



BULLI SEAM OPERATIONS

SECTION 7
PLANNING FRAMEWORK AND
PROJECT JUSTIFICATION

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7 PLANNING FRAMEWORK AND PROJECT JUSTIFICATION

This section outlines the statutory requirements relevant to the assessment of the Project and its justification (i.e. the need for the Project on economic, social and environmental grounds when considered against the objects of the EP&A Act).

The Project is largely located within the existing mining tenements CCL 724, CCL 767, CCL 381 and CL 388 (Figure 1-2). ICHPL would lodge MLAs with the DPI-MR as required for Project mining extensions that are outside the existing mining tenements (MLAs 1 to 3) (Figure 1-2).

The Appin Mine and West Cliff Colliery operate under a number of statutory approvals, permits and licences granted by various departments of the NSW Government.

Key existing Appin Mine and West Cliff Colliery licences include EPL 758 for Appin East, EPL 398 for Appin West and EPL 2504 for West Cliff issued by the DECC. Key existing approvals include Part 3A approvals granted by the Minister (or delegate) for specific surface infrastructure developments (e.g. West Cliff Washery Reliability Improvement Project – Section 2.4.3), approvals under section 138 of the *Coal Mines Regulation Act, 1982* and recent SMP approvals including the following:

- Longwalls 701 to 704 within Area 7 approved by the DPI-MR on 1 November 2006.
- Longwall 409 within Appin Area 4 approved by the DPI-MR on 13 November 2007.
- Longwalls 34 to 36 within West Cliff Area 5 approved by the DPI-MR on 13 May 2009.

Other existing approvals include water extraction licences granted by the DWE and mining and occupational health and safety related approvals granted by the DPI and WorkCover NSW. In addition, supplementary approvals are progressively obtained from the SCA and DECC for surface activities within the Metropolitan Special Area, Woronora Special Area, O'Hares Creek Special Area and the Dharawal State Conservation Area in accordance with the requirements of the conditions of existing mining tenements.

The Project will be assessed in accordance with the framework established by the EP&A Act and the EP&A Regulation.

7.1 MAJOR PROJECTS

Part 3A of the EP&A Act provides an approval process for projects deemed to be Major Projects.

Section 75B(1) of the EP&A Act defines projects to which Part 3A applies:

This Part applies to the carrying out of development that is declared under this section to be a project to which this Part applies:

- (a) *by a State environmental planning policy, or*
- (b) *by order of the Minister published in the Gazette (including by an order that amends such a policy). ...*

Schedule 1 of the Major Projects SEPP describes development that is declared to be a project to which Part 3A of the EP&A Act applies. The Project was considered to be a project to which Part 3A of the EP&A Act applies under Schedule 1, Group 2 (*Mining, petroleum production, extractive industries and related industries*) clause 5, subclause (1)(a) and (1)(c) of the Major Projects SEPP:

- 5 *Mining*
 - (1) *Development for the purpose of mining that:*
 - (a) *is coal ... mining, or*
 - ..., or*
 - (c) *has a capital investment value of more than \$30 million or employs 100 or more people.*

On 16 August 2008, the Director-General of the DoP, under delegation from the Minister, formed the opinion that the Project is of a kind that meets the description in the Major Projects SEPP (set out above). Pursuant to clause 6(1) of the Major Projects SEPP, the Project was declared to be a project to which Part 3A of the EP&A Act applies. In accordance with section 75D(1) of the EP&A Act, the Minister is the approval authority for the Project.

7.1.1 Application of Other Provisions of the Environmental Planning and Assessment Act, 1979

Section 75R of the EP&A Act outlines the applicability of other provisions of the EP&A Act in the assessment and approval of a Project under Part 3A and provides that:

- Parts 4 and 5 of the EP&A Act do not, except as provided by Part 3A, apply to a project approved under Part 3A, including the declaration of a project as a project to which Part 3A applies, and any approval or other requirement under Part 3A for the Project.
- Part 3 of the EP&A Act and State Environmental Planning Policy (SEPP) apply to the declaration that a project is the type of project to which Part 3A applies and the carrying out of a project to which Part 3A applies.
- Non-SEPP Environmental Planning Instruments (EPIs) (e.g. Local Environmental Plans and Regional Environmental Plans) do not apply to a project approved under Part 3A.
- Notwithstanding the above, under Section 75J(3), the provisions of any EPI that would ordinarily apply to the Project if it were not to be assessed under Part 3A, may be taken into account by the Minister in deciding whether or not to approve the carrying out of the Project.
- Further, clause 8N(1) of the EP&A Regulation provides that a project to which Part 3A applies (other than a critical infrastructure project) may not be given project approval if that project, or any part of that project, is located within an environmentally sensitive area of State significance or a sensitive coastal location and would be prohibited by an EPI if Part 3A of the EP&A Act did not apply.
- Similarly, clause 8O(1) of the EP&A Regulation provides that a project to which Part 3A applies (other than a critical infrastructure project) may not be given project approval if that project, or any part of that project, is not the subject of an authorisation or requirement under section 75M of the EP&A Act to apply for approval of a concept plan and would be prohibited by an EPI if Part 3A of the EP&A Act did not apply.
- Divisions 6 (Contributions) and 6A (Affordable Housing Contributions) of Part 4 of the EP&A Act also apply to a project to which Part 3A applies.

7.1.2 Approvals and Legislation that do not Apply to Approved Part 3A Projects

Sections 75U(1) and (2) of the EP&A Act outline the authorisations that are not required for a Project approved under Part 3A. These authorisations are those ordinarily required under the following legislative provisions:

- Part 3 of the *Coastal Protection Act, 1979*;
- Sections 201, 205 and 219 of the *Fisheries Management Act, 1994*;
- Division 8 of Part 6, Part 4 and section 139 of the *Heritage Act, 1977*;
- Section 87 and 90 of the *National Parks and Wildlife Act, 1974*;
- Section 12 of the *Native Vegetation Act, 2003*;
- Part 3A of the *Rivers and Foreshores Improvement Act, 1948*;
- Section 100B of the *Rural Fires Act, 1997*; and
- Section 89, 90 and 91 of the *Water Management Act, 2000*.

7.1.3 Approvals and Legislation that must be Applied Consistently for Part 3A Projects

Section 75V(1) of the EP&A Act outlines the authorisations that cannot be refused if they are necessary for the carrying out of a project approved under Part 3A and those authorisations must be substantially consistent with the Part 3A approval. These authorisations include those required under the following legislative provisions:

- Section 15 of the *Mine Subsidence Compensation Act, 1961*;
- Mining Lease under the *Mining Act, 1992*;
- production lease under the *Petroleum (Onshore) Act, 1991*;
- environment protection licence under Chapter 3 of the PoEO Act;
- Section 138 of the *Roads Act, 1993*; and
- a licence under the *Pipelines Act, 1967*.

7.2 ENVIRONMENTAL PLANNING INSTRUMENTS

Due to the operation of section 75R of the EP&A Act, the various EPIs do not apply to the carrying out of a Part 3A project. However, under section 75J of the EP&A Act, the Minister *may* take into account such EPIs in determining a Part 3A application. Given this, various EPIs that may be of some relevance are addressed below.

7.2.1 State Environmental Planning Policies

The following SEPPs are potentially relevant to the Project.

State Environmental Planning Policy (Major Projects) 2005

Clause 2 of the Major Projects SEPP outlines a number of aims of the SEPP, the following being relevant to the Project:

- (a) *to identify development to which the development assessment and approval process under Part 3A of the Act applies,*

...

On 16 August 2008, the Director-General of the DoP, under delegation from the Minister, formed the opinion that the Project is of a kind that meets the description in Schedule 1 to the Major Projects SEPP. Pursuant to clause 6(1) of the Major Projects SEPP, the Project was declared to be a project to which Part 3A of the EP&A Act applies.

State Environmental Planning Policy No. 33 (Hazardous and Offensive Development)

State Environmental Planning Policy No. 33 (Hazardous and Offensive Development) (SEPP 33) applies to the whole of NSW.

Clause 2 sets out the aims of SEPP 33, the following being relevant to the Project:

- (a) *to amend the definitions of hazardous and offensive industries where used in environmental planning instruments, and*

...

- (d) *to ensure that in determining whether a development is a hazardous or offensive industry, any measures proposed to be employed to reduce the impact of the development are taken into account, and*

- (e) *to ensure that in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact, and*

...

For development for the purposes of a potentially hazardous industry or a potentially offensive industry, clause 12 of SEPP 33 requires a preliminary hazard analysis (PHA) to be prepared in accordance with the current circulars or guidelines published by the DoP. Clause 13 of SEPP 33 requires the approval authority (in this case the Minister), in considering an application to carry out development for the purposes of a potentially hazardous or a potentially offensive industry, to consider:

- (a) *current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development, and*
- (b) *whether any public authority should be consulted concerning any environmental and land use safety requirements with which the development should comply, and*
- (c) *in the case of development for the purpose of a potentially hazardous industry – a preliminary hazard analysis prepared by or on behalf of the applicant, and*
- (d) *any feasible alternatives to the carrying out of the development and the reasons for choosing the development the subject of the application (including any feasible alternatives for the location of the development and the reasons for choosing the location the subject of the application), and*
- (e) *any likely future use of the land surrounding the development.*

In accordance with the EARs and as part of the preparation of this EA, a PHA has been conducted in accordance with SEPP 33 (Appendix M). The PHA has been prepared in accordance with the general principles of risk evaluation and assessment outlined in the DUAP *Multi-Level Risk Assessment Guidelines* (1999). In addition, the PHA considers the qualitative criteria provided in *Risk Criteria for Land Use Planning: Hazardous Industry Planning Advisory Paper No. 4* (DUAP, 1992b) and is documented in general accordance with *Guidelines for Hazard Analysis: Hazardous Industry Planning Advisory Paper No. 4* (DUAP, 1992a).

Extensive consultation has been undertaken with public authorities during the preparation of this EA as described in Section 3.

Project alternatives (including the location of surface facilities) are discussed in Section 7.6.

The land surrounding the Project site comprises a wide range of rural, environmental protection, special use (e.g. catchment areas) and residential/rural residential zonings under the Wollondilly LEP, Campbelltown EPIs and Wollongong LEP as discussed in Attachment 5, and the Project is generally consistent with the uses that are permissible in adjoining zones.

Consideration of the potential for the Project to adversely affect Sydney's water supply is discussed in Sections 5.5 and 5.6.

Consideration of the potential for the Project to adversely affect surface developments is provided in Appendix A and Sections 5.3 and 5.4.

Management of mine subsidence to minimise potential impacts on major infrastructure such as the South-Western Freeway/Hume Highway is provided in Appendix A and Section 5.4.

State Environmental Planning Policy No. 44 - Koala Habitat Protection

State Environmental Planning Policy No. 44 - Koala Habitat Protection (SEPP 44) requires the council in certain LGAs (including Wollongong, Campbelltown and Wollondilly LGAs) to consider whether the land which is the subject of the Development Application is "potential koala habitat" or "core koala habitat".

Since the Project is a project to which Part 3A applies, the Minister is the approval authority.

In regard to SEPPs, sections 75R(2) and (3) of the EP&A Act state:

- (2) *Part 3 and State environmental planning policies apply to:*
 - (a) *the declaration of a project as a project to which this Part applies or as a critical infrastructure project, and*
 - (b) *the carrying out of a project, but (in the case of a critical infrastructure project) only to the extent that the provisions of such a policy expressly provide that they apply to and in respect of the particular project.*
- (3) *Environmental planning instruments (other than State environmental planning policies) do not apply to or in respect of an approved project.*

The effect of these provisions is that SEPPs only apply to the declaration of a project as a project to which Part 3A of the EP&A Act applies, and to the carrying out of a project where the SEPP expressly provides that they apply to Part 3A projects. In respect of SEPP 44, it does not include any express provisions applying it to Part 3A projects and therefore is of no application to the carrying out of this Project.

In addition, Clause 5 of SEPP 44 states that it:

...does not apply to land dedicated or reserved under the National Parks and Wildlife Act 1974 ...

Dharawal State Conservation Area is reserved under the *National Parks and Wildlife Act, 1974* and hence SEPP 44 does not apply to the reserved land.

Notwithstanding, an assessment of core koala habitat within the study area (including the Project extent of longwall mining areas [including reserved land within the Dharawal State Conservation Area], the proposed Stage 4 Coal Wash Emplacement and other clearance activities) has been undertaken (Appendix F and Section 5.9).

As described in Section 5.9, areas of core Koala habitat at the Project are located away from major surface disturbance areas and therefore the potential impacts of the Project on koala habitat are primarily related to mine subsidence effects. As described in Section 5, the predicted (and previously observed) effects of subsidence on terrestrial fauna habitats are minimal and it is considered very unlikely that subsidence resulting from the Project would have any material effect on Koala habitat (Section 5.9).

Accordingly the Minister can be satisfied as to the management of koala habitat at the Project.

State Environmental Planning Policy No. 55 (Remediation of Land)

State Environmental Planning Policy No. 55 (Remediation of Land) (SEPP 55) applies to the whole of NSW and is concerned with the remediation of contaminated land. It sets out matters relating to contaminated land that a consent authority must consider in determining an application for development consent.

"Contaminated land" in SEPP 55 has the same meaning as in Part 7A of the EP&A Act as follows:

contaminated land means land in, on or under which any substance is present at a concentration above the concentration at which the substance is normally present in, on or under (respectively) land in the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment.

Clause 7(1) of SEPP 55 provides that a consent authority must not consent to the carrying out of any development on land unless:

- (a) it has considered whether the land is contaminated, and
- (b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and
- (c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

Further, clause 7(2) of SEPP 55 provides:

- (2) Before determining an application for consent to carry out development that would involve a change of use on any of the land specified in subclause (4), the consent authority must consider a report specifying the findings of a preliminary investigation of the land concerned carried out in accordance with the contaminated land planning guidelines [Managing Land Contamination - Planning Guidelines SEPP 55 – Remediation of Land] [DUAP and NSW Environment Protection Authority (EPA), 1998].
- (3) The applicant for development consent must carry out the investigation required by subclause (2) and must provide a report on it to the consent authority. The consent authority may require the applicant to carry out, and provide a report on, a detailed investigation (as referred to in the contaminated land planning guidelines) if it considers that the findings of the preliminary investigation warrant such an investigation.
- (4) The land concerned is:
 - (a) land that is within an investigation area,
 - (b) land on which development for a purpose referred to in Table 1 to the contaminated land planning guidelines is being, or is known to have been, carried out,

- (c) to the extent to which it is proposed to carry out development on it for residential, educational, recreational or child care purposes, or for the purposes of a hospital—land:
 - (i) in relation to which there is no knowledge (or incomplete knowledge) as to whether development for a purpose referred to in Table 1 to the contaminated land planning guidelines has been carried out, and
 - (ii) on which it would have been lawful to carry out such development during any period in respect of which there is no knowledge (or incomplete knowledge).

Clause 7(2) provides that, before a consent authority determines an application for development consent, the consent authority must consider the "preliminary investigation" carried out by the applicant and the "preliminary investigation" must specify whether:

- the proposed development would involve a "change of use"; and
- that "change of use" is to certain land specified in clause 7(4).

The certain land specified in clause 7(4) on which the "change of use" must relate is either:

- land that is an "investigation area" – defined in SEPP 55 as land declared to be an investigation area by a declaration in force under Division 2 of Part 3 of the *Contaminated Land Management Act, 1997* (CLM Act); or
- land on which development for a purpose referred to in Table 1 of the contaminated land planning guidelines (being *Managing Land Contamination - Planning Guidelines SEPP 55 – Remediation of Land* [DUAP and EPA, 1998]) is being, or is known to have been, carried out.

The majority of the Project does not involve a "change of use" because the Project would involve the continued development of underground mining and associated surface activities within the existing mining tenements held by ICHPL (Figure 1-2). The Project involves continued underground mining within the existing mining tenements as well as upgrade and augmentation of existing surface facilities associated with the Appin Mine and West Cliff Colliery (Section 2).

Where these activities are to be undertaken within the existing mining tenements, surface facility areas and surface leases, these Project activities would not result in any change in use of the land, as mining related activities are already occurring.

That part of the Project described in Section 1.1.4 as the future extension of underground mining activities into MLA 1, MLA 2 and MLA 3 would involve a change of use.

However, SEPP 55 does not include any express provisions applying it to Part 3A projects and therefore is of no application to the carrying out of the Project, if approved. Notwithstanding, ICHPL would implement general land contamination management measures (Section 5.3), including undertaking Preliminary Investigations in accordance with *Managing Land Contamination - Planning Guidelines SEPP 55 – Remediation of Land* (or subsequent revisions) where relevant, over the Project life and implementing land contamination management and mitigation measures, where required.

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

• **Clause 2**

Clause 2 sets out the aims of the Mining SEPP as follows:

- (a) *to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and*
- (b) *to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and*
- (c) *to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources.*

• **Clause 7**

Clause 7 (1) of the Mining SEPP states that development for any of the following purposes may be carried out only with development consent:

- (a) *underground mining carried out on any land,*

...

