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Murrumbidgee to Googong Water Transfer - Construction Environment Management Plan

BWA-M2G-EN-PLN-001-4

January 2012

Delivered by the Bulk Water Alliance

Abigroup Constructing Australia's Future | ACTEW CORPORATION | GHD | John Holland

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Certificate of approval for issue of documents

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Abbreviations

Abbreviation	
ACTEW	ACTEW Corporation Limited
ACTPLA	ACT Planning and Land Authority
AEMP	Aquatic Ecology Management Plan
AQMP	Air Quality Management Plan
BWA	Bulk Water Alliance
CEMP	Construction Environment Management Plan
CESM	Community Engagement and Stakeholder Management
DECCW	NSW Department of Environment, Climate Change and Water
DECCEW	ACT Department of Environment, Climate Change, Energy and Water

Abbreviation	
ECP	Environmental Control Plan
EMS	Environmental Management System
EIRMP	Emergency and Incident Response Management Plan
EPA	Environment Protection Authority
EPBC ACT 1999	*Environmental Protection and Biodiversity Conservation ACT 1999*
ESCP	Erosion and Sediment Control Plan
EWMS	Environmental Work Method Statement
HLPS	High Lift Pump Station
HMP	Heritage Management Plan
LALC	Local Aboriginal Land Council
LLPS	Low Lift Pump Station
M2G	Murrumbidgee to Googong
NVMP	Noise and Vibration Management Plan
PCL	Parks, Conservation and Lands
PER	Public Environment Report
POEO	NSW *Protection of the Environment Operations ACT 1997*
RAO's	Representative Aboriginal Organisations
SAD	Sensitive Area Diagram
SEP	Site Environmental Plan
SQE	Safety, Quality and Environment
SWMP	Soil and Water Management Plan
TEMP	Terrestrial Ecology Management Plan
WMP	Waste Management Plan

Environmental Commitments and Approval Conditions

Table 1.1 EIS / EA Commitments

No.	Commitment	Reference
EIS Commitment 1	The construction and operation Environmental Management Plans, rehabilitation plan and monitoring/adaptive management plan, will be prepared and implemented as described in chapter 27.	CEMP
EIS Commitment 3	The proponent will consult with the NSW Department of Water and Energy with regard to watercourse crossing methodologies and site-specific mitigation measures for watercourses that can then be incorporated into the CEMP.	Soil and Water Management Plan (SWMP)
EIS Commitment 9	A sediment and erosion control plan will be developed for the project as part of the CEMP. The plan will address the requirements associated with working in the riparian zone of the Murrumbidgee river and Burra Creek, as well as the requirements for the minor waterway crossings. The CEMP will include a provision for monitoring total dissolved solids, turbidity and pH (triggers will be based on the ANZECC 2000 guidelines or any seasonal site specific triggers developed for Burra Ck) during construction and will be included in the aquatic ecology management sub-plan.	SWMP, Aquatic Ecology Management Plan (AEMP)
EIS Commitment 15	An aquatic ecology management sub-plan will be prepared as part of the CEMP, outlining the procedures to manage and minimise the potential for impact to aquatic environments.	AEMP
EIS Commitment 18	The construction and scour widths will be reduced in areas that contain EECs and/.or threatened species habitat. The exact location and extent of reduced construction corridor widths will be determined in the CEMP.	Terrestrial Ecology Management Plan (TEMP)
EIS Commitment 38	The detailed design of the project and CEMP will aim to ensure that disruption to any farming businesses or recreational uses in the vicinity of the project is minimised.	Community Engagement and Stakeholder Management Plan (CESM Plan)
EIS Commitment 43	The CEMP will include measures to minimise the potential for impacts to land use during construction.	CESM Plan

Table 1.2 Conditions of Approval (NSW Department of Planning, DoP)

No.	Condition	Reference
Condition 5.1	Prior to the commencement of construction, the proponent shall develop and implement a **Compliance Tracking Program** for the project, to track compliance with the requirements of this approval during the construction and operation of the project and shall include, but not necessarily limited to:	Compliance Tracking Plan (BWA-M2G-EN-PLN-009-2)
Condition 5.1 a)	Provisions for periodic reporting of the compliance status to the Director-General including at least prior to the commencement of construction of the project, prior to the commencement of operation of the project and within two years of operational commencement	Section 8.4 of CEMP
Condition 5.1 b)	A program for independent environmental auditing in accordance with *AS/NZS ISO 19011:2003 – Guidelines for Quality and /or Environmental Management Systems Auditing.*	Section 8.3 and 8.4 of CEMP
Condition 5.1 c)	Procedures for rectifying any non-compliance identified during environmental auditing or review of compliance.	Section 8.5 of CEMP
Condition 5.1 d)	Mechanisms for recording environmental incidents and actions taken in response to those incidents	Section 8.5 of CEMP
Condition 5.1 e)	Provisions for reporting environmental incidents to the Director-General during construction and operation	Section 8.5 of CEMP
Condition 5.1 f)	Provisions for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.	Section 7 of CEMP
Condition 6.1	Prior to commencement of any construction or operational activities or as otherwise agreed by the Director-General, the proponent shall nominate for the approval of the Director-General, a suitably qualified and experienced Environmental Representative(s) independent of the design, construction and operation personnel. The proponent shall engage the Environmental Representative during any construction activities, and throughout the life of the project, or as otherwise agreed by the Director-General. The Environmental Representative shall: a) Oversee the implementation of all environmental management plans and monitoring programs required under this approval, and advise the Proponent upon the achievement of these plans/programs; b) Consider and advise the Proponent on its	Section 8.4.2 of CEMP

