Preliminary environmental assessment

Murrumbidgee River to Googong Water Transfer Project

August 2008

ACTEW CORPORATION

Water Security – Major Projects

ACTEW Corporation Ltd.
ActewAGL House
Level 9, 221 London Circuit
GPO Box 366 Canberra ACT 2601

Tel. (02) 6248 3111
Fax. (02) 6248 3567

ABN 86 069 381 960

www.actew.com.au

CONTENTS

LIST OF TABLES

LIST OF FIGURES

Executive summary

ACTEW Corporation proposes to pump water from the Murrumbidgee River near Angle Crossing in the Australian Capital Territory (ACT), to Burra Creek for 'run-of-river' discharge into Googong Reservoir (the project). The proposed underground pipeline will traverse through the Williamsdale and Burra districts of New South Wales (NSW).

Following studies conducted by ACTEW over a period of several years, the ACT Government announced the project in October 2007 as part of an overall program to secure ACT and regional water supply, including supply to the Yass Valley, Palerang and Queanbeyan in NSW. The project is an essential component of the ACT's Water Security Program. It aims to access a more reliable water source than offered by ACT rivers, and water sources less dependant on ACT local rainfalls. In addition, the project will allow ACT to realise the economic potential of the currently under-utilised storage at Googong.

The project supports the strategic planning aims of the NSW Government especially with respect to the *Sydney–Canberra Corridor Regional Strategy 2007–31* (Department of Planning 2008). This strategy recognises the need for intergovernmental collaboration to support growth in the NSW southern region (Yass Valley, Palerang and Queanbeyan) and is founded on the principles outlined in the memoranda of understanding between the NSW Government, the ACT Government and the Australian Government for water resources and settlement.

In recognition of the project's regional importance, and that ACTEW intends to make an application for a pipelines licence under the *Pipelines Act 1967*, ACTEW seeks the minister's approval that the project constitutes a major project to which Part 3A of the applies. This request is made in accordance with section 75B(1)(a) of the *Environmental Planning and Assessment Act 1979*, in that the project is within the scope of item 26A of schedule 1 of the *State Environmental Planning Policy (Major Projects) 2005*. This is in accordance with the direction provided by the Department of Planning as to the appropriate planning approvals pathway for this project.

A preliminary environmental assessment of the project has been undertaken based on the results of early studies. This assessment has allowed for the identification of the environmental risks posed by the project and for the proposal of further studies to address key environmental issues.

ACTEW proposes herein the scope for further environmental study to cover:

- Burra Creek hydraulics and fluvial geomorphology.
- Burra Creek water quality.
- Burra creek biodiversity (aquatic ecosystems).
- Aboriginal and historical heritage.

The studies are expected to form the basis of procedures, practices and protocols to mitigate and manage any environmental impacts of the project. Such management and mitigation and offset measures would be included in the statement of commitments for the project.

A number of general environmental issues have been identified, which are commonly encountered in pipeline projects (eg, geology and soils, traffic and access, resource management, hazards and risks). These issues are proposed to be managed using industry best practice management techniques.

1 Introduction

1.1 BACKGROUND

The Australian Capital Territory (ACT) draws its water supply from two separate catchment systems: the Cotter River catchment (wholly within the ACT) and the Googong system, which was developed on the Queanbeyan River in NSW. The primary purpose of Googong Reservoir is to supply potable water to the ACT and Queanbeyan, in NSW.

ACTEW Corporation (ACTEW) proposes to pump water from the Murrumbidgee River (within ACT) to Googong Reservoir. The location of the project within the context of surrounding areas, such as Canberra and Googong Reservoir, is shown in Figure 1. Figure 2 shows the entire project corridor within the local region. The project aims to compliment other initiatives to secure water supply for the ACT and surrounding region by accessing a more reliable water source (the Murrumbidgee River) than other ACT rivers, and one not wholly dependant on local rainfall. In doing so, ACTEW will realise the economic potential of ACT's investment in the under-utilised storage of Googong Reservoir.

The ACT Government announced the project in October 2007, as part of its response to ACTEW's recommendations to secure ACT and Queanbeyan water supply (documented in ACTEW 2007). These recommendations are based on the findings of the Future Water Options project completed by ACTEW in 2005. The ACT Government approved the 'addition to the current capacity to extract water from the Murrumbidgee River by working towards constructing pumping capacity for transfer to the Googong Reservoir', as well as three other initiatives including:

- Construction of an enlarged Cotter Dam.
- Pursuing the possibility of purchasing water from Tantangara Dam.
- Design of a demonstration water purification plant.

These initiatives are currently being implemented by ACTEW.

This document relates to the initiative involving the extraction and pumping of raw water from the Murrumbidgee River to the Googong Reservoir (referred to as M2G). More specifically, this document considers the aspect of the project that is physically located within NSW.

Community engagement and stakeholder management has commenced for the project. Details of work conducted and the program in place are provided herein (Section 5).

A preliminary environmental assessment (PEA) has been undertaken for the project corridor within the ACT and NSW. The NSW component of the assessment extends from the NSW border at Williamsdale, east of the Monaro Highway, to Burra Creek near Burra Road, within the Commonwealth owned Googong Foreshores. The NSW portion of the underground pipeline via which water would be transferred would be approximately 10.2 kilometres (km) in length (the total pipeline length is approximately 13km). The project will discharge up to 100 ML/day into Burra Creek for 'run of river' flow to Googong Reservoir.

It is important to note that the Googong Foreshores area (containing the reservoir waters) is land owned by the Commonwealth of Australia, within NSW borders. Therefore, the land that is subject to NSW development assessment for the M2G project includes that traversed from the ACT and NSW border, east to the point of discharge of flows within the Googong Foreshores.

Figure 1 Location of the Murrumbidgee River to Googong Water Transfer Project within ACT and NSW

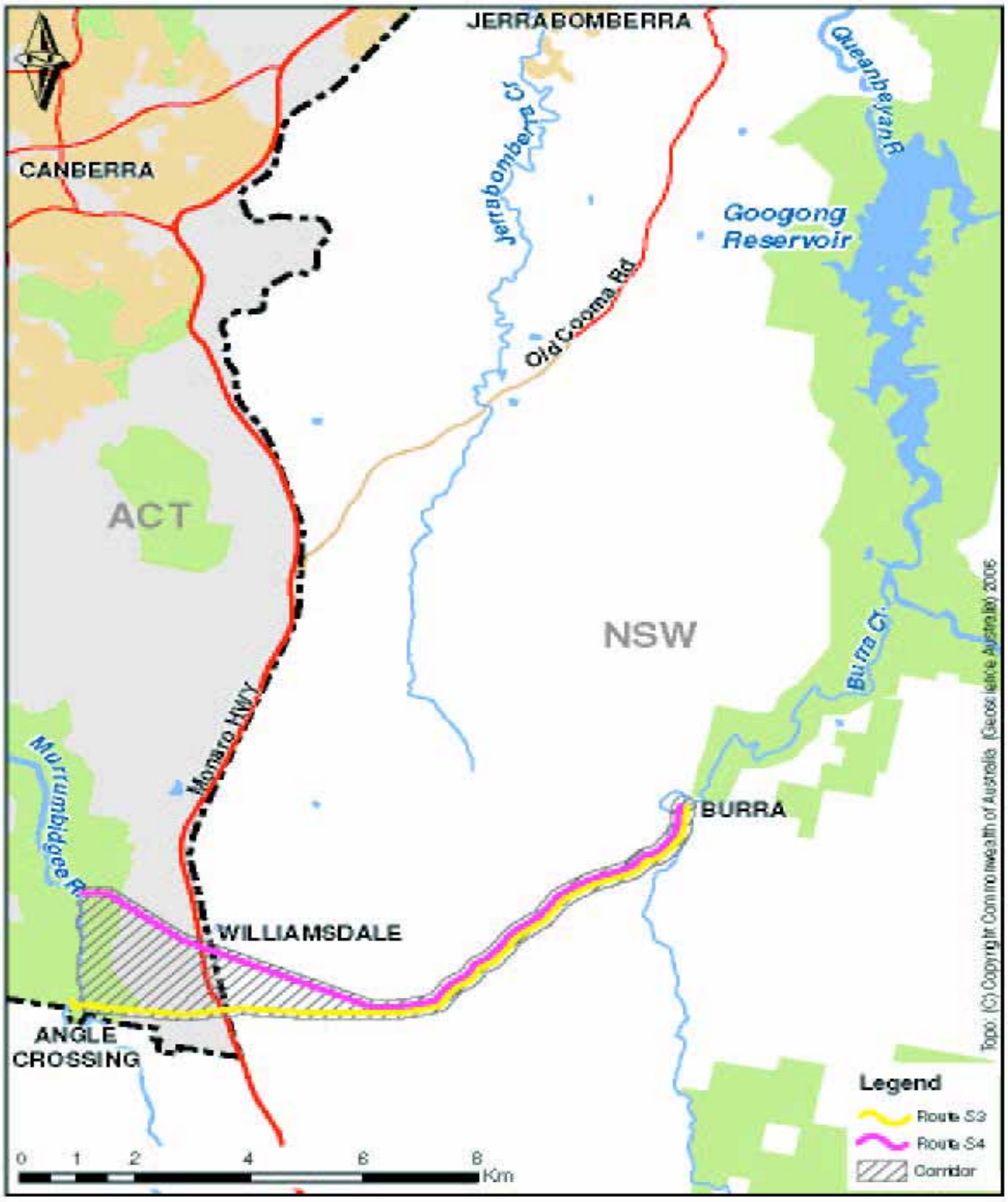
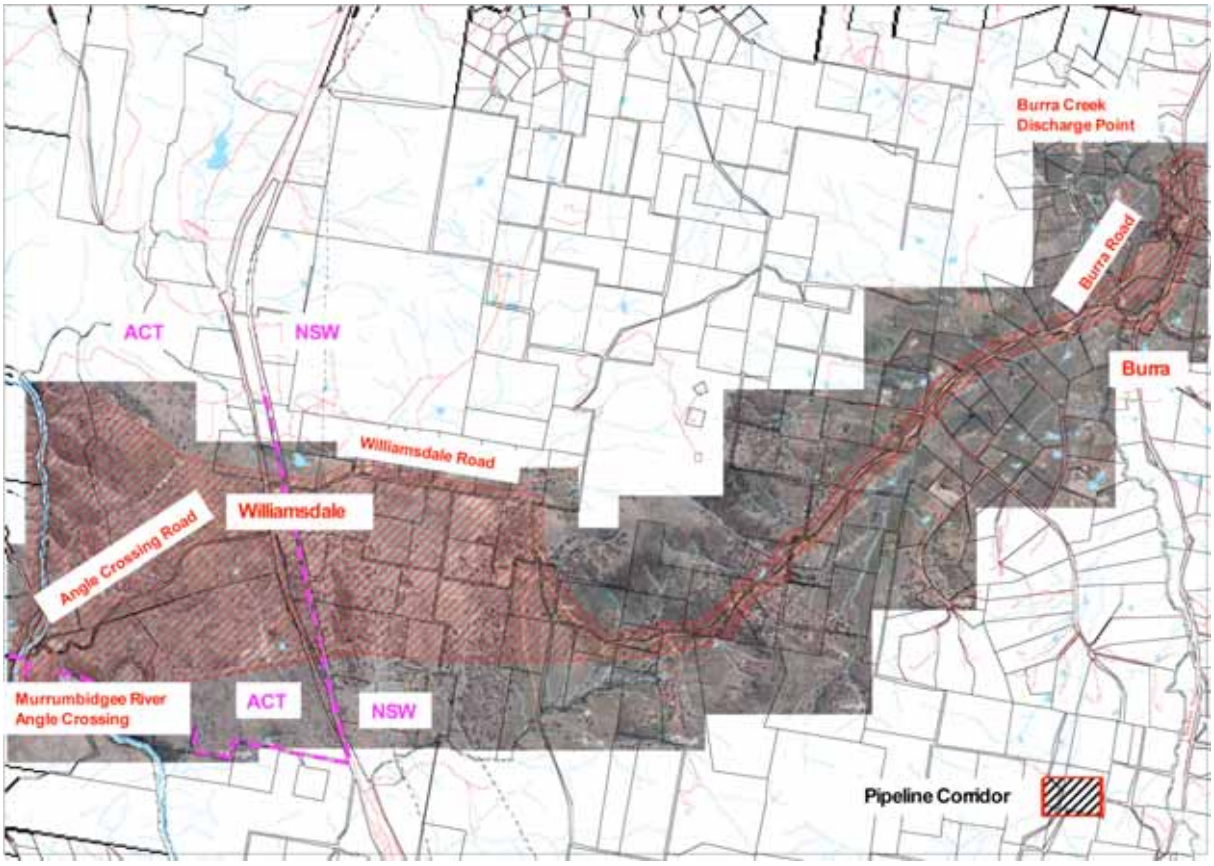


