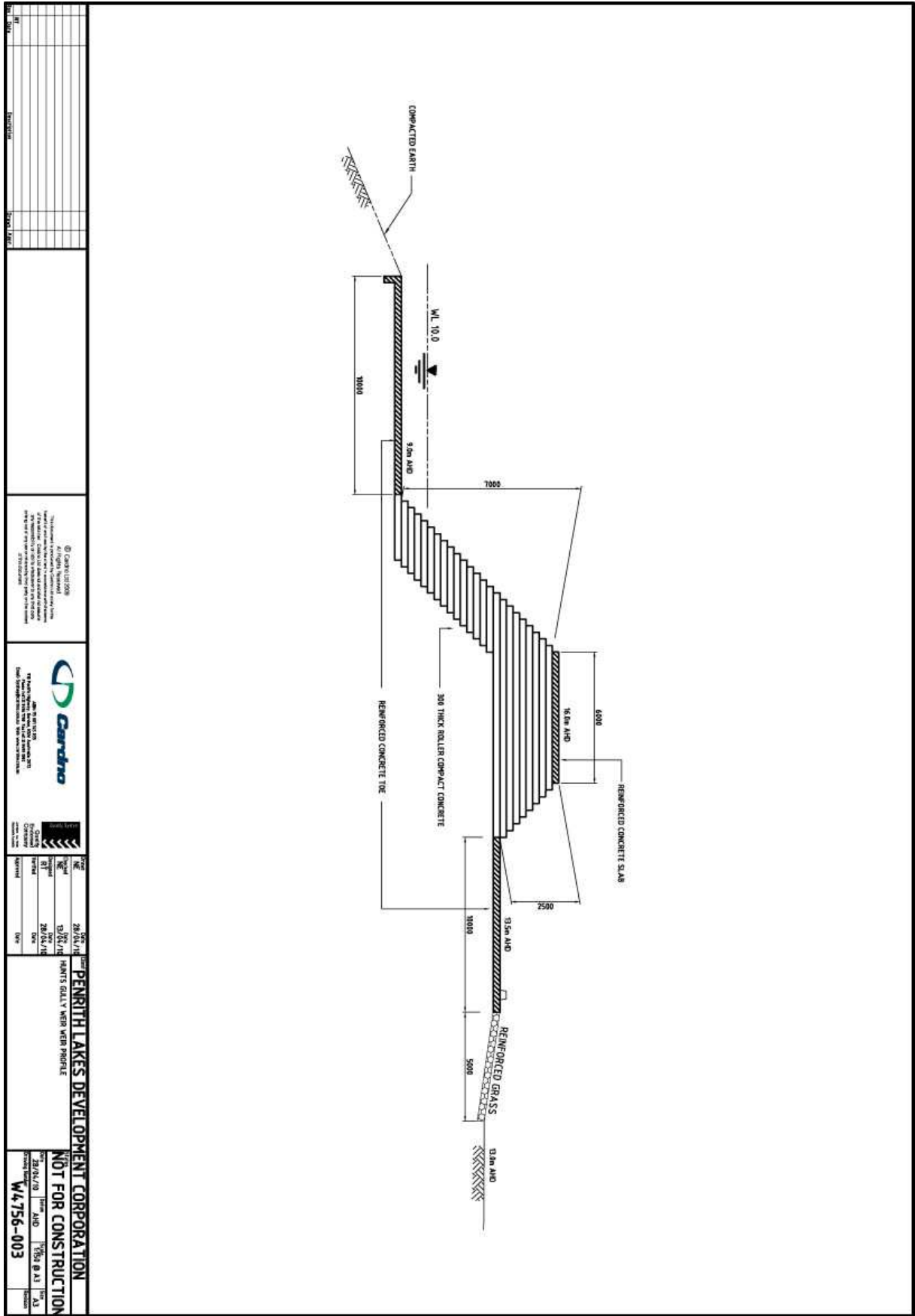


Figure 4.3 Concept dimensions of the proposed Hunts Gully Weir, option 1. (Source: Cardno Lawson Treloar, 2010)



Figure 4.4 Layout of the proposed Hunts Gully Weir, option 1. (Source: Cardno Lawson Treloar, 2010)

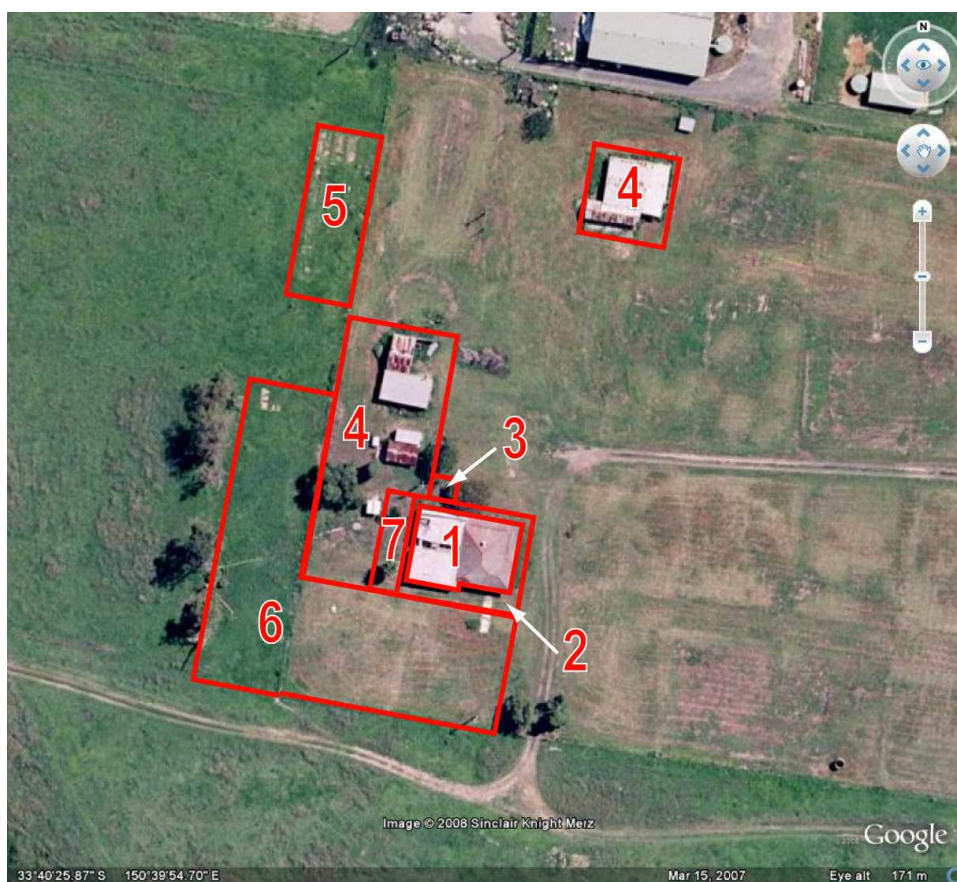


Figure 4.5 Smith Road Management Zones. (Source: Base photo Google Earth, with GML additions 2010)



Figure 4.6 Layout of the proposed Hunts Gully Weir, option 1 and the areas of known and potential historical archaeology in the vicinity. (Source: Cardno Lawson Treloar, 2010 with GML additions 2010)

4.5 Endnotes

- ¹ Cardno Lawson Treloar, 2010, 'Penrith Lakes Scheme – Flood Infrastructure Design', prepared for PLDC, May 2010.
- ² Godden Mackay Logan, 2008, 'Penrith Lakes Scheme Smith Road Residence Archaeology Handbook (Part of Appendix A- Archaeological Management Plan)', draft report prepared for Penrith Lakes Development Corporation.