The Project comprises underground mining (Section 2.5).

Part 3 of the Mining SEPP only has application in respect of development applications made under Part 4 of the EP&A Act. Given that the Project requires approval under Part 3A of the EP&A Act and not Part 4 of the EP&A Act these provisions of the Mining SEPP have no application to it. However, for completeness sake a discussion of these provisions follows.

• **Clause 12**

Clause 12 of the Mining SEPP requires that, before determining an application for consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must:

- (a) *consider:*
 - (i) *the existing uses and approved uses of land in the vicinity of the development, and*
 - (ii) *whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development, and*
 - (iii) *any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses, and*
- (b) *evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a) (i) and (ii), and*
- (c) *evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii).*

The existing Appin East pit top is located in close proximity to the village of Appin, while the Appin West and West Cliff pit tops are located in rural and bushland settings, respectively.

The existing underground mine development areas associated with the Appin Mine and West Cliff Colliery and the proposed Project mining extensions encompass numerous other landuses in the vicinity of the development, including water supply catchment, nature conservation, rural/agricultural uses, military uses, residential development, business, industrial and special uses/infrastructure (Attachment 5).

The potential impacts of the Project on houses, buildings and infrastructure as a result of mine subsidence (including potential impacts on heritage values – where relevant) are described in Section 5.4 and Section 5.11.

The Project is located within three Mine Subsidence Districts proclaimed under section 15(1) of the *Mine Subsidence Compensation Act, 1976*. These are the Wilton, Appin and South Campbelltown Mine Subsidence Districts (refer Appendix A). Within these proclaimed mine subsidence districts, it is mandatory to obtain the MSB's approval to subdivide, erect or alter any improvements on land (Section 7.3.1).

The potential impacts of the Project on agricultural and military landuses are provided in Section 5.3.

In the Project Application area, there is a range of privately owned and publically owned infrastructure that may be affected by mine subsidence. As a component of the Project consultation programme, ICHPL has consulted with the range of infrastructure owners. Potential impacts on infrastructure and proposed management processes are described where relevant in Appendix A and Section 5.4.

Noise, air and transport impact assessments have been conducted for the Project (Appendices I, J and K) and these assessments indicate that the Project would not result in significant additional impacts on adjoining landuses near the Project surface installations (Sections 5.12, 5.13 and 5.15).

The Project would not have a significant impact on the use of the Metropolitan, O'Hares Creek or Woronora Special Areas for water catchment, or nature conservation. Similarly, the Project would not have a significant impact on the use of the Dharawal State Conservation Area or Dharawal Nature Reserve. The Project is not incompatible with these existing landuses (Sections 5.3 to 5.10).

The development of the Project would result in significant socio-economic benefits to the regional economy and the State of NSW (Sections 5.16 and 7.8.3).

ICHPL would, where practicable, implement a range of measures to avoid or minimise incompatibility of the Project with existing and future landuses in the Project Application area (Sections 5 and 6).

- **Clause 14**

Clause 14(1) of the Mining SEPP requires that, before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the approval should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following:

- (a) *that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable,*
- (b) *that impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable,*
- (c) *that greenhouse gas emissions are minimised to the greatest extent practicable.*

In addition, clause 14(2) requires that, without limiting clause 14(1), in determining a Development Application for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development, and must do so having regard to any applicable State or national policies, programmes or guidelines concerning greenhouse gas emissions.

The potential impacts of the Project on groundwater and surface water resources are discussed in Sections 5.5 and 5.6, including measures to minimise potential impacts which are described in Sections 5.5.3 and 5.6.3. The potential impacts of the Project on threatened species and biodiversity are described in Sections 5.7 to 5.9, including measures to minimise potential impacts which are described in Sections 5.7.3, 5.8.3 and 5.9.3.

The Project greenhouse gas emissions assessment is provided in Section 5.14. Greenhouse gas abatement measures are described in Section 5.14.3 and Appendix J. These sections of the EA and Appendices B, C, D, E and F address the EARs for the quantitative assessment of potential scope 1, 2 and 3 greenhouse gas emissions of the Project, and the qualitative assessment of the potential impacts of these emissions on the environment.

• **Clause 15**

Clause 15 of the Mining SEPP requires that:

- (1) *Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider the efficiency or otherwise of the development in terms of resource recovery.*
- (2) *Before granting consent for the development, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at optimising the efficiency of resource recovery and the reuse or recycling of material.*
- (3) *The consent authority may refuse to grant consent to development if it is not satisfied that the development will be carried out in such a way as to optimise the efficiency of recovery of minerals, petroleum or extractive materials and to minimise the creation of waste in association with the extraction, recovery or processing of minerals, petroleum or extractive materials.*

The proposed Project mine extensions include extraction of the full seam thickness (Section 2). In addition, the Project would include upgrades to the West Cliff washery which would provide for ongoing efficient recovery of saleable coal (Section 2). As described in Section 3, ICHPL has progressively presented Project description information, mine layout plans and other information to the DPI-MR during the development of this EA. It is in ICHPL's financial interest to maximise the efficiency of coal recovery and minimise the generation of coal wash which requires disposal.

• **Clause 16**

Clause 16(1) of the Mining SEPP requires that, before granting consent for development for the purposes of mining or extractive industry that involves the transport of materials, the consent authority must consider whether or not the consent should be issued subject to conditions that do any one or more of the following:

- (a) *require that some or all of the transport of materials in connection with the development is not to be by public road,*
- (b) *limit or preclude truck movements, in connection with the development, that occur on roads in residential areas or on roads near to schools,*
- (c) *require the preparation and implementation, in relation to the development, of a code of conduct relating to the transport of materials on public roads.*

The primary public road network transport routes to and from the Project include routes that are adjacent to commercial areas, residential areas and schools.

During construction, the Project would involve a minor increase in truck and light vehicle movements associated with construction activities intermittently over a period of up to approximately one year, while Project upgrades are being undertaken. During the operation of the Project there would be additional increases in the frequencies of deliveries, as well as additional delivery of coal to West Cliff and Port Kembla due to increased ROM coal and saleable coal production. Section 5.15 provides a review of potential transport impacts associated with these movements and describes the driver's code of conduct under which coal haulage movements would occur.

The Project would involve the continuation and expansion of the existing road delivery of coal to Port Kembla and small deliveries to the coking plants at Coalcliff and Corrimal and the continued transport of coal wash from the Dendrobium Washery at Port Kembla to West Cliff for on-site disposal (via backloaded coal trucks). Alternative transport modes for the transport of coal that were considered for the Project are described in Section 7.6.4.

Clause 16(2) of the Mining SEPP requires that, if the consent authority considers that the development involves the transport of materials on a public road, the consent authority must, within seven days after receiving the Development Application, provide a copy of the application to each roads authority for the road, and the RTA (if the RTA is not a roads authority for the road).

In addition, Clause 16(3) of the Mining SEPP requires that the consent authority:

- (a) *must not determine the application until it has taken into consideration any submissions that it receives in response from any roads authority or the Roads and Traffic Authority within 21 days after they were provided with a copy of the application,*
...

ICHPL has consulted with the RTA, Campbelltown City Council, Wollondilly Shire Council and Wollongong City Council during the development of the EA and these authorities are aware of the proposed continuation and expansion of the existing road transport of materials on the public road network, as a component of the Project (Sections 3.1.2 and 3.1.3).

- **Clause 17**

Clause 17 of the Mining SEPP requires that before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the approval should be issued subject to conditions aimed at ensuring the rehabilitation of land that will be affected by the development. In particular, the consent authority must consider whether conditions of the consent should:

- require the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated, or*
- require waste generated by the development or the rehabilitation to be dealt with appropriately, or*
- require any soil contaminated as a result of the development to be remediated in accordance with relevant guidelines (including guidelines under section 145C of the Act and the Contaminated Land Management Act 1997), or*
- require steps to be taken to ensure that the state of the land, while being rehabilitated and at the completion of the rehabilitation, does not jeopardize public safety.*

At the cessation of the Project, in the event that further mining does not proceed under subsequent approvals, a comprehensive programme would be implemented for the rehabilitation of the pit tops and any ancillary surface developments (e.g. ventilation shaft installations), including the remediation of any contaminated soil, if applicable (Section 6). The proposed management of Project coal wash material is discussed in Section 2.8 and the management of other wastes is described in Section 2.12. One of the key objectives of lease relinquishment (Section 6) would be the development of landforms which are stable in the long-term, and therefore do not jeopardise public safety.

7.2.2 Illawarra Regional Environmental Plan No 1

The *Illawarra Regional Environmental Plan No 1* (Illawarra REP) applies to land within the Wollongong LGA, which forms a small component of the Project Application area in the east (Figure 2-9) and also comprises a significant component of the Project coal road transport routes (Figure 1-1).

Aims

The aim of the Illawarra REP is to maximise the opportunities for the people of the region and the State to meet their individual and community, economic and social needs with particular reference to the way in which these needs are related to the allocation, availability, accessibility and management of the region's land resources, having regard to the relevant objectives specified in those Parts of the Illawarra REP that are relevant to the Project.

The Project is consistent with these aims, in that it is an employment generating development that would contribute to the economic well-being of the community. Environmental impact mitigation and environmental management and monitoring measures for the Project which relate to the management of land resources at the Project are presented in Section 5.

Provision Relating to Coal

Part 4 of the Illawarra REP contains provisions relating to coal. The clauses that are relevant to the Project are set out below.

Clause 36 of the Illawarra REP provides objectives relating to coal as follows:

- to ensure that proposed development is assessed in relation to the feasibility of its rendering coal resources unavailable,*
- to eliminate haulage of coal on public roads as far as practicable in order to overcome conflict with other road users and the adverse environmental impact of such haulage, and*
- to provide guidelines for ensuring coal washery refuse emplacements are located and designed with minimum adverse environmental impact.*

With respect to clause 36, subclause (a), the Project proposes the efficient recovery of coal resources. However in developing the Project, there would be areas of coal that would not be recovered and would no longer be available for mining (e.g. pillars left between each longwall) that are required for roof support during mining and to comply with the requirements of the DSC with respect to mining within Broughtons Pass Weir and Cataract Dam Notification Areas (Section 7.3.1).

As described in Section 2, ROM coal from Appin East pit top would continue to be transferred via Appin Road to the West Cliff Washery. Deliveries of up to approximately 9.4 Mtpa of coal would also continue to be transported by road from the Project to PKCT, BlueScope Steelworks, Dendrobium Washery and small volumes to the Illawarra Coke Company's Corrimal and Coalcliff coke works and other customers.

While alternative coal transport arrangements were considered (Section 7.6.4), given the lack of rail access to the Project, road transport remains the most appropriate transport method for the delivery of coal from the Project to Port Kembla, and customers in the local region.

The objective contained in clause 36, subclause (c) is addressed in the discussion on clause 41 below.

Clause 37 of the Illawarra REP outlines requirements that should be satisfied prior to the consent authority granting consent:

The consent authority shall not grant development consent to a new coal mine, the expansion of an existing coal mine or other major coal industry unless it is satisfied that:

- (a) *there is a proposed environmentally acceptable mode of transport associated with the development which is, or is capable of being, integrated into a comprehensive system for handling all coal movements within the region, and*
- (b) *if public road haulage is the only feasible mode of transport, it is restricted to the most environmentally acceptable route.*

Road haulage is the only feasible mode of transport for the delivery of coal from the Project to Port Kembla and other customers in the local region. The acceptability of the current transport routes was considered by Traffix in the Road Transport Assessment (Appendix K). This assessment concluded that the current transport routes were the most environmentally acceptable routes (Section 7.6.4 and Appendix K).

Clause 41 of the Illawarra REP outlines criteria that must be considered in relation to the location and design of coal washery refuse emplacements:

The location and design of coal washery refuse emplacements shall be determined after consideration of the following criteria:

- (a) *the emplacement will be stable and will not create any problems of instability in the emplacement area or the underlying foundation material,*

- (b) *the emplacement will be so designed and managed as to prevent water pollution,*
- (c) *the coal washery refuse will be placed where it will ultimately blend with the existing landscape or will be placed behind tree screen barriers or berms so as to reduce the visual impact of the emplacement on surrounding areas,*
- (d) *the emplacement will be adequately compacted and sealed to prevent fire risk,*
- (e) *the site of the emplacement will be the subject of a progressive revegetation program using species indigenous to the region,*
- (f) *adequate dust control measures will be employed,*
- (g) *the manner of emplacement so as to allow future accessibility and resource recovery should there be a demand for the material has been considered,*
- (h) *the site is not adjacent to urban areas,*
- (i) *a system of transportation of the coal washery refuse will be utilised which will minimise potential conflicts with public road users and have a minimal adverse environmental impact, and*
- (j) *the site is the most suitable of a number of alternative sites and that disused quarries and joint user emplacement have been taken into consideration in the selection of the site.*

The West Cliff Coal Wash Emplacement is located in the Wollondilly LGA, and hence the Illawarra REP does not apply to this facility. Notwithstanding, ICHPL has considered a range of coal wash emplacement and disposal alternatives. As described in Section 2.8.3, the West Cliff Stage 4 Coal Wash Emplacement is considered the most viable coal wash management option for the following reasons (Cardno Forbes Rigby, 2009):

- Stage 4 is located entirely within the West Cliff Colliery surface lease, the conditions of which state that surface emplacement of coal wash is a permitted landuse.
- Stage 4 is close to the existing washery on-site at the West Cliff pit top.
- Stage 4 is logistically feasible for transportation of coal wash from the Dendrobium Washery. Currently, coal wash is transported from the Dendrobium Washery to the West Cliff pit top in trucks on the return trip from delivering coal to PKCT.

- The Stage 4 area comprises steeply incised deep valleys, which optimises emplacement capacity per hectare. For example a flatter site would require vegetation clearing and disturbance over a larger area to accommodate similar volumes of coal wash.

The NSW State Government introduced a coal washery rejects levy in late 2008. The levy will come into force in November 2009 and relates to disposal of coal washery reject (coal wash) material at scheduled waste facilities. The levy is currently set at \$15 per tonne.

The disposal of Appin Mine and West Cliff Colliery coal wash at the West Cliff Coal Wash Emplacement (i.e. adjacent to the West Cliff Washery) would not trigger a requirement to pay the coal washery rejects levy.

Once in force it is anticipated that the coal washery reject levy would make off-site coal wash disposal options (that are not subject to a levy exemption) markedly less economically viable.

As described in Section 2.8 ICHPL would:

- fund and commence development of a pilot-scale research and development trial for underground coal wash emplacement technology at the Project (within five years of the grant of Project Approval);
- research and consider alternatives to coal wash emplacement, including reviewing the relevance of technological advances made by other companies in the industry (e.g. it is understood that Metropolitan Colliery is developing a methodology for underground emplacement);
- pursue the use of coal wash as an engineering fill material;
- negotiate with owners of suitably located and available sites that could be used as alternative emplacement sites to extend the life of the West Cliff Stage 3 Coal Wash Emplacement (subject to the financial implications of the coal washery reject levy); and
- report progress of these actions to the NSW Government in the AEMR.

Accordingly, the Minister can be satisfied as to these matters with respect to the management of coal wash at the Project.

Provisions Relating to Transport and Service Corridors

Part 9 of the Illawarra REP contains provisions relating to transport and service corridors. The clauses that are potentially relevant to the Project are set out below.

Clause 80, subclauses (c) and (f) of the Illawarra REP outline objectives relating to transport and service corridors that are potentially of relevance to the Project:

(c) *to improve road safety and protect public investment in main and arterial roads by the control of adjacent land uses,*

...

(f) *to reduce the adverse environmental impact of road haulage of extractive materials and other bulk freight.*

In addition, clause 87 of the Illawarra REP requires:

The consent authority should consider attaching conditions requiring transport of extractive materials or other bulk freight by other than road transport to appropriate development consents.

Consideration of the potential impacts on road safety (e.g. for the South Western Freeway/Hume Highway) associated with Project mine subsidence and associated management measures are provided in Appendix A and Section 5.4.

Consideration of the issue of public road haulage of product coal and coal wash is discussed above with respect to the requirements of Part 4 of the Illawarra REP. The Minister, in his determination of the Project, may consider attaching conditions which limit the Project maximum transport of product coal and coal wash on the public road network.

Accordingly, the Minister can be satisfied as to these matters with respect to the management of transport and service corridors at the Project.

Provisions Relating to Coastal Lands, Wetlands and Other Waterbodies

Part 13 of the Illawarra REP contains provisions relating to coastal lands, wetlands and other water bodies. While there are no coastal lands or wetlands of relevance to the Project, clause 105, subclause (c) of the Illawarra REP outlines objectives relating to other waterbodies that are potentially of relevance to the Project and the (man-made) Cataract and Woronora Reservoirs:

- (c) *to protect the productive ecosystems and natural habitats of the region's estuaries, wetlands, lakes and lagoons and their scenic attributes.*

Consideration of the potential impacts of the Project on the Woronora and Cataract Reservoirs (man-made water storage reservoirs) are addressed in Appendices B and P and Sections 5.2 and 5.5. Consideration of the potential scenic (aesthetic) impacts of the Project is provided in Section 5.19. The scenic attributes of the Woronora and Cataract Reservoirs are not expected to be materially modified.