Figure 2 The Murrumbidgee to Googong Water Transfer Project pipeline corridor



1.2 PURPOSE OF THIS DOCUMENT

This PEA has been prepared to accompany a major project application under section 75E of the *Environmental Planning and Assessment Act 1979* (*EP&A Act*). The PEA contains:

- A description of the project.
- The findings of the preliminary environmental assessment.
- A range of proposed environmental management measures for the project.
- The proposed scope of the ensuing environmental assessment.

The intention of the PEA is to provide a foundation for the formulation of environmental assessment requirements for approval, to be provided to the proponent by the Director-General in accordance with section 75F(2) of the *EP&A Act*.

2 Planning and assessment process

The M2G project environmental planning and assessment framework involves three levels of government:

- Commonwealth.
- Territory (ACT) and state (NSW).
- NSW local government.

This section outlines the approach taken to obtaining project approval for the NSW component of the M2G under the *EP&A Act*, to fit the purpose of this document. Details of the broader statutory planning framework are also discussed, including ACT and Commonwealth legislative planning considerations.

Underlying the approach to NSW development assessment is the consideration that ACTEW are not considered a public authority or utility under NSW legislation. Hence, legislative provisions relating directly to public authorities are not applicable to this project. However, the activities conducted by ACTEW are considered to be synonymous with those conducted by other public authorities and utilities in the provision of water and energy services (as is further explained herein).

2.1 PROJECT APPROVAL UNDER PART 3A OF THE EP&A ACT

Section 75B of the *EP&A Act* specifies the types of projects to which Part 3A of the Act may apply. Section 75B(1) provides that Part 3A 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).'

Section 75B(2) specifies that the kinds of projects that may also constitute projects to which Part 3A applies:

'(a) Major infrastructure or other development that, in the opinion of the Minister, is of State or regional environmental planning significance.'

The application of this part of the Act to the M2G is two-fold.

Project significance

The NSW Department of Planning has recognised the importance of the water security works proposed by ACTEW in relation to both the delivery of secure water supply to the ACT and region and as an integral factor in achieving desired strategic planning outcomes in NSW (specifically within the Sydney-Canberra Corridor) (correspondence Haddad to Costello, 8 February 2008). The M2G may be a project to which Part 3A applies in accordance with section 75B(2).

Declared major projects

Clause 6 and schedule 1 of the *State Environmental Planning Policy (Major Projects) 2005* identifies development to which Part 3A of the *EP&A Act* applies. Clause 6 provides:

'Development that, in the opinion of the Minister, is development of a kind:

(a) that is described in Schedule 1 or 2…
is declared to be a project to which Part 3A of the Act applies.'

Schedule 1, item 26A prescribes:

'Development for the purposes of a pipeline in respect of which:

(a) a licence is required under the Pipelines Act 1967, or
(b) an application for a licence is made under that Act on or after the commencement of this clause, or
(c) a licence was granted under that Act before the commencement of this clause.'

ACTEW intends to make an application for a pipeline licence under the *Pipelines Act 1967.* This will allow compulsory land and/or easement acquisition if required. In addition to the project's regional and state importance and the potential applicability of section 75B(2)(a) of the Act, the project can also be considered a declared major project in accordance with section 75(B)(1)(a) of the Act and clause 6 and schedule 1 of the *State Environmental Planning Policy (Major Projects) 2005*.

ACTEW is the proponent for the proposal and now seeks project approval. This PEA supports the major project application to the Department of Planning for the M2G. This is in accordance with the direction provided by the Department of Planning as to the appropriate planning approvals pathway for this project.

If the Minister for Planning is satisfied the project is within the scope of item 26A referred to above, it becomes a project to which Part 3A applies. Furthermore, ongoing discussions with the Department of Planning indicate that assessment under Part 3A due to the application of the *State Environmental Planning Policy (Major Projects) 2005* is appropriate.

Land owner's consent

Section 8F of the *Environmental Planning and Assessment Regulation 2000* (the regulation) outlines the requirements for the consent and/or notification of the owner of land on which a project is to be carried out. Consent of the owner is not required where the application relates to a linear infrastructure project (clause 1(d)). For the purpose of section 8F of the regulation, 'linear infrastructure project' is defined as development for the purposes of linear transport or public utility infrastructure. The M2G project is in pursuance of the capture and supply of water to the ACT and region and is therefore a linear infrastructure project. As such, there is an obligation under clause 3(a) (section 8F of the regulation) for the proponent to:

Give notice of the application… to the public by advertisement published in a newspaper circulating in the area of the project before the start of the public consultation period for the project.

ACTEW commenced stakeholder engagement and community consultation for this project in January 2008. This began with direct notification of the landowners within the project corridor, by postal delivery of a letter and fact sheets. The letter and fact sheet outlined the project and the type of surveys that might be taking place in the immediate future, and provided a community contact telephone line for more information. This letter was sent to all identified owners along the route (approximately 40). Further details of the community engagement and stakeholder consultation are contained in Section 5 of this document.

2.2 NSW ENVIRONMENTAL PLANNING POLICIES

Part 3 of the *EP&A Act* establishes requirements for three main types of environmental planning instruments (EPIs), which are designed to account for regulation of competing land uses. These include:

- Local environmental plans (LEPs).
- Regional environmental plans (REPs).
- State environmental planning policies (SEPPs).

A number of SEPPs apply across the state of NSW and to the catchments of the Queanbeyan and Molonglo Rivers. There are no SEPPs that relate specifically to the area within the project corridor. The *State Environmental Planning Policy (Major Projects) 2005* applies to the project in establishing the project as one that may be assessed under Part 3A.

There are no REPs that apply to the land encompassing the project corridor.

The existing local environmental planning instrument that applies to the M2G project corridor is the *Yarrowlumla Local Environmental Plan 2002* (Yarrowlumla LEP). The relevant local government authority responsible for the LEP is Palerang Council.

According to Part 4, division 1, section 76A of the *EP&A Act*:

'if an environmental planning instrument provides that specified development may not be carried out except with development consent, a person must not carry the development out on land to which the provision applies unless:

(a) such a consent has been obtained and is in force, and
(b) the development is carried out in accordance with the consent and the instrument.'

As per these provisions, Palerang Council has vested authority for the management of the land within the Palerang local government area, and development in that area is guided by the requirements of the *Yarrowlumla Local Environmental Plan 2002*.

In accordance with Part 2 of the Yarrowlumla LEP, the lands potentially traversed by the project include those zoned as the following:

- Zone No 1(a) – General Rural Zone.
- Zone No 1(d) – Rural Residential Zone.
- Zone No 5(a) – Water Catchment Zone.
- Zone No 6(a) – Recreation Zone.

The Water Catchment Zone boundary within the LEP specifically corresponds to the Googong Foreshores area. The LEP states that the objective of this zone is to:

'restrict development of land to such uses as are compatible with the water catchment area identified by this zone.'

As prescribed in clause 11 of the LEP (refer to 'Table' therein) the M2G project, considered 'public utility undertakings', is allowable provided development consent is sought from the relevant authority.

A 'public utility undertaking' is defined by the LEP as:

'A building, work or undertaking carried out under the authority of any Government agency or other public authority (including the Council), or in pursuance of any Commonwealth or State Act for the purpose of:

(a) railways or roads, or
(b) railway, road, water or air transport, or wharf or river undertakings, or
(c) the provision of sewage of drainage services, or
(d) the supply of water, hydraulic power, electricity or gas, or
(e) telecommunications facilities.'

As this project directly relates to the pursuance of the provisions of the Commonwealth *Canberra Water Supply (Googong Dam) Act 1974* (a Commonwealth Act) for the purpose of the supply of water, the M2G project constitutes a 'public utility undertaking', and is therefore an activity that is allowable with development consent. Development consent will not be sought from Palerang Council given the project would be assessed under Part 3A of the *EP&A Act*. Development consent is required from the Department of Planning.

The application of this Commonwealth legislation to the M2G project is discussed in section 2.4.