5.0 Conclusions and Recommendations

5.1 Conclusions

- Three pieces of infrastructure are proposed to facilitate water management and flood mitigation at Penrith Lakes: a set of pipelines to connect Wildlife Lake with the Nepean River; a set of pipelines to connect Main Lake with Nepean River; and a weir along the northern boundary of Wildlife Lake at Hunts Gully Creek to mitigate flooding events.
- This report has been prepared to identify and assess the historical archaeological resources in the area of the proposed Hunts Gully Weir only and to provide management recommendations to mitigate any potential impacts.
- Four options for the weir have been considered by the design team. The design team considered option 1 the preferred design, which comprises a weir height of 16m AHD for a length of 65m, and a higher weir level of 18.5m AHD until it intersects with the 18.5m AHD contour of the design ground levels. The current report has assessed the impact of option 1 on potential historical archaeology only.
- The proposed Hunts Gully Weir will not impact the Smith Road Residence management zones which relate to archaeological sites and built heritage, identified in GML's Smith Road Residence Archaeology Handbook, Draft Report, September 2008. These management zones are all located at the top of hill and away from the area of proposed impact. The staging of machinery and equipment during construction works should also avoid the Smith Road Residence management zones.
- The proposed Hunts Gully Weir is close to the location of a former building identified in the 1961 photograph (Figure 3.3). There are potential archaeological remains associated with this former building. Based on the current designs of option 1, the weir will not impact these potential archaeological remains. Nonetheless, this area should be avoided during excavation and construction works and the staging of machinery and equipment.
- As the project will be assessed under Part 3A of the EP&A Act, the Minister for Planning may determine that provisions of the Heritage Act are suspended, including that an excavation permit would not be required to disturb or destroy the potential remains of the outbuilding or shed (from the 1961 photograph) or any other archaeological sites that may be impacted during works. The Minister, however, may place conditions on this project in the form of Director-General's Requirements, such as those which would required heritage to be properly assessed and recorded prior to removal. However, the best action from a heritage viewpoint would be to design the weir so that it does not disturb the potential archaeological remains of the outbuilding or shed.

5.2 Recommendations

1. The historical management zones of the Smith Road Residence should be avoided during excavation and construction works as well as during the staging of machinery and equipment.
2. In the event that intact archaeological remains of the former building identified in the 1961 photograph, or other remains not identified by this assessment, were to be discovered during

excavation, work should cease in the affected area(s) and an archaeologist should be contacted to assess the remains and advise on appropriate action, including notification to the Heritage Council of NSW under Section 146 of the Heritage Act.

3. In the event that archaeological evidence relating to Aboriginal occupation and/or use of the site were to be discovered, the Department of Environment, Climate Change and Water should be notified immediately in accordance with Section 91 of the *National Parks and Wildlife Act 1974* (NSW). The Local Aboriginal Land Council should also be notified at this time.

6.0 Appendices

Appendix A

Penrith Lakes Scheme – Development Application No. 4

New South Wales Government Department of Urban Affairs and Planning

Sydney Region West - Planning

Mr Ian Stainton
Chief Executive Officer
Penrith Lakes Development Corporation Ltd
Locked Bag 2000
SOUTH PENRITH NSW 2750

Contact:

Our Reference: T Doran

Your Reference: P97/00237 Pt4

Penrith Lakes Scheme - Development Application No.4

Dear Mr Stainton

I refer to the above development application lodged with the Department of Urban Affairs and Planning in November 1997. Pursuant to Section 92 of the Environmental Planning and Assessment Act, 1979, you are advised that the Minister for Urban Affairs and Planning has granted consent to the development subject to conditions. I enclose a copy of the instrument of consent for your information and attention.

Condition 39(i) specifically requires that in the event any previously unknown Aboriginal sites or relics are uncovered during excavation that work will cease immediately and that the material is to be assessed by the National Parks and Wildlife Service and Aboriginal stakeholders. Condition 40(i) requires that any nonAboriginal relics which are uncovered during excavation should be notified to the Heritage Office and excavation should cease. In both instances the Department believes that it is important that machinery operators are given the necessary training and guidance to enable these conditions to be effectively implemented. The Department also believes that it is important that appropriate protocols are in place so that PLDC staff know precisely what action needs to be taken and who should be contacted in the event that any unknown archaeological remains are uncovered.

During the assessment of the development application a number of matters which were not considered to be directly related to development were raised. These matters have not been covered by conditions of consent, however, the Department believes that in the broader context of the Lake Scheme the Corporation should consider the matters and should take appropriate action.

Level 8, Signature Tower
2-10 Wentworth Street
Parramatta NSW 2150

PO Box 404 Parramatta 2124
Telephone: (02) 9895 7633
Facsimile: (02) 9895 6270

The Department of Land and Water Conservation raised issues concerning rehabilitation works and requested that the following be undertaken:

- The Corporation gather seeds from plants indigenous to the area prior to their removal for replanting purposes within the Scheme area.
- In preparing the *Plan of Management for Flora and Fauna in the Penrith Lakes Scheme*, the Corporation address the following:
 - the maintenance and conservation of plant species found on the site and listed by Benson and McDougall (1991) as vulnerable in Western Sydney (page 18, Flora and Fauna Study, Appendix 'C' refers), and;
 - provide an indication of the area of terrestrial native habitat to be restored and species proposed within the plan of management;

Penrith City Council raised a number of issues and requested the following:

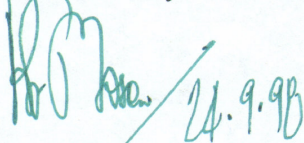
- In consultation with the Department of Urban Affairs and Planning, the Corporation examine sediment and erosion control measures for the disposal of sediment and weed growth dredged from the lakes.
- The Corporation enter into discussions with the Olympic Coordination Authority, the Hawkesbury Nepean Catchment Management Trust, the Middle Nepean Hawkesbury Catchment Management Committee and Penrith Council to ensure total catchment management principles are initiated and implemented as the scheme progresses.

Discussion also be held with the Department of Urban Affairs and Planning, the RTA and Penrith Council at an early date regarding the proposed relocation of Castlereagh Road.

A number of submissions raised the question of the water supply for the Scheme and, as discussed, the Corporation is asked to prepare a report in consultation with the Department of Urban Affairs and Planning which examines the possibility of using effluent from the Penrith Sewerage Treatment Plant and considers what effects such usage would have on water quality in the Lakes.

Should you wish to discuss these matters, Terry Doran of this Office can be contacted on telephone no. 9895 7092.

Yours sincerely



Ron Mason
Director
Sydney Region West

Governnet:G:\SYDWESTPENRITH\LAKE\LETTERS\DA4ADV.DOC

Blue font represents 2004 S96 (1) Modification

Red font represents 2005 S96 (2) Modification

**NOTICE OF DETERMINATION OF DEVELOPMENT APPLICATION UNDER
SECTION 92 OF THE ENVIRONMENTAL
PLANNING AND ASSESSMENT ACT (1979).**

development application

<i>applicant name:</i>	Penrith Lakes Development Corporation
<i>application date:</i>	26 November 1997
<i>applicant address:</i>	1951 Castlereagh Road, Cranebrook
<i>proposed development:</i>	Development as described in the develop application identified as DA 4 and its supporting papers for the purposes of implementing the Penrith Lakes Scheme as defined in Schedule 1 of Sydney Regional Environmental Plan No. 11 – Penrith Lakes Scheme on land described in, and identified on the plan, attached at Schedule B, and subsequently modified by the Statement of Environmental Effects for the Camenzuli Property dated March 2005, and prepared by Arup Pty Ltd (which was subsequently modified by the supplementary noise information prepared by Arup Pty Ltd, and dated 22 August 2005).