No.	Condition	Reference
	compliance obligations against all matters specified in the conditions of this approval and the Statement of commitments as referred to under condition 1.1 of this approval, permits and licences, and c) Have the authority and independence to recommend to the Proponent reasonable steps to be taken to avoid or minimise unintended or adverse environmental impacts, and, failing the effectiveness of such steps, to recommend to the proponent that relevant activities are to be ceased as soon as reasonably practical if there is a significant risk that an adverse impact on the environment will be likely to occur.	
Condition 6.2	The proponent shall prepare and implement a Construction Environmental Management Plan (CEMP) to outline environmental management practices and procedures to be followed during construction of the project. The plan shall be consistent with the Guideline for the Preparation of Environment Management Plans (DIPNR, 2004) and shall include, but not limited to:	CEMP
Condition 6.2 a	a description of all relevant activities to be undertaken on the site during construction including an indication of stages of construction, where relevant;	Section 1.1 of CEMP
Condition 6.2 b	details of the areas designated for the erection of public information signage;	Appendix E of CEMP
Condition 6.2 c	statutory and other obligations that the proponent is required to fulfil during construction including all relevant approvals, consultations and agreements required from authorities and other stakeholders and key legislation and policies;	Section 2 of CEMP
Condition 6.2 d	details of how the environmental performance of the construction works will be monitored and what actions will be taken to address identified adverse environmental impacts;	Section 8 of CEMP
Condition 6.2 e	a description of the roles and responsibilities for all relevant employees involved in the construction of the project;	Section 3 of CEMP
Condition 6.2 f	details of any construction camp sites and the management of these sites;	Appendix D, Works Boundary Plan
Condition 6.2 g	specific consideration of relevant measures to address any requirements identified in the documents referred to under conditions 1.1 b) and 1.1 c) of this approval;	Refer to Table 1.1, EIS / EA Commitments
Condition 6.2 h	the additional monitoring listed in this approval;	Morphological, Water Quality and Ecology monitoring – refer to Figure 1.2 of this CEMP
Condition 6.2 i	complaints handling procedures during construction;	Section 6 of CEMP, CESMP 10.2

No.	Condition	Reference
Condition 6.2 j	route alignment sheet to identify the final pipeline alignment including identification of areas where the easement area has been reduced to minimise impacts to threatened species as contained in condition 2.6	Appendix A of CEMP, Sensitive Area Diagrams

Table 1.3 DA Conditions (ACT)

No.	Condition	Reference within CEMP
A2	That prior to the commencement of works, the applicant / lessee will nominate an independent person, who will be approved by ACTPLA, to audit and ensure that all conditions of approval set out in the decision by ACTPLA, or any relevant decision under the EPBC Act are fully completed in accordance with the next condition of this decision.	Section 8.4.2 of CEMP
A3	Prior to the completion of work, the applicant/lessee must submit a report prepared and endorsed by the person identified under the previous condition of this decision to provide demonstrated evidence that: a) the requirements set out in any relevant decision made under the EPBC Act have been fully completed to the satisfaction of DEWHA. b) the mitigation measures committed to within the Final EIS accepted by the Minister for Planning on 12 May 2010 and detailed within this decision are completed to the satisfaction of ACTPLA and to any relevant government entity to which that requirement relates.	Compliance Tracking Plan (BWA-M2G-EN-PLN-009-2)
B6	A Construction Environment Management Plan (CEMP) must be endorsed by PCL TAMS and the Environment Protection Agency (EPA) prior to the commencement of works on site. The CEMP will include as a minimum, the following sub-plans and mitigation measures:	CEMP
B6 (a)	An *Integrated Risk Management sub-plan* that aligns to AS/NZS ISO 31000:2009 – Risk Management Principles and Guidelines. The applicant will submit a report to ACTPLA, prepared and endorsed by the auditor as defined in Condition A2 to ensure implementation of the *Integrated Risk Management sub-plan* during construction and operational phases;	BWA Risk Management Plan (BWA-PRW-CD-PLN-002)
B6 (b)	A *Soils and Water Management sub-plan* that details the mitigation and management of impacts on soils, erosion, sedimentation, water quality, and the hydrologic environments during construction and operation would be endorsed by EPA;	Soil and Water Management Plan (SWMP)
B6 (c)	A *Waste Management sub-plan* that includes disposal requirements, measures to prevent the generation of, and measures to reduce, reuse or recycle wastes be endorsed by TAMS;	Waste Management Plan (WMP)
B6 (d)	A *Noise and Vibration Management sub-plan* that includes	Noise and Vibration

No.	Condition	Reference within CEMP
	noise control measures and monitoring during construction and operation phase be endorsed by EPA; and	Management Plan (NVMP)
B6 (e)	An *Air and Dust Management sub-plan* to implement the mitigation measures to control dust from exposed areas, stockpiles, plant equipment and unsealed roads be endorsed by EPA.	Air Quality Management Plan (AQMP)
15	A Compliance Monitoring and Tracking Program be developed and implemented to track and audit the requirements and compliance of conditions of the approval. The program will be submitted to and approved by ACTPLA prior to the commencement of construction or operation as appropriate. This program will relate to both the construction and operational stages of the project and will include, but not necessarily limited to: a) provisions for periodic review of the compliance status of the development against the requirements and conditions of approval; b) provisions for periodic reporting of compliance status to ACTPLA, and c) mechanisms for rectifying any non-compliance identified during auditing or review of compliance.	Tracking of compliance during construction – Lotus Notes Project Pack. Compliance Tracking Plan (BWA-M2G-EN-PLN-009-2)