2.3 OTHER NSW LEGISLATION

The following NSW legislation may have relevance to the project, and, will be considered in the environmental assessment:

- *Contaminated Land Management Act 1997*.
- *Fisheries Management Act 1994*.
- *Heritage Act 1977*.
- *National Parks and Wildlife Act 1974*.
- *Native Title (New South Wales) Act 1994*.
- *Native Vegetation Act 2003*.
- *Pipelines Act 1967*.
- *Protection of the Environment Operations Act 1997*.
- *Roads Act 1993*.
- *Threatened Species Conservation Act 1995*.
- *Waste Avoidance and Resource Recovery Act 2001*.
- *Water Act 1912*.
- *Water Management Act 2000*.

With respect to the above legislation, due consideration will be given to clauses 75U and 75V of the *EP&A Act* for approved Part 3A projects. These sections of the *EP&A Act* cater for approvals under other NSW legislation that either do not apply or are to be applied consistently.

Approvals to be applied consistently

Furthermore, the Act (section 75V) stipulates approvals and legislation that must be applied consistently to the approval of a project under Part 3A. Specifically, section 75V, as it relates to this project, states:

'An authorisation of the following kind cannot be refused if it is necessary for carrying out an approved project and is to be substantially consistent with the approval under this Part: …

(e) an environment protection licence under Chapter 3 of the Protection of the Environment Operations Act 1997 (for any of the purposes referred to in section 43 of that Act),

(f) a consent under section 138 of the Roads Act 1993,
(g) a licence under the Pipelines Act 1967.'

A licence under the *Protection of the Environment Operations Act 1997* is likely to be required for the M2G, which will be considered in the environmental assessment.

ACTEW intend to make an application for a pipelines licence under the *Pipelines Act 1967* to acquire land and/or easements over which the pipeline and associated infrastructure would be located. If the M2G is approved under Part 3A of the *EP&A Act*, then a licence under the *Pipelines Act 1967* must not be refused if it is considered necessary for the carrying out of the project. ACTEW Corporation have already submitted an application for an authority to survey in accordance with clause 5E of the *Pipelines Act 1967* (29 April 2008) to gain access to NSW land within the project corridor for the purposes of conducting surveys and specialist studies to determine a preferred pipeline route. At the time of preparing this document, the Authority to Survey had not been issued.

With respect to the application of the *Roads Act 1993* to the M2G project, section 138(5) of the *Roads Act 1993* states that section 138 *'does not apply to anything done under the provisions of the Pipelines Act 1967...'*. Consent under section 138 is for activities involving work in, on or over a public road. Consent for the M2G works may not be required provided an application for a pipeline licence is made.

Approvals that do not apply

Section 75U(1) of the *EP&A Act* outlines the approvals and authorisations under other NSW legislation that do not apply to an approved Part 3A project. Specifically, these include:

- The concurrence under Part 3 of the *Coastal Protection Act 1979* of the minister administering that part of the Act.
- A permit under section 201, section 205 or section 219 of the *Fisheries Management Act 1994*.
- An approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977.*
- A permit under section 87 or a consent under section 90 if the *National Parks and Wildlife Act 1974* (this section relates to the protection of Aboriginal objects).
- An authorisation referred to in section 12 of the *Native Vegetation Act 2003* (or under any Act to be repealed by that Act) to clear native vegetation or State protected land.
- A permit under Part 3A of the *Rivers and Foreshores Improvement Act 1948.*
- A bush fire safety authority under section 100B of the *Rural Fires Act 1997.*
- A water use approval under section 89, a water management work approval under section 90 or an activity approval under section 91 of the *Water Management Act 2000* (section 75U(1)).

It should be noted that the *Rivers and Foreshores Act 1948* has been repealed.

Section 75U(2) of the Act also states that:

'Division 8 of Part 6 of the Heritage Act 1977 does not apply to prevent or interfere with the carrying out of an approved project.'

2.4 COMMONWEALTH LEGISLATION

The project is conducted within the framework of the following Commonwealth legislation:

- *Canberra Water Supply (Googong Dam) Act 1974.*
- *Australian Capital Territory (Planning and Land Management) Act 1988.*
- *Environment Protection and Biodiversity Conservation Act 1999*.

These are discussed in this section and will be considered in the environmental assessment.

The following additional Commonwealth legislation may have relevance to the project, and will also be addressed in the environmental assessment:

- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*.
- *Protection of Movable Cultural Heritage Act 1986*.
- *Native Title Act 1993*.

Canberra Water Supply (Googong Dam) Act 1974

The project corridor traverses Commonwealth owned land, comprising part of the Googong Foreshores. The Googong Foreshores is an area encompassing 5089 hectares, surrounding and including the Googong Dam and part of its tributaries to the south. The Googong Foreshores lie within NSW state boundaries, to the south-east of the ACT. The land represents that defined in the *Canberra Water Supply (Googong Dam) Act 1974* (or the *Googong Dam Act*) as the Googong Dam Area (GDA). The Commonwealth acquired this land from NSW in 1973 (TAMS 2007) for the purpose of constructing the Googong Dam.

The ACT Government has vested responsibility for the management of the Googong Foreshores area and ACTEW is responsible for the water resource it contains. Specifically, the *'operation, maintenance, upgrading and augmentation of water supply and treatment infrastructure within the Googong Dam area'.* The responsibility for dam operation is vested in ACTEW via a written instrument by the ACT Executive (dated 13 August 2003), which appoints ACTEW as an authorised person for the purposes of the *Googong Dam Act* (permitted under section 7 of the Act). Both the ACT Government and ACTEW conduct their respective responsibilities for management of the Googong Foreshores on behalf of the ACT Executive. There are no approval requirements for this project under the *Googong Dam Act* since the intended outcomes are in line with the functions outlined in the Act.

As land acquired by the Commonwealth, the Googong Foreshores remain part of NSW (unlike a 'territory'). As such, NSW laws apply to this section of the project corridor where they are capable of operating concurrently with the *Googong Dam Act* (as stated in section 27). In the event of contradiction of law, Commonwealth legislation takes precedence over any other (TAMS 2007). The plan states:

'NSW laws that operate within the Dam Area cannot restrict or impede the ACT in carrying out its functions under the Googong Dam Act because they would be inconsistent with that Act.'

This interpretation of this legislative framework is mirrored in *Cross Border Water Supply between the ACT and NSW* (Government of NSW, Government of Australian Capital Territory and Government of Australia, 2006), which states that the ACT has overall management responsibility for water supply and land management with the Googong Dam Area, and the power to carry out works in NSW necessary for Territory water supply.

Development within the Googong Foreshores, where not inconsistent with the Commonwealth's *Canberra Water Supply (Googong Dam) Act 1974*, is controlled mainly under the provisions of *Environmental Planning and Assessment Act 1979* (NSW) and vested with local government especially in the form of LEPs.

Australian Capital Territory (Planning and Land Management) Act 1988

The *Australian Capital Territory (Planning and Land Management) Act 1988* establishes the National Capital Authority as the Commonwealth Government agency with responsibility to prepare and administer a National Capital Plan, with the intention to represent the Commonwealth interest in the Territory. Approvals from the National Capital Authority under this Act will be sought if required for works within designated areas in the ACT. The only designated area within the project corridor is the Monaro Highway Corridor, which will be intersected by the pipeline route.

The National Capital Plan also identifies special requirements for some areas within the Territory, which are not designated areas. Where special requirements have been identified, development approval is the responsibility of the Territory planning authority, but the authority must ensure that any approval granted is consistent with the special requirements of the National Capital Plan. Special requirements primarily relate to the visual impact of the works. Those applicable to the M2G project corridor include those that flank the Monaro Highway (outside the road reserve but within 200 metres of the road centreline), and those for the Murrumbidgee River Corridor.

Requirements for approvals under the *Australian Capital Territory (Planning and Land Management) Act 1988* will be sought by ACTEW, in combination with development approvals required under ACT legislation.

Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) is the key federal legislation for environmental protection. The Act establishes a requirement for, and a system of, environmental assessment and approval by the Commonwealth for actions that crucially affect matters of national significance or Commonwealth land, or that are undertaken by the Commonwealth. If the Federal Minister for the Environment determines that an approval is required under the EPBC Act, the proposed action is deemed to be a 'controlled action' and must undergo assessment and obtain an approval prior to being undertaken.

Matters of national environmental significance (NES) that are potentially relevant to this project are world and national heritage places, threatened species, ecological communities, and migratory species listed in the EPBC Act. Actions that significantly impact on Commonwealth land are provided for in subsections 26(1) and 26(2) of the EPBC Act. The Googong Foreshores area is encapsulated in the project corridor. Hence, both matters of NES and impacts upon Commonwealth land will be considered in the assessment in accordance with the EPBC Act.

2.5 ACT LEGISLATION

The ACT Acts and regulations that are to be considered for all components of the proposal that are located on ACT land include, without being limited to:

- *Land Planning and Development Act 2007.*
- *Territory Plan 2008.*
- *Utilities Act 2000.*
- *Land Acquisitions Act 1994.*
- *Heritage Act 2004.*
- *Environment Protection Act 1997.*
- *Water Resources Act 2007.*

In general, the *Land Planning and Development Act 2007* provides a planning approval framework for development. The approving authority is the ACT Planning and Land Authority (ACTPLA). An assessment scope will be sought under this Act, and will guide the preparation of the environmental assessment and the development application for the project. Other legislation listed above relates to separate assessments and/or approvals that may be required for the project within the ACT.

Murray-Darling Basin Agreement

The Murray Darling Basin Agreement is an agreement between the Commonwealth, NSW, Victoria, South Australia, QLD and the ACT to provide for the integrated management of the Murray-Darling Basin. The purpose of the agreement (clause 1) is '*to promote and coordinate effective planning and management for the equitable efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin*'.

The agreement was originally signed by the Commonwealth, New South Wales, Victoria and South Australia governments in 1987. In 1992, a new Murray-Darling Basin Agreement was signed and given full legal status by

the *Murray-Darling Basin Act 1993*. In 1998, the ACT Government formalised its participation in the agreement through a memorandum of understanding that relates to the component of the Murrumbidgee River that flows through the ACT, its sub-catchments in that territory and the Canberra water supply system.

The Murray-Darling Basin Commission (MDBC), the executive arm of the Murray-Darling Basin Ministerial Council, administers the agreement. The MDBC is required to equitably and efficiently manage and distribute the water resources of the River Murray in accordance with the Murray-Darling Basin Agreement to obtain the highest achievable quality and efficiency of use of such resources.