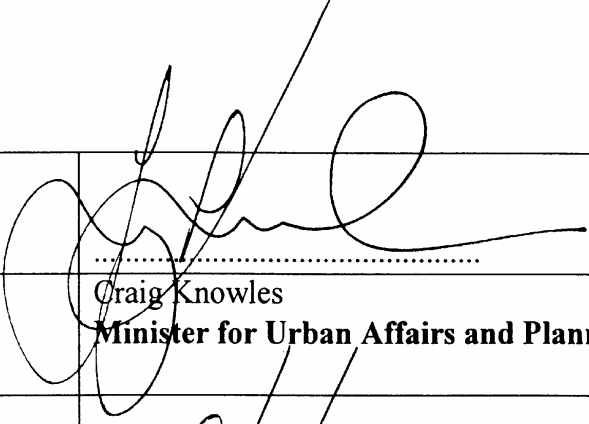
determination

<i>made on:</i>	9th September 1998
<i>determination:</i>	Pursuant to clause 8 of Sydney Regional Plan No. 11 - Penrith Lakes Scheme consent is granted subject to conditions under Section 91 of the Environmental Planning and Assessment Act 1979 shown in the attached Schedule A.
<i>reasons for conditions:</i>	<ol style="list-style-type: none">1. To minimise any adverse impacts on the environment or the amenity of the area.2. To ensure the development is undertaken within acceptable technical and operational criteria.3. To ensure the area is rehabilitated to an agreed plan.

Notes:

1. To find out when this consent becomes effective, see section 83 of the Environmental Planning and Assessment Act 1979 (EP&A Act); and
2. To find out when this consent is liable to lapse, see section 95 of the EP&A Act.

Signed

signature:	
name:	Craig Knowles Minister for Urban Affairs and Planning
date:	9/9/98

Note

The above references to sections of the Act refer to the Environmental Planning and Assessment Act, 1979, prior to its amendment by the Environmental Planning and Assessment Amendment Act, 1997, which commenced on 1 July 1998.

Definitions

A reference in Schedule A to:

- a) the consent authority means the Minister for Urban Affairs and Planning
- b) the Applicant means the Penrith Lakes Development Corporation or its successors in title
- c) the Director General means the Director General of the Department of Urban Affairs and Planning or her duly authorised delegate
- d) the EPA, means the Environment Protection Authority
- e) the Minister means the Minister for Urban Affairs and Planning
- f) NPWS, means the National Parks and Wildlife Service
- g) PLDC means the Penrith Lakes Development Corporation or its successors in title
- h) Sydney Water means the Sydney Water Corporation
- i) SEE means Statement of Environmental Effects
- j) EPL means Environment protection Licence
- K) DEC means Department of Environment Conservation

SCHEDULE A

STATUTORY RESPONSIBILITY

1. That the applicant (and its successors in title) shall for the duration of this Development Consent meet the statutory requirements of all public authorities having statutory responsibilities in respect of the development, and shall negotiate with all authorities having an interest in the proposed development with a view to meeting any reasonable requirements relative to the proposed development.

ENVIRONMENT PROTECTION AUTHORITY APPROVALS

2. That the applicant shall, prior to the commencement of construction of the proposed development obtain from the Environment Protection Authority all statutory approvals required under the Pollution Control Act, 1970, Clean Air Act 1961, Clean Waters Act, 1970 and Noise Control Act, 1975, in regard to any necessary pollution control safeguards.

GUARANTEE

3. (a) That the applicant shall guarantee to meet the cost of remedial works to be carried out by the Minister in the event of -
 - (i) the applicant failing to perform or committing a breach of the conditions; or
 - (ii) any defects arising in the landforms, structures, plant, equipment or associated works,
- (b) That for the purposes set out in (a) above the applicant shall lodge with the Minister a Bank Guarantee, in the form approved by the Director of Urban Affairs and Planning and executed by a bank whereby the bank undertakes to pay the Minister the agreed sum, or a portion of the agreed sum as appropriate, in the event of -
 - (i) the applicant failing to perform or committing a breach of the conditions; or
 - (ii) any defects arising in the landforms, structures, plant, equipment or associated works, the applicant's obligation under this condition shall remain in force until the Minister is satisfied that the conditions set out in this consent have been fully performed and upon the Minister being so satisfied, the said Bank Guarantee or any unused part thereof shall be released to the applicant.
- (c) For the purposes of clause 3(b) "agreed sum" means the sum calculated in accordance with conditions 4, 5 and 6.
- (d) The current bank guarantee shall continue to apply to the proposed development. Any renewal of the bank guarantee necessitated by the review of the cost of remedial works referred to in conditions 4, 5 and 6 shall be lodged with the Minister within 3 months of the date of each detailed consent.
- (e) That if the applicant fails to comply with or breaches any of the conditions of consent, or in the event of any defects arising in the landforms, structures, plant, equipment or associated works, within the defects liability period set out in condition 7, then but not otherwise, the Minister may thereupon undertake works, including constructing a pump and pipeline, rounding off banks, fencing, demolishing, recontouring, revegetating and remove or take such other action as it may think fit to compel the applicant's compliance with the said conditions and all losses and expenses consequent upon such construction, demolition, recontouring, revegetation or removal or any other action as aforesaid and all damages which may sustain shall thereby be recovered by the

Minister from the applicant as a debt in any court of competent jurisdiction to the extent of the Bank Guarantee referred to in condition 3(b).

- (f) That in the event of default by the applicant in respect of the matters referred to in this consent, or in the event of any defects arising, in the landforms, structures, plant, equipment or associated works, the Minister
- (i) may serve on the applicant a notice (which is hereinafter referred to as the "default notice") -
- (a) indicating the matters, in which, in the opinion of the Minister, the applicant is said to be in default;
- (b) requiring the applicant, in the matter and within the date and time specified in the default notice to :
- (1) rectify the default referred to therein, and allowing reasonable time for rectification of any default;
and
- (2) showing cause why the Minister should not exercise his right under condition 3(e)
PROVIDED THAT the Minister may defer the coming into operation of condition 3(e) above until the expiration of the time specified in the default notice; and
- (3) showing cause why the Minister should not institute proceedings under section 123 of the Environmental Planning and Assessment Act.
- (ii) may consider any explanation and representation made by the applicant in pursuance of clause (1)(b)(2) of this condition.

CALCULATION OF BANK GUARANTEE

4. **Bank Guarantee for Defects. arising in Structures. Plant. Equipment or Associated works**

The guarantee for each two year period shall be for an amount of 2.5% of the estimated value of works to be undertaken adjusted each two years, at the time of detailed consent.

5. **Bank Guarantee for Defects Arising in Landforms.**

The guarantee for each two year period shall be for an amount of 2.5% of the estimated value of the total landform cost adjusted each two years, at the time of detailed consent.

6. **Breach of any conditions of Consent**

The guarantee for each two year period shall be the amount calculated by reference to the estimated cost to complete banks, construct foreshores of incomplete lakes, fence and provide a pump station and pipeline in the event of the Applicant terminating all extraction of works pursuant to condition 58.

7. **Liability Period**

The defects liability period shall be –

- (a) for plant, equipment and associated works 12 months after the issue of a Certificate of Practical Completion in respect of the previous 2 year period; and

- (b) for landforms and flood structures 12 months after issue of Certificate of Practical Completion in respect of the previous 2 year period, with the final two year period in any consent warranted for a period of two years, fair wear and tear excepted.