Accordingly, the Minister can be satisfied as to these matters with respect to the management of waterbodies at the Project.

Provisions Relating to Environmental Heritage

Part 15 of the Illawarra REP contains provisions relating to environmental heritage. Items of environmental heritage are defined as a building, work, relic, or place of historic, scientific, cultural, social, architectural, archaeological, natural or aesthetic significance described in Schedule 1 of the Illawarra REP. Schedule 1 of the Illawarra REP includes the following items relating to the Bulli Colliery (Appendix H):

- Shaft No 1 (excluding Fan C. 1948); and
- Shaft No 2 original shaft sinking head frame with winding equipment.

Clause 124 of the Illawarra REP outlines the objectives with respect to such listed items of environmental heritage:

- (a) *to encourage the conservation of the environmental heritage of the region, and*
- (b) *to control the demolition and renovation of items identified by this plan as items of the environmental heritage of the region.*

Clauses 126, and 128 of the Illawarra REP are also of potential relevance to the Project development at, or in the vicinity of, the above listed heritage items:

126 Conservation of items of the environmental heritage

- (1) *A person shall not, in respect of a building, work, or relic or place that is an item of the environmental heritage:*
 - (a) *demolish, renovate or extend that building or work,*
 - (b) *damage or despoil that relic or place or any part of that relic or place,*
 - (c) *excavate any land for the purpose of exposing or removing that relic,*
 - (d) *erect a building on the land on which that building, work or relic is situated or the land which comprises the place, or*
 - (e) *subdivide the land on which that building, work or relic is situated or the land which comprises that place, except with the consent of the consent authority.*
- (2) *The consent authority shall not grant consent pursuant to subclause (1) in respect of an item of the environmental heritage unless it has made an assessment of:*
 - (a) *the significance of the item as an item of the environmental heritage of the local government area in which the item is situated,*
 - (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 archaeological features of the setting should be retained, and*
 - (d) *whether the item constitutes a danger to the users or occupiers of that item or to the public.*

...

128 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 it has made an assessment of the effect which the carrying out of that development would have on the historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance of the item of the environmental heritage and its setting.

ICHPL has committed to consult further with the SCA to determine if the heritage listed components of the Bulli Colliery Shaft No. 1 and Shaft No. 2 should be retained and managed as heritage sites, or if they should be removed. In the event that the SCA and ICHPL determine that the items can be retained, a management plan would be developed (Section 5.11). In the event that the listed heritage items cannot be retained, full recording of the sites to the standard required by the Heritage Branch of DoP for items of regional significance would be carried out prior to removal of all or part of the items (Section 5.11).

In addition, clause 131 of the Illawarra REP identifies general principles of relevance to the Project Aboriginal Cultural Heritage Assessment (Appendix G):

The consent authority and determining authorities shall have regard to the findings and recommendations of the Illawarra Region Aboriginal Resources Study published by the Department of Environment and Planning in 1980 when considering development proposals or activities for the region.

The Aboriginal Cultural Resources Study Illawarra Region (Sefton, 1980) describes a range of aspects including the importance of Aboriginal resources, legal protection, prehistory and history, categories of relics, physical environment, known Aboriginal sites and areas of significance as per the level of knowledge at the time it was drafted, and may be of relevance to the Minister's consideration of the Project. However, the Project Aboriginal Cultural Heritage Assessment (Appendix G) presents the results of contemporary desktop research, field survey and consultation with the Aboriginal community with respect to the Project and surrounds.

Accordingly, the Minister can be satisfied as to these matters with respect to the management of items of environmental heritage at the Project.

7.2.3 Greater Metropolitan Regional Environmental Plan No 2—Georges River Catchment

The *Greater Metropolitan Regional Environmental Plan No 2—Georges River Catchment* (Greater Metropolitan REP) applies to the catchment of the Greater Metropolitan Region. The catchment consists of parts of a range of LGAs that are within the Georges River Catchment, including Wollondilly, Campbelltown City and Wollongong City. The Greater Metropolitan REP contains planning principles to help councils prepare local environmental plans that apply to the land within the catchment.

Aims and Objectives

Clause 5 outlines the aims and objectives of the Greater Metropolitan REP:

5 Aims and objectives

- (1) *The general aims and objectives of this plan are as follows:*
 - (a) *to maintain and improve the water quality and river flows of the Georges River and its tributaries and ensure that development is managed in a manner that is in keeping with the national, State, regional and local significance of the Catchment,*
 - (b) *to protect and enhance the environmental quality of the Catchment for the benefit of all users through the management and use of the resources in the Catchment in an ecologically sustainable manner,*
 - (c) *to ensure consistency with local environmental plans and also in the delivery of the principles of ecologically sustainable development in the assessment of development within the Catchment where there is potential to impact adversely on groundwater and on the water quality and river flows within the Georges River or its tributaries,*
 - (d) *to establish a consistent and coordinated approach to environmental planning and assessment for land along the Georges River and its tributaries and to promote integrated catchment management policies and programs in the planning and management of the Catchment,*

- (e) *to encourage more effective consultation between local government and State Government agencies in executing the responsibility for environmental planning within the Catchment,*
 - (f) *to provide a mechanism that assists in achieving the water quality objectives and river flow objectives agreed under the Water Reform Package.*
- (2) *The specific aims and objectives of this plan are as follows:*

Environmental protection and water quality and river flows

- (a) *to preserve and protect and to encourage the restoration or rehabilitation of regionally significant sensitive natural environments such as wetlands (including mangroves, saltmarsh and seagrass areas), bushland and open space corridors within the Catchment, by identifying environmentally sensitive areas and providing for appropriate land use planning and development controls,*
- (b) *to preserve, enhance and protect the freshwater and estuarine ecosystems within the Catchment by providing appropriate development,*
- (c) *to ensure that development achieves the environmental objectives for the Catchment.*

Regional role and land use

- (a) *to identify land uses in the Catchment which have the potential to impact adversely on the water quality and river flows in the Georges River and its tributaries and to provide appropriate planning controls aimed at reducing adverse impacts on the water quality and river flows,*
- (b) *to conserve, manage and improve the aquatic environment within the Catchment which is a significant resource base for the aquaculture industry, by providing controls aimed at reducing pollution entering the Catchment's watercourses,*
- (c) *to protect the safety and well being of the local and regional community in accordance with standards and processes aimed at improving the water quality and river flows in the Catchment to enable recreation,*
- (d) *to aid in the improvement of the environmental quality of Botany Bay in conjunction with other regional planning instruments.*

Planning Principles

Planning principles are contained in clauses 7 and 8 in Part 2 of the Greater Metropolitan REP. Clause 8 provides general planning principles as follows:

- (a) *the aims, objectives and planning principles of this plan,*
- (b) *the likely effect of the proposed plan, development or activity on adjacent or downstream local government areas,*
- (c) *the cumulative impact of the proposed development or activity on the Georges River or its tributaries,*
- (d) *any relevant plans of management including any River and Water Management Plans approved by the Minister for Environment and the Minister for Land and Water Conservation and best practice guidelines approved by the Department of Urban Affairs and Planning (all of which are available from the respective offices of those Departments),*
- (e) *the Georges River Catchment Regional Planning Strategy (prepared by, and available from the offices of, the Department of Urban Affairs and Planning),*
- (f) *all relevant State Government policies, manuals and guidelines of which the council, consent authority, public authority or person has notice,*
- (g) *whether there are any feasible alternatives to the development or other proposal concerned.*

Clause 9 of the Greater Metropolitan REP provides specific planning principles. The following subclauses of clause 9 are potentially relevant to the Project:

- (2) *Bank disturbance*
Disturbance of the bank or foreshore along the Georges River and its tributaries is to be avoided and those areas and any adjoining open space or vegetated buffer area must be protected from degradation.
- ...
- (5) *Land degradation*
Land degradation processes, such as:
 - (a) *erosion,*
 - (b) *sedimentation,*
 - (c) *deterioration of soil structure,*
 - (d) *significant loss of native vegetation,*
 - (e) *pollution of ground or surface water,*

- (f) *soil salinity and acidity, and*
- (g) *adverse effects on habitats and sensitive natural environments (aquatic and terrestrial) within the Catchment, must be avoided where possible, and minimised where avoidance is not possible.*

...

(12) *Water quality and river flows*

Water quality and river flows within the Catchment are to be improved through the implementation of environmental objectives for water quality and river flows agreed between the Minister for Environment and the Minister for Land and Water Conservation and by the application of consistent decisions affecting the use and management of land.

...

The Minister's Consideration

In deciding whether or not to approve the carrying out of the Project, the Minister may, take into account:

- the aims and objectives of the Greater Metropolitan REP (as set out above);
- the general planning principles of the Greater Metropolitan REP (as set out above);
- the specific planning principles (where relevant) of the Greater Metropolitan REP; and
- the likely effect of the Project on adjacent or downstream LGAs.

As described in Sections 5.3 and 5.6, surface disturbance associated with the development of the Project and potential sources of erosion, sedimentation and pollution would be minimised. There would also be clearing of vegetation associated with the Project (primarily the Stage 4 Coal Wash Emplacement), however as the mining operation is underground, clearing would be minimised (Section 5.8). The potential impacts of the Project on water resources, aquatic habitats and terrestrial habitats are addressed in Sections 5.5 to 5.9.

There would be no significant cumulative effects on water quality or quantity in adjacent or downstream LGAs as a result of the Project. Similarly, identified potential effects of the Project on aquatic and terrestrial habitats (Sections 5.7 to 5.9) would be localised.

Planning Requirements and Consultation

Part 3 of the Greater Metropolitan REP outlines planning and consultation requirements. As the Project is potentially a development to which SEPP 33 applies (Section 7.2.1), in accordance with the planning control and consultation table set out in clause 11 of the Greater Metropolitan REP, the Minister may take into account in deciding whether or not to approve the Project under Part 3A:

- *Whether adequate provisions have been made to contain water that may be contaminated by its use for fire control purposes.*
- *Whether the proposal meets the requirements of the local council's stormwater management plan or, if no such plan has been prepared, the local council's stormwater management objectives or policy determined by the council in consultation with the relevant Catchment Management Committees, the community, the Environment Protection Authority and the Department of Land and Water Conservation.*
- *Whether the proposal is in accordance with the Council's soil erosion and sediment management plan or policy.*
- *Whether any potential impacts will arise in regard to groundwater.*
- *Whether adequate provisions for on-site bushfire hazard reduction are made.*
- *Whether the proposal is in accordance with any water management plan approved by the Minister for the Environment and the Minister for Land and Water Conservation where such a plan has been prepared.*

A Water Savings Action Plan was completed by Sydney Water and ICHPL for the Appin West pit top in 2006 (ICHPL, 2006a) (Section 2). A site water balance has been completed for the three pit tops as a component of the Surface Water Assessment (Appendix C) and the Project incorporates suitable drainage and water retention structures to contain runoff from the surface facility areas in accordance with the applicable erosion, sediment control and stormwater management guidelines and criteria (e.g. Landcom, 2004) (Section 5.6).

Potential impacts of the Project on groundwater resources are described in Section 5.5 and Appendix B. The implementation of erosion, sediment and pollution controls for Project surface activities within the Metropolitan, O'Hares Creek and Woronora Special Areas are described in Section 5.6.3. Project bushfire hazard reduction measures are described in Section 5.3.

In addition, as the Project would potentially involve development which adjoins, and is within 100 m of, a drainage line or creek, in accordance with the planning control and consultation table set out in clause 11 of the Greater Metropolitan REP, the Minister may take into account in deciding whether or not to approve the Project under Part 3A:

- *Bushfire hazard reduction measures are not to be confined to the vegetated buffer area.*
- *Whether the proposed vegetated buffer will act as a buffer between developed land and environmentally sensitive areas, including adjacent waterways.*
- *Whether the following specifications have been satisfied for the proposed vegetated buffer area:*
 - (a) *100 metre minimum buffer width from the edge of the gorge or the top of the banks of the Georges River and its tributaries on currently forested Crown lands and natural bushland classified as community land under the Local Government Act 1993,*
 - (b) *40 metre minimum buffer width from the edge of the gorge or the top of the banks of the Georges River and its tributaries on freehold land that has not been previously developed or cleared,*
 - (c) *40 metre minimum buffer widths from wetlands identified by the National Parks and Wildlife Service and local council State of the Environment Reports required under the Local Government Act 1993,*
 - (d) *40 metre minimum buffer width from other environmentally sensitive areas, including remnant vegetation and steep slopes, identified on maps prepared by and available from the National Parks and Wildlife Service.*
- *The requirements of the document entitled Planning for Bush Fire Protection, ISBN 0 9751033 2 6, prepared by the NSW Rural Fire Service in co-operation with the Department of Planning, dated December 2006.*
- *The requirements of the NSW State Rivers and Estuaries Policy prepared by and available from the Department of Land and Water Conservation and the NSW Wetlands Management Policy prepared by and available from that Department where the development proposals are likely to impact on the quality of water and river flows of the Georges River or its tributaries.*
- *The need to filter runoff from developed areas to improve water quality within the Georges River and its tributaries.*
- *The need to reduce the loss of riparian vegetation and to remove invasive weed species.*
- *The need to minimise damage to river banks and channels so as to reduce bank erosion.*
- *The need to increase or maintain terrestrial and aquatic biological diversity and to provide fauna habitat and corridors.*

It is anticipated that Project stream remediation works (Section 6) would be undertaken in close proximity to and within 40 m of streams.

Project bushfire hazard reduction measures are described in Section 5.3.3 and would be applied to Project activities, where relevant.

Where Project activities are undertaken in the vicinity of streams, suitable drainage and water retention structures to contain runoff in accordance with applicable erosion, sediment control and stormwater management guidelines and criteria (e.g. Landcom, 2004) would be incorporated. Implementation of erosion, sediment and pollution controls for Project surface activities (including works in the Metropolitan, Woronora and O'Hares Creek Special Areas) are described in Section 5.6.3.

A small portion of the Project extent of longwall mining area drains to the Woronora Reservoir. Overflow from the Woronora Reservoir flows into the lower reaches of the Woronora River (Figure 1-1) and ultimately the Georges River. A larger portion of the Project extent of longwall mining area drains more directly to the Georges River and its tributaries.

As described in Section 5 and Appendix C, although mine subsidence effects can result in isolated, episodic pulses in iron, manganese, aluminium and EC, these pulses have not had any measurable effect on water quality on downstream reservoirs.

Of relevance to impacts on water supply quality, the Metropolitan PAC Report states (page 60):

The Panel notes that surface water monitoring undertaken by the Proponent suggests such water quality impacts appear to be both localised and transient, with negligible downstream impacts on the water quality of Woronora Reservoir stored waters. SCA supports this contention. However the Panel considers that it is the redirection of flows and disconnection of pre-existing aquatic regimes together with the localised impacts of water quality changes that have significant potential to affect aquatic systems.

This is further supported by the findings of the SCPR (DoP, 2008) which states:

No evidence was presented to the Panel to support the view that subsidence impacts on rivers and significant streams, valley infill or headwater swamps, or shallow or deep aquifers have resulted in any measurable reduction in runoff to the water supply system operated by the Sydney Catchment Authority or to otherwise represent a threat to the water supply of Sydney or the Illawarra region.

Consideration of aquatic and terrestrial biodiversity impacts and Project management and mitigation measures is provided in Sections 5.7 to 5.9, including potential impacts on riparian vegetation and invasive weed management.

7.2.4 Drinking Water Catchments Regional Environmental Plan No. 1

The *Drinking Water Catchments Regional Environmental Plan No 1* (Drinking Water Catchments REP) commenced on 1 January 2007 and *State Environmental Policy 58 - Protecting Sydney's Water Supply* was repealed. The Drinking Water Catchments REP applies to land within the 'hydrological catchment', which comprises a number of sub-catchments which contribute to Sydney's (and surrounding regional centres) water supply, including the Upper Nepean River and Woronora River catchments (clause 6).

Aims of the Plan

The aims of the Drinking Water Catchments REP are detailed in clause 3:

This plan aims:

- (a) *to create healthy water catchments that will deliver high quality water while sustaining diverse and prosperous communities, and*
- (b) *to provide the statutory components in Sustaining the Catchments that, together with the non-statutory components in Sustaining the Catchments, will achieve the aim set out in paragraph (a), and*
- (c) *to achieve the water quality management goals of:*
 - (i) *improving water quality in degraded areas and critical locations where water quality is not suitable for the relevant environmental values, and*
 - (ii) *maintaining or improving water quality where it is currently suitable for the relevant environmental values.*

Assessment and Approval of Development Activities

The Minister may take into account clauses 25 and 26 of the Drinking Water Catchments REP in deciding whether or not to approve the Project under Part 3A.