Table 1.4 ACT Environmental Authorisation 802 Conditions

Condition	Commitment	Reference
5.1	The Authorisation holder shall comply with the provisions of the following Australian Standards, Guidelines, Industry Codes of Practice and Policies provided such provisions are not in conflict with the conditions in this Authorisation, and the provisions of any policies made by the Authority. • AS 1940 - The Storage and Handling of Flammable and Combustible Liquids, Standards Association of Australia. • AS 2187.2-2006 Explosives – Storage and use – Use of explosives • AS 4282-1997 Control of the obtrusive effects of outdoor lighting • AS 2436–1981 Guide to noise control on construction, maintenance and demolition sites. • AS/NZS 5667.1-1998 Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples. • Environment Protection Guidelines for Construction and Land Development in the ACT, August 2007. • Environment Protection Policies prepared under the *Environment Protection Act 1997*. • ACT Code of Forest Practice, Version 1, August 2005.	Section 2.2.3 in the NVMP, Section 2. in the SWMP, Section 2.2 in the CEMP
11.1	The Authorisation holder shall authorise at least two senior employees or agents:	Table 3.2 of the CEMP

Condition	Commitment	Reference
	a) to speak on behalf of the Authorisation holder; and b) to provide any information or document required under this Authorisation.	
11.2	The Authorisation holder shall inform the Authority of the names and telephone numbers (including after hours numbers) of those persons within five (5) working days of this Authorisation coming into force. The details may be provided by facsimile to (02) 6207 6084 or email to Environment.Protection@act.gov.au.	Section 3.4 of the CEMP
11.3	The Authorisation holder shall inform the Authority of any change in the information provided under clause 11.2 within five (5) working days of the change. The details may be provided by facsimile to (02) 6207 6084 or email to Environment.Protection@act.gov.au.	Section 3.4 of the CEMP
11.4	Any person nominated by the Authorisation holder to meet the requirements of clause 11.2 shall be readily contactable on the person's nominated telephone numbers.	Section 3.4 of the CEMP
17.1	The Authorisation holder shall prepare and submit Environment Management Plans (EMPs) acceptable to the Authority prior to the commencement of each phase of the projects.	This document and sub plans
17.2	The EMPs should identify all activities that may have an adverse impact on the environment or the potential to cause environmental harm, and detail the mechanisms employed to prevent or minimise the impact of these activities.	Section 4 of the CEMP and sub plans
17.3	The EMPs, once accepted by the Authority are to be implemented. They will also form the basis for future authorisation conditions and environmental improvements.	Section 1.4 of the CEMP
17.4	Where a variation to the mechanisms employed to prevent or minimise the adverse environmental impacts of the activity or the way in which the activity is carried out as detailed in the endorsed EMPs is proposed, the Authorisation holder must seek endorsement from the Authority for the variation. A revised EMP acceptable to the Authority must be submitted within 3 months of the endorsement of the variation.	Section 9.2 of the CEMP
20.1	A weekly report, or other period agreed by the Authority, on compliance with all conditions of the Authorisation is to be provided to the Authority on the Monday of the following week. The report will include but is not limited to: (a) Air monitoring results; (b) Water monitoring results; (c) Noise monitoring results; (c) Blasting monitoring results; (d) Controlled discharges from sediment control ponds; and (e) Weekly field inspection results of all controls used in the management of pollutants to the environment.	Section 8.1 of the CEMP

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1 Introduction

1.1 Background

The Murrumbidgee to Googong (M2G) Water Transfer is one of the recommended options for delivering improved security to the water supply for the ACT and region. It involves pumping water from the Murrumbidgee River (within the ACT) and transferring it via a pipeline to Burra Creek (in NSW), from where it would flow for approximately 13km to the Googong Reservoir.

This Construction Environmental Management Plan (CEMP) for the M2G project provides a system and procedures to ensure that the Bulk Water Alliance (BWA) establishes and maintains best practice controls to manage potential environmental impacts during the construction of the Project.

The BWA is committed to providing the services it offers in a manner that conforms to the contractual requirements and to all relevant regulatory and legislative requirements. To achieve this, the BWA will plan, implement and control an Environmental Management System (EMS) that facilitates the management of the environmental aspects of the Project.

The BWA will ensure that the controls are properly implemented and are regularly monitored and audited to assess their effectiveness. Changes to the stipulated controls will be instigated if they are not achieving their objectives.

This CEMP is consistent with:

- AS/INZS SO 14001:2004;
- M2G Environmental Assessment (NSW);
- M2G Environmental Impact Statement (ACT);
- BWA Project Alliance Agreement (BWA PAA);
- DIPNR (now Department of Planning or DoP) Guideline for the Preparation of Environmental Management Plans (EMP), (2004); and
- Environmental Guidelines for Preparation of an Environmental Management Plan (ACT), (2009).

1.1.1 Description and Location of the Project

The project involves construction and operation of pumping and pipeline infrastructure with the capacity to transfer up to 100ML/day of water a distance of approximately 12km from the Murrumbidgee River at Angle Crossing, to the Googong Reservoir via 13km run-of-river flow in Burra Creek.

Water would be pumped from the Murrumbidgee River via an intake/low lift pump station and a high lift pump station, and transferred to Burra creek via a 1 metre diameter underground pipeline. The water would discharge into Burra Creek via an outlet structure. Following discharge, water would flow along Burra Creek to the Googong Reservoir, which forms part of the ACT's water supply. Associated with the pipe and pumping infrastructure would be a mini-hydro power facility to capture and reuse part of the energy required to transfer the water.

The proposed transfer of water would supplement natural inflows to the reservoir, which have decreased by about 85% from 2001 to 2008. Googong Reservoir supplies water that is treated to drinking quality standards to Queanbeyan and the ACT.

The intake/low lift pump station (LLPS) will be located on the east bank of the Murrumbidgee River, within the ACT, approximately 34km south of Canberra. It will be located in an area known as Angle Crossing, located on Angle Crossing Road, approximately 4km west of the Monaro Highway.

The high lift pump station (HLPS) will be located within the ACT, approximately 290 m to the east of the LLPS.