STAGING SEQUENCE

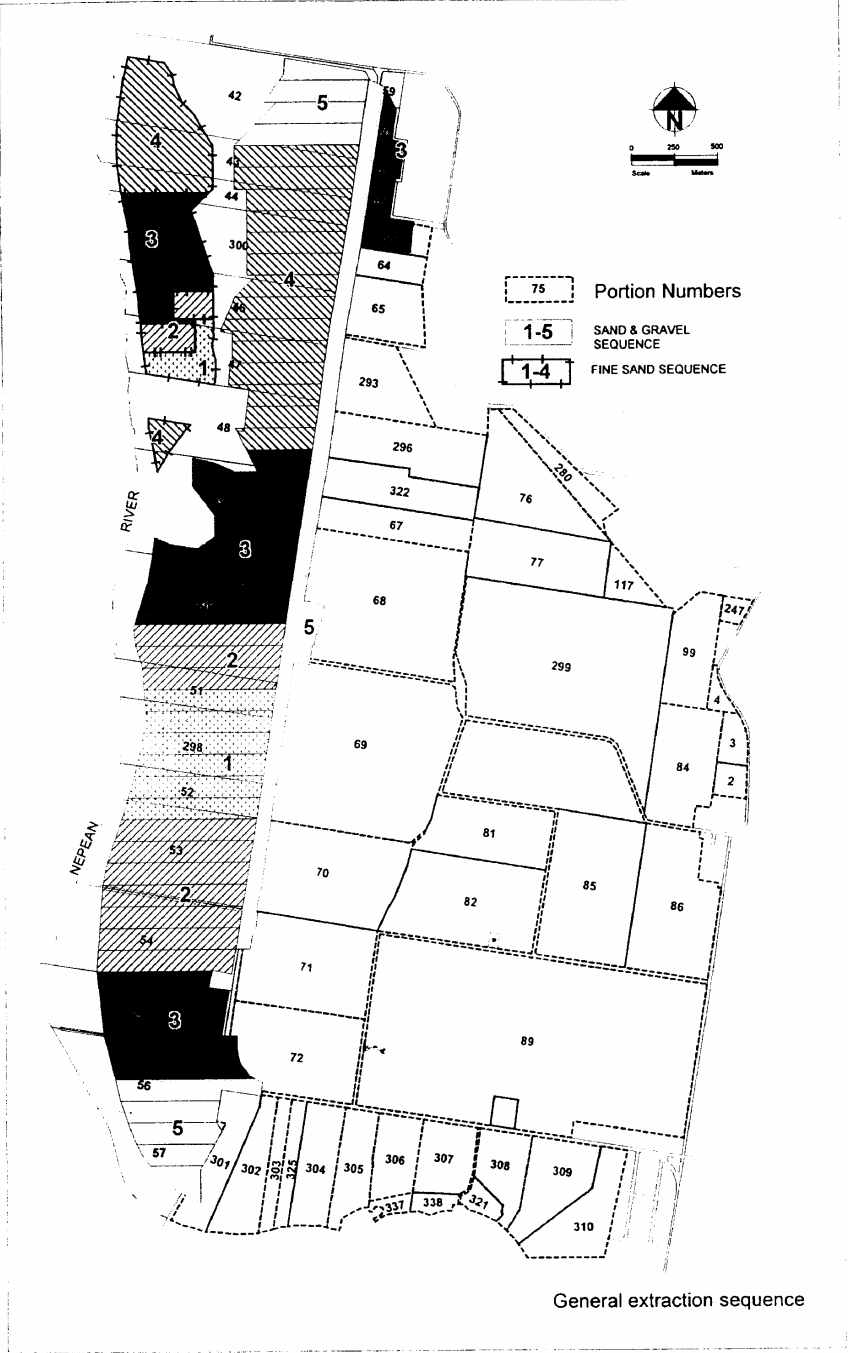
- 8. The Applicant shall carry out development in accordance with the sequence plan shown in Plan 'SEQ' (overleaf) except as provided for in condition 9.
- 9. Condition 8 may be varied:
 - (a) When the consent authority following consultation with the Applicant directs otherwise;
 - (b) When the consent authority deems appropriate following a request for change of sequence from the applicant.

DETAILED CONSENT

- 10. The Applicant will lodge with the consent authority at two yearly intervals, detailed plans of works to be carried out within the subsequent two years. The first of such intervals shall commence from 1 July 1998.
- 11. Prior to preparing plans as required by condition 10 the Applicant shall consult with the relevant authorities and organisations as directed by the Regional Manager of the Department's Sydney Region West Office
- 12. Such plans shall be drawn at a scale of 1: 1000 and show -
 - (a) the relationship to the Sequence Plan (as shown in Plan 'SEQ');
 - (b) engineering design details;
 - (c) shall include details of landscaping and final rehabilitation plantings to be undertaken including species name, density or spacing, location and number of trees and shrubs to be planted. The plan will also include details of proposed ground cover plantings or sowing of grasses;
 - (d) shall demonstrate the proposed respective locations of site for plant, buildings, roads, means of access to works, drainage, parking area and other works generally if applicable.
- 13. Consent is deemed to have been refused where the consent authority has not determined the detailed plans within ninety days after lodgement of those detailed plans with the consent authority, except when notified otherwise by the consent authority.

Plan 'SEQ'

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LAND REHABILITATION

14. All land rehabilitation is to be generally in accordance with the Land Rehabilitation Manual, 1987.
15. Within two years of the date of this consent the applicant shall consult with the Hawkesbury-Nepean River Trust and submit to the Department of Urban Affairs and Planning for approval, design principles for the Wildlife Lake that will maximise the wildlife value of the lake. Detailed plans based on the approved Principles shall be prepared by the Applicant and submitted to the Department of Urban Affairs and Planning for approval.

16. **Bank Slopes**

The completed landforms above normal water level shall have an overall slope no steeper than 611: 1 V. Intermediate slopes steeper than this are permissible provided the overall slope is no greater than 6H: 1 V. Any departures from the uniform 6H:IV slope are to be specifically justified

Drainage and Erosion Control

17. Capacities of drainage and erosion control works are to be determined in accordance with the Australian Rainfall and Run-off Manual, 1987.
18. Minimum design storm return periods are to be
- lateral drains 5 years
 - waterways 20 years
19. A minimum of 100mm of topsoil is to be spread on all the reconstructed landforms which are to be revegetated.

20. **Revegetation**

Revegetation of landforms must commence within 30 days from the placement of topsoil. Extension of this time may be granted by the Regional Manager of the Department's Sydney Region West Office where site conditions prevent revegetation works being carried out. Subject to the concurrence of the Regional Manager, works may be deferred temporarily due to unfavourable weather conditions.

21. **Repairs and Maintenance**

Land shall be maintained, repaired and managed to the satisfaction of the consent authority. The repairs and maintenance are to be generally in accordance with the Land Rehabilitation Manual, 1987.

22. **Landscaping Species Selection**

Indigenous native trees and shrubs of the floodplain shall be used. Exception to the planting of indigenous trees and shrubs may be permitted provided these are in accordance with the Penrith Lakes Landscaping Manual (1987) or approved Conservation Management Plans.

23. **Plant Density**

Planting of trees and shrubs will be at a density of 163 units per hectare of future land area.

24. Condition 23 may be varied where the land area concerned may be future urban or where the land may be otherwise unable to support 163 units per hectare. Such variation should be specifically referred to in the appropriate landscaping plan.