Clause 25 provides:

- 25 *Recommended practices and performance standards of the Sydney Catchment Authority*
- (1) *Any development or activity proposed to be carried out on land to which this plan applies should incorporate any current recommended practices and performance standards endorsed or published by the Sydney Catchment Authority that relate to the protection of water quality (the Authority's current recommended practices and standards).*
- (2) *If any development or activity does not incorporate the Authority's current recommended practices and standards, the development or activity should demonstrate to the satisfaction of the consent authority or determining authority how the practices and performance standards proposed to be adopted will achieve outcomes not less than the Authority's current recommended practices and standards.*

...

Clause 26 provides:

26 *Development consent cannot be granted unless neutral or beneficial effect on water quality*

A consent authority must not grant consent to the carrying out of development under Part 4 of the Act on land in the hydrological catchment unless:

- (a) *it has considered whether the proposed development will have a neutral or beneficial effect on water quality, and*
- (b) *it is satisfied that the carrying out of the proposed development would have a neutral or beneficial effect on water quality.*

The water quality protection measures implemented for the Project (Section 5.6) would be generally consistent with the recommended practices and performance standards of the SCA, where applicable to the protection of water quality.

Potential impacts on water quality as a result of the Project would be localised (e.g. localised changes in water quality in the Upper Nepean, Woronora River and their tributaries). Although mine subsidence effects can result in localised, episodic elevations in concentrations/levels of iron, manganese, aluminium and EC, these events have not had any measurable effect on water quality on downstream reservoirs. The Project would not impact on the performance of Woronora Reservoir or Cataract Reservoir (Section 5.2).

This is supported by the findings of the SCPR (DoP, 2008) which states:

No evidence was presented to the Panel to support the view that subsidence impacts on rivers and significant streams, valley infill or headwater swamps, or shallow or deep aquifers have resulted in any measurable reduction in runoff to the water supply system operated by the Sydney Catchment Authority or to otherwise represent a threat to the water supply of Sydney or the Illawarra region.

Stream impact minimisation criteria, remediation, measures and compensatory measures to further offset the effects of the Project on local water quality are described in Sections 5.2.1 and 8 and Appendix P.

In addition, clause 28 of the Drinking Water Catchments REP creates a concurrence requirement for the Chief Executive of the SCA in respect of development on land in the "hydrological catchment" as follows:

28 *Development that needs concurrence of Chief Executive*

(1) *A person must not carry out development on land in the hydrological catchment except with the concurrence of the Chief Executive (except as provided by subclause (3)).*

...

(6) *This clause does not apply to where the Minister is the consent authority.*

Pursuant to clause 28(6), since the Minister is the consent authority for the Project Application, concurrence of the Chief Executive of the SCA to the Project Approval is not required under clause 28 of the Drinking Water Catchments REP.

7.2.5 Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2 - 1997)

The *Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2 - 1997)* (Sydney REP No. 20) applies to certain land in the Greater Metropolitan Region including certain lands in the LGAs of Campbelltown and Wollondilly (clause 2). The Sydney REP No. 20 does not apply to lands reserved under the *National Parks and Wildlife Act, 1974* and hence does not apply to the Dharawal State Conservation Area.

Aims

The aim of the Sydney REP No. 20 is set out in clause 3:

The aim of this plan is to protect the environment of the Hawkesbury-Nepean River system by ensuring that the impacts of future land uses are considered in a regional context.

Planning Principles

Clause 4 (1)(a) of the Sydney REP No. 20 outlines that the general planning considerations set out in clause 5, and the specific planning policies and related recommended strategies set out in clause 6 which are applicable to the proposed development, must be taken into consideration by a consent authority determining an application for consent to the carrying out of development on land to which the Sydney REP No. 20 applies.

Clause 8 provides general planning considerations as follows:

5 General planning considerations

The general planning considerations relevant for this Part are:

- (a) the aim of this plan, and
- (b) the strategies listed in the Action Plan of the Hawkesbury-Nepean Environmental Planning Strategy, and
- (c) whether there are any feasible alternatives to the development or other proposal concerned, and
- (d) the relationship between the different impacts of the development or other proposal and the environment, and how those impacts will be addressed and monitored.

Clause 6 of the Sydney REP No. 20 provides specific planning policies and recommended strategies. The following subclauses of clause 6 are potentially relevant to the Project:

(1) Total catchment management

Policy: Total catchment management is to be integrated with environmental planning for the catchment.

Strategies:

- (a) Refer the application or other proposal for comment to the councils of each adjacent or downstream local government area which is likely to suffer a significant adverse environmental effect from the proposal.
- (b) Consider the impact of the development concerned on the catchment.
- (c) Consider the cumulative environmental impact of development proposals on the catchment.

(2) Environmentally sensitive areas

Policy: The environmental quality of environmentally sensitive areas must be protected and enhanced through careful control of future land use changes and through management and (where necessary) remediation of existing uses.

Note: Environmentally sensitive areas in the Hawkesbury-Nepean catchment are: the river, riparian land, escarpments and other scenic areas, conservation area subcatchments, national parks and nature reserves, wetlands, other significant floral and faunal habitats and corridors, and known and potential acid sulphate soils.

Strategies:

- (a) Rehabilitate parts of the riverine corridor from which sand, gravel or soil are extracted so that attached aquatic plant beds are replaced and water quality and faunal habitats improved.
- (b) Minimise adverse impacts on water quality, aquatic habitats, riverine vegetation and bank stability.
- (c) Minimise direct and indirect adverse impacts on land reserved or dedicated under the National Parks and Wildlife Act 1974 or the Forestry Act 1916 and conservation area sub-catchments in order to protect water quality and biodiversity.
- (d) Protect wetlands (including upland wetlands) from future development and from the impacts of land use within their catchments.
- (e) Consider the need to include buffer zones (such as adequate fire radiation zones) for proposals on land adjacent to land reserved or dedicated under the National Parks and Wildlife Act 1974 or the Forestry Act 1916.
- (f) Consider the views of the Director-General of National Parks and Wildlife about proposals for land adjacent to land reserved or dedicated under the National Parks and Wildlife Act 1974.
- (g) Consideration should be given to the impact of the development concerned on the water table and the formation of acid sulphate soils.
- (h) New development in conservation area sub-catchments should be located in areas that are already cleared.

(3) Water quality

Policy: Future development must not prejudice the achievement of the goals of use of the river for primary contact recreation (being recreational activities involving direct water contact, such as swimming) and aquatic ecosystem protection in the river system. If the quality of the receiving waters does not currently allow these uses, the current water quality must be maintained, or improved, so as not to jeopardise the achievement of the goals in the future. When water quality goals are set by the Government these are to be the goals to be achieved under this policy.

Note: Aquatic ecosystems and primary contact recreation have the same meanings as in the document entitled Australian Water Quality Guidelines for Fresh and Marine Waters, published in 1992 by the Australian and New Zealand Environment and Conservation Council.

Strategies:

- (a) *Quantify, and assess the likely impact of, any predicted increase in pollutant loads on receiving waters.*
- (b) *Consider the need to ensure that water quality goals for primary contact recreation and aquatic ecosystem protection are achieved and monitored.*
- (c) *Approve development involving primary contact recreation or the withdrawal of water from the river for human contact (not involving water treatment), such as showers, only in locations where water quality is suitable (regardless of water temperature).*
- (d) *Do not carry out development involving on-site disposal of sewage effluent if it will adversely affect the water quality of the river or groundwater. Have due regard to the nature and size of the site.*
- (e) *Develop in accordance with the land capability of the site and do not cause land degradation.*
- (f) *Consider the need for an Erosion and Sediment Control Plan (to be in place at the commencement of development) where the development concerned involves the disturbance of soil.*

(g) *Minimise or eliminate point source and diffuse source pollution by the use of best management practices.*

(h) *Site and orientate development appropriately to ensure bank stability. Plant appropriate native vegetation along banks of the river and tributaries of the river, but not so as to prevent or inhibit the growth of aquatic plants in the river, and consider the need for a buffer of native vegetation.*

(i) *Consider the impact of the removal of water from the river or from groundwater sources associated with the development concerned.*

(j) *Protect the habitat of native aquatic plants.*

(4) Water quantity

Policy: Aquatic ecosystems must not be adversely affected by development which changes the flow characteristics of surface or groundwater in the catchment.

Strategies:

(a) *Future development must be consistent with the interim or final river flow objectives that are set for the time being by the Government.*

(b) *Ensure the amount of stormwater runoff from a site and the rate at which it leaves the site does not significantly increase as a result of development. Encourage on-site stormwater retention, infiltration and (if appropriate) reuse.*

(c) *Consider the need for restricting or controlling development requiring the withdrawal or impoundment of water because of the effect on the total water budget of the river.*

(d) *Consider the impact of development on the level and quality of the water table.*

(5) Cultural heritage

Policy: The importance of the river in contributing to the significance of items and places of cultural heritage significance should be recognised, and these items and places should be protected and sensitively managed and, if appropriate, enhanced.

Strategies:

- (a) *Encourage development which facilitates the conservation of heritage items if it does not detract from the significance of the items.*
- (b) *Protect Aboriginal sites and places of significance.*
- (c) *Consider an Aboriginal site survey where predictive models or current knowledge indicate the potential for Aboriginal sites and the development concerned would involve significant site disturbance.*
- (d) *Consider the extent to which heritage items (either identified in other environmental planning instruments affecting the subject land or listed in Schedule 2) derive their heritage significance from the river.*

(6) *Flora and fauna*

Policy: Manage flora and fauna communities so that the diversity of species and genetics within the catchment is conserved and enhanced.

Strategies, generally:

- (a) *Conserve and, where appropriate, enhance flora and fauna communities, particularly threatened species, populations and ecological communities, aquatic habitats, wetland flora, rare flora and fauna, riverine flora, flora with heritage value, habitats for indigenous and migratory species of fauna, and existing or potential fauna corridors.*
- (b) *Locate structures where possible in areas which are already cleared or disturbed instead of clearing or disturbing further land.*
- (c) *Minimise adverse environmental impacts, protect existing habitat and, where appropriate, restore habitat values by the use of management practices.*
- (d) *Consider the impact on ecological processes, such as waste assimilation and nutrient cycling.*
- (e) *Consider the range of flora and fauna inhabiting the site of the development concerned and the surrounding land, including threatened species and migratory species, and the impact of the proposal on the survival of threatened species, populations and ecological communities, both in the short and longer terms.*

- (f) *Consider the need to provide and manage buffers, adequate fire radiation zones and building setbacks from significant flora and fauna habitat areas.*
- (g) *Consider the need to control access to flora and fauna habitat areas.*
- (h) *Consider the need to maintain corridors for fish passage, and protect spawning grounds and gravel beds.*

Strategies for wetlands:

- (i) *Maintain the ability of wetlands to improve the quality of water entering the river through the filtering of sediments and the absorption of nutrients.*
- (j) *Maintain the ability of wetlands to stabilise soils and reduce bank erosion.*
- (k) *Maintain the ability of wetlands to reduce the impact of flooding downstream through the retention of floodwaters.*
- (l) *Maintain a variety of wetland flora and fauna species in the region and consider the scarcity of particular species on a national basis.*
- (m) *Encourage the appropriate management of wetlands, including monitoring and weed control.*
- (n) *Provide opportunities for recreation, scientific research and education where they are compatible with the conservation of wetlands.*
- (o) *Consider the need to protect and improve the quality and quantity of surface water and groundwater entering wetlands by controlling development in the catchment of wetlands.*
- (p) *Consider the desirability of protecting any wetlands of local significance which are not included on the map.*
- (q) *Consider the desirability of protecting or, if necessary, actively managing, constructed wetlands if they have significant conservation values or make a significant contribution to improvements in water quality.*

(7) *Riverine scenic quality*

Policy: The scenic quality of the riverine corridor must be protected.

Strategies:

- (a) *Maintain areas of extensive, prominent or significant vegetation to protect the character of the river.*
- (b) *Ensure proposed development is consistent with the landscape character as described in the Scenic Quality Study.*
- (c) *Consider the siting, setback, orientation, size, bulk and scale of and the use of unobtrusive, non-reflective material on any proposed building or work, the need to retain existing vegetation, especially along river banks, slopes visible from the river and its banks and along the skyline, and the need to carry out new planting of trees, and shrubs, particularly locally indigenous plants.*
- (d) *Consider the need for a buffer between new development and scenic areas of the riverine corridor shown on the map as being of significance beyond the region (which are also scenic areas of significance for the region) or so shown as being of regional significance only.*
- (e) *Consider the need for controls or conditions to protect those scenic areas.*
- (f) *Consider opportunities to improve riverine scenic quality.*

(8) *Agriculture/aquaculture and fishing*

Policy: Agriculture must be planned and managed to minimise adverse environmental impacts and be protected from adverse impacts of other forms of development.

Note: Refer also to items (1)–(7) and (12) for relevant strategies.

Strategies:

- (a) *Give priority to agricultural production in rural zones.*
- (b) *Ensure zone objectives and minimum lot sizes support the continued agricultural use of Class 1, 2 and 3 Agricultural Land (as defined in the Department of Agriculture's Agricultural Land Classification Atlas) and of any other rural land that is currently sustaining agricultural production.*

(c) *Incorporate effective separation between intensive agriculture and adjoining uses to mitigate noise, odour and visual impacts.*

(d) *Protect agricultural sustainability from the adverse impacts of other forms of proposed development.*

(e) *Consider the ability of the site to sustain over the long term the development concerned.*

(f) *Consider the likely effect of the development concerned on fish breeding grounds, nursery areas, commercial and recreational fishing areas and oyster farming.*

(12) *Metropolitan strategy*

Policy: Development should complement the vision, goal, key principles and action plan of the Metropolitan Strategy.

Strategies:

- (a) *Consider the impacts of transport infrastructure proposals on water quality and air quality.*
- (b) *Consider the impacts of metropolitan waste disposal on water quality.*
- (c) *Consider the impacts of development on air quality.*
- (d) *Consider the need for waste avoidance, waste reduction, reuse and recycling measures.*
- (e) *Consider the implications of predicted climate change on the location of development and its effect on conservation of natural resources.*

In completing the specialist studies and in drafting the EA, aspects of the Sydney REP No. 20 planning policies and strategies have been considered where relevant, including:

- catchment management (Appendix C and Section 5.6);
- environmentally sensitive areas (e.g. riparian land, conservation areas, nature reserves) (Appendices C, D, E, F and Section 5);
- water quality and quantity (Appendices B and C and Sections 5.5 and 5.6);
- cultural heritage (Appendices G and H and Sections 5.10 and 5.11);
- flora and fauna (Appendices D, E, F and Sections 5.7, 5.8 and 5.9);

- riverine scenic quality (Section 5.19); and
- waste reduction, air quality and climate change (Appendix J and Sections 2.12, 5.13 and 5.14).

In addition, the Sydney REP No. 20 sets out specific development controls and considerations for the consent authority in clause 11, and the following sub-clauses are considered of potential relevance to the Project:

(9) *Items of non-Aboriginal heritage*

Definition:

The following, when carried out in relation to anything listed in Schedule 1 as a heritage item:

- (a) *demolishing a building or work,*
- (b) *altering a building or work, except changes resulting from any maintenance necessary for its ongoing protective care which do not adversely affect its heritage significance,*
- (c) *damaging or moving a relic, including excavation for the purpose of exposing or moving a relic,*
- (d) *damaging or despoiling a place,*
- (e) *erecting a building on, or subdividing, land on which a building, work or relic is situated or that comprises a place.*

Consent required.

Special circumstances:

Consent may be granted to use a building that is a heritage item, or the land on which it is erected, for any purpose, if the consent authority is satisfied that the use would have little or no adverse effect on the environment or the amenity of the locality, and the conservation of the building depends on granting consent.

The potential impacts of the Project on non-Aboriginal heritage items listed in Schedule 1 of the Sydney REP No. 20 have been considered in the Project non-Aboriginal Heritage Assessment (Appendix H), where relevant.

(15) *Land uses in or near the river*

Definition:

All uses in the river or a tributary of the river, or within 40 metres of the high water mark of the river or a tributary of the river where it is tidal or within 40 metres of the bank where it is non-tidal. This includes clearing and the construction and use of piers, wharves, boat sheds or other structures which have direct structural connection to the bank or bed of the river or a tributary of the river.

Consent required.

Additional matters for consideration by the consent authority:

- (a) *The need to locate access points where riverbanks are stable, away from river shallows and major beds of attached aquatic plants, away from fishing grounds and fish breeding areas, where the proposed activities do not conflict with surrounding recreational activities, and where significant fauna and wetland habitats will not be adversely affected.*
- (b) *The need to require remedial works, such as the re-establishment of flora and fauna habitats.*
- (c) *The potential for use of the land as a buffer to filter water entering the river.*
- (d) *The need for an Erosion and Sediment Control Plan.*
- (e) *The need for a Vegetation Management Plan*

The Project would include activities in streams and within 40 m of the banks of streams (including the Nepean River) in the Project area, including environmental monitoring and stream remediation activities (Sections 5 and 6).

Consideration of the potential impacts of these activities and the implementation of erosion and sediment controls are provided in Sections 5.3 and 5.6, and the Project would include development and implementation of a Catchment Monitoring Programme. Vegetation management measures for the Project are described in Section 5.8, including the implementation of a Biodiversity Management Plan.