The environmental assessment documentation to be prepared for the ACT and Commonwealth components of the project will assess and detail the requirements of the Murray-Darling Basin Agreement in relation to the sourcing of water from the Murrumbidgee River and its effect on the Cap and diversions for the ACT Government.

2.6 OTHER POLICIES

Googong Foreshores Draft Plan of Management

In September 2007, the ACT Government published the Googong Foreshores Draft Plan of Management. The plan acknowledges that the Googong Foreshores is a valuable, attractive and biologically diverse area that provides a source for high quality potable water for the ACT and Queanbeyan, whilst, protecting biodiversity, cultural heritage, and recreational opportunities.

The plan establishes a framework for managing activities that will retain the values of the area (heritage, environmental and social) whilst ensuring these activities do not adversely impact on the areas' primary purpose of providing a potable water supply to the ACT and the Queanbeyan region. In relation to the management and maintenance of the water supply infrastructure, the draft plan requires that a best practice approach is adopted for management of the reservoir and the water quality therein (TAMS 2007).

2.7 GOOGONG FORESHORES CROSS-JURISDICTIONAL ARRANGEMENTS

The Googong Foreshores is Commonwealth-owned within NSW boundaries. However, some ACT frameworks are used in the management of Googong water resources and the Googong Foreshores (TAMS 2007). The *ACT Environmental Flow Guidelines 2006* (ACT Government 2006) established under the *Water Resources Act 1998* (ACT) specify environmental flows in New South Wales immediately downstream of Googong Dam as these are under the direct control of the ACT through regulation of releases. The *Fish Stocking Plan for the ACT 2001–2005* (ACT Government 2000) is a coordinated program that includes Googong Reservoir. Stocking of the reservoir is carried out in cooperation with the NSW Department of Primary Industries, which provides the majority of fish stocks.

3 Strategic setting

3.1 STRATEGIC CONTEXT

Water supply in ACT and surrounding region

The need to review the ACT's water supply security derived from the decline in average inflows into the dams that supply the ACT and region since 2001. In April 2004, ACTEW commenced an investigation into options to secure long-term reliable water sources for the ACT and region (ACTEW 2004). The following year, in response to continuing drought, ACTEW initiated its Future Water Options project to further examine each option and recommend a preferred approach to the ACT Government for water security. As a result, the following options were short-listed:

- Enlargement of the existing Cotter Dam.
- Construction of a new dam on the Gudgendy River (Tennet Dam).
- Transfer of water to the ACT from Tantangara Dam in NSW via the Murrumbidgee River (and involving the transfer of Tantangara Dam flows from the Murrumbidgee River to Googong Reservoir).

The findings of the Future Water Options project are reported in ACTEW (2005). At that stage, raw water transfer from the Murrumbidgee River to Googong (then referred to as the 'Angle Crossing Option') was considered a short-term drought contingency measure as opposed to a permanent solution to address long-term drought conditions, with various transfer options from Angle Crossing having been explored.

During and since the period of the Future Water Options project, ACTEW implemented a series of measures that provided water to the ACT additional to that which would previously have been available. However, an ensuing review of supply options and new alternatives to ensure water security for the ACT and region was prompted due to the following reasons:

- Dam inflows in 2006 were the worst on record.
- The climatic outlook was for significant deterioration of catchment inflows.
- Likely predicted impacts included longer and drier drought periods than those experienced from 2001.

This recent review constituted the foundation to ACTEW's Water Security Program and resulted in a series of recommendations to the ACT Government. The government's response was announced in October 2007 and included as key initiatives:

- Enlarging the Cotter Dam from 4 gigalitres (GL) to 78GL.
- Installation of infrastructure to increase the volume of water transferred from the Murrumbidgee River to the Googong Reservoir.
- Pursuing the possibility of purchasing water from Tantangara Dam.
- Designing a demonstration Water Purification Plant, with the water produced by the plant to be used for purposes other than drinking.
- Increasing funding for demand reduction measures by $2 million.
- Investigating the extension of permanent water conservation measures.
- Implementing a pilot 'Smart Metering' program.
- Voluntarily offsetting the additional greenhouse gases generated by these projects.

Following on from the ACT Government's announcement, ACTEW have commenced implementation of these initiatives. For the M2G project (or 'the installation of infrastructure to increase the volume of water transferred from the Murrumbidgee River to the Googong Reservoir'), a preliminary design study (GHD 2008) has been

completed to determine a preferred option for extraction (intake) locations within the ACT, pipeline corridors for the route within the ACT and NSW and discharge locations for ultimate discharge into Googong Reservoir.

Sydney-Canberra Corridor Regional Strategy

Regional strategies are currently being developed for high priority areas within NSW. The *Sydney–Canberra Corridor Regional Strategy 2007–31* (Department of Planning 2008) applies to the local government areas of Wingecarribee, Goulburn Mulwaree, Upper Lachlan, Yass Valley, Palerang and Queanbeyan. The strategy builds on previous planning work, including the 1995 Sydney–Canberra Corridor Strategy, as well as the Australian Capital Territory (ACT) and Subregion Planning Strategy.

In accordance with the recently signed and interlinked memoranda of understanding on water resources and settlement, the strategy recognises the importance of working cooperatively with the ACT and represents the NSW Government's position on settlement within the cross-border region. The key purpose of the strategy is to accommodate and manage growth while ensuring that the rural landscapes and environmental settings that define the region's character are not compromised. The strategy aims to ensure that land is available and appropriately located to sustainably accommodate the projected population growth, housing, employment and environmental needs over the next 25 years.

The strategy acknowledges the importance of a coordinated approach to settlement and as such will continue to inform future infrastructure priorities for the Sydney–Canberra Corridor. It is intended to be the pre-eminent strategic policy document for the Sydney–Canberra Corridor Region and will complement and inform other relevant state and local strategies and planning instruments.

It is envisaged that the strategy will provide clearer direction on the NSW Government's state and regional land use planning objectives. The regional strategy for the Sydney-Canberra corridor includes in its southern sector part of the area of the Queanbeyan and Molonglo River catchments (Government of NSW, Government of Australian Capital Territory and Government of Australia, 2006). The southern area of the region (Palerang, Yass Valley and Queanbeyan) is covered by the two previously mentioned memoranda, providing for use and protection of water resources in accordance with an agreed set of settlement principles and residential settlement in the areas.

3.2 NEED FOR THE PROJECT

The ACT region has experienced severe drought conditions over the last six years. In 2006 alone, inflows into ACT catchments were down by almost 90 per cent. The medium and long-term prospect suggests a further decline to long-term average inflows by almost 50 per cent. These factors prompted ACTEW to conduct a review and reconsider the region's water supply options, as well as explore new alternatives to ensure future water security. In July 2007, ACTEW completed a detailed review and submitted key recommendations for the Water Security Program.

The M2G proposal is one of the recommended works under this scheme and forms part of ACTEW's continued response to securing future water supplies for the ACT and region's increasing population and to address climate change. The M2G proposal will increase and diversify water sources in the region by accessing water that is less dependent on rainfall within ACT borders. The proposal will also make better use of the water storage capacity in the Googong Reservoir.

The project also supports and helps to achieve strategic planning outcomes for the Sydney-Canberra region, especially with respect to the *Sydney-Canberra Corridor Regional Strategy 2008*. Specifically, the project supports the aim of the memorandum of understanding on water resources between the ACT and NSW for the area, providing regional water security for the medium term.

4 The project

The project involves the transfer of water from the Murrumbidgee River in the ACT to Burra Creek, for 'run of river' flow into the Googong Reservoir. Specifically, the project incorporates:

- Extraction of water from the Murrumbidgee River near the Angle Crossing causeway via a system of pumping stations (ACT).
- An underground pipeline traversing ACT and NSW lands.
- Regulated flow discharge into Burra Creek within the Googong Foreshores (within NSW).

4.1 LOCATION AND STUDY AREA

The overall M2G project corridor is located south-west of Canberra and is bound by the Murrumbidgee River Corridor to the west (near Angle Crossing) and the western edge of the Burra Creek arm of the Googong Foreshores in the east.

The NSW project corridor is the area contained within the ACT/NSW border in the west (near the Monaro Highway, Williamsdale) and Googong Foreshores in the east. The Googong Foreshores is Commonwealth owned land within the state of NSW. Currently the corridor (for pipeline route options) remains broad (about 2km in width) at the western edge and narrows to approximately 300 metres (m) in width at the end of the first southern bend in Williamsdale Road. The corridor remains at a 300m width for the remainder of the route to the discharge at Burra Creek. The corridor includes and follows Williamsdale Road and Burra Road, within the districts of Williamsdale and Burra.

The entire project corridor, including ACT land, is shown in Figure 1. The portion of the project relating to NSW land that is the subject of this application and preliminary assessment, lies to the east of the ACT and NSW border.

4.2 PROJECT SCOPE

The project has been developed around the extraction of water from the Murrumbidgee River near the Angle Crossing causeway via a system of pumping stations and pipelines, and within ACT land, to ensure compliance with the Murray Darling Basin Agreement. The proposed intake site and structure will be determined during detailed design and guided by consultation with stakeholders.

The pumping system will comprise a low lift submersible pumping station within the intake structure and a high lift pumping station located higher up on the eastern bank of the Murrumbidgee River some 300m from the intake.

The total length of the water pipeline is approximately 13km and is planned to discharge into Burra Creek just downstream of an existing flow measuring station located with the Googong Foreshores, downstream of the Burra Road bridge crossing of Burra Creek. The pipeline length located within NSW will be approximately 10.2km.

The capacity of the scheme will be designed for a base flow of up to a nominal 100 mega litres per day (ML/d) being capable of operating at a range of flows in 15ML/d steps. This flexibility is required to maximise water transfer whilst ensuring residual environmental flows are maintained in the Murrumbidgee River. Hydraulic design of the pipeline will be in accordance with ACTEW standard pipeline design practice.

ACTEW Networks will provide the power supply (within the ACT lands) to the pumping station from the existing power grid located within 1.5km of the pumping stations (GHD 2008).

4.3 CORRIDOR AND ROUTE REFINEMENT

Following the ACT Government's announcement of the initiative to pump water from Murrumbidgee to Googong in October 2007, ACTEW commenced the preliminary design phase of the project. This phase involved the assessment of several route corridors within the wider ACT and NSW region. Project corridor options stemmed from two potential extraction locations on the Murrumbidgee River in the ACT: Angle Crossing and Point Hut, located to the north of the former.