25. Water Plants

Both submergent and emergent varieties of water plants to be planted concurrently to the first filling of any lake. Landscape plans should make reference to where such planting will occur, density and species.

26. Geo-Technical

All geo-technical works to be carried out in accordance with the detailed plans to be submitted for approval by the Regional Manager of the Department's Sydney Region West Office before rehabilitation works commence (refer to condition 10).

WATER

27. Water Management Plan

The Applicant shall implement and manage the water management of the site in accordance with section 5.1 of the SEE.

28. Reticulation Pipes

Alternative methods for water transfer are to be made available by the applicant should water levels be reduced to a level that causes the reticulation pipes to be unserviceable.

NOISE LIMITS

29 The Applicant shall not exceed the following maximum noise levels in those areas designated.

(a) Dwellings inside and outside the Scheme area (but not on the Castlereagh Escarpment):

(i) Maximum Noise Levels

Noise levels as measured at any one dwelling are not to exceed the following criteria:

Maximum Noise Limits (L10)

Absolute maximum	70dB(A)
Greater than	65dB(A) for 1 month
Greater than	60dB(A) for 3 months
Greater than	55dB(A) for 30 months
Less than	55dB(A) for remainder of the time

The above absolute maximum may be exceeded as a result of the construction of noise control works eg noise bunds.

(ii) The Applicant shall construct up to 5m high noise bunds to ensure that the noise limit criteria indicated in (i) above can be met at occupied residential properties in the locality, provided that the residents affected agree to the construction of the bunds. These bunds shall be removed when they cease to mitigate against the adverse noise, dust and visual impacts of the proposal.

(iii) **The Applicant shall:**

(a) not undertake any works within 98.5m of the eastern boundary of Lot 2 DP617921; and

- (b) construct and maintain a 2 metre high noise bund along the eastern boundary of the limit of works on Lot 2 DP 617921 for the duration of works on Lot 2 DP 617921.

(b) Dwellings on the Castlereagh Escarpment

Maximum Noise Levels

Noise levels as measured at any one dwelling on the Escarpment are not to exceed the following criteria:

Maximum Noise Limits (L10)

Absolute maximum	70dB(A)
Greater than	65dB(A) for 3 month
Greater than	55dB(A) for 30 months
Less than	55dB(A) for remainder of the time

- (c) Except as may be expressly provided by an EPL, noise generated from extraction and transport operations must not exceed the noise limits in the table below.

Noise Limits dB(A)

Location	5.00am- 6.00am	7.00pm- 8.00pm	8.00pm- 9.00pm
	$L_{Aeq}(15 \text{ minute})$	$L_{Aeq}(15 \text{ minute})$	$L_{Aeq}(15 \text{ minute})$
Dixons Residence	55	55	55
Smith Street	38	43	43
Camenzuli Residence	41	50	47

Notes:

- (i) *If the Applicant has a written noise agreement with any landowner, and a copy of this agreement has been forwarded to the Department and the DEC, then the applicant may exceed the noise limits in the table for the landowner's land in accordance with the terms of the noise agreement.*
 - (ii) *Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary.*
 - (iii) *To determine compliance with the $L_{Aeq}(15 \text{ minute})$ noise limits in the above table, where it can be demonstrated that direct measurement of noise from the development is impractical, the DEC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in section 4 of the NSW Industrial Noise Policy shall be applied to the measured noise levels where applicable.*
 - (iv) *The noise emission limits in the above table do not apply under meteorological*
 - i wind speeds in excess of 3m/s at 10 metres above ground level; and/or*
 - ii temperature inversion conditions in excess of 3°C/100m, and wind speeds in excess of 2m/s at 10 metres above ground level.*
- (d) The Applicant shall ensure that all extraction and transport operations carried out between 5.00am and 7.00am comply with the DEC's intrusive and sleep disturbance criteria set out in the Industrial Noise Policy.

HOURS OF OPERATION

30. The standard hours of operation for non-noise sensitive areas are:

Sand and gravel extraction, including haulage to processing plants	5.00am to 9.00pm, Monday to Friday; 5.00am to 7.00pm, Saturday.
Overburden stripping and rehabilitation	7.00am to 7.00pm, Monday to Saturday;

None of the above works must be undertaken on Sundays or public holidays.

- 31 The standard hours of operation for extraction and rehabilitation on Lot 2 DP61792 and in the Exclusion Zone shown by side hatching in “Figure 1 – Exclusion Zone for Additional Hours” are:

Sand and gravel extraction, including haulage to processing plants	7.00am to 6.00pm, Monday to Friday; 7.00am to 1.00pm, Saturday.
Overburden stripping and rehabilitation	7.00am to 5.00pm, Monday to Friday; 7.00am to 1.00pm, Saturday.

None of the above works must be undertaken on Sundays or public holidays.

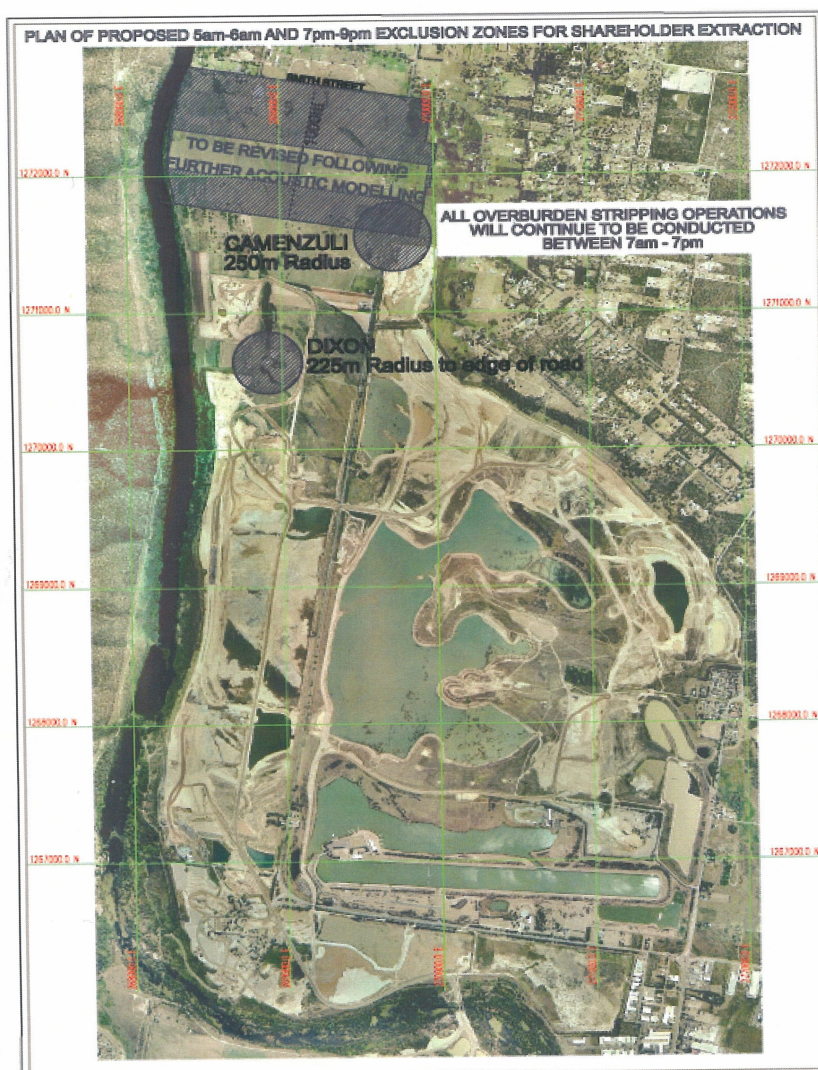


Figure 1 – Exclusion Zone for Additional Hours

Note

If the Applicant has a written noise agreement with the owners of the Dixon or Camenzuli residence(s), then the Exclusion Zone for Additional Hours shall be removed for the respective residence(s). Notwithstanding the above, the Exclusion Zone shall be maintained for a distance of 1000 metres from Smith Street residences.