The pipeline will cross rural residential land in an east/northeast direction for approximately 12km. It is generally located in the vicinity of Angle crossing, Williamsdale and Burra Roads, within the districts of Williamsdale and Burra. The majority (approximately 9.2km) of the pipeline will be located in NSW, with approximately 2.8km located in the ACT. Table 1.7 summarises the key features of the M2G project with Figure 1.1 providing an overview of where the project lies in a regional setting.

Table 1.1 Key features of the project

Infrastructure	Description
Intake/low lift pump station	The intake/low lift pump station will comprise a concrete box structure built into the riverbank. The low lift pump station will include a screen, grit collection and removal, pumps and valves and filtration to prevent fish transfer.
High lift pump station	The pump station will pump water to a high point at Gibraltar Range, from where it will run under gravity to the discharge point. The high lift pump station will consist of a building enclosing a pump hall and electrical services and an amenities area.
Pipeline	The pipeline will transfer the water from the low lift pump station to the high lift pump station, then onto the outlet structure. It will be constructed of 1016 mm diameter steel pipe. The pipeline will be approximately 12 km long, with the pipe located approximately 1.8 m to 4 m below ground level. Air valves and scour valves will be located at regular intervals along the pipeline to provide pressure relief and to allow cleaning.
Outlet structure	The outlet structure will take the form of a weir box arrangement located on the bank of Burra Creek. It will comprise a rectangular concrete box approximately 12 m along the creek bank with a 250 mm grated opening along the west bank of Burra Creek. Water will flow into the weir box from the pipeline and will discharge over the weir and run down the creek bank to the creek, which flows to Googong Reservoir. This method of discharge is designed to minimise scouring of the creek bed near the outlet.
Electric power supply	The electrical infrastructure will comprise a 132 kV/11 kV substation in Williamsdale and a single 11 kV cable from the mini hydro to the high lift pump station.
Mini-hydro power generator	Electricity provided by the grid will be supplemented by electricity generated by a mini-hydro electric power facility which will be constructed as part of the project. The mini-hydro power generator will have the capacity to recover approximately 18% (without Tantangara flows) and 20% (with Tantangara flows) of the 1,138 kWh/ML of electricity required for pumping activities.

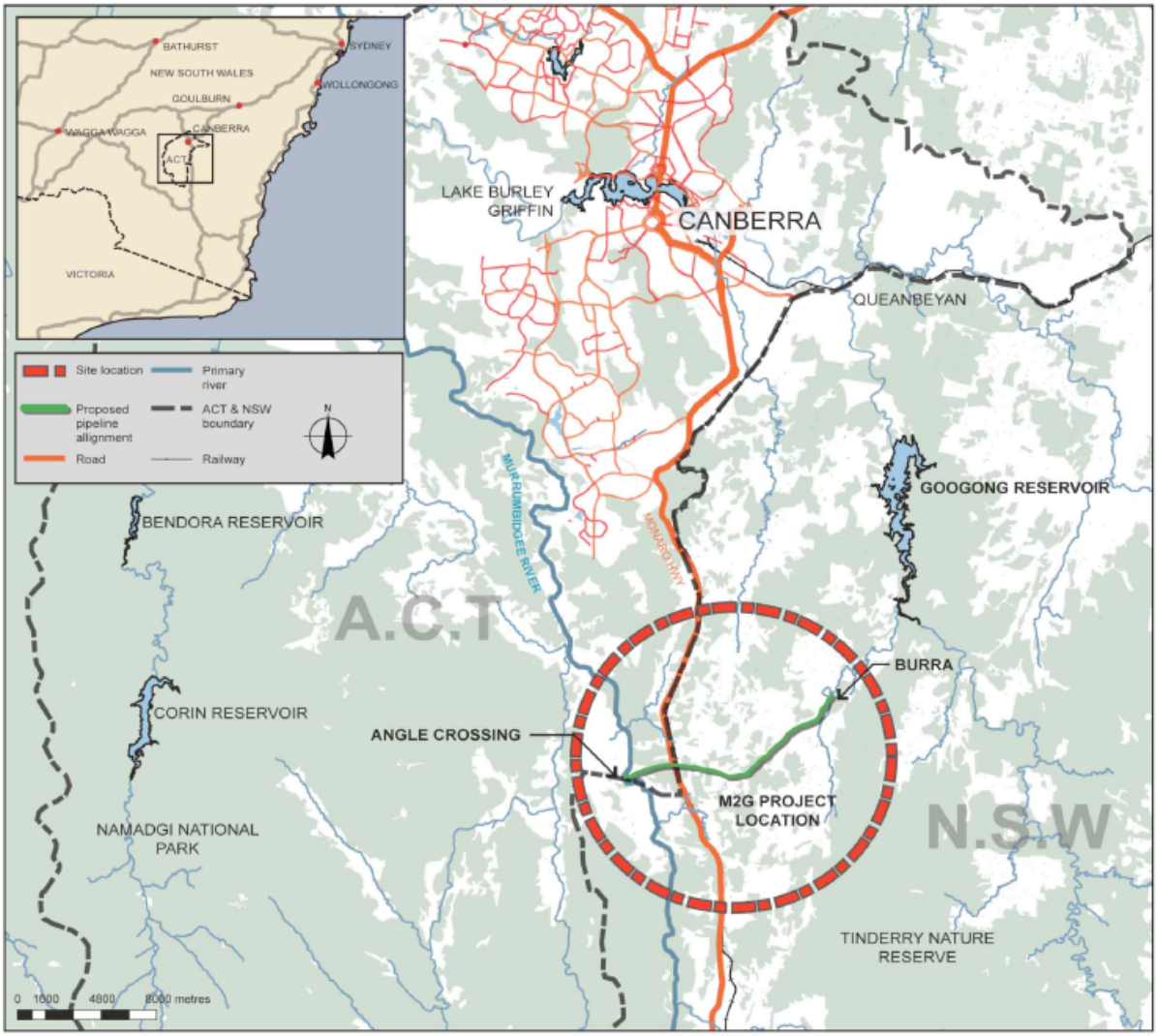


Figure 1.1 Regional setting of the M2G pipeline

1.2 Purpose of the CEMP

The primary purpose of the CEMP is to provide an easily interpreted reference document that ensures all the project's environmental commitments, safeguards and mitigation measures from the:

- BWA Environmental Management System (EMS);
- Environmental planning documents (ACT, NSW and Commonwealth);
- Development Approvals, and
- Project Alliance Agreement (PAA),

are collectively being implemented, monitored, audited/reviewed and improved during the course of construction activities.