7.2.6 Local Environmental Plans

The Project Application area falls within three LGAs (i.e. Wollondilly, Campbelltown and Wollongong) (Figure 7-1). The majority of the Project Application area is located in the Wollondilly LGA, with a portion of the north and a portion of the east and south-east being located in the Campbelltown and Wollongong LGAs respectively (Figure 7-1).

The boundary between the Wollondilly and Campbelltown LGAs follows the Nepean River approximately north-south on the eastern border of the Appin Area 7 domain as far as Mallaty Creek, and then extends east to the Woronora River, which forms part of the western boundary of the Wollongong LGA. In the south-east, the Wollongong LGA boundary runs approximately south-west near the eastern boundary of the North Cliff mining domain, and extending south of the Cataract Reservoir.

Certain clauses of the Wollondilly LEP, Campbelltown EPIs and Wollongong LEP that would ordinarily be applicable, but for the Project being assessed under Part 3A of the EP&A Act, may be taken into account by the Minister in deciding whether or not to approve the carrying out of the Project. These are described in Attachment 5.

7.2.7 Section 94 Contribution Plans

Three section 94 contributions plans are in force in the Project Area, including:

- *Wollondilly Development Contributions Plan, 2005* (Wollondilly Contributions Plan).
- *Campbelltown City Council Section 94A Development Contributions Plan* (Campbelltown Contributions Plan).
- *Wollongong City Council Section 94A Development Contributions Plan* (Wollongong Contributions Plan).

Under the combined operation of section 75R(4) and section 94B(2) of the EP&A Act, the Minister must consider the Wollondilly Contributions Plan, Campbelltown Contributions Plan and Wollongong Contributions Plan but may impose a condition under section 94 or 94A of the EP&A Act even though it is not authorised by, or is not determined in accordance with, these Contributions Plans.

Contributions under section 94 can only be required in circumstances where the development will or is likely to require the provision of or increase the demand for public amenities or services.

7.2.8 Subregional Planning

The Metropolitan Strategy is a broad framework to secure Sydney's place in the global economy by promoting and managing growth. It is a strategic document that outlines a vision for Sydney over the next 25 years (DoP, 2005).

Due to the size and complexity of the Sydney metropolitan region, draft Subregional Strategies have been prepared. The Subregional Strategies interpret the actions and objectives of the Metropolitan Strategy for application at local and subregional levels, to aid local government and agencies in strategic planning for greater Sydney's growth (DoP, 2007b).

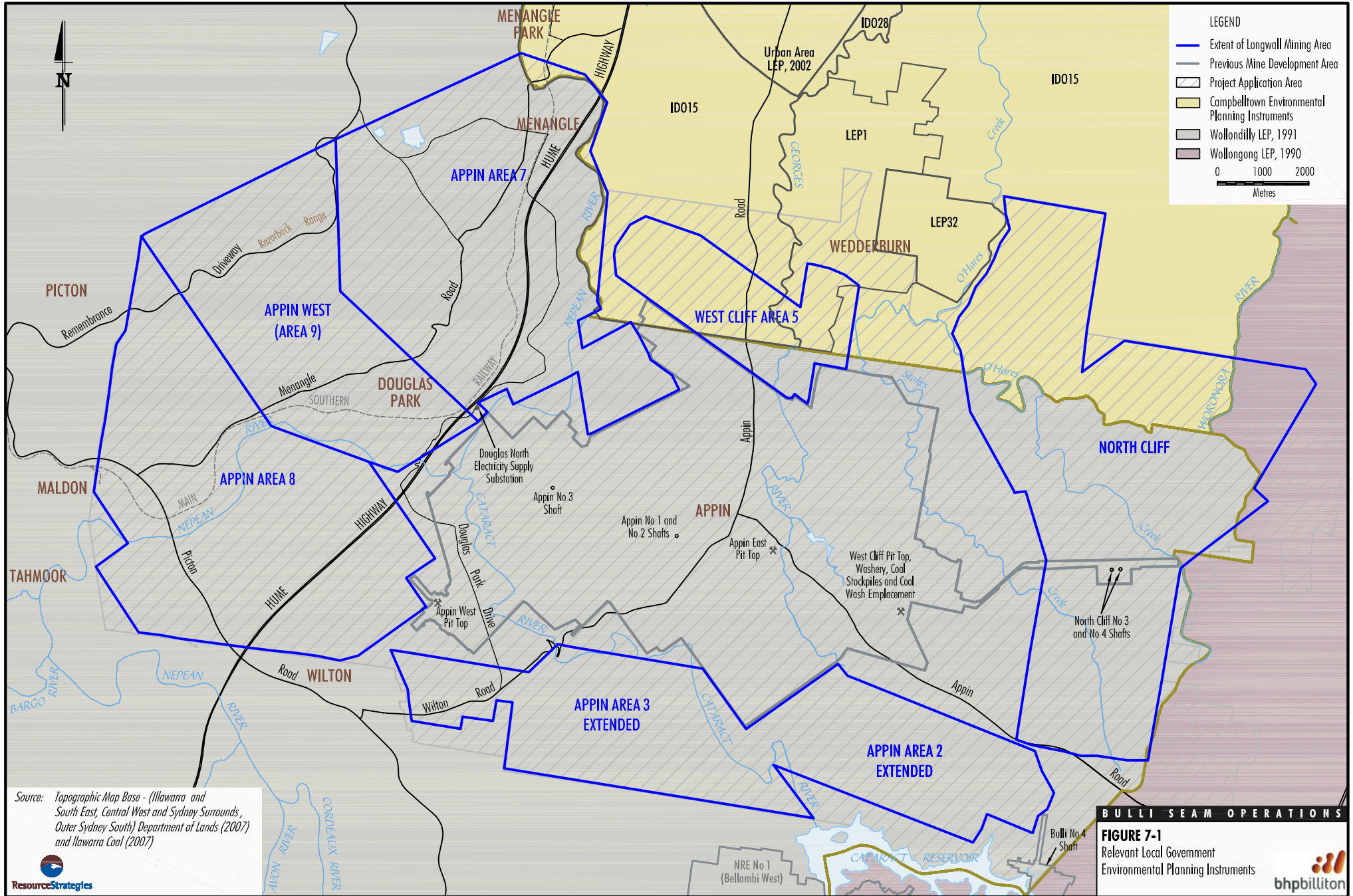
Subregional Strategies will be adopted as components of the Metropolitan Strategy by the NSW Government. The Subregional Strategies will be given statutory force through Ministerial directions issued under section 117 of the EP&A Act (DoP, 2007b).

South West Subregion Draft Subregional Strategy

The South West is a large diverse subregion with an area of 3,378 km². It covers Liverpool, Campbelltown, Camden and Wollondilly LGAs and has a mix of urban and resource based landuses (DoP, 2007b).

Urban landuses are concentrated in the north and east of the subregion, focusing on the centres of Liverpool and Campbelltown (DoP, 2007b).

Resource based landuses are largely spread across the western and southern parts of the subregion. They include agriculture, coal mining, coal seam methane gas production, clay and sand, loam and gravel extraction (DoP, 2007b).



Source: Topographic Map Base - (Illawarra and South East, Central West and Sydney Surrounds, Outer Sydney South) Department of Lands (2007) and Illawarra Coal (2007)



BULLI SEAM OPERATIONS

FIGURE 7-1
Relevant Local Government
Environmental Planning Instruments



The South West Growth Centre is within the South West Subregion and covers approximately 17,000 ha. The South West Growth Centre is located outside and to the north of the Project Application Area and contains the villages of Austral, Leppington, Rossmore, Catherine Fields, part of Kemps Creek, Badgerys Creek and Bringelly (DoP, 2007b).

Macarthur South

Located within the South West Subregion, Macarthur South is a rural area south of Campbelltown that is located largely within the Project extent of longwall mining area.

Macarthur South is bounded on the east by the Georges River, on the south by the Upper Nepean Water Catchment and Nepean River, and on the west by the Razorback range and Elizabeth Macarthur Agricultural Institute. The Macarthur South area includes the villages of Appin, Wilton, Menangle and Douglas Park.

A number of landholders in the Macarthur South area approached the DoP about the development potential of the area, and requested the inclusion of Macarthur South on the Metropolitan Development Program (DoP, undated).

The Metropolitan Development Program is the Government's key program for tracking and managing housing supply and covers major infill sites as well as the release of land not previously urbanised (DoP, 2009a).

Investigations into the area's development potential occurred in the early 1990s. The Macarthur South Regional Environmental Study, prepared in 1991, concluded that development of the area, apart from a small part of Mount Gilead, should be deferred due to the high cost of infrastructure required and until water quality, air quality and coal mining issues could be satisfactorily resolved (DoP, undated).

In 2007 the DoP initiated a broad strategic review of the potential for urban release in Macarthur South as the result of a number of requests from landholders. This review was documented in the draft *Urban Investigation of Macarthur South – Discussion Paper* (DoP, undated).

As a component of this review the DoP conducted a Macarthur South forum with a range of stakeholders (including ICHPL) in February 2008.

The *South West Subregion Draft Subregional Strategy* identifies the Macarthur South area as having important coal resources and indicates that the mining industry should be encouraged to plan mining operations to prevent conflict between mining and urban development post-2031 (DoP, 2007b).

The Project is generally consistent with the South West Subregional Strategy in that it would involve extraction of coal resources within the Macarthur South area (current mine planning indicates extraction of a majority of the Project longwall mining coal reserves from this area by 2031).

In 2009, the NSW Government decided to cease and defer further investigation of Macarthur South as a land release area due to factors including the infrastructure cost of servicing the area, the economic value of coal and agricultural resources in the Macarthur South area and the status of land supply in the south-west (DoP, 2009b).

7.3 OTHER APPLICABLE STATUTORY APPROVALS

7.3.1 NSW Approvals

The following NSW Acts may be applicable to the Project:

- *Contaminated Land Management Act, 1997;*
- *Dangerous Goods Act, 1975;*
- *Heritage Act, 1977;*
- *Mining Act, 1992;*
- *Mine Subsidence Compensation Act, 1961;*
- *National Parks and Wildlife Act, 1974;*
- *Native Vegetation Act, 1995;*
- *Noxious Weeds Act, 1993;*
- *Road and Rail Transport (Dangerous Goods) Act, 1997;*
- *Roads Act, 1993;*
- *Protection of the Environment Operations Act, 1997 (PoEO Act);*
- *Threatened Species Conservation Act, 1995 (TSC Act);*
- *Sydney Water Catchment Management Act, 1998;*
- *Coal Mine Health and Safety Act, 2002;*
- *Crown Lands Act, 1989;*
- *Dams Safety Act, 1978;*
- *Energy and Utilities Administration Act, 1987;*

- *Fisheries Management Act, 1994*;
- *Water Act, 1912*; and
- *Water Management Act, 2000*.

Relevant licences or approvals required under these Acts would be obtained for the Project as required.

For example, the Project would require additional Mining Leases under the *Mining Act, 1992*; under the PoEO Act, a revision of EPLs (EPL 758 for Appin East; EPL 398 for Appin West and EPL 2504 for West Cliff) and water licences under the *Water Act, 1912* and *Water Management Act, 2000* for groundwater and surface water extraction, where applicable.

Section 47 of the *Sydney Water Catchment Management Act, 1998* requires the Determining Authority to give notice of the Project Application to the SCA and provide the SCA with an opportunity to make representations regarding the application. The DoP must also give the SCA 28 days notice if it intends to determine the application otherwise than in accordance with SCA's representations.

Additional detail on the likely Project requirements under the *NSW Mining Act, 1992*, *Dams Safety Act, 1978*, *Mine Subsidence Compensation Act, 1961*, and *National Parks and Wildlife Act, 1974* are provided below.

Mining Act, 1992

Under the *Mining Act, 1992*, environmental protection and rehabilitation are regulated by conditions included in all Mining Leases, including requirements for the submission of a MOP prior to the commencement of operation, and subsequent AEMR.

Collectively, the MOP and AEMR constitute the MREMP Guidelines (DPI-MR, 2006) which has been developed by DPI-MR.

The MREMP is a framework that aims to facilitate the development of mining in NSW in a safe manner such that operations are safe, the environment is protected, the resources are efficiently extracted and rehabilitation achieves a stable, satisfactory outcome (DPI-MR, 2006). The structure and content of the Project MOP and AEMR would be developed in accordance with the MREMP Guidelines (DPI-MR, 2006) and through consultation with various regulatory and advisory agencies including DPI-MR, DECC, DoP, SCA and relevant local councils.

As Project rehabilitation and remediation activities would be undertaken progressively, the MREMP would be used throughout the Project life to both plan and track the performance of these activities as they are carried out.

In accordance with the precedent set by the Metropolitan Coal Project (Project Approval 08_0149), it is anticipated that the requirement to prepare SMPs for the Project would be removed from relevant Mining Leases and would be replaced by a requirement to prepare Extraction Plans under the Project Approval (if the Minister approves the Project).

Condition 6, Schedule 3 of Project Approval 08_0149 describes the Extraction Plan as follows:

Extraction Plan

6. *The Proponent shall prepare and implement an Extraction Plan for all second workings in the mining area to the satisfaction of the Director-General. This plan must:*
 - (a) *be prepared by a team of suitably qualified and experienced experts whose appointment has been endorsed by the Director-General;*
 - (b) *be approved by the Director-General before the Proponent is allowed to carry out the second workings covered by the Extraction Plan;*
 - (c) *include a detailed plan for the second workings, which has been prepared to the satisfaction of DPI ...;*
 - (d) *include detailed plans of any associated surface construction works;*
 - (e) *include the following to the satisfaction of DPI:*
 - *a coal resource recovery plan that demonstrates effective recovery of the available resource;*
 - *revised predictions of the conventional and non-conventional subsidence effects and subsidence impacts of the extraction plan, incorporating any relevant information that has been obtained since this approval; and*
 - *a Subsidence Monitoring Program to:*
 - *validate the subsidence predictions; and*
 - *analyse the relationship between the subsidence effects and subsidence impacts of the Extraction Plan and any ensuing environmental consequences;*

- (f) include a:
- Water Management Plan ...
 - Biodiversity Management Plan ...
 - Land Management Plan ...
 - Heritage Management Plan ...
 - Built Features Management Plan

...

- (g) include a Public Safety Management Plan, which has been prepared in consultation with DPI and the DSC (for any mining within the DSC notification area), to ensure public safety in the mining area.

...

New Mining Tenements

ICHPL would apply to the DPI-MR for three new Mining Leases (MLA 1, MLA 2 and MLA 3) (Figure 1-2) and would also apply for specific surface Mining Leases for the construction and operation of surface facilities as required.

Extraction Plans

Over the life of the Project, Extraction Plans would be progressively prepared as detailed mine designs are completed for each part of the Project area.

The main aspects to be addressed by Project Extraction Plans would include:

- a detailed mine plan;
- plans of associated surface construction works;
- a coal resource recovery plan;
- final prediction of systematic (conventional) and non-systematic (non-conventional) subsidence effects;
- demonstration that the predicted subsidence impacts and consequences are consistent with those authorised by the Project Approval;
- a Subsidence Monitoring Programme;
- a Catchment Monitoring Programme;
- a Biodiversity Management Plan;
- a Heritage Management Plan; and
- a Built Features Management Plan.

The Extraction Plan process provides a mechanism for the presentation of further detail regarding particular management measures for individual longwalls or mining domains. As part of the preparation of Extraction Plans, consultation would be undertaken with relevant stakeholders (e.g. relevant landholders, infrastructure owners and government authorities).

Dams Safety Act, 1978

In accordance with clause 14 of the *Dams Safety Act, 1978*, the DSC has the following functions:

- (a) to maintain a surveillance of prescribed dams, the environs under, over and surrounding prescribed dams and the waters or other materials impounded by prescribed dams to ensure the safety of prescribed dams,
- (b) to examine and investigate the location, design, construction, reconstruction, extension, modification, operation and maintenance of prescribed dams, the environs under, over and surrounding prescribed dams and the waters or other materials impounded by prescribed dams,
- (c) to obtain information and keep records on matters relating to the safety of dams,
- (d) to formulate measures to ensure the safety of dams,
- (e) to make such reports or recommendations to the Minister or any other person in relation to the safety of prescribed dams as the Committee considers necessary or appropriate,
- (f) to make reports and recommendations with respect to the prescription of dams for the purposes of this Act,
- (g) to exercise such other functions as are conferred or imposed on the Committee by or under this or any other Act or the regulations, and
- (h) to do such supplemental, incidental and consequential acts as may be necessary or expedient for the exercise of its functions.

A portion of the Project longwall mining would be located within the Cataract and Broughtons Pass Notification Areas (Section 2.5). The Cataract Dam, Broughtons Pass Weir and Brennans Creek Dam are all prescribed dams as listed in Schedule 1 of the *Dams Safety Act, 1978*.

Prior to the commencement of mining within a Notification Area, ICHPL must receive the consent of the Minister administering the *Mining Act, 1992*. The DSC advises the Minister administering the *Mining Act, 1992* on the extent and type of mining to be permitted, and on any special conditions which should apply.