33. Maintenance and Purchase of Machinery and Vehicles

- (a) All machinery used in quarry and reconstitution operations shall be properly maintained so as to prevent undue noise.
- (b) Any new machinery or equipment purchased for use on site, either in addition to or as replacement of existing machinery or equipment, shall be fitted with the manufacturers standard noise control equipment available at the time of purchase.

AIR QUALITY

- 34. Dust emanating from extraction and rehabilitation is not to exceed 4g per square metre per month (annual average) and 260ug/cubic metre for maximum concentration for a 24 hour period as measured at residences most likely to be affected by the operations.
- 35. When wind speeds average 5 m/s and nearby residences are likely to be significantly affected by dust, authorised Council or Environment Protection Authority officers may direct the Applicant to cease operations and the Applicant shall comply with these directions.
- 36. An additional dust monitor shall be erected on the eastern side of Castlereagh Road in the vicinity of the Sydney International Regatta Centre.
- 36A. Prior to carrying out any works on Lot 2 DP 617921 the Applicant shall erect a dust monitor in the vicinity of 138-147 West Wilchard Road to demonstrate compliance with the dust deposition criteria set out in Condition 34.

37. Use of Watering

That the Applicant shall keep all unsealed roads used for extractive or other material or overburden haulage sufficiently damp, at all times to prevent windblown or traffic generated dust. Plant shall be provided and operated to enable watering at least at a rate of 1.0 litres per square metre per hour.

38. Grasses

Rehabilitated areas shall be grassed as soon as possible, in accordance with condition 20 and the Land Rehabilitation Manual, 1987.

ABORIGINAL HERITAGE

39. Destruction of Aboriginal sites

- (a) If any new or unknown Aboriginal sites or relics are uncovered during the development, work affecting those sites or relics is to cease immediately and the material assessed by Aboriginal stakeholders willing to participate in the process and NPWS. Applications for consent to destroy new or presently known Aboriginal sites or relics is to be sought in accordance with a protocol to be developed by the Applicant in consultation with Aboriginal stakeholders and NP&WS. Aboriginal community participation

- (b) The Applicant will further consult with the NPWS regarding appropriate Aboriginal community participation in monitoring, surveying, and any salvaging requirements during the development process. The Applicant will also consult with the NPWS regarding Aboriginal participation in management of the heritage values of the site in the interim period before the proposed regional park is established.

Management of conservation areas

- (c) The Applicant will develop a conservation management plan that addresses the interim day-to-day management of all areas set aside for heritage conservation for the intervening period before the proposed regional park is established. The plan is to ensure that the natural values of the land are not diminished and will be prepared in consultation with relevant stakeholders, including the NPWS, the Aboriginal community and the park advisory committee.

Geomorphic Unit D1

- (d) Excavation shall not occur within 20 m of Smith's Lane to ensure that portion of geomorphic unit D I (as identified in the *Supplementary Notes to Archaeological Investigations in the DA 4 area, Penrith Lakes Scheme, prepared by Dr J Kohen, May 1998*) is retained.

EUROPEAN HERITAGE

40. Archaeological Relics

- (a) If any archaeological relics are exposed during the course of development, the applicant shall notify the Heritage Office and obtain any necessary approvals to continue works. The applicant shall comply with any request made by the Office to temporarily cease work for the purpose of archaeological recording.

Due Care

- (b) Where excavation and associated works are to be carried out in the vicinity of heritage items that are to be retained, the Applicant is to take appropriate action to secure the properties and ensure that these items are not damaged by these works.

Castlereagh Road

- (c) In association with the relocation of Castlereagh Road, the Applicant is to retain or reinstate a section of Castlereagh Road in the vicinity of Landers Inn for interpretation purposes. The extent of the retained or reinstated road and its dimensions are to be determined by the Applicant in consultation with the Department of Urban Affairs and Planning but shall be within the present alignment of Castlereagh Road.

Landers Inn

- (d) The Landers Inn complex and the curtilage shown shaded in green in the diagram identified as "Diagram I" and attached to these conditions of consent is to be retained.

Archival Recordings

- (e) Where work is to be carried out in the vicinity of built items identified in Tables 5.1.1, 5.1.2 and 5.1.4 within the Heritage Assessment Report prepared by Siobhan Lavelle (August 1997) (identified as Appendix E1 of the papers supporting DA 4) as holding local significance and these items are to be demolished, an archival recording of these items shall be carried out prior to their demolition. The recording shall be undertaken in accordance with the NSW Heritage Manual, November 1996. A copy of the documentation shall be lodged with the Department of Urban Affairs and Planning and a second copy shall be made available to the management authority for the Penrith Lakes Scheme.

Penrith Quarry Complex

- (f) Subject to safe working procedures, a professional recording of the Penrith Quarry Complex (RES 21) is to be prepared for the Applicant prior to its demolition. The recording is to include a history of the item and its comparison with other sites. The recording shall be undertaken in accordance with the NSW Heritage Manual, November 1996. A copy of the documentation shall be lodged with the Department of Urban Affairs and Planning and a second copy shall be made available to the management authority for the Penrith Lakes Scheme.

Minnaville (RES Site 15)

- (g) Prior to demolition of the buildings and bulk excavation works, appropriate professional studies and investigations are to be undertaken in terms of recommendations 3 to 5 of the Archaeological and Heritage Assessment report for Minnaville, prepared by Siobhan Lavelle (September 1996) (identified as appendix E2 of the papers supporting DA 4). A copy of the documentation shall be lodged with the Department of Urban Affairs and Planning and a second copy shall be made available to the management authority for the Penrith Lakes Scheme.

Conservation Management Plans

- (h) Where items are to be retained and are owned by the Applicant, a conservation management plan is to be prepared for all items identified as holding local significance in tables 5. 1.1 and 5.1.4, as well as, the Mass Concrete House located at 95 Castlereagh Road, Castlereagh and Landers Inn.
- (i) A Conservation Management Plan shall be prepared for Hadley Park and include matters associated with Nepean Park and surrounding lands and be submitted to the Heritage Council for approval.

Collections Policy

- (j) The Applicant is to prepare a Collections Policy to guide the collection and order of European artefacts, their storage and recording.

Cultural Landscape Study

- (k) A Cultural Landscape Study detailing the history of land grants and development within the DA 4 area and providing a comparative assessment of the significance of the area, is to be prepared. A copy of the documentation shall be lodged with the Department of Urban Affairs and Planning and a second copy shall be made available to the management authority for the Penrith Lakes Scheme.

NATURAL ENVIRONMENT

- 41. (a) Prior to works being undertaken in the vicinity of the former settling pond (identified as site 12 within the DA 4 flora and fauna investigation report prepared by Kevin Mills, December 1996), the Applicant is to undertake a field survey to determine whether the Green and Golden Bell Frog is present in this location. Should this species of frog be found, the Applicant is to relocate the population to the most optimum location for this species elsewhere on the site.
- (b) The applicant is to develop a strategy for the management of the Nepean River Corridor in association with the Hawkesbury Nepean Catchment Trust.
- (c) The treed creek north of Hadley Park is to be retained as part of the curtilage around Hadley Park to permit the retention of a stand of *Angophora subvelutina*.