In addition, the purpose of the CEMP is also to document the hazard/risk identification and management process for the construction techniques to be adopted by the BWA during the construction phase, and to document the systematic process of implementing controls to minimise the impacts of construction Activities on the environment.

The CEMP is designed to reflect and operate under the principles and objectives of the BWA's EMS.

The CEMP is designed to be "flexible" enough to facilitate construction activities and promote innovation whilst maintaining stringent requirements to protect the surrounding environment and to meet legislative, regulatory, licence and statutory approval requirements.

1.3 Objectives of the CEMP

The key performance objective set by the BWA is to ensure compliance with all environmental legislation and approvals in the ACT, NSW and the Commonwealth, minimise pollution by mitigating potential environmental impacts, and ensuring that environmental quality is not compromised during the construction of the project.

This CEMP is a critical component of the EMS which will be utilised by the construction team to identify and manage potential impacts associated with construction activities. The M2G CEMP is the overarching document for managing environmental risk on the M2G Project and falls within the BWA Environmental Management System (EMS). The relationship of the CEMP to subordinate plans and the Operational Environment Management Plan (OEMP) is shown in Figure 1.2.

In addition to the above objectives, the BWA has also adopted the following specific objectives and targets as outlined in Table 1.2.

Table 1.2 Objectives and Targets

No.	Objective	Target
1	To employ best management practices to ensure that the construction project meets all environmental legislative requirements and compliance with all planning approvals, licence conditions and regulatory requirements.	(a) No breaches of environmental legislation or regulatory requirements (b) No significant environmental incidents (Refer Appendix F Procedure for Dealing with Environmental Incidents)
2	To ensure that construction activities are conducted in a manner that minimises adverse environmental impacts.	(a) Zero pollution events (b) Zero impact to water quality and human health
3	To employ best management practice to minimise noise and vibration impacts.	(a) No noise and vibration complaints associated with construction activities. (b) Zero structural damage claims associated with vibration impacts as a result of construction activities. (c) Maintain noise levels in compliance with Schedule 2 Part 2.2 of the *Environmental Protection Regulation 2005* (ACT) (d) Maintain noise levels in compliance with NSW Criteria limits as specified in the Environmental Protection Licence (NSW) (e) Noise levels will be maintained in accordance with Environmental Authorisation 802 (issued by ACT Environmental Protection Authority).
4	Apply best management practices to soil and water quality management on site to prevent sediment discharge offsite and potential impacts on water quality.	(a) Zero disruptions to ACT & NSW water supply due to inadequate water quality as a result of construction impacts. (b) Zero pollution events which result in unauthorised discharge of sediment laden water into the receiving