ICHPL has consulted with the DSC during the preparation of this EA (Section 3.1.2). Within the Cataract and Broughtons Pass Notification Areas, the mine layout would be designed to conform with the requirements of the DSC (Section 2.5), with reference to the DSC guideline *Mining in Notification Areas of Prescribed Dams* (DSC, 1998).

Prior to mining within the Cataract and Broughtons Pass Notification Areas, ICHPL would obtain all necessary approvals from the Minister administering the *Mining Act, 1992* in accordance with the requirements of the *Dams Safety Act, 1978* and the DSC.

National Parks and Wildlife Act, 1974

Section 30G(1) of the *National Parks and Wildlife Act, 1974* describes the purpose of reserving land as a State Conservation Area is to identify, protect and conserve areas:

- (a) *that contain significant or representative ecosystems, landforms or natural phenomena or places of cultural significance, and*
- (b) *that are capable of providing opportunities for sustainable visitor use and enjoyment, the sustainable use of buildings and structures or research, and*
- (c) *that are capable of providing opportunities for uses permitted under other provisions of this Act in such areas, including uses permitted under section 47J, so as to enable those areas to be managed in accordance with subsection (2).*

Section 30G(2) outlines the management principles for State Conservation Areas:

- (a) *the conservation of biodiversity, the maintenance of ecosystem function, the protection of natural phenomena and the maintenance of natural landscapes,*
- (b) *the conservation of places, objects and features of cultural value,*
- (c) *provision for the undertaking of uses permitted under other provisions of this Act in such areas (including uses permitted under section 47J) having regard to the conservation of the natural and cultural values of the state conservation area,*

- (ca) *provision for the carrying out of development in any part of a special area (within the meaning of the Hunter Water Act 1991) in the state conservation area that is permitted under section 185A having regard to the conservation of the natural and cultural values of the state conservation area,*
- (d) *provision for sustainable visitor use and enjoyment that is compatible with the conservation of the state conservation area's natural and cultural values and with uses permitted under other provisions of this Act in such areas,*
- (e) *provision for the sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to the conservation of the state conservation area's natural and cultural values and with uses permitted under other provisions of this Act in such areas,*
- (f) *provision for appropriate research and monitoring.*

Under the *National Parks and Wildlife Act, 1974*, surface access for the purposes of remediation, monitoring and other Project activities at the surface in the Dharawal State Conservation Area would require ICHPL to obtain suitable approvals to occupy or use the land to be obtained from the DECC. This is described further in Section 7.5.

Mine Subsidence Compensation Act, 1961

Under the *Mine Subsidence Compensation Act, 1961* (MSC Act) a MSB is established, which is a service organisation operating for the community in coal mining areas of NSW, which is responsible for administering the MSC Act.

Under the MSC Act (section 10) a Mine Subsidence Compensation Fund has been established into which colliery holders are required to make annual payments. From this fund the MSC Act provides for compensation or repair services where property improvements are damaged by mine subsidence resulting from the underground extraction of coal.

Claims can be made for damage to improvements (which includes all types of construction), and for damage to household and other effects. If a claim is accepted, the MSB may offer the owner the option of having repairs carried out by the MSB's contractors or of having the MSB provide a financial settlement. The usual practice is for the MSB to arrange, supervise and pay for the repairs (MSB, 2007).

The MSC Act also makes the MSB responsible for reducing the risk of mine subsidence damage to properties by assessing and controlling the types of buildings and improvements which can be erected in declared Mine Subsidence Districts. Approval must be obtained from the MSB prior to any building activity or extensions within declared Mine Subsidence Districts. The Project is located within the Mine Subsidence Districts of Wilton, Appin and South Campbelltown (Figure 5-8).

The MSB may also carry out preventative or mitigation works to reduce subsidence damage on an improvement in accordance with section 13A of the MSC Act:

The Board may carry out, or cause to be carried out such works as, in its opinion, would reduce the total prospective liability of the Fund by preventing or mitigating damage that the Board anticipates would, but for those works, be incurred by reason of subsidence, whether or not the damage anticipated is damage to improvements or household or other effects on the land on which the works are to be carried out.

7.3.2 Commonwealth Approvals

The EPBC Act may be applicable to the Project (Section 7.4).

In accordance with the requirements of the *Lands Acquisition Act, 1989*, a Commonwealth Mining Lease is required for mining in Commonwealth land. A Commonwealth Mining Lease is therefore required for Project extensions of the North Cliff mining domain into the Holsworthy Military Reserve. This is described further in the sub-section below.

Native Title Act, 1993

The Commonwealth *Native Title Act, 1993* (CNTA) provides for the recognition and protection of native title rights in Australia. The CNTA provides a mechanism to determine whether native title exists and what the rights and interests are that comprise that native title. The process is designed to ensure that indigenous people who profess an interest in the land (or any part thereof) have the opportunity to express this interest formally, and to negotiate with the Government and the applicant about the proposed grant or renewal, or consent to access native title land.

The NSW *Mining Act, 1992* must be administered in accordance with the CNTA. The primary effect of the CNTA on exploration and mining approvals is to provide native title parties with "rights to negotiate" about the grant and some renewals by governments of exploration and mining titles.

The CNTA, where applicable, would be complied with in relation to the granting and renewal of any necessary mining tenements for the Project.

Other

The Commonwealth *National Greenhouse and Energy Reporting Act, 2007* (NGER Act) and *Carbon Pollution Reduction Scheme Act, 2009* (CPRS Act) that may be enacted in the future by the Commonwealth Government may also be applicable to the Project. The relevance of these acts is discussed in Section 5.14.

Lands Acquisition Act, 1989 (Commonwealth)

Section 124 of the *Lands Acquisition Act, 1989* allows for regulations to be made on the following matters:

- the exploration for minerals on relevant land;
- the mining for, or recovery of, minerals on or from relevant land; and
- the carrying on of operations, and the execution of works, relating to the above.

To date, no regulations have been made pursuant to section 124 (Department of Finance and Deregulation, 2008).

The *Lands Acquisition Act, 1989* provides at sub-section 124(8) that until such time as the regulations are made and take effect, the provisions of the 1955 legislation continue:

- (8) *If, on the day on which this Act commences, there are no regulations in effect for the purposes of subsection (1) of this section, section 51 and subsections 53(2) and (2A) of the Lands Acquisition Act 1955 continue to apply as if that Act had not been repealed until such time as the first such regulations take effect.*

Essentially the 1955 legislation provides that the Minister for Finance and Deregulation may authorise exploration on Commonwealth lands while the Governor-General may authorise the granting of leases/licences to mine on Commonwealth land.

The *Lands Acquisition Act, 1955* provides for exploration and mining on Commonwealth land to be subject to the relevant State/Territory mining legislation and to any conditions the Commonwealth may wish to apply (Department of Finance and Deregulation, 2008).

All proposals to explore or mine on Commonwealth land are also considered in accordance with the provisions of the EPBC Act (Section 7.4) *Australian Heritage Commission Act, 1975* and the CNTA, where applicable (Department of Finance and Deregulation, 2008).

Activities within Commonwealth Mining Leases must still comply with the requirements of applicable NSW legislation such as the EP&A Act and PoEO Act, where relevant.

7.4 EPBC – ASSESSMENT OF MATTERS OF NATIONAL SIGNIFICANCE

The EPBC Act defines proposals that are likely to have an impact on a matter of environmental significance as a “controlled action”. Proposals that are, or may be, a controlled action are required to be referred to the Commonwealth Minister for the Environment, Heritage and the Arts for a determination as to whether or not the action is a controlled action.

The Project will be referred to the Commonwealth Minister for the Environment, Heritage and the Arts for an assessment of whether or not it is a controlled action under the EPBC Act.

7.5 DHARAWAL STATE CONSERVATION AREA

The following extracts from the *Dharawal Nature Reserve and Dharawal State Conservation Area Plan of Management* (the Plan of Management) (DEC, 2006d) describe how the State Conservation Area was gazetted in order to provide for the continuation of mining:

A number of coal mining leases and authorisations to prospect currently exist within the state conservation area and will continue to operate. In order to accommodate these existing interests, the majority of the area has been reserved as a state conservation area. This state conservation area category provides for the continuation of existing mineral and petroleum exploration and extraction.

...

Due to continued mining interests, Dharawal State Conservation Area equates to the IUCN Category VI Managed Resource Protected Area. That is an “Area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.”

...

Where an existing mineral interest, such as a mine, is operating in a state conservation area, or a potential future mineral interest is likely to operate in a state conservation area, the area cannot be reclassified until the mining interest expires. Any new mining and mineral and onshore petroleum exploration and extraction within state conservation areas requires the concurrence of the Minister for the Environment.

...

Both Dharawal Nature Reserve and Dharawal State Conservation Area overlie the extensive Southern Coalfields and have a history of underground mining and associated surface activities. The majority of the area of the two reserves was reserved as a state conservation area to protect conservation values while continuing to accommodate mining and mineral exploration. As such, existing mining interests encompass almost the entire extent of Dharawal State Conservation Area and mining and surface exploration operations will continue until the interests expire. Mining interests are likely to persist for some time as over 30 years of coal reserves are estimated to remain in the area....

The western portions of the Dharawal State Conservation Area have previously been undermined by the West Cliff Colliery longwalls (Figure 2-9).

As a component of the Project, surface activities would be required in the Dharawal State Conservation Area during the life of the Project, for example:

- exploration activities;
- stream restoration activities;
- environmental monitoring; and
- associated access tracks.

Section 47GC of the *National Parks and Wildlife Act, 1974* outlines the power to grant leases and licences for the use of lands in State Conservation Areas:

47GC Power to grant leases and licences and to purchase land

- (1) *A state conservation area trust may, with the written consent of the Director-General (and subject to any conditions imposed in giving that consent):*
 - (a) *grant leases of land in the state conservation area, and*
 - (b) *grant licences to occupy or use land in the state conservation area, and*
 - (c) *purchase or take a lease of any land (whether or not adjoining the state conservation area) required for use in connection with the area.*
- (2) *If the Director-General has the care, control and management of the state conservation area, the Director-General may grant any such leases or licences.*

If the Project is approved by the Minister for Planning, ICHPL would require appropriate licences from DECC (e.g. under 47GC[1][b] of the *National Parks and Wildlife Act, 1974*) to undertake ongoing surface activities in the State Conservation Area.

Section 47J of the *National Parks and Wildlife Act, 1974* outlines general provisions relating to mining and State Conservation Areas:

- (1) *In this section, mining interest means:*
 - (a) *any mining lease under the Mining Act 1992, or*
 - (b) *any mining licence under the Offshore Minerals Act 1999, or*
 - (c) *any lease under the Petroleum (Onshore) Act 1991.*
- (2) *Subject to this section, the Mining Act 1992, the Offshore Minerals Act 1999, the Petroleum (Onshore) Act 1991 and the Petroleum (Offshore) Act 1982 apply, at any time, to lands within a state conservation area to the extent to which those Acts are in force at that time.*
- (3) *A mining interest shall not be granted in respect of lands within a state conservation area without the concurrence in writing of the Minister.*

(4) *A renewal of, or extension of the term of, a mining interest in respect of lands within a state conservation area (other than an existing interest referred to in section 47H) shall not be granted under the Mining Act 1992, the Offshore Minerals Act 1999 or the Petroleum (Onshore) Act 1991 without the concurrence in writing of the Minister.*

(5) *Except as provided in this section, nothing in this Division affects the right, title or interest of any person (other than a person who is or was trustee of the lands comprised in a state conservation area) in respect of minerals in any such lands.*

(6) *A mineral claim must not be granted under the Mining Act 1992 over any lands within a state conservation area.*

(7) *Where a provision of the Mining Act 1992 or the Offshore Minerals Act 1999 prevents, or has the effect of preventing, a person from exercising in lands within a state conservation area any of the rights conferred by either of those Acts or by an instrument under either of those Acts, except with the consent of the Minister for the time being administering the Mining Act 1992 or the Offshore Minerals Act 1999, as the case requires, that Minister shall not, in the case of any such lands, give consent under that provision without the approval of:*

- (a) *where the lands are not within an irrigation area or special land district as defined in the Crown Lands Act 1989—the Minister, or*
- (b) *where the lands are within such an irrigation area—the Minister for the time being administering the Water Management Act 2000, or*
- (c) *where the lands are within such a special land district—the Minister for the time being administering the Crown Lands Act 1989 obtained after consultation with the Minister administering the Water Management Act 2000.*

As the Project includes state conservation area land, the consent of the Minister for the Environment is required in respect of the Project Application (see clause 8F of the EP&A Regulation).

7.6 ALTERNATIVES CONSIDERED

7.6.1 Mining Method

The Appin Mine and West Cliff Colliery currently employ conventional longwall underground mining methods to extract coal from the Bulli Seam (Section 2). The Bulli Seam at the Project could not be mined economically by open cut mining methods given the depth of the seam and open cut mining would not be compatible with other landuses in the Project extent of longwall mining area, such as water supply catchment, conservation and residential landuses. Open cut mining was therefore not considered to be an option for the Project.

While bord and pillar mining is an underground mining technique that can be viable for some shallow coal seams, it is now uneconomic in Australia to use bord and pillar mining as the primary production method at depths from the surface that are greater than about 200 m (DoP, 2008). Longwall mining is recognised as a safer mining method compared with bord and pillar. The depth of the Bulli Seam in the Project extent of longwall mining area ranges from approximately 300 m to 850 m from the surface.

In addition, the SCP (DoP, 2008) stated:

Safety, productivity and cost considerations dictate that longwall mining is now the only major, viable, high production mining method in the majority of Australian underground coal mines that operate at a depth of greater than about 300 m and in virtually all new coal mines (irrespective of depth).

This is also considered to be the case for the Project.

The remaining option is not to complete any mining in the Project extent of longwall mining area (i.e. the do-nothing option). However, the Project would provide very significant socio-economic benefits to the region, the State of NSW and society, and these benefits would not be realised if the Project did not proceed. A summary justification of the Project is provided in Section 7.8 and the socio-economic benefits of the Project are described in Section 5.16 and Appendix L.

7.6.2 Longwall Width

The current longwall widths at the Appin Mine are 320 m (rib to rib) with chain pillars of up to 45 m in width. The current longwall widths at the West Cliff Colliery are 305 m (rib to rib) with chain pillars of up to 45 m in width.

ICHPL has examined the current longwall mining production rates and capacities and identified that improvements to underground production rates can be made with upgrades and replacement of components of the mining and materials handling chain. Project upgrades are described in Section 2.4.

As a component of the Project, alternative longwall widths were considered (i.e. narrower and wider longwalls).

Narrower Longwalls

Varying longwall geometry (such as longwall width, longwall length and pillar width) can affect the development and expression of subsidence effects at the surface. When individual longwalls are narrower and pillar widths are larger as a proportion of the total longwall width, the amount of coal left *in-situ* within a mining domain increases and subsidence movements (including systematic tensile and compressive strains) at the surface can generally be reduced, although there may be some localised exceptions.

Narrowing of longwalls can therefore result in some reduction in the scale of subsidence effects that occur at the surface. However, it is important to consider whether such a reduction would also be accompanied by any material change in the environmental consequences that arise from mine subsidence. This has been considered in Appendix L and is summarised in Section 7.6.3.

Review of Longwall Geometry During the Project Life

As a component of the Extraction Plan process (Section 7.3.1), longwall geometry would be reviewed and the width of longwalls and pillars would be determined to achieve the environmental outcomes described in this EA and authorised by the Project Approval while maximising economic return on investment.

The development of wider longwalls has advantages with respect to a number of aspects of the mining operation. These include:

- it reduces the length of development required per tonne of coal mined (i.e. the less longwalls that are required, the less pre-mining development is required to construct the drives to establish the longwalls within that domain);
- higher rates of coal extraction are achievable within a mining domain, and hence the efficiency of recovery of the State's coal resource can be improved;
- depending on layout, the number of longwall moves (i.e. to relocate the longwall machine at the end of each longwall) can be reduced and hence costs, safety hazards and downtime associated with these moves can be minimised; and
- wider longwalls and reduced numbers of longwall moves allows proponents to increase annual ROM coal production rates per longwall machine and hence improve mining efficiency and associated economic benefits.

In addition to the above, in the event that the environmental impacts associated with mine subsidence exceed that authorised by the Project Approval, in addition to remediating the impacts, adaptive management measures would be applied to bring the impacts back within the EA predictions. Such adaptive management measures would include reducing longwall width, increasing pillar widths or shortening a longwall to reduce subsidence effects at the surface.

7.6.3 Environmental Impact Reduction Alternatives

Development of the EA Base Case Longwalls

ICHPL has already made significant reductions in the potential Project mining reserve within its mining tenements in developing the EA Base Plan Longwalls.

The EA Base Plan Longwalls incorporate an estimated reduction of the mining reserve by approximately 72.5 Mt of ROM coal and a reduction in the Project life by approximately seven years as a result of changes to the mine plan that have been adopted for the EA. It is estimated that the undiscounted value of 72.5 Mt of ROM coal is approximately \$9.8 billion (Appendix L).

These changes have resulted from adopting the stream impact minimisation criteria described in Section 2.5.2 and by adopting setbacks from some key major infrastructure.

In order to put this into perspective, the environmental benefits and economic costs of this voluntary reduction in the Project extent of longwall mining area has been simply estimated by extending the economic modelling of the Project for an extra seven years using consistent operating and capital cost profiles (Appendix L).

The results of this can be summarised as follows (Appendix L):

- An estimated reduction of some 30 km of stream length (of 3rd order and above) subject to >200 mm of valley closure.
- An estimated reduction in vegetation clearance of some 25 ha associated with general surface disturbance and reduced need for further extension of the West Cliff Coal Wash Emplacement.
- Reduction in potential impacts to Aboriginal heritage sites and upland swamps.
- Reductions in greenhouse gas emissions associated with reducing the total ROM coal quantity.
- A reduction of the net production benefits of the Project by \$580M.
- A reduction in environmental impact costs of the Project by \$378M.
- A reduction in the social benefits associated with the length of Project life of \$57M.

Summing the three values above indicates there is a reduction in the net benefits of the Project to the community of \$259M as a result of the adoption of the EA Base Case Longwalls (Appendix L).

Whilst this very significant reduction in the mining reserve would not be considered economically efficient (Appendix L), the EA Base Plan Longwalls have been adopted as a result of ICHPL's internal policies and consideration of the views of stakeholders.

It is estimated that adoption of the EA Base Plan Longwalls has reduced potential stream related environmental impact costs by approximately 30% when compared to full extraction.

Environmental Impact Reduction Alternatives

In accordance with the recommendations of the Metropolitan PAC Report (Section 4.2), a number of environmental impact reduction alternatives have been considered to examine the relative costs and benefits of these alternatives. The alternatives comprise modifying the mine layout (e.g. by adjusting mining parameters or adjusting the mine plan to set back from key features) to achieve various environmental outcomes for streams and upland swamps.

A range of alternatives to the EA Base Plan Longwalls were examined. The likely environmental benefits and economic costs of these alternative Project layouts were considered in Appendix L. A summary of the alternatives is provided in Table 7-1 and Appendices O and P.

Analysis indicates that all of the environmental impact reduction alternatives would result in a net cost to society and would therefore be considered to be economically inefficient (Appendix L).

7.6.4 Coal Transport

Road Transport Routes

ICHPL delivers coal to PKCT, BlueScope Steelworks, Dendrobium Washery (all located at Port Kembla) and small volumes to the Illawarra Coke Company's Corrimal and Coalcliff coke works (Figure 1-1) and other customers in the local region (Appendix K and Section 5.15).

Given the lack of rail access to the Project, road transport remains the most appropriate transport method for the delivery of coal from the Project to Port Kembla, and customers in the local region. In preparing the Road Transport Assessment (Appendix K), consideration was given to whether alternative routes may be available that would have lesser environmental impacts than the currently utilised routes.

With respect to the routes from the Appin Mine and West Cliff Colliery to the facilities at Port Kembla (Figure 1-1) Traffix (Appendix K) concluded:

...the existing transport routes are considered the most appropriate for adoption given the majority of the route is high capacity and no reasonable alternative route exists. This could be reviewed periodically if required to take account of changes to the road network system that could influence the most appropriate route choice for haulage vehicles.

With respect to the routes from the West Cliff Colliery to the Coalcliff Coke Works Traffix (Appendix K) concluded:

The existing route to the Coalcliff Coke Works is approximately 32 km in length. An alternative option includes using the Princes Highway (Bulli Pass) and Lawrence Hargrave Drive to access the Coalcliff Coke Works which would reduce the travelling distance to some 27 km. However, this is not considered appropriate due to reduced speed limits and the additional number of residential and built up areas through which this route would be required to traverse, given the increased safety and environmental amenity impacts.

With respect to the routes from the West Cliff Colliery to the Corrimal Coke Works Traffix (Appendix K) concluded:

The existing route to the Corrimal Coke Works is also approximately 32 km in length. A number of shorter alternative routes are available including the use of the Princes Highway (Bulli Pass). The shorter travel distance is offset however by the reduced vehicle speeds along the alternative routes.

No change to the current coal delivery routes is proposed as a component of the Project. The current transport routes are considered to be the best available road transport routes on balance of both transport efficiency and consideration of road safety/environmental issues.

Rail Transport

The Project is not located in close proximity to any operational rail lines that could be utilised to transport coal to Port Kembla. However, the Main Southern Railway which runs from Sydney to the Victorian border passes through the Project extent of longwall mining area. It is not considered to be feasible to utilise the Main Southern Railway for the delivery of Project coal to Port Kembla, because there is currently no connection to the Illawarra Railway that would avoid the requirement to ship coal through the southern suburbs of Sydney.

The presence of large areas of land reserved for conservation and water supply in the region also restricts the potential for new rail developments to link the Project to Port Kembla. However, an existing partly constructed (but now abandoned) rail corridor from the Main Southern Railway east of Maldon (Figure 2-10) to Dombarton, potentially provides an alternative rail transport route between the Project mining area and Port Kembla.

Table 7-1
Summary of Project Environmental Impact Reduction Alternatives

Code	Description
A1	Altering the North Cliff domain mine layout to utilise 163 m wide longwalls.
A2	Altering the Appin Area 2 and 3 Extended domain mine layout to utilise 163 m wide longwalls.
A3	<i>Combination of A1 and A2.</i>
B1	Longwall setbacks from the North Cliff domain swamps predicted to experience more than 200 mm closure.
B2	Longwall setbacks from the Appin Area 2 and 3 Extended domain swamps predicted to experience more than 200 mm closure.
B3	<i>Combination of B1 and B2.</i>
B4	Longwall setbacks from eight swamps in North Cliff and Appin Area 2 and 3 Extended that are predicted to experience more than 200 mm closure and have a high erosion index.
C1	Longwall setbacks from additional North Cliff domain streams 3 rd order and above.
C3	Longwall setbacks from additional Appin Area 2 and 3 Extended domain streams 3 rd order and above.
C4	<i>Combination of C1 and C3.</i>
C9	Longwall setbacks from additional west cliff area 5, Appin Area 7, Appin Area 9 and Appin Area 8 streams 3 rd order and above.
C10	<i>Combination of C4 and C9.</i>

Source: Appendix L.

The Maldon-Dombarton Rail Line was partially developed in the 1980s and was to improve access for coal to Port Kembla. Some 15 km of dual standard gauge track is in place between Port Kembla and Dombarton. Construction of the 35 km link between Dombarton and Maldon commenced in 1983, however the contract for construction of the 4 km Avon tunnel was cancelled by the NSW Government in mid-1988 on the basis that the line was not economically viable (Commonwealth Department of Infrastructure, Transport, Regional Development and Local Government [DITRDLG], 2009).

The Port Kembla Port Corporation, utilising funding provided by the DITRDLG contracted Connell Hatch, along with sub-contractors Strategic Design and Development, to undertake a pre-feasibility study of the rail line, which was completed in July 2009.

The study examined the economic viability of the Maldon-Dombarton Rail Line in the context of the growth in coal export demand, the growth of Southern Sydney as a freight and business hub and the expansion of Port Kembla following the transfer of vehicle imports from Port Jackson (DITRDLG, 2009).

In the event that the Maldon-Dombarton Rail Line is considered to be feasible and the rail link is to be completed, Illawarra Coal would review the viability of developing additional surface facilities at the Project to utilise this rail infrastructure.

Any additional infrastructure that may be developed in the future to take advantage of the Maldon-Dombarton Rail Line would be subject to separate environmental assessment and approval.

7.6.5 Coal Wash Production

Approximately 46 Mt of Project coal wash would be produced over the life of the Project at the West Cliff Washery (Section 2.8). In addition, approximately 27 Mt of coal wash would be produced over the Project life by the approved Dendrobium Washery and would be backloaded in coal delivery trucks to West Cliff for emplacement.

Coal wash material is separated out during coal processing at the washery in order to produce product coal that meets suitable market specifications for metallurgical coal (coking coal) (and thermal coal or energy coal). Coal wash generally consists of a mixture of carbonaceous shale and mudstone with minor quantities of sandstone and low quality coal. Coal wash products and specifications are described in Section 2.8.2.

It is in ICHPL's commercial interests to minimise the production of coal wash material during operations at the Project and at the Dendrobium Mine, as the handling and emplacement of coal wash incurs expenses associated with handling, transport, emplacement, landform rehabilitation, monitoring and water management. ICHPL therefore manages longwall mining operations to recover as much coal as possible within each longwall, while minimising the mining of floor or roof rock that bounds the seam and would report to the coal wash stream in the washery.

It is also in ICHPL's commercial interests to minimise the amount of coal that reports to the coal wash stream as it reduces product yield. As a component of the West Cliff CPP Reliability Improvement Project a series of improvements to the West Cliff Washery would be undertaken. These works would increase throughput and improve coal recovery and efficiency with the installation of additional washery components, replacement of existing components and system upgrades.

ICHPL would continue to review coal wash production rates and opportunities for improved washery coal recovery that may be posed by improved technology, or increased efficiency of mining over the life of the Project.

7.6.6 Coal Wash Disposal

Coal wash material is emplaced at the West Cliff Coal Wash Emplacement (Section 2.8.3).

As part of the assessment process for approval of the West Cliff Stage 3 Coal Wash Emplacement, an assessment of alternative uses for coal wash was undertaken by ICHPL (Cardno Forbes Rigby, 2007b). A range of options were examined as described in Section 2.8.5. Cardno Forbes Rigby (2007b) concluded that the West Cliff Coal Wash Emplacement remained the only viable short to medium-term option for coal wash disposal, supplemented by a range of possible re-use opportunities (subject to commercial negotiations).

At present, it is considered neither technically or economically feasible to emplace the annual Project and Dendrobium Mine coal wash production (i.e. up to 3.4 Mtpa) underground. However, over the Project life underground emplacement technologies may provide an opportunity to emplace a proportion of the coal wash produced by the Project underground, and hence reduce the area required at the surface for coal wash emplacement.

Within five years of the grant of Project Approval, ICHPL would fund and commence development of a pilot-scale research and development trial for underground coal wash emplacement technology at the Project. The trial would draw upon available information/technical data from similar investigations and trials in the Southern Coalfield and internationally.

The results of the trial would be used to inform a value analysis of the feasibility of a portion of the coal wash being emplaced underground at the Project. The value analysis would include consideration of aspects such as:

- practical application and mine safety for underground emplacement at the Project design volumes/rates;
- infrastructure requirements (including supporting equipment) for underground emplacement;
- water, materials and energy consumption/use requirements; and
- consideration of benefits/costs of underground emplacement versus ongoing surface emplacement at the West Cliff pit top.

Infrastructure required for the pilot-scale trial would be subject to future separate approvals. The future underground emplacement of coal wash would also be subject to future separate approvals should the value analysis warrant its further development.

ICHPL would also continue to:

- research and consider alternatives to coal wash emplacement;
- pursue the use of coal wash as an engineering fill material;
- negotiate with owners of suitably located and available sites that could be used as alternative emplacement sites (subject to economic feasibility in the context of the coal washery reject levy); and
- report progress of these actions to the NSW Government via AEMRs.

7.6.7 Pit Top Locations/Endeavour Project

The location of the Project surface facilities are primarily defined by the existing Appin Mine and West Cliff Colliery facilities. Given these constraints, the location of the Project pit tops at Appin West, Appin East and West Cliff is not considered to be an alternative that requires further consideration.

In the event that engineering or feasibility studies over the life of the Project indicate that an additional pit top is required to facilitate efficient mining operations or to facilitate use of the Maldon-Dombarton Rail Line (Section 7.6.4), such development would be subject to separate environmental assessment and approval.

A Preliminary Environmental Assessment for the Endeavour Project was submitted to the DoP in December 2005 (Olsen Environmental Consulting, 2005). The Endeavour Project would enable coal to be conveyed underground between the Appin Mine and West Cliff Colliery mining operations and would include a 2,400 m drift to bring coal from the Bulli Seam to the surface adjacent to the West Cliff Washery.

While the Endeavour Project is not currently considered to be economically viable, ICHPL would continue to review options to link the two mining operations underground (including the Endeavour Project). In the event that underground transfer of coal between the Appin Mine and West Cliff Colliery is developed over the Project life, this would potentially provide environmental benefits with respect to operational noise reductions at Appin East where the coal is currently brought to the surface, and reduced coal haulage on the section of Appin Road between Appin East and West Cliff.

7.6.8 Surface Goaf Gas Drainage

The implementation of surface goaf gas drainage techniques may potentially provide significant safety and efficiency benefits for longwall mining operations during the life of the Project (and if the drained gas is flared or utilised for power generation there is also potential for reduction in greenhouse gas emissions). However, as described in Section 2.5.5, given the variable gas quantities and the wide range of topography, vegetation cover and land ownership/access constraints across the Project area, the specific locations of goaf drainage boreholes and associated temporary surface infrastructure would be defined as a component of future detailed mine planning, engineering and feasibility studies.

Therefore a process for the environmental assessment and management of impacts associated with the potential implementation of surface goaf gas drainage during the life of the Project has been developed and is provided in Section 2.5.5. This methodology effectively integrates the option of implementing surface goaf gas drainage at the Project, by providing a mechanism to assess and manage any such proposals over the Project life.

As described in Section 2.5.5, any surface goaf gas drainage proposals in the Dharawal State Conservation Area would be subject to a separate Part 3A assessment and approval process.

7.7 ECOLOGICALLY SUSTAINABLE DEVELOPMENT CONSIDERATIONS

Background

The concept of sustainable development came to prominence at the World Commission on Environment and Development (1987), in the report titled *Our Common Future*, which defined sustainable development as:

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

In recognition of the importance of sustainable development, the Commonwealth Government developed a National Strategy for Ecologically Sustainable Development (NSES) (Commonwealth of Australia, 1992) that defines ecologically sustainable development (ESD) as:

using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.

The NSES was developed with the following core objectives:

- enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- provide for equity within and between generations; and
- protect biological diversity and maintain essential processes and life support systems.

In addition, the NSES contains the following goal:

Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

In accordance with the core objectives and a view to the achieving this goal, the NSES presents private enterprise in Australia with the following role:

Private enterprise in Australia has a critical role to play in supporting the concept of ESD while taking decisions and actions which are aimed at helping to achieve the goal of this Strategy.

Australia's commitment to the principles of ESD is considered in the EPBC Act, which defines principles of ESD:

- (a) *decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations;*
- (b) *if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;*
- (c) *the principle of inter-generational equity - that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;*
- (d) *the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making;*
- (e) *improved valuation, pricing and incentive mechanisms should be promoted.*

For the purposes of this EA, the relevant definition of ESD is that in section 6(2) of the *Protection of the Environment Administration Act, 1991*, which is the definition adopted by the EP&A Act. This definition provides as follows:

Ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:

- (a) *the precautionary principle – namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:*
 - (i) *careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
 - (ii) *an assessment of the risk-weighted consequences of various options.*
- (b) *inter-generational equity – namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*

- (c) *conservation of biological diversity and ecological integrity – namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*
- (d) *improved valuation, pricing and incentive mechanisms – namely, that environmental factors should be included in the valuation of assets and services, such as:*
- (i) *polluter pays – that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,*
 - (ii) *the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*
 - (iii) *environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

Ecologically Sustainable Development Assessment

Project design, planning and assessment have been carried out applying the principles of ESD, through:

- incorporation of risk assessment and analysis at various stages in the Project design and environmental assessment and within decision-making processes;
- adoption of high standards for environmental and occupational health and safety performance;
- consultation with regulatory and community stakeholders; and
- optimisation of the economic benefits to the community arising from the development of the Project.

Assessment of potential medium and long-term impacts of the Project was carried out during the preparation of this EA on aspects of surface water and groundwater, transport movements, air quality emissions (including greenhouse gas emissions), noise emissions, aquatic and terrestrial ecology, coal wash management, heritage and socio-economics.

The Project design takes into account biophysical considerations, including the principles of ESD as defined in section 6(2) of the *Protection of the Environment Administration Act, 1991*.

In addition, it can be demonstrated that the Project can be operated in accordance with ESD principles through the application of mitigation and management measures to minimise environmental impacts of the Project.

The following sub-sections describe the consideration and application of the principles of ESD to the Project.

Precautionary Principle

Environmental assessment involves predicting what the environmental outcomes of a development are likely to be. The precautionary principle reinforces the need to take risk and uncertainty into account, especially in relation to threats of irreversible environmental damage.

A Preliminary Hazard Analysis (Appendix M), Environmental Risk Assessment (Appendix N), Upland Swamp Risk Assessment (Appendix O), Stream Risk Assessment (Appendix P), Aboriginal Heritage Site Risk Assessment (Appendix Q) and Major Cliff Line Risk Assessment (Appendix R) were conducted to identify Project related risks and develop appropriate mitigation measures and strategies.

The Preliminary Hazard Analysis considers off-site risks to people, property and the environment (in the presence of controls) arising from atypical and abnormal hazardous events and conditions (i.e. equipment failure, operator error and external events).

The Environmental Risk Assessment addressed potential environmental impacts associated with the Project, including long-term effects. In addition, long-term risks are considered by the specialist studies conducted in support of this EA (Section 1.4).

The Upland Swamp, Stream, Aboriginal Heritage Site and Major Cliff Line Risk Assessments address potential environmental impacts on these key features identified in the SCPR (DoP, 2008) (Section 5.2).

Within the Socio-Economic Assessment (Appendix L), risk and uncertainty have been taken into account through sensitivity testing.

Findings of these specialist assessments are presented in Section 5 and relevant appendices. Measures designed to mitigate potential environmental impacts arising from the Project are also described in Section 5.

The specialist assessments, Preliminary Hazard Analysis, Environmental Risk Assessment and Appendices O to R, have evaluated the potential for harm to the environment associated with development of the Project. A range of mitigation measures have been adopted as components of the Project design to minimise the potential for serious and/or irreversible damage to the environment, including the development of environmental management and monitoring programmes, compensatory measures and ecological initiatives (Section 5). Where residual risks are identified, contingency controls have been considered (Section 5).

In addition, for key Project environmental assessment studies (i.e. Groundwater Assessment [Appendix B], Surface Water Assessment [Appendix C], Aquatic Ecology, Terrestrial Flora and Fauna Assessments [Appendices D, E and F], Aboriginal Cultural Heritage Assessment [Appendix G], and Socio-Economic Assessment [Appendix L]), peer review by recognised experts was undertaken (Attachment 3).

As described in Section 5.5, ICHPL would undertake geological investigations such as in-seam drilling to identify geological features that may be of relevance to Project subsidence predictions and potential environmental impacts as a component of the ongoing mining operation. These investigations would help to manage the risk of unexpected outcomes in regard to surface water and/or groundwater potential impacts and therefore increase the level of certainty that predictions of environmental impacts would not be exceeded.

The approach with respect to the management of subsidence effects on surface features in the Project extent of longwall mining area, which provides for the implementation of additional response and contingency measures in the event that the impacts being observed exceed those predicted (Section 5), also provides increased certainty that the environmental outcomes predicted in this EA would be achieved.

Social Equity

Social equity is defined by inter-generational and intra-generational equity. Inter-generational equity is the concept that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations, while intra-generational equity is applied within the same generation.

The principles of social equity are addressed through:

- assessment of the socio-economic impacts of the proposal, including the distribution of impacts between stakeholders (including the conduct of specific Choice Modelling studies to evaluate social values of key environmental impacts for the Project) and consideration of the potential socio-economic costs of climate change (Appendix L);
- management measures to be implemented in relation to the potential impacts of the Project on water resources, heritage, land resources, noise, air quality, ecology, transport, hazards and risks, greenhouse gas emissions, visual character and socio-economics (Section 5);
- implementation of environmental management and monitoring programmes (Section 5) to minimise potential environmental impacts (which include environmental management and monitoring programmes covering the Project life); and
- implementation of compensatory measures and ecological initiatives during the life of the Project to compensate for potential localised impacts that have been identified for the development (Sections 5 and 8).

In particular, the Project would benefit current and future generations through the maintenance and expansion of employment (up to an additional 100 people during Project construction and employment to some 1,170 staff and on-site contractors during Project operations). Flow-on employment effects in the region would also continue to be significant (Appendix L).

Consideration of the economic benefits potentially forgone if the Project does not proceed amounts to a net production benefit of approximately \$10.3 billion, and a net benefit of approximately \$8.3 billion (Appendix L).

The Project incorporates a range of environmental management and mitigation measures to minimise potential impacts on the environment and the costs of these measures would be met by ICHPL. These costs have been included in the economic assessment, the potential benefits to current and future generations have therefore been calculated in the context of the mitigated Project.

Conservation of Biological Diversity and Ecological Integrity

Biological diversity or 'biodiversity' is considered to be the number, relative abundance, and genetic diversity of organisms from all habitats (including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are a part) and includes diversity within species and between species as well as diversity of ecosystems (Lindenmayer and Burgman, 2005). For the purposes of this EA, ecological integrity has been considered in terms of ecological health and ecological values.

The Project site has recognised ecological values, which include the presence of threatened flora and fauna species as well as EECs (Sections 5.8 and 5.9). The environmental assessments in Sections 5.7 to 5.9 (and Appendices D, E and F) describe the potential impacts of the Project on the biological and ecological environment.

Greenhouse Gas Emissions and Biological Diversity and Ecological Integrity

As described in Section 5.14, natural ecosystems are considered to be vulnerable to climate change. Patterns of temperature and precipitation are key factors affecting the distribution and abundance of species (Preston and Jones, 2005). Projected changes in climate will have diverse ecological implications. Habitat for some species will expand, contract and/or shift with the changing climate, resulting in habitat losses or gains, which could prove challenging, particularly for species that are threatened.

Human-caused Climate Change is listed as a key threatening process under the TSC Act and Loss of Climatic Habitat Caused by Anthropogenic Emissions of Greenhouse Gases is listed as a key threatening process under the EPBC Act.

In making its final determination to list anthropogenic climate change as a key threatening process, the NSW Scientific Committee (2000b) found that:

1. The distribution of most species, populations and communities is determined, at least at some spatial scale, by climate.

2. Climate change has occurred throughout geological history and has been a major driving force for evolution.
3. There is evidence that modification of the environment by humans may result in future climate change. Such anthropogenic change to climate may occur at a faster rate than has previously occurred naturally. Climate change may involve both changes in average conditions and changes to the frequency of occurrence of extreme events.
4. Response of organisms to future climate change (however caused) is likely to differ from that in the past because it will occur in a highly modified landscape in which the distribution of natural communities is highly modified. This may limit the ability of organisms to survive climate change through dispersal (Brasher and Pittock, 1998; AGO, 1998). Species at risk include those with long generations, poor mobility, narrow ranges, specific host relationships, isolate and specialised species and those with large home ranges (Hughes and Westoby, 1994). Pest species may also be advantaged by climate change.

Measures to Maintain or Improve the Biodiversity Values of the Surrounding Region

A range of mitigation, management and monitoring measures would be implemented for the Project to maintain or improve the biodiversity values of the surrounding region in the medium to long-term, as described below.

High frequency fire has the potential to impact on biodiversity by reducing vegetation structure and resulting in a corresponding loss of animal species. High frequency fire is listed as a key threatening process under the TSC Act. A range of management measures would be implemented for the Project to minimise the risk of bushfire and in doing so, would maintain or improve the biodiversity values of the surrounding region. These measures are described in Section 5.3.

A range of vegetation management measures would be implemented for the Project to minimise impacts on flora, fauna, and their habitats, including activities in the Dharawal State Conservation Area. For example, consistent with ICHPL's existing approach, surface works would, where practicable, be sited to minimise the amount of vegetation clearance required.

Project rehabilitation works would include activities that are to be undertaken progressively (e.g. rehabilitation of minor disturbance areas associated with exploration activities) and that would be undertaken at the cessation of the Project (e.g. the rehabilitation of the pit tops).

Section 6 presents ICHPL's rehabilitation strategy for the Project. Implementation of measures to minimise impacts on flora, fauna and their habitats would assist in maintaining or improving the biodiversity values of the surrounding region.

Compensatory measures are proposed to offset the localised effects of the Project on local water quality (Section 8).

ICHPL would operate the Appin Mine and West Cliff Colliery in accordance with the requirements of the existing EPLs (758 Appin East, 398 Appin West, 504 West Cliff) which regulate the controlled release of treated water, where relevant. It is also anticipated that the Project would provide an opportunity to continue to improve water management at the existing operations. As a result, the habitat or lifecycle of native species and the biodiversity values associated with downstream waterways would be maintained.

Table 7-2 summarises a number of Project research, offset and compensatory measures that would assist in maintaining the biodiversity of the region.

In addition, as described in Section 5.8.4, the Project would include the clearing of approximately 65 ha of native vegetation for the Stage 4 Coal Wash Emplacement. Consistent with the approved compensatory land package for the Stage 3 Coal Wash Emplacement, the Project compensatory land package would include the following:

- transfer of at least 130 ha of native bushland (ratio of 2:1) from ICHPL to the NSW State Government;
- funding for costs associated with transferring the relevant land title to the NSW State Government; and
- funding for minor site improvement works if required.

Valuation

One of the common broad underlying goals or concepts of sustainability is economic efficiency, including improved valuation of the environment. Resources should be carefully managed to maximise the welfare of society, both now and for future generations.

In the past, some natural resources have been misconstrued as being free or underpriced, leading to their wasteful use and consequent degradation. Consideration of economic efficiency, with improved valuation of the environment, aims to overcome the underpricing of natural resources and has the effect of integrating economic and environment considerations in decision making, as required by ESD.

While historically, environmental costs have been considered to be external to Project development costs, improved valuation and pricing methods attempt to internalise environmental costs and include them within Project costing.

The Socio-Economic Assessment (Appendix L) undertakes an analysis of the Project and incorporates environmental values via direct valuation where practicable (e.g. greenhouse gas emissions of the Project) including valuations of community values via Choice Modelling surveys of some 2,960 people in NSW, where the trade-off between net production benefits and environmental impacts is considered. Furthermore, wherever possible, direct environmental effects of the Project are internalised through the adoption and funding of mitigation measures by ICHPL to mitigate potential environmental impacts (e.g. stream restoration costs, infrastructure management costs).

Greenhouse gases directly generated at the Project (i.e. Scope 1 emissions) on average are estimated at 5,352,018 t CO_{2-e} per year (Appendix J). Indirect emissions associated with the on-site use of fuel and electricity (i.e. Scope 2 and Scope 3 emissions) are estimated on average to be 743,325 t CO_{2-e} per year (Appendix J).

The EA also contains an assessment of the greenhouse gas emissions which may be emitted by other parties from off-site transport of coal wash, transport and use of the product coal that is produced by the Project in accordance with the requirements of the EARs. On average over the life of Project, the indirect (i.e. Scope 3) emissions from these activities are estimated to be 23,428,765 t CO_{2-e} per year (Appendix J).

The benefit cost analysis in Appendix L indicates a net production benefit of approximately \$10.3 billion, and a net benefit of approximately \$8.3 billion would be forgone if the Project is not implemented.

**Table 7-2
Summary of Project Research, Offset and Compensatory Measures**

Activity	Financial Contribution
Research Programmes	
<p>Swamps:</p> <ul style="list-style-type: none"> • The possible mechanisms for subsidence impacts on swamp hydrology across a range of swamp types, terrain and mining operations. The objective is to improve predictability of impacts on swamp hydrology. • The relationship between changes in swamp hydrology and environmental consequences. The two key issues here are severity and duration of the hydrologic disturbance. Both are relevant to considering whether mitigation or remediation measures might play a role in management of mining impacts. • The possibilities of using remediation techniques and the circumstances in which they may be applicable. • Developing a suite of indicators that could form the basis of an accepted stratified approach to monitoring impacts and consequences on upland swamps. • The value that the community places on both the catchment protection and conservation roles of upland swamps. 	\$250,000
<p>Streams:</p> <ul style="list-style-type: none"> • Non-systematic subsidence effects and associated environmental consequences in significant watercourses. • Techniques for remediating stream bed fracturing. 	\$250,000
Catchment Condition Work	
<ul style="list-style-type: none"> • Financial contribution towards rehabilitation and revegetation works within the Dharawal State Conservation Area or SCA controlled catchments. 	\$50,000/year of longwall mining in the relevant domains
<ul style="list-style-type: none"> • Financial contribution to management within the Dharawal State Conservation Area or SCA controlled catchments: <ul style="list-style-type: none"> – Pest Control - pest control programmes for pests such as the Red Fox, European Rabbit, Feral Deer, Feral Pig and Feral Cat. – Weed Control - weed control programmes for weeds such as Pampas Grass, African Love Grass, Lantana, African Boxthorn, Bridal Veil Creeper, Prickly Pear, Onion Grass and Blackberry. – Fire Management - fire management programmes. 	\$25,000/year of longwall mining in the relevant domains
Total	\$1,775,000

7.7.1 Consideration of the Consistency of the Project with the Objects of the EP&A Act

The EARs (Section 1.2) require consideration of the consistency of the Project with the objects of the EP&A Act. Section 5 of the EP&A Act describes the objects of the EP&A Act as follows:

- (a) *to encourage:*
- (i) *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
 - (ii) *the promotion and co-ordination of the orderly and economic use and development of land,*
 - (iii) *the protection, provision and co-ordination of communication and utility services,*
 - (iv) *the provision of land for public purposes,*
 - (v) *the provision and co-ordination of community services and facilities, and*
 - (vi) *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
 - (vii) *ecologically sustainable development, and*
 - (viii) *the provision and maintenance of affordable housing, and*
- (b) *to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and*
- (c) *to provide increased opportunity for public involvement and participation in environmental planning and assessment.*

The Project is considered to be generally consistent with the objects of the EP&A Act, because it is a Project which:

- incorporates:
 - measures for the management and conservation of resources including water and natural areas (Sections 5.5 to 5.9);
 - development of the State's mineral resources (i.e. coal resources);
- includes the economic use and development of land, while maintaining key existing landuses including water catchment, nature conservation, agricultural and rural residential/residential uses at the Project and would maintain and expand the operation of the existing Appin Mine and West Cliff Colliery;
- incorporates measures to manage and protect the existing communication and utility services in the region that may potentially be subject to Project mine subsidence effects (Appendix A);
- includes measures to minimise potential amenity impacts (e.g. air and noise emissions) on public land in the vicinity of the Appin Mine and West Cliff Colliery surface installations;
- would support the ongoing provision of community services and facilities through significant contributions to State royalties, State taxes, Commonwealth tax revenue and any applicable section 94 contributions (Sections 5.16, 5.17 and 7.2.7);
- incorporates a range of measures for the protection of the environment, including the protection of native plants and animals, threatened species, and their habitats (Sections 5.7 to 5.9);
- incorporates relevant ESD considerations (this Section);
- is a Major Project that would be determined by the Minister (Section 7.1), however consultation with a range of stakeholders has been undertaken (Section 3); and
- involves public involvement and participation though both the SCI and the Project EA consultation programme (Section 3), which would be ongoing following the public exhibition of the EA document and DoP assessment of the Project in accordance with the requirements of the EP&A Act.

7.8 PROJECT JUSTIFICATION

The EARs for the Project (Section 1.2) require a conclusion, justifying the Project on economic, social and environmental grounds. An assessment of the potential impacts and benefits of the proposal has been conducted in this EA and associated supporting studies. The following sub-section provides a brief overview of the findings of this EA.

7.8.1 Consistency with the Findings and Recommendations of the Southern Coalfield Panel Report

The SCPR (DoP, 2008) was released by the DoP on 10 July 2008. The SCPR recommendations and associated supplementary recommendations provided in the Metropolitan PAC Report have been considered in the preparation of this EA, where relevant (Section 4) (DoP, 2008).

7.8.2 Consideration of Potential Environmental Impacts, Mitigation Measures and Environmental Management

The EARs for the Project outline key environmental issues which the Director-General of the DoP has specified must be addressed by this EA. Table 1-3 provides a summary of the EARs and a reference to the relevant section of this EA where the issues are addressed.

In accordance with the requirements of the EARs, an Environmental Risk Assessment has been conducted for the Project (Section 5.1 and Appendix N). The key potential environmental issues identified by the Environmental Risk Assessment and the section of this EA where the issues are addressed are provided in Table 5-1.

A summary of environmental issues raised during consultation with government and non-government stakeholders and the sections of this EA where they are addressed is provided in Section 3.

As described in Section 7.7, the Project would be developed and operated in accordance with ESD principles.

Section 5 of this EA provides comprehensive consideration of the potential environmental impacts and environmental mitigation and management measures for the potential impacts of the Project. Section 6 (Rehabilitation and Mine Closure) provides a description of the rehabilitation measures that would be employed. A summary of the proposed Project environmental management, monitoring and reporting as well as specific environmental commitments made in relation to the Project are provided in Section 8 (Statement of Commitments).

7.8.3 Consideration of Potential Socio-Economic Benefits

In addition to the existing Appin Mine and West Cliff Colliery workforce of some 875 people, the Project would provide up to 100 direct construction jobs and would provide increased employment (some 1,170 ICHPL staff and on-site contractors) following construction of the Project.

Employment and expenditure associated with the Project is also predicted to have significant flow-on effects in the regional and NSW economy (Section 5.16). The Socio-Economic Assessment (Appendix L) indicates that the Project is predicted to generate up to 3,296 direct and indirect jobs in the Illawarra and Outer South Western Sydney economy and up to 5,791 direct and indirect jobs in the wider NSW economy.

The Socio-Economic Assessment (Appendix L) has indicated the development of the Project would provide a net production benefit of approximately \$10.3 billion, and a net benefit of approximately \$8.3 billion would be forgone if the Project is not implemented. These very significant economic benefits to society (and the State of NSW) would be foregone if the Project does not proceed.

It is estimated that in total over the life of the Project, the Appin Mine and West Cliff Colliery would contribute over \$3 billion in royalties (Appendix L) and some \$274M in employee and contractor payroll tax to the State of NSW.