TRANSPORT

42. That the transport route for the carriage of all materials shall be via internal trunk haul roads as described in Figure 4.6 of the Statement of Environmental Effects.
43. That no road, public reserve or public place shall be used for the passage of *vehicles in the* transport Of extractive material between the lands and any State Highway, Trunk, Main or Secondary road as respectively classified under the Main Roads Act, 1924, as amended.
44. The applicant shall prepare and submit to the Director General for approval detailed plans for the relocation of traffic from Castlereagh Road to Cranebrook Road and a report addressing the traffic and associated impacts of the proposal, prior to any closures of Castlereagh Road. Detailed plans shall be to RTA standards.
45. Detailed plans for the construction of an underpass on Castlereagh Road are to be submitted to the RTA for approval.
46. The applicant is to consult with the RTA in respect of any proposed realignment of Castlereagh Road. Any future realigned Castlereagh Road must satisfy the evacuation objectives detailed within the Hawkesbury/Nepean Flood Plain Management Strategy.
47. The applicant is to consult with the Department of Land and Water Conservation in respect of the Hawkesbury/Nepean Flood Plain Management Strategy and its implications for the proposed development.
48. Access

Appropriate approval is required from the Roads and Traffic Authority, for the location and design of access to be provided at any point on Castlereagh Road.

EXCAVATION IN THE VICINITY OF CASTLEREAGH ROAD

49. Where excavation takes place within 100 metres of Castlereagh Road a 1.2 metre high earth embankment should be built as a safety measure. The embankment may be built no closer than 20 metres to Castlereagh Road. Details of the embankment to be submitted as part of the appropriate two year detailed consent application. (refer to condition 10).

OTHER LANDOWNERS

50. Drainage

The applicant is to permit natural drainage of adjacent existing development areas into the scheme. Detailed plans shall be submitted outlining the mitigation measures to be undertaken to protect adjacent sites. These plans shall be drawn in accordance with sound engineering practice.

51. The Applicant is not to carry out any works that would cause inundation of surrounding developed areas by discharges produced by a 100 year recurrence interval rainfall event.
52. Where the Applicant alters discharge patterns from existing development the proposed measures to facilitate drainage including details of scour protection works should be submitted to Penrith City Council for Council's consent with a supporting report by a qualified civil engineer.

53. Damage to Other Property

That the Applicant shall take all reasonable steps in carrying out works on the land the subject of the application in such a manner as to prevent any injury, loss or damage to persons and stock on any other property.

54. Alterations to services or municipal facilities on the subject land necessitated by the development shall be carried out at the Applicant's expense to the reasonable satisfaction of the authority administering the service/facility. The service authority's written concurrence to such works shall be obtained prior to the commencement of such works.

55. Adverse Water Supply

That the Applicant shall, if directed in writing by the Council on the advice of the Department of Land and Water Conservation and at the Applicant's cost, make available or make arrangements for a supply of water to any person in the immediate locality of the operations who at the date of consent was licensed under the Water Act, 1912, to extract water from the aquifer and who can demonstrate to the satisfaction of the Department of Land and Water Conservation that the supply of such water has been adversely affected in quality or quantity by the development. Provided that Council in making such a direction shall not require an alternative supply of water exceeding the provision of the licence and shall specify a period for maintenance of the supply which in its opinion is reasonable having regard to the circumstances.

56. Limits of Working

That the Applicant shall not excavate or stockpile

- (a) within 30 metres of any Main or County Road;
- (b) within 15 metres of any other dedicated road, any public place or public reserve; and
- (c) within 15 metres of any adjoining privately owned property except with the written permission of the owner of that property and the consent of the Council.

except as provided for in condition 39(iii).

WORKS IN THE VICINITY OF THE NEPEAN RIVER

57. Proposed Weirs

- (a) The Applicant is to review the design of proposed weirs and outlets to the Nepean River in consultation with NSW Fisheries.

Riverbank Setback

- (b) Subject to condition 57 (iii), no quarrying activities are to take place within 100 metres of the waters edge of the Nepean River, with the exception of works for the construction of proposed weirs and/or for remedial purposes. Remedial and weir construction works are permitted subject to the Applicant obtaining necessary statutory approvals.

Variation of Riverbank Setback

- (c) Excavation works are permitted to within 40 metres of the top of the high bank of the Nepean River, subject to the Minister's approval of the detailed Two Year Plans and provided these plans are adequately supported

by geotechnical studies that address river bank stabilisation and interim flood protection works (refer to condition no. 10).

Soil and Water Conservation Management Plan

- (d) The Applicant is to prepare in consultation with the Department of Land and Water Conservation a Soil and Water Conservation Management Plan to guide works within 40 metres of the banks of the Nepean River.

TERMINATION OR TEMPORARY CESSATION OF EXTRACTION

58. Details

The Applicant shall, in accordance with clause 6, prepare and submit to the Director General for consent details of proposals for completion and construction of landforms, banks, fencing and works including the construction of a pump and pipeline in the event of termination of the extraction works or temporary cessation of such works.

59. Temporary Cessation of Works

Where the Minister after consultation with the Applicant notifies the Applicant that he has formed the view that effective sand and gravel extraction has temporarily ceased and considerable time will elapse before effective extraction will resume then the Applicant shall undertake and substantially complete the works consented to in those circumstances pursuant to condition 58 within one year of the date of the notification and shall totally complete such works within 2 years of that date.

60. Total Cessation of Works

Where the applicant issues a termination notice to the Minister setting out the reasons for ceasing all sand and gravel extraction and the Minister agrees to such termination then the Applicant shall substantially complete the works consented to in those circumstances pursuant to condition 58 within one year of the date of the termination notice and shall totally complete such works within 2 years of that date.

MONITORING

61. Monitoring Programme

The applicant shall carry out the tests, recording and reporting referred to in conditions 62 and 63 to enable the impact of on-site activities to be assessed.

62. Land Rehabilitation

Compaction Tests

- (a) The Applicant will at its cost, be responsible for compaction tests at the following frequencies:

Engineered Zones - 1 test every 2500 cubic metre

- (b) Tests are not required in other construction zones.

- (c) The above frequency has been determined on the basis that the Applicant has a suitably qualified Engineer on site to supervise earthworks. Frequency of testing is to increase to 1 test every 500 cubic metres in Engineered Zones if such professional supervision is not provided.

- (d) Compaction tests shall be done in accordance with AS 1289E4.1-1982 unless specific approval is given by the consent authority to change the test method.
- (e) Testing to be undertaken by a National Australian Testing Authority registered laboratory.
- (f) Should the Applicant wish to undertake its own tests then: -
 - (i) it is to be National Australian Testing Authority registered; and
 - (ii) a minimum of 10% of all tests are to be undertaken by an independent consultant.
- (g) Any failures are to be rectified by the Applicant.

63. Settlement

- (a) The Applicant shall install up to 10 settlement plates in Open Space areas, the location of which are to be nominated by the consent authority.
- (b) The Applicant shall arrange to have these plates surveyed at appropriate intervals (more frequently at commencement) until such time that settlement is substantially completed .

64. Records and Reporting

- (a) The Applicant will establish and maintain records of
 - works as executed diagrams;
 - compaction test results;
 - settlement plate results; and
 - any other relevant information relating to construction.
- (b) Records are to be available for inspection by an appointee of the consent authority at any time during normal working hours.