Two route corridors were examined from Point Hut, both involving proposed pipeline routes traversing Queanbeyan local government area in NSW. One option was located to the north, while the second was located in the immediate vicinity of the proposed Googong Township. Both of these Point Hut options involved discharge of flows into the lower waters at Googong Reservoir.

Several project corridors to the south of the above were examined, all with extraction locations at, or near, Angle Crossing. The southern area was generally preferred without specific preference for one or other option. The selection of this general route corridor was based on the following:

- Specialist environmental and other assessments (including water quality, hydrology, terrestrial and aquatic biodiversity, cultural (Aboriginal and historical) heritage).
- Preliminary engineering design.
- Environmental planning approvals and risk.
- Stakeholder issues.

The final pipeline alignment within the project corridor has not yet been determined. Further refinement of the alignment will reflect protection of remnant vegetation areas prevalent in the road reserves, and preferred construction conditions.

The project corridor identified in this document for NSW is the same corridor that defined in ACTEW's authority to survey issued under the NSW *Pipelines Act 1967* on 22 July 2008. Options for pipeline alignments will be examined fully within this corridor.

5 Community engagement and stakeholder management

5.1 INTRODUCTION

A community engagement and stakeholder management (CE&SM) plan has been prepared to support the approvals, design and delivery phases of the M2G. Implementation of this plan commenced in January 2008 and will continue for the duration of the project (until mid 2011).

The CE&SM plan provides a clear process for ensuring community engagement and stakeholder management throughout the design and delivery phases of the project. It provides:

- An overview of the organisational and community context applicable to the project.
- A description of the community engagement and stakeholder management strategy and approach for the project.
- A method for investigating the issues pertaining to the program and project.
- Identification of project's stakeholders, their issues, influencing level, key messages to be used in communicating with them, and the project phases where they are likely to be impacted or interested.
- An overview of the communication tools and techniques that will be used to engage and communicate with stakeholders, and aligning these with project delivery milestones.
- A mechanism for the recording and evaluating community comments and issues.
- A reporting framework to inform the design and construction of the project.
- An evaluation and monitoring program to assess the level of community engagement and effectiveness of the plan.

5.2 METHODOLOGY

The CE&SM plan is outlined in flowchart below:

5.3 STRATEGIC POSITIONING AND APPROACH

A stakeholder scan has been undertaken to identify the stakeholders, and to identify the most appropriate tool(s) to engage and communicate effectively with the community about this project. Relevant stakeholders for the project include the following groups and individuals:

- Statutory authorities.
- Local councils.
- Individual landowners.
- Commonwealth, state and territory (NSW and ACT) government departments (officers).
- Industries – potential customers.
- Industries – bystanders.
- Media – local, metropolitan and national.
- Communities around the pipeline corridor.
- Elected representatives (federal, state, territory and local).
- Representative Aboriginal Organisations (RAOs) and land councils.
- Special interest groups:
  - Environment groups.
  - Local residents groups.
  - Local interest groups.
  - Recreational user groups.
  - Non-local interest groups.
- Utility and transport service providers.

The CE&SM plan categorises each of these stakeholder groups according to their level of interest in the proposal and their potential level of impact on project planning, implementation and outcomes. This has been identified through the initial discussions with these groups and individuals. Nonetheless, stakeholder engagement is a dynamic process and the role and importance of stakeholders will grow and diminish over time. New stakeholders may emerge as the engagement process progresses. Accordingly, this plan will remain dynamic and be revised as the project progresses to reflect any change in focus by various stakeholders.

The delivery of the CE&SM on the M2G project will consider:

- Appropriateness to audience, goal and message.
- Relevance to project goals.
- Timing and consistent information.
- Attitudes of community toward the issue/activity.
- Cultural appropriateness including language.
- Environment—geographic considerations.

The overriding philosophy regarding communications on this project is to proactively disseminate information in a planned and systematic manner, to consult with stakeholders at key stages, and to continuously evaluate community feedback and the effectiveness of the strategy and make adjustments to increase its effectiveness over the design, construction and delivery phases.

5.4 PRELIMINARY ISSUES AND MESSAGES

A stakeholder analysis was conducted during the development of the CE&SM plan, which identified a number of key issues for the project. The analysis confirmed the types of issues that are likely to be raised during the stakeholder engagement process, which may be a risk to the project and project approval. These include:

- Pipeline route selection.
- Impacts of ongoing pipeline access/maintenance (particularly weed management).
- Visual amenity and property values.
- Environmental flow issues related to the national water debate.
- Reduced amenity for recreational users at Angle Crossing, ACT.
- Compulsory land acquisitions.
- Limitations on easements.
- Clarification of health and safety issues.

- Levels of consultation.
- Compensation for affected landowners.
- Legal issues around land rights.
- Erosion management.

5.5 CONSULTATION CONDUCTED TO DATE

Since ACTEW and the ACT Government accepted the recommendations in October 2007, the community has been informed of the progress of M2G. Community consultation conducted so far has included:

October 2007

ACT Government announced its acceptance of the recommendations to progress with the Water Security Projects, including the M2G project.

October 2007 to December 2007

Initial geotechnical and survey work was conducted during the route selection process. The ACT Government departments (ACT Health and Department of Territory and Municipal Services including Environment ACT) were consulted on the possible route options.

February 2008

An initial letter and fact sheet was sent to NSW residents, outlining the project, the type of surveys to be undertaken and details of the community contact line for further information. This letter was sent to all identified owners along the route.

The delivery of the letter and fact sheet resulted in some enquiries via the community information line and the email, mostly relating to access and overall project objectives.

Letters were also sent to Palerang Council, Burra Community Association (BCA), B.U.R.R.A (Burra Urila Residents and Ratepayers Association) and Burra Rural Fire Brigade. The letter invited any organisation or individual to call the community line for further information and offered of a briefing.

March 2008

A letter was sent to the identified Burra residents inviting them to a drop-in session held at the community hall to engage with landholders and encourage them to find out more about the project and the proposed pipeline corridor.

The Murrumbidgee to Googong Transfer Information Session (or drop-in session) was held during the afternoon and evening of 25 March 2008 at the Burra Community Hall. The session was attended by approximately 40 residents, and attended not only by the landholders specifically along the route, but residents from the wider community interested in the project.

May – June 2008

Presentations were made to the BCA, Queanbeyan Business Council and the Upper Murrumbidgee Catchment Coordination Committee.

Ongoing

There is a standing avenue for stakeholder contact via the community information line and ACTEW's Water Security – Major Projects information line and email address.

Project information has been uploaded to the B.U.R.R.A website (www.burra.org.au) and in the Burra Community Association's monthly community update.

Consultation with government authorities

Consultation with various NSW Government departments commenced in November 2007. A summary of the consultation conducted is provided below.

Department of Planning (DoP)

November 2007

- Consultation regarding the implications of the M2G in the NSW planning context, including:
  - The project importance on a regional scale.
  - The need to acquire easements for the pipelines on NSW lands, and the ability to do so as a non public utility under the *Pipelines Act 1967*.
  - A letter was sent introducing the project and the potential applicability of section 75B of the EP&A Act.

17 January 2008

Meeting between DoP and ACTEW regarding the Water Security projects, specifically the M2G. Outcomes were:

- There would be limited ability for the department to consider ACTEW's seeking concept plan approval for the suite of water security projects due to the lack of relevancy of some of the projects to NSW.
- ACTEW to consider:
  - The *SEPP (Infrastructure) 2007.*
  - Land use zonings along the pipeline route.
  - Whether or not ACTEW would seek a pipeline licence.
  - Engaging in discussion with the Department of Water and Energy to clarify issues relating to pipeline licences.
- Consultation with other agencies should continue as it would for other stakeholders.

March – July 2008

- Various discussions regarding the following:
  - Timing of planning focus meeting (PFM) for the project (the department advised that a PFM would be held post submission of a major project application).
  - Timing of ACTEW's submission of an application for a pipeline licence (the department advised that it could accept an application based on the intention to submit an application for a pipeline licence).
  - Total project cost, major project application fee, application of clause 8F of the *Environmental Planning and Assessment Regulation 2000.*

Department of Water and Energy (DWE)

November – July 2008

Discussion regarding pipelines projects and the operation of the *Pipelines Act 1967,* including:

- The applicability of the *Pipelines Act 1967* for a non public utility pipeline project.
- The pipelines licence application process.
- The process for application for an authority to survey for the purpose of obtaining access to NSW lands. Access would be required for preliminary and detailed design studies and environmental assessments.

ACTEW submitted an application for an authority to survey on 29 April 2008, and approval was received on 22 July 2008.

November – December 2007

Discussions regarding potential approval implications of the M2G within NSW for the discharge of water into Burra Creek. The following advice was obtained:

- Since the extraction of water would occur outside of NSW, a licence/approval under the Water Act 1912 would not be required.
- As at this time. There were no licensed water diverters on Burra Creek.
- The department might need to consider special arrangements for the lower section of Burra Creek if a licence was applied for in the future.

Department of Environment and Climate Change (DECC)

November 2007

Discussion regarding approvals under the *Protection of the Environment Operations Act 1997*. The following advice was obtained:

- Licence would only be required where best practice management techniques would not be able to prevent pollution.
- Depending on the amounts of spoil to be removed for pipeline construction, the project could be considered a scheduled activity.
- Consideration should be given to the NSW Water Quality and River Flow Objectives when assessing impacts on water quality.

6 Existing environment

The existing local environment, in which the project corridor is located, directly influences the significance of key and other impacts generated from the proposal. The refined pipeline alignment will determine the specific nature of these impacts. The pipeline extends east to west for approximately 13km, from the extraction point at the Murrumbidgee River, ACT, to the discharge point at Burra Creek, NSW. About 10.2km of the pipeline is located within the NSW local government area of Palerang Council. The project corridor in NSW is bound to the west by the Monaro Highway and is centred on Williamsdale Road and Burra Road within Williamsdale and Burra communities. The project intends on avoiding interactions with environmentally and culturally sensitive protected areas, built up areas, major topographic features and other constraints. This section provides a brief description of the present conditions found within the local environment under NSW and Commonwealth jurisdiction, where the corridor will be located.

6.1 AIR QUALITY AND MICROCLIMATE

The study area is located within a rural landscape characterised by large and small rural landholdings, state forests and small townships. The nearest townships and urban residential areas are located in the Queanbeyan township (approximately 10km away). There is one industry in close proximity to the pipeline corridor, the quarry (along Williamsdale Road, Williamsdale). Air quality throughout the study area is considered to be good.

Climatic information has been derived from the Bureau of Meteorology (http://www.bom.gov.au). Records from the nearest automated weather station are sourced from Canberra Airport, approximately 38km from the project corridor. The pipeline corridor is located within a temperate climate, distinctively characterised by mild/warm summers and cold winters. Mean temperatures are within the range of 13–27 degrees Celsius during summer and between 0–12 degrees Celsius in winter. Uniform rainfall is experienced throughout the year with an average of 620mm received per annum.

6.2 CATCHMENT AREAS

The project falls within two primary sub-catchments, divided into the western and eastern segments of the corridor. Drainage to the west enters the Murrumbidgee River, and runoff to the east enters the Molonglo and Queanbeyan river system (including Googong Reservoir). The main western channels include Waterhole, Lobb's Hole, Deep, Guises, Dunn's and Tuggeranong Creeks. The main watercourses to the east include Dog Trap Gully, Jerrabomberra, Four Mile, Barracks and Burra Creeks. The proposed pipeline will cross Burra Creek in at least one, possibly two, locations.

The Googong Reservoir catchment is subject to a variety of impacts stemming from past and present use of the foreshores. Erosion and turbidity issues were previously identified in Burra Creek. A range of activities have the potential to initiate or elevate soil erosion in the catchment, including road works, earthworks, forestry operations and stocking (TAMS 2007).

Riparian vegetation common to both catchments varies from patches of macrophytes and emergent reeds (such as *Phragmites australis*) to remnant native grasses and introduced weeds, to scattered shrubs and trees.

Impacts on aquatic fauna in the catchment are to be considered in the environmental assessment, with special regard to mitigation measures for changes in hydrology, and especially for species listed in the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)*, Fisheries Management Act 1994 (FM Act), Threatened Species Conservation Act 1995* (TSC Act) and the *Nature Conservation Act 1992* (NC Act).

6.3 LANDSCAPE AND SOILS

The route passes through a variety of topographies, vegetation types, land conditions and uses, all of which also vary in conservation value. The corridor falls under four local landscape units as used by Fallding *et al*. (2001). These are Tharwa, Royalla, Queanbeyan-Canberra and Lake George Range units. Each unit is distinguished by various ecological, social, economic and administrative characteristics. Elevation in the corridor varies from 550m to 1120m.

Topography along the route also changes considerably, ranging from deeply incised hills and gorges along the Murrumbidgee River at Angle Crossing and Queanbeyan River below Googong Dam to broad low lying plains within the Jerrabomberra and Tuggeranong Valleys and smaller flood plains along Jerrabomberra Creek.

Eight geological units were identified in the corridor. Most of these contain parent material from the Silurian period of the Palaeozoic era. Nine soil landscapes occur in the region and primarily comprise two specific soil types, with Lithosols in the upper layers and Podzolic soils in the deeper layers. Shallow sections of most soil landscapes are generally well drained.

6.4 BIODIVERSITY

In October 2007, Biosis Research conducted a preliminary aquatic and terrestrial assessment of the pipeline corridor (Biosis 2007a, 2007b, 2008). The following details the outcomes of the assessment unless otherwise specified.

Terrestrial

Regardless of final pipeline route, the corridor will be predominantly located in agricultural areas. Habitats of significant value are likely to contain high biodiversity and possibly, threatened, endangered or rare fauna, flora and communities as listed in the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act), Threatened Species Conservation Act 1995* (*TSC Act)* and *Nature Conservation Act 1992* (*NC Act)*. Sensitive areas of moderate and high potential constraint include sections of Murrumbidgee River Corridor (MRC), remnant Box/Gum grassy woodland and secondary grasslands, dry sclerophyll shrubby woodland/open forest, native pasture land, high quality corridor vegetation and riparian vegetation. Specific examples of such areas in the project corridor and the surrounding region, identified in Biosis Research (2007a) include:

- Box/Gum grassy woodland communities have been identified to the east of the Murrumbidgee corridor and south of Angle Crossing Road. Along Williamsdale Road near Knowles Lane (access to Williamsdale quarry) and south of Williamsdale Road about 2.5km east of the Monaro Highway. The communities may also occur within woodland stands between Williamsdale Road and Deep Creek and on the lower slopes south-west of Gibraltar Hill.
- Angle Crossing Road reserve, which contains localised patches of highly diverse grasslands and threatened species such as Small Purple-pea *Swainsona recta* and Silky Swainson-pea *Swainsona sericea.*
- Goulburn-Bombala railway corridor, which contains localised patches of highly diverse grasslands and threatened species such as Small Purple-pea *Swainsona recta* and Silky Swainson-pea *Swainsona sericea.*
- The Golden Sun Moth *Synemon plana* has been recorded in areas to the north of the project corridor, including in the Googong Development Area, Jerrabomberra Valley, Queanbeyan Nature Reserve and Poplars.
- Pink-tailed Worm-lizard *Aprasia parapulchella* and Rosenberg's Monitor *Varanus rosenbergi* have been widely recorded between Williamsdale and Queanbeyan and variously sighted near Gigerline Gorge in the Gigerline nature reserve north of the project corridor.
- *Rutidosis* site, Queanbeyan, Queanbeyan West.
- Braidwood Rural Lands Protection Board Travelling Stock Route.

Areas of low conservation value include urban roadside vegetation and highly modified pastures.

The Googong Foreshores reserve is located to the south-east of the project corridor. It contains an extensive area of intact forest and woodland, a diversity of habitats, threatened flora and fauna species and unique geological and geomorphological features (TAMS, 2007). There are about 3000 hectares (ha) of relatively intact open forest and woodland, mainly along the eastern escarpment, and about 1500 ha of partly cleared former grazing land, in which regeneration is occurring, to the west of the Reservoir (TAMS, 2007). Habitats that occur in the region include steep and rocky slopes with open forest and woodland cover, rocky gullies, regenerating woodlands and riparian areas along rivers and creeks, and open grassland (TAMS, 2007). Collectively, these habitats form a much greater corridor of high conservation value, containing primarily intact indigenous vegetation and include certain reserves such as Burra Creek Reserve (TAMS, 2007).

Field studies have confirmed that the main vegetation communities at Googong Foreshores are grassy woodlands and open forests. Grassland areas have been recorded along Burra Creek. Yellow Box (*Eucalyptus melliodora*) and Broad-leaved Peppermint (*Eucalyptus dives*) Woodland communities frequent along parts of Burra Creek, though the most dominant association is Apple Box (*Eucalyptus bridgesiana*). Sections of cold air drainage and within broader valleys of the creek, Snow Gum – Black Sallee Grassy Woodlands have been found (TAMS, 2007). Many areas of shrubland and grassland are considered to be secondary communities following disturbance to tree cover (TAMS, 2007).

The fauna of Googong Foreshores has not been thoroughly surveyed. However, existing surveys provide an indication of the faunal importance of the area (TAMS, 2007). The presence of the Googong Reservoir, which backs up the waters in the Queanbeyan River and Burra Creek, contributes to the diversity of foreshores habitat reflected in the number of bird, bat and reptile species recorded (TAMS, 2007).

Aquatic

The aquatic ecology in Burra Creek has been assessed as being in poor condition in its upper reaches and moderate condition in its lower reaches, mainly due to the lack of good condition and intact riparian vegetation (Biosis Research 2007b). No native fish were observed during Burra Creek field studies conducted in the preliminary design phase of the M2G project. However, exotic fish species including the Eastern Gambusia fish and Redfin Perch were observed at several locations along Burra Creek. Although Murray Cod, Macquarie perch and Silver Perch have been identified as potentially occurring in Burra Creek or Googong Reservoir, these threatened aquatic species were not observed in the field (Biosis Research 2007b). Large macrophyte beds mainly consisting of *Phragmites australis* or *Typha sp*. were present throughout the reach of Burra Creek.

There is a population of the threatened Macquarie Perch (*Macquaria australisica*) in the Queanbeyan River above Googong Reservoir (TAMS, 2007). The threatened Murray Cod and Silver Perch are also present as a result of the fish stocking program (TAMS 2007). Riparian vegetation includes Cumbungi (*Typha* sp.), Common Reed (*Phragmites australis*), sedges and rushes (TAMS 2007).

6.5 CULTURAL (ABORIGINAL AND HISTORICAL) HERITAGE

A preliminary cultural heritage assessment was carried out to determine the impact within the pipeline corridor (Navin Officer 2008). The assessment identified that the corridor contains several landscapes and features that have cultural significance. These features are both recognised on heritage registers (from the Department of Environment and Climate Change (DECC) or other state/territory agencies) and by Aboriginal and local communities. Prominent landforms such as the Molonglo River Gorge, Murrumbidgee River Corridor (MRC) and Burra Creek Valley have both formally and informally recognised cultural values. Other features within the corridors that also have cultural landscape values are Lambridge Homestead Precinct, Lanyon Homestead Conservation Area, London Bridge Homestead Precinct, London Bridge natural arch and limestone caves area, the MRC nature reserve and the Gale Precinct area.

6.6 LAND USE AND INFRASTRUCTURE

Local land uses include: farming (mostly cattle grazing and pasture improvement); urban and rural residential development; road, power, water and communications easements; mining; and conservation.

The corridor covers approximately 74 rural property lots along Angle Crossing Road and Williamsdale Road and through the Burra area. Angle Crossing is a significant recreation area, containing various outdoor facilities including a natural beach and swimming hole. Depending on the location of extraction point, the proposal may affect the recreational use and vehicular access of this area, particularly during the construction phase. Along Angle Crossing Road there is some unleased ACT land and some privately leased land (west of Monaro Highway).

The Murrumbidgee River and surrounding land is collectively known as the Murrumbidgee River Corridor (MRC). The MRC is managed by Environment ACT and contains a number of nature reserves (such as Gigerline Nature Reserve), recreation reserves, a European heritage conservation zone and rural leases.

As previously discussed, the discharge point is located within the Googong Foreshores area, a locality that is owned by the Commonwealth and managed by the ACT Government (with delegation of water resource responsibilities to ACTEW). Issues regarding this area are to be addressed to the Commonwealth as well as to NSW. This area is a large recreation area and as such, may encounter various impacts similar to those upon Angle Crossing, as a result of the project. More specifically, the area of land on either side of Burra Creek within the Googong Foreshores, south of London Bridge Homestead, is characterised by cleared pastoral land with patches of tree cover (TAMS, 2007). Access is via a vehicle track south of the homestead or off Burra Road, which forms the southwest boundary of Googong Foreshores (TAMS, 2007).

7 Preliminary environmental assessment

7.1 ENVIRONMENTAL RISK ANALYSIS

A preliminary environmental risk analysis was undertaken for the project to identify key and other environmental issues. It comprised a qualitative assessment based on information gathered during preliminary investigations. The level of environmental risk was assessed by considering potential environmental impacts of the project and the ability to manage those impacts in a way that minimises harm to the environment. Despite its qualitative nature, it facilitates scoping of environmental investigations and assessments, guides project design, and assists in identifying appropriate mitigation measures and management responses.

The following risk categories were adopted to determine areas of higher environmental risk requiring further scrutiny:

- Category A – May have high or significant impacts, actual or perceived. Further assessment is necessary to determine the level of potential impact and to develop appropriate measures to mitigate and manage the impacts.
- Category B – May have high, significant to moderate impacts. These impacts can be mitigated by the application of standard environmental management measures.
- Category C – Have low impacts and can be managed with the application of standard environmental management measures.

7.2 KEY ENVIRONMENTAL ISSUES

The preliminary environmental risk analysis indicates that the following environmental risks fall into Category A and require more detailed assessment and potentially project-specific management approaches:

- Burra Creek hydraulics and fluvial geomorphology.
- Burra Creek water quality.
- Burra Creek biodiversity (aquatic ecosystems).
- Aboriginal and historical heritage.

The impacts on Murrumbidgee River resulting from the extraction of water at Angle Crossing will be assessed and documented as part of the ACT and Commonwealth planning assessment and approvals process.

Other environmental risks were identified as category B or C risks, representing risks that can be managed with the application of standard mitigation measures. Further assessment may also be required (category B items). These are discussed in section 7.4. The potential impact associated with such issues would be mitigated during construction and/or operation through the adoption of best practice management and mitigation measures for the construction and operation of pipelines. These environmental issues may be unlikely to require project-specific management measures. However, should any of these be elevated to key environmental issues (due to reconsideration of existing information, assessment of the findings of assessments conducted or any other reason), an appropriately detailed assessment of such issues would be conducted.

Burra Creek hydraulics and fluvial geomorphology

The proposed project will modify existing flow and sediment regimes within Burra Creek.

SUMMARY OF POTENTIAL IMPACTS

A previous study (Starr 2005) assessed a 60 ML/day discharge assuming an even discharge over either eight hours or 24 hours, and assuming there would be low flows in Burra Creek during times of discharge. The report concluded that, under these conditions, there would be no impact on the banks of Burra Creek. However, it also lists a number of issues to be further considered, including the ability to modify or cease flows in response to increases in natural flows in the Creek.

Other potential impacts, including an increase in bedload entrainment, plus potential changes to channel morphology and vegetation were considered not be significant. Any fluvial geomorphologic impacts may have consequent impacts on aquatic biodiversity.

APPROACH TO ASSESSMENT

Channel forming flows in Burra Creek will be determined to allow operating rules to be developed for the modification or cessation of project transfer flows. A monitoring system will be developed to verify the longer-term adequateness of the operating arrangements to mitigate impacts.

Burra Creek water quality

The project involves the crossing of Burra Creek in at least two locations, changes natural flow regimes and introduces Murrumbidgee River water into Burra Creek for 'run-of-river' discharge into Googong Reservoir.

SUMMARY OF POTENTIAL IMPACTS

The following potential Burra Creek water quality impacts have been identified:

- Reduced water quality in Burra Creek at various locations due pipeline crossings during construction.
- Changed water quality in Burra Creek due to operation of the project (eg transfer of water with higher levels of nutrients, increase in turbidity and sediment levels in Burra Creek and Googong Reservoir).

Reduced water quality in Burra Creek and Googong Reservoir may require modification to the existing Googong Water Treatment Plant to maintain drinking water quality standards. This will also be addressed as part of the ACT planning assessment and approvals process, and through any modification of ACTEW's Water Utility Licence conditions issued under ACT legislation.

APPROACH TO ASSESSMENT

Construction management plans will be developed to address any water quality impacts that may result from construction activities. The existing water quality in the Murrumbidgee River and Burra Creek will be clearly defined. Transfer water quality impacts on Burra creek will be determined in conjunction with the development of operating rules as above.

Burra Creek biodiversity (aquatic ecology)

The project changes natural flow regimes and introduces Murrumbidgee River water into Burra Creek for 'run-of-river' discharge into Googong Reservoir.

SUMMARY OF POTENTIAL IMPACTS

The following potential aquatic ecology impacts have been identified:

- Changed water quality in Burra Creek due to operation of the project may impact on aquatic ecology in specific locations.
- Changes in water quality conditions (eg, alkalinity, conductivity and turbidity) may impact upon macroinvertebrate communities.
- Potential upstream migration of fish species usually absent from Burra Creek from Googong Reservoir (due to increased flows).

APPROACH TO ASSESSMENT

The development of operating rules will be informed by Burra Creek water quality targets and biodiversity assessments. Appropriate site-specific management measures would be developed to mitigate impacts on riparian vegetation due to increased flows and siting of near stream infrastructure.

An ongoing Murrumbidgee River and Burra Creek water quality monitoring program will be developed and implemented prior to commissioning to monitor the effectiveness of operating rules and other mitigation measures developed.

Cultural (Aboriginal and historical) heritage

The project is being conducted within areas that have both formally recognised and unrecognised cultural values, primarily within the Burra Creek Valley and the Murrumbidgee River Corridor (Navin Officer 2008).

SUMMARY OF POTENTIAL IMPACTS

The following potential impacts have been identified in relation to impacts on cultural (Aboriginal and historical) heritage in the vicinity of the project corridor:

- Potential impacts on important Aboriginal sites within the Burra Creek Valley, specifically impacts from increased flows in the creek on downstream caves.
- Potential unplanned construction impacts on unrecorded archaeological deposits within the project corridor.
- Increased flows in Burra Creek in the Googong Foreshores may impact upon the structural stability of the London Bridge natural arch, approximately 7km downstream of the discharge location.

APPROACH TO ASSESSMENT

A full archaeological survey of the project corridor would be conducted to confirm the location of recorded sites and identify any new sites or areas of potential archaeological deposits (PADs). An assessment of the significance of sites and any areas of potential impact from the project would be conducted to guide the pipeline route and associated placement of infrastructure adopting avoidance as a management strategy. Consultation with the Local Aboriginal Land Council (LALC) – Mogo LALC – has commenced, and early and ongoing consultation with other Aboriginal community organisations and local government authorities will commence shortly. Liaison at the earliest opportunity would allow for timely determination of preferred management outcomes for those items that would be affected by the project.

The potential impact of increased flows in Burra Creek (and potentially increased tourism in the immediate area within the Googong Foreshores) on London Bridge natural arch and associated Aboriginal items would be assessed in a more detailed site-specific assessment. Site-specific mitigation and management measures would be developed if considered necessary.

The statement of commitments would include procedures dealing with unexpected identification or impact on cultural (Aboriginal and historical heritage) items.

7.3 OTHER ENVIRONMENTAL ISSUES

Other environmental issues listed in Table 1 are considered to be of lesser consequence than the key issues, taking into account the scope of the project, the existing environment and the implementation of standard and best practice management and mitigation measures for pipeline projects.

Refinement of the proposed management and mitigation measures for these issues will occur during the preparation of the detailed environmental assessment. Any additional environmental safeguards required to minimise and mitigate impacts will be documented in the statement of commitments in accordance with section 75F(6) of the *EP&A Act* as part of the environmental assessment.

Table 1 Other environmental issues, potential impacts and mitigation measures

Issue	Potential impacts	Management and mitigation measures
Geology and soils	Potential risks from erosion and contamination during construction and operational phases are as follows: • Soils exposed during excavation and vegetation removal may result in erosion. • Watercourses within the project corridor may be impacted through an increase in sediment loads during rainfall events that would lower existing water quality. Other pollutants could potentially be introduced to waterways during construction, through chemical spills. • Acid sulphate and/or contaminated soils that potentially exist in the area may impact on the surrounding environment once exposed. • Expansive soils that exist in the area may create stability issues during construction. • Compaction of soils during construction could lead to decreased permeability.	• The measures to be implemented during construction of the project will be detailed in the statement of commitments. These will be transferred to the Construction Environmental Management Plan (CEMP) and implemented as appropriate. • A site specific erosion and sedimentation control plan(s) will be developed for construction. • The CEMP would include appropriate protocols for accidental spills to minimise damage should spills occur. • Areas of acid sulphate soils will be assessed though it is unlikely that acid sulphate soils occur in the area. • A detailed environmental site (contamination) assessment would be undertaken to improve understanding of potential sources of land contamination and potential impacts of the project (including compaction of soils) and aid the development of safeguards and mitigation measures.
Air quality	• Plant, equipment and vehicles utilised during construction and operation will increase localised traffic levels and are likely to generate greenhouse gas emissions and impact on local air quality. • Energy usage required for construction activities would result in the release of greenhouse gas emissions. • Dust emissions may be generated from earthmoving equipment activities, vegetation loss and wind erosion of stockpiled excavated material during construction.	• Existing local air quality would need to be determined, project emissions predicted (for construction and operation), and potential impacts assessed. Greenhouse gas emissions for the construction of the project will be in line with government guidelines (such as the NSW Greenhouse Plan 2005). • Standard soil and water mitigation measures for pipeline projects would be adopted. • All measures will be included in the statement of commitments and outlined in the CEMP and Operation Environmental Management Plan (OEMP).

Issue	Potential impacts	Management and mitigation measures
Biodiversity (terrestrial)	The project requires construction work in terrestrial and riparian environments. Impacts on terrestrial habitats due to construction include: • Removal of native vegetation (possibly in endangered ecological communities), habitat loss, habitat fragmentation and reduced habitat linkages for fauna. • Disturbance of habitat may encourage further migration of weeds (noxious and environmental) within corridor. • Impacts on fauna include entrapment, increased interactions between fauna and vehicles and disturbance to fauna life cycles and breeding cycles.	• The project will avoid, mitigate then offset any vegetation loss in order of preference. There is likely to be minimal removal of vegetation along the pipeline route due to incorporating assessment outcomes in the design • Sensitive areas (such as EECs, SEPP 14 wetlands, areas of Commonwealth significance, threatened flora/fauna habitat) will be clearly identified through field study, and avoided where possible. • Re-instatement of vegetation will occur where practicable. • Effective weed management will be implemented as outlined in the CEMP. • Measures associated with fauna will be included in the statement of commitments and outlined in CEMP and OEMP.
Traffic and access	The project requires the use of existing public and potentially private roads during construction and operation. Vehicles and plant associated with the project must share these roads with other vehicles and plant. The following impacts are likely: • There may be short-term lane and/or road closures during construction of the project. This combined with the set-up and operation of satellite site compounds will increase traffic in the local area and cause potential temporary congestion. • Changes to local and private property access may concern the community. • There may be potential disruption to travel patterns during construction. • There may be safety issues associated with temporary traffic arrangements. • Local roads may need to be upgraded to accommodate construction traffic and/or pipeline. This may cause additional disruption to road users, safety issues and increased traffic in adjacent areas.	• A traffic management plan would be developed and implemented (and outlined in the CEMP). • There will be further ongoing consultation with residents and road authorities regarding traffic and access alternatives and issues. • Where oversized vehicles are used, suitable controls and management will be put in place and heavy vehicle permits would be obtained as required. • Transport movements would be timed to minimise impacts in during certain hours as determined through consultation. • All measures will be included in the statement of commitments and outlined in CEMP and OEMP.

Issue	Potential impacts	Management and mitigation measures
Visual amenity, landscape and urban design	• The project will make visual changes upon the landscape during construction, which may impose on the existing visual amenity of the area. Visual amenity impacts upon the landscape in the operational phase are expected to be minimal. Likely impacts and factors affecting these are considered below: • The pipeline will be buried underground so visual amenity impacts will be minimal and temporary (apparent only during construction). • Visual amenity impacts in the operational phase of the project will depend upon the specific location and design of the discharge structure within the Googong Foreshores. • There will be temporary visual impacts due to construction activities (satellite sites, actual works).	• The visual amenity impacts of the discharge structure will be considered in the design phase. Issues relating to visual amenity will be considered during detailed design. There would be early authority and public consultation of the proposed design solution. • The stakeholder engagement and community consultation program would account for issues relating to the amenity of satellite sites. Responses would be incorporated in the database and considered in site design and location. • Architect and landscape architect skills would be integrated in the design team to provide input on the aesthetics of the above ground structures. • In assessing visual amenity impacts, consideration would be given to land use, heritage, recreational and precinct character, as well as pedestrian and cyclist use, and open space networks. • Urban and landscape vision and design objectives would be documented.
Resource use	• The project would generate a number of resource and waste streams and utilise a variety of materials during construction. • Resources and waste generated during construction would potentially include building materials, excess unsuitable spoil material, vegetation material, spent oils and liquids from maintenance of construction plant and equipment and general refuse and sewage.	• Resource use and management would be undertaken in accordance with the resource management hierarchy principles of the *Waste Avoidance and Resource Recovery Act 2001*.
Utilities and services	• The M2G may impact upon other major projects/infrastructure/land use in the area, due to construction and operation. • There may be delays and interruptions to road, rail and other services during construction works. • Not properly identifying services and utilities would impact upon these, eg powerlines and underground cables.	• Standard pipeline design and installation approaches will be included in the statement of commitments and hazards and risk management plan. Measures will be outlined in CEMP and OEMP.

Issue	Potential impacts	Management and mitigation measures
Hazards and risks	• Potential hazards and risks associated with construction of the project include hazards of working on and close to an urban arterial road under traffic, storage of hazardous materials and use of heavy machinery.	• Specific construction hazards will be addressed through best practice industry occupational health and safety measures including training, accreditation and adherence to WorkCover requirements. • Inspections, audits and site management planning for occupational health and safety would support these measures. • Measures will be included in the statement of commitments and hazards identification and risk assessment. Measures will be outlined in CEMP and OEMP.
Socio-economic issues	The project will impose socio-economic issues during construction and operation. These are considered below: • Construction of the pipeline would impact those living and working in close proximity to these activities. • Recreational users of the Googong Foreshores may be impacted by the project during construction. • The Googong Foreshores recreational area may experience increased tourism due to the reservoir containing increased water. This may impact on recreational facilities, access tracks and roads in the localised area. • The project will generate economic activity and employment as a result of project construction and operation. • Reduced recreational amenity and/or recreational areas may result from the project due to the location of permanent structures and changes in flows.	• A comprehensive community engagement and stakeholder management (CE&SM) program has commenced and would continue to determine a profile of the project corridor and the surrounding local area. • A review of socio-economic issues for the area would be undertaken to more fully assess the impacts of the project. • Stakeholder views and community responses would be considered in the assessment.

Issue	Potential impacts	Management and mitigation measures
Noise and vibration	The construction and operation of the pipeline will increase noise and vibration levels at sensitive receivers closest to the corridor. During operation (pumping and discharge of flows), these levels are likely to be minimal. Construction noise will result from actual works and traffic.	• A construction and operational noise and vibration assessment would be undertaken for the project. Occupants of noise sensitive properties would be consulted as part of this assessment. This would involve: – Identification of all noise sensitive receivers. – Noise monitoring for baseline noise levels. – Modelling and predictions of noise levels. • Activities would be organised so that noise and vibration impacts are minimised during construction and operation. • Construction activities that could potentially produce significant noise and vibration levels would be scheduled during practicable hours. • Measures will be included in the statement of commitments and outlined in CEMP and OEMP.

8 Proposed scope of environmental assessment

The proposed scope of the environmental assessment for the project is outlined in Table 2. This scope is based on the preliminary assessment of key issues discussed in section 7.2 of this document. Preliminary information obtained for the project indicates that environmental issues other than those considered key issues, can be managed through the detailed design stage and with the application of best practice measures and site-specific safeguards as described in Table 2.

Notwithstanding this, other environmental issues may be subject to further more detailed assessment in order to best inform route selection and to ensure avoidance of identified environmental constraints. For instance, detailed field surveys for biodiversity (terrestrial) will be conducted in conjunction with the aquatic ecological study. This will aid pipeline route selection allowing avoidance of ecological sensitive species and communities.

Table 2 Scope of the project environmental assessment

Issue	Scope of studies for the environmental assessment
General	• Consideration of planning and statutory requirements. • Strategic justification for the project. • Description of the project. • Discussion of project options. • Outline of construction activities. • Consideration of the principles of sustainability in the context of the project.
Community engagement and stakeholder management	• Description of engagement and consultation activities conducted to date, issues identified, and influences on project design and construction activities. • Outline of overall community engagement and stakeholder management strategy to be implemented during construction.
Environmental risk analysis	• Identification of potential environmental impacts associated with the project, proposed mitigation measures and potentially significant residual impacts after the application of proposed mitigation measures. • Should any additional key environmental impacts be identified, an appropriately detailed impact assessment would be included in the environmental assessment.
Burra Creek hydraulics and fluvial geomorphology	• Channel forming flows in Burra Creek will be determined to allow development of operating rules for modification or cessation of project transfer flows. • A monitoring system will be developed to verify the longer-term adequateness of the operating arrangements to mitigate impacts.

Issue	Scope of studies for the environmental assessment
Burra Creek water quality	• Determination of existing water quality in Murrumbidgee River and Burra Creek. • Identification of potential water quality impacts in Burra Creek, proposed mitigation measures and any potentially significant residual impacts after the identified mitigation measures are applied. • Development of ongoing water quality management measures including an ongoing water quality monitoring program implemented well before construction commences.
Burra Creek biodiversity (aquatic ecosystems)	• Detailed assessment of aquatic biodiversity across project corridor. • Identification of potential aquatic ecology constraints. • Development of future operational requirements for water transfer (if necessary) in relation to possible aquatic ecology impacts. • Development of site-specific management and mitigation measures to address impacts due to changes in flows and siting of near stream infrastructure.
Cultural (Aboriginal and historical) heritage	• Detailed cultural heritage impact assessment of the items within the path of the project. • Site-specific assessment of potential impacts on London Bridge natural arch and associated Aboriginal sites within the Burra Creek Valley. • Early consultation with the local Aboriginal Land Council, Aboriginal community organisations and local government authorities to determine preferred management outcomes for those items that would be affected by the project. • Identification of site-specific mitigation and management measures for affected heritage items (if necessary). • Inclusion of procedures dealing with unexpected affectation of Aboriginal objects in the statement of commitments. • Consideration of the heritage significance of the existing Burra Creek Valley and London Bridge natural arch in concept and final design of discharge and associated infrastructure.
Draft statement of commitments	• A draft list of construction and ongoing environmental management and mitigation measures to be applied to the project.

9 References

ActewAGL. 2004. Options for the Next ACT Water Source. Report prepared for ACTEW.

ACTEW. 2005. Future Water Options for the ACT Region – Implementation Plan.

ACTEW. 2007. Water Security for the ACT and Region – Recommendations to ACT Government.

Biosis Research. 2007a. Draft Overview of Ecological constraints for the Murrumbidgee River to Googong Dam Raw Water Transfer – Preliminary Design Project. Draft report prepared for ACTEW.

Biosis Research. 2007b. Aquatic Ecology Assessment of Burra Creek, NSW. Report prepared for ACTEW.

Biosis Research. 2008. Murrumbidgee to Googong pipeline: Interim Aquatic Advice. Draft report prepared for ACTEW.

Department of Planning. 2008. *Sydney–Canberra Corridor Regional Strategy 2007-31*. Department of Planning.

Falding, M., Kelly, A.H.H., Bateson, P. and Donovan, I. 2001. *Biodiversity Planning Guide for NSW Local Government.* Edition 1. Prepared by Land & Environment Planning and Environs Australia for the NSW National Parks and Wildlife Service, Sydney.

GHD. 2008. Murrumbidgee to Googong Water Transfer Project Preliminary Design Study – Preliminary Design Report. Report prepared for ACTEW.

Government of NSW, Government of Australian Capital Territory and Government of Australia. 2006. Cross Border Water Supply between the ACT and NSW.

Navin Officer. 2008. Murrumbidgee to Googong Raw Water Transfer Preliminary Design Project – Desktop Cultural Heritage Assessment of Shortlisted Options. Report prepared for ACTEW.

Starr, Barry. 2005. An evaluation of potential geomorphic and biophysical impacts on discharges to Burra Creek. Prepared for ACTEW.

TAMS (Territory and Municipal Services). 2007. Googong Foreshores Draft Plan of Management 2007. Published by TAMS.