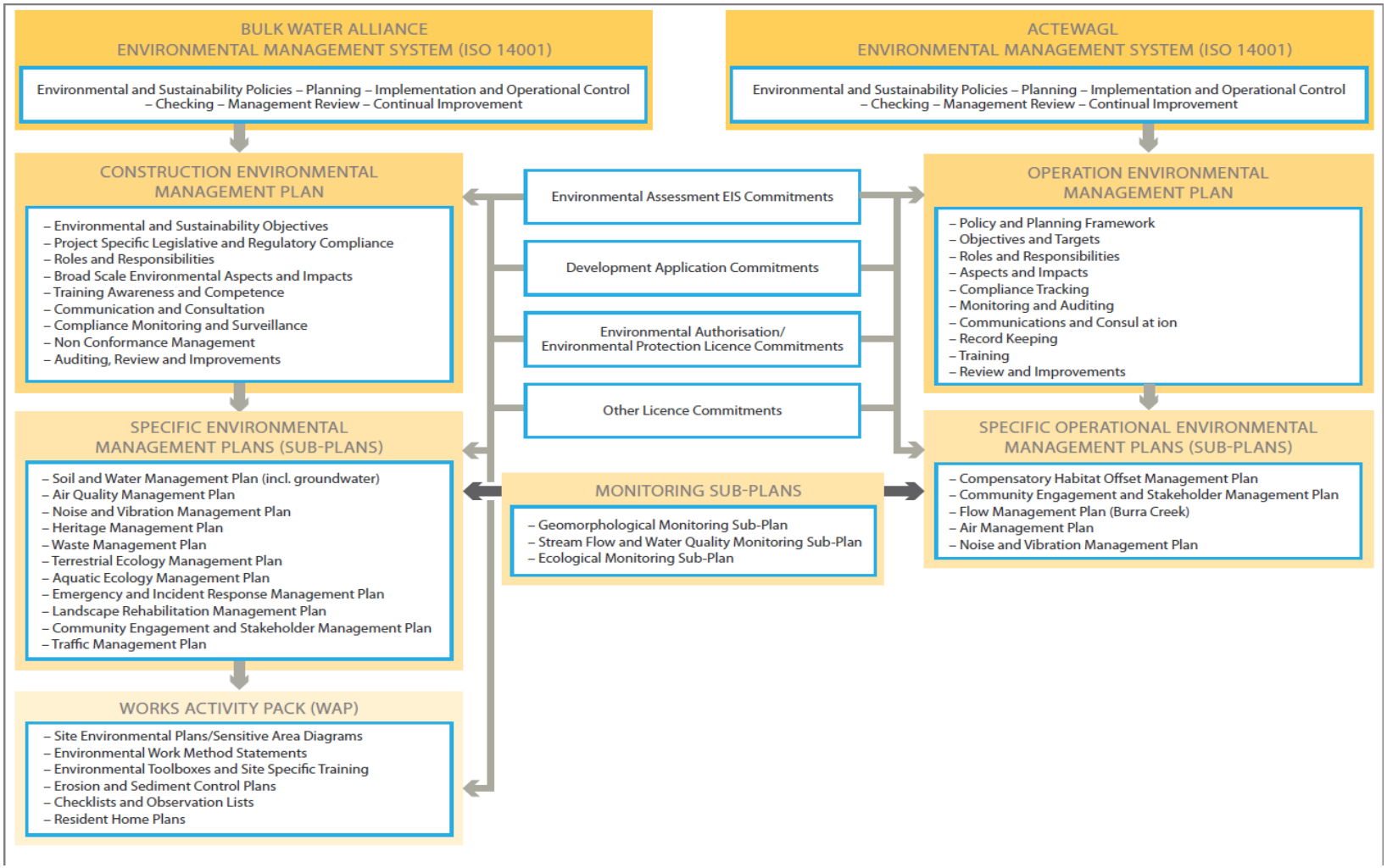
No.	Objective	Target
		environment.
5	To minimise air pollution from construction activities.	(c) Zero dust complaints or complaints associated with construction emissions. (d) Monitoring stations to be below a monthly average of 4mg/m^2
6	To minimise impacts to the environment caused by the management of contaminated soil.	(a) Zero contaminated soil as a result of construction activities. (b) If construction activities result in any contaminated land then there will be 100% remediation of any contaminated soils in consultation with the relevant State or Territories Environment Protection Authority.
7	To protect vegetation and fauna within and adjacent to construction activities.	(a) No disturbance or damage to vegetation communities outside the construction corridor. (b) Maximise the conservation of significant vegetation within the construction corridor which is not felled to facilitate construction activities. (c) No impact on native fauna, threatened or protected flora and fauna species outside the construction corridor. (d) Successful rehabilitation of areas affected by construction (Refer Landscape Rehabilitation Management Plan) (e) Minimal spread of declared weeds or exotic species (Refer Weed Management Plan) (f) Zero impact on livestock
8	To avoid pollution of the environment and impacts on water quality caused by spills or leaks on site.	(a) No spills reaching waterways. (b) NSW POEO 1997 Section 120 No Pollution to Waters (c) Zero impacts on ACT's potable water supply.
9	To minimise waste resulting from project activities.	(a) To promote and facilitate proactive waste management and recycling on site
10	To avoid adverse impacts on heritage items and to appropriately manage sites with cultural and heritage value.	(a) No adverse impacts on sites of cultural and heritage value (b) No adverse impacts on heritage items
11	Undertake operations in a manner which promotes the principles of sustainability.	(a) Remain consistent with ACTEW policy for greenhouse gas emissions (b) To actively promote sustainability during construction phases
12	Community Engagement and Stakeholder Management	(a) Zero complaints from community members or landholders relating to construction activities (b) Keep community members and landholders informed of construction activities affecting them. (Refer KPI's, Community Engagement Management Plan)

Additional objectives and performance goals are included in each of the specific environmental management plans (sub-plans) listed in Figure 1.2.

1.4 Environmental Management Structure

Figure 1.3 below outlines the structure that underpins the M2G CEMP Framework and this plan's relationship to subordinate plans (sub-plans) and the Operational Environment Management Plan (OEMP).

Figure 1.2 Environmental Management System Documentation Hierarchy



1.5 BWA Environmental Policy

Bulk Water Alliance

Environmental Policy

The Bulk Water Alliance is committed to undertaking its business in a manner that recognises the importance of environmental protection and sustainability. It attempts to "minimise adverse impact on the environment" in all its operations by:

- Complying with all applicable laws, regulations and statutory requirements relating to environmental aspects;
- Managing environmental and related aspects and impacts in accordance with Bulk Water Alliance requirements, policies and procedures;
- Applying waste minimisation principles and taking all practicable steps to prevent pollution and other adverse environmental impacts;
- Establishing, monitoring and auditing environmental management systems and programs that are consistent with certification requirements of AS/NZS ISO 14001;
- Educating and training our employees to continually improve awareness, skills and knowledge of environmental management;
- Compiling meaningful and accurate environmental performance statistics and distributing such information as appropriate;
- Establishing and reviewing performance measures and taking necessary action to improve performance
- Monitoring and evaluating the environmental performance of subcontractors and suppliers and implementing effective communication with them on matters of environmental concern;
- Reporting to the Alliance Leadership Group on environmental performance, including infringements and regulatory non-compliance; and
- Supporting ecologically sustainable development initiatives that are consistent with current technical knowledge.
- Prevent, or otherwise minimise, mitigate and remediate harmful effects on the Environment
- Monitor, reduce and / or offset Greenhouse Gas emissions.

Ian Carmody Lachlan Marks Gavin Morrison

6th May 2010 – Rev 3

1.6 BWA Sustainability Policy

Bulk Water Alliance

Sustainability Policy

The Bulk Water Alliance is committed to undertaking its business in a manner that recognises the importance of sustainability.

We recognise that ***sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs***, and we will implement this policy within the Bulk Water Alliance by:

- Complying with all applicable laws, regulations and statutory requirements relating to sustainability issues
- Adhering to the Bulk Water Alliance Charter Mission & Performance Objectives;
- Managing sustainability and related issues in accordance with Bulk Water Alliance requirements, policies and procedures;
- Applying best practice principles to options assessments and decision making processes;
- Establishing, monitoring and auditing a sustainability program that is consistent with the Australian Green Infrastructure Council's sustainability assessment categories;
- Educating and training our employees to continually improve awareness, skills and knowledge of sustainability issues and practices;
- Compiling meaningful and accurate sustainability performance statistics and distributing such information as appropriate;
- Establishing and reviewing sustainability performance measures and taking necessary action to improve performance;
- Monitoring and evaluating the sustainability performance of subcontractors and suppliers and implementing effective communication with them on sustainability issues;
- Supporting sustainability initiatives that are consistent, particularly through innovation, with current technical knowledge;
- Supporting feasible Greenhouse Gas Reduction opportunities identified through the design and construction processes;
- Measuring and reporting Greenhouse Gas emissions throughout the construction period; and
- Reporting to the Alliance Leadership Group on triple-bottom line performance, including production of an annual sustainability report for the Alliance.

Ian Carmody Lachlan Marks Gavin Morrison

6th May 2010 – Rev 3

securing **water** for life

1.7 Sustainability

The BWA is committed to undertaking its business in a manner that recognises the importance of sustainability. We recognise that *sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs*.

Our sustainability aspirations are:

- demonstrate outstanding performance against international and national sustainability indicators;
- contribute to addressing climate change issues faced by the wider Australian community;
- amongst industry stakeholders, foster a culture of awareness and continuous learning about integration of economic, social and environmental considerations throughout the whole project cycle; and
- to leave a legacy for future generations who can enjoy a secure and safe water supply, rich cultural heritage, and a diverse natural environment.

In addition, as ACTEW has voluntarily committed to offsetting all emissions, each project must monitor the use of resources which emit greenhouse gases during construction. Where possible, project teams should leverage from the BWA Sustainability Program to transform identified environmental risks into sustainability opportunities.

To facilitate the benchmarking of BWA sustainability performance, the following guiding questions have been developed.

Table 1.3 AGIC Category and Guiding Questions

AGIC Category	Guiding Question
Project Management & Governance	How can we demonstrate sustainability is everyday practice and that sustainability principles are embedded into all processes throughout all phases of a project?
Economic Performance	How can we demonstrate effective use of economic and financial resources with regards to the long-term economic sustainability of the project?
Using Resources	How can we demonstrate reduction in resource use, especially non-renewable resources, and demonstrate efforts to use renewable energy sources?
Emissions, Pollution & Waste	How can we demonstrate efforts in reducing GHG emissions, pollution and waste as much as possible?
Biodiversity	How can we demonstrate improvements in biodiversity and conservation of ecological systems?
People & Place	How can we demonstrate the enhancement of the health, quality and wellbeing of the local and broader community through the delivery of the projects, and leave a positive legacy for current and future generations?
Workforce	How can we demonstrate that we promote the safety, health and personal development of the workforce, and that we seek to enhance workforce wellbeing through skill and capability development?

2 Legislative and Regulatory Compliance

2.1 Relevant Legislation

Key environmental legislation relating to environmental management for the M2G project includes:

2.1.1 Commonwealth Legislation

- Environmental Protection and Biodiversity Conservation Act 1999;
- Australian Capital Territory (Planning and Land Management) Act 1988;
- Water Act 2007; and
- Canberra Water Supply (Googong Dam) Act 1974.

2.1.2 NSW Legislation

- NSW Catchment Management Authorities Act 2003;
- Googong Dam Catchment Area Act 1975;
- Protection of the Environment Operations Act 1997;
- Environment Planning and Assessment Act, 1979;
- Noxious Weeds Act, 1993;
- Rural Lands Protection Act 1998;

2.1.3 ACT Legislation

- Planning and Development ACT 2007;
- Building ACT 2004;
- Heritage ACT 2004;
- Environmental Protection ACT 1997;
- Nature Conservation ACT 1980;
- Water Resources ACT 2007;
- Utilities ACT 2000;
- Fisheries ACT 2000;
- Water and Sewerage ACT 2008, and
- Native Title ACT 1994.

Refer to the Environmental Assessment / Environmental Impact Statement (EIS) for brief summary of each piece of legislation and how they apply to the M2G project.

2.2 Guidelines and Standards

The key reference material relevant to environmental management during the design and construction of the M2G project include:

2.2.1 National

Australian Pipeline Industry Association Ltd., March, 2009, *Code of Environmental Practice, Onshore Pipelines*, APIA

2.2.2 NSW

- Managing Urban Stormwater: Soils and Construction – Volume 1, 4th Edition (Landcom), March 2004
- Managing Urban Stormwater: Soils and Construction, Volume 2C, Unsealed Road Construction (DECC, 2008);
- Greening Australia's Victoria revegetation techniques, 2003
- Florabank Native Seed Collection Code of Practice, Greening Australia NSW, 1999
- NSW Fisheries, 1999. Policy and Guidelines for Bridges, Roads, Causeways, Culverts and Similar Structures;
- Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings – NSW Fisheries - January 2003;
- Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings - November 2003; and
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ 2000).
- DECCW (2009), Interim Construction Noise Guidelines
- NHMRC 2008 Guideline for Managing Risks in Recreational Waters

2.2.3 A.C.T

- Environmental Protection Guidelines for Construction and Land Development in the ACT, Environment Protection Authority, ACT (August 2007)
- ACT Code of Forest Practice, Environment Protection Authority (August 2005)
- Air Environment Protection Policy, Environment Protection Authority (November 1999)
- Noise Environmental Protection Policy, Environment Protection Authority (May 2008)
- Water Quality Environmental Protection Policy, Environment Protection Authority (April 2008)
- General Environmental Protection Policy, Environment Protection Authority (August 2007)
- Guidelines for Preparation of an Environmental Management Plan, Environment Protection Authority (September 2004).

2.3 Approvals, Licences and Permits

Tables 2.1, 2.2 and 2.3 identify the major approvals, permits and licences relevant to the M2G Project that may be required to be obtained for each jurisdiction.

Table 2.1 Approval Requirements for the Commonwealth

Approval Required	Relevant Legislation	Authority
Controlled Action **Matter of National Environmental Significance (Aquatic and Terrestrial fauna and flora)**	*Environmental Protection and Biodiversity Conservation Act 1999*	Department of Sustainability, Environment, Water, Population and Communities (SEWPaC)
Pipeline crossing a designated area (Monaro Highway)	*Australian Capital Territory (Planning and Land Management) Act 1988*	National Capital Authority

Table 2.2 Approval Requirements for NSW

Approval Required	Relevant Legislation	Authority
Part 3A 'Critical Infrastructure'	*Environment Planning and Assessment Act, 1979*	NSW Minister for Planning (DoP)
Environment Protection Licence	*Protection of Environment Operations Act. 1997*	Environment Protection Authority (NSW EPA)
Pipelines Licence	*Pipelines Act. 1967*	Office of Water (NSW)

Table 2.3 Approval Requirements for the ACT

Approval required	Relevant Legislation	Authority
EIS and Development Application	*Planning and Development Act2007*	ACTPLA
Environment Authorisation	*Environmental Protection Act 1997*	ACT EPA (Environment Protection Authority)
Environment Protection Agreement	*Environmental Protection Act 1997*	ACT EPA (Environment Protection Authority)
Water Extraction Exemption Licence	*Water Resources Act 2007*	ACT EPA (Water Resources Unit)
Waterway Works Licence	*Water Resources Act 2007*	ACT EPA (Water Resources Unit)
Clearing Native Vegetation (Licence to Take)	*Nature Conservation Act 1980*	TAMS (Parks, Conservation Service)
Scientific Licence (Fish and fauna relocation)	*Nature Conservation ACT 1980*	TAMS (Parks, Conservation Service)
Heritage Approval – Conservation Management Plan	*Heritage Act 2004*	ACT Heritage Council

Other licences, permits and approvals required for construction are provided in the M2G Compliance Tracking Plan (BWA-M2G-EN-PLN-009-2) and in each of the specific environmental sub-plans listed in Figure 1.2.

2.4 Construction Hours

The NSW construction hours are;

a) 7.00 am to 6.00 pm Mondays to Fridays, inclusive;

b) 8.00 am to 1.00 pm Saturdays; and

c) At no time on Sundays or public holidays

The ACT construction hours are;

- General working hours will occur between 7.00 AM to 6.00 PM on Monday to Saturday.
- No works generating significant noise levels will be permitted on Sundays or public holidays.

Should work be required to be undertaken outside of these approved hours, then negotiations will be entered into with the respective agency representatives in approving and complying with the out of hours work requirements.

2.4.1 Blasting Hours

In NSW, Blasting activities will only occur between;

a) 9.00 AM and 5.00 PM Monday to Friday and

b) 9.00 AM and 1.00 PM Saturday.

In the ACT, Blasting activities will only occur between;

a) 8.00 AM and 5.00 PM Monday to Friday, excluding Public Holidays.

2.4.2 NSW Conditions of Approval

Construction works would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday, 8.00 am to 1.00 pm Saturday and at no time on Sundays or public holidays). Blasting is allowed only during the hours of 9am to 5pm Monday to Friday, 8 am to 1pm Saturday and at no time on Sundays or public holidays. These hours for construction and blasting do not apply in the event of a direction from police or other relevant authority for safety reasons, to prevent environmental harm or risk to life.

The hours of construction activities may be varied with the prior written approval of the Director General, NSW Department of Planning (DoP).

Any request to alter the hours of construction shall be:

- considered on a case by case basis;

- accompanied by details of the nature and need for activities to be conducted during the varied construction hours and any other information necessary to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the site;
- affected residential receivers being informed of the timing and duration of work approved under this condition at least 48 hours before that work commences.

Discussions with the NSW DoP will be entered into at the earliest possible convenience to ensure that the process and approval required for extending or varying the hours of construction is in accordance with their and the community's expectations.

2.4.3 ACT Conditions of Approval / Environmental Authorisation

As stipulated above, construction hours for the M2G project will follow NSW Department of Planning's conditions of approval referred to in Section 2.4.1 above. Should the M2G project wish to work outside of these approved hours, they would need to comply with the noise levels stipulated in Environmental Authorisation 802. Environmental Authorisation 802 allows for construction work to occur on Sundays or Public Holidays so long as noise levels are complied with at the sensitive receivers. It is not envisaged that work would take place on these days, but should the project need to work on these days, compliance with noise levels will be adhered to.

With respect to hours for blasting, it is noted that the NSW condition allows for blasting to occur from Monday to Friday inclusive and 9.00am to 5.00pm Saturdays whereas the ACT Environmental Authorisation 802 only allows for blasting to occur between Monday to Friday inclusive. It is likely that no blasting will occur on a Saturday, Sunday or Public Holiday. However, should blasting need to occur in the ACT on a Saturday the M2G project will seek authorisation from the ACT EPA prior to undertaking this blasting work.

3 Structure and Responsibilities

3.1 Bulk Water Alliance Structure

The Bulk Water Alliance is comprised of the owner (ACTEW Corporation and ActewAGL) and non-owner participants: John Holland Group and Abigroup (Constructor) and GHD (Designer). Management of the Bulk Water Alliance is achieved through the Alliance Program Management Team (APMT) who, through the Alliance Program Director, reports to the Alliance Leadership Group (ALG).