65. Noise

- a) The Applicant shall, on a six monthly basis or at other periods determined by the Department's Regional Manager of the Sydney Region West Office, measure noise emanating from the overall quarry and reconstitution operations at four residential sites within proximity to the operations. One such site shall be the closest residential site to the operations. These measurements will be carried out using 20 minute spot checks.
- b) The noise levels of all quarry and reconstitution machinery shall be tested in accordance with AS2012-1977 on an annual basis as evidence that the noise level of individual items of machinery has not increased through improper maintenance or neglect. These tests will be commenced by April 1999. Any new equipment will be tested within three months from the date of its arrival on site.
- c) A report containing the results of all noise monitoring undertaken in the preceding 6 month period or other period determined by the Regional Manager shall be submitted to the Minister within 3 months of the end of the period.

66. Air Quality

- (a) The Applicant shall, on a monthly basis, obtain and analyse dust samples collected in accordance with EPA licence conditions. Vertical dust deposit gauges shall be located at each site and, in addition directional dust gauges shall be located where agreed. This monitoring shall continue for one year from the date of this consent. Such monitoring shall cease after this period provided results obtained during the period indicate that dust emanating from quarry and reconstitution operations has not exceeded 4g/sq.m./month (annual average) at neighbouring residences.
- (b) PLDC shall install and operate a high volume dust sampler to ensure compliance with the 24 hour maximum concentration level. This monitoring shall continue for one year from the date of consent to the development application. Such monitoring shall cease after this period provided results obtained during the period indicate that dust emanating from quarry and reconstitution operations has not exceeded 260 ug/cubic.m./24 hour maximum concentration.
- (c) PLDC shall monitor wind speed and direction.
- (d) A report containing the results of all air quality monitoring undertaken in the preceding 3 month period shall be submitted to the EPA and Penrith City Council within 2 months of the end of the period.

67. Monitoring Records

The Applicant shall maintain a record of the following which shall be available upon request of the consent authority:

- (a) Works as executed drawings, 1: 1000 scale with 1 m contours;
- (b) Details of where topsoil was stripped from, placed and method of placement;
- (c) A report showing landforms completed and areas revegetated;
- (d) A summary of all works undertaken in regard to repairs and maintenance of landforms;
- (e) The results of all noise monitoring undertaken in the previous 12 month period;
- (f) The results of all air quality monitoring undertaken in the previous 12 month period;
- (g) Photogrammetric surveys at an appropriate scale showing the extent of rehabilitation which has been carried out in the lands;
- (h) The results of compaction and settlement tests;
- (i) The species composition and location of plantings completed together with loss rates;
- (j) Planting times and methods and cumulative maintenance procedure;
- (k) A description of all ancillary works which have an effect on the external environment;
- (l) And any other matters the consent authority may direct be included from time to time.

The Applicant shall maintain these records for the life of the scheme and shall then make available these records, in good order, to the consent authority.

68. The Applicant shall lodge with the consent authority summary reports of the records (referred to in condition 66) within three months of the completion of every two year period from June 1997.

69. Certificate of Practical Completion

The Applicant shall issue to the Minister a Certificate of Practical Completion on completion of works authorised by each detailed approval pursuant to condition 10.

70. Joint Inspection

That the Applicant shall make a representative available for joint inspection of the lands with officers of the Council, the Department of Land and Water Conservation and any other statutory authorities concerned with the proposed operation of these conditions. Such inspections shall be carried out after six (6) months but shall not be regarded as replacing any other inspections which any other authority is entitled to make.

71. Audit Checks

Inspections will be carried out on behalf of the Department of Urban Affairs and Planning on an audit principle to ensure works are in accordance with approved plans.

SCHEDULE B

PLDC Land							
Ref	Description	Torrens Register	Vol.	Fol.	Conv	Bk	Area (ha)
1	Lot 471 DP 558416	471/558416	12116	85			9.146
2	Lot 470 DP 558416	470/558416	12116	84			0.101
3	Part Por 42				988	3192	32.375
4	Lot 1 DP 63308	1/63308	11693	241			19.35
5	Por43				852		36.13
6	Lot 1 DP 73955	1/73955	3460	31			7.845
7	Lot 1 DP 120891	1/120891	7777	57			13
8	Lot 1 DP 120872	1/120872	7777	56			2.023
9	Part Por 44				130	3136	6.475
10	Lot 300 DP 752021	300/752021	7074	206			45.19
11	Part Por 46				422	3462	18.129
12	Lot 1 DP 60859	1/60859	15175	87			18.72
13	Lot 1 DP 87060	1/87060	6733	116			17.82
14	Lot 2 DP 87060	2/87060	6733	115			20.23
16	Lot 1 DP 219895	1/219895	9849	93			32.39
17	Lot 21 DP 530256	2/1530256	10914	62			8.966
18	Lot 45 DP 545813	45/545813	11695	145			11.53
19	Lot 44 DP 545813	44/545813	11695	144			11.22
20	Lot 42 DP 546220	42/546220	11695	157			5.373
21	Lot 23 DP 530256	23/530256	10974	6			8.65
22	Lot 3 DP 219895	3/219895	9849	95			15.95
23	Lot 1 DP 436198	1/436198	12771	89			29.69
24	Part Por 51				687	2228	4.705
25	Lot 4 DP 2223	4/2223	13771	232			15.71
26	Part Por 298				709	1948	9.308
27	Lot 2 DP 348979	2/348979	5446	194			2.668
28	Lot 2981 DP 128099	2981/128099	8258	233			27.98
29	Part Por 52				386	2236	3.237
30	Lot 1 DP 2223	1/2223	916	35			16.13
31	Part Por 53				917	2240	3.49
32	Lot 2 DP 236125	2/236125	10784	45			43.563
33	Lot 1 DP 236125	1/236125	10784	44			0.355
34	Part Por 54				491	2973	11.47
35	Part Por 54				483	2050	39.651
36	Lot A DP 374807	A/374807	13771	231			20.39
37	Lot B DP 374807	B/374807	6614	133			20.89
38	Lot 1 DP 128036	1/128036	7209	143			5.911
39	Lot 2 DP 128036	2/128036	7209	142			14.12
40	Lot 56 DP 7868-6----	56/78686	7209	144			14.77
41	Lot X DP 421674	X/421674	8380	19			11.09
42	Lot Y DP 421674	Y/421674	8380	20			6.37
43	Order No F151934 Part Por 57		6178	202			7.285
44	Lot 104 DP 599725	104/599725	13906	14			2.587
45	Lot 103 DP 599725 (Part Only)	103/599725	13906	13			2.716
46	Lot 2 DP 630803	2/630803	15010	63			5.287
47	Lot 34 DP 241197	34/241197	11624	62			5.136
152	Lot 481 DP 849952	481/849952	4558	110			35.284
174	Sheens Lane Lot 1 DP 47720	1/47720	15721	175			1.92
48	Lot 2 DP617921						7.6
		Subtotal					709.926

Private Land							
Ref	Description	Torrens Register	Vol.	Fol.	Conv	Bk	Area (ha)
133	Comm. For Main Roads	1/419190	8168	52			0.749
153	Nepean Park Pty Ltd	482/849952	4558	110			13.727
		Subtotal					14.476
Roads							
Ref	Description	Torrens Register	Vol.	Fol.	Conv	Bk	Area (ha)
169	Castlereagh Road (Part) MR no 155	Govt. Gaz. 9.10.1942 No 136					14.4
173	Jacksons Lane (Pen C.C.C.)	Govt. Gaz. 26.2.1964 No 79					1.97
		Subtotal					16.37
Crown Land							
Ref	Descr	Torrens Register	Vol.	Fol.	Conv	Bk	Area (ha)
178	Non Public Crown Road	Road betw. Pors 50 & 51					2.63
181	Crown Subdivision Road	Road betw. Pors 55 & 56					0.964
		Subtotal					3.594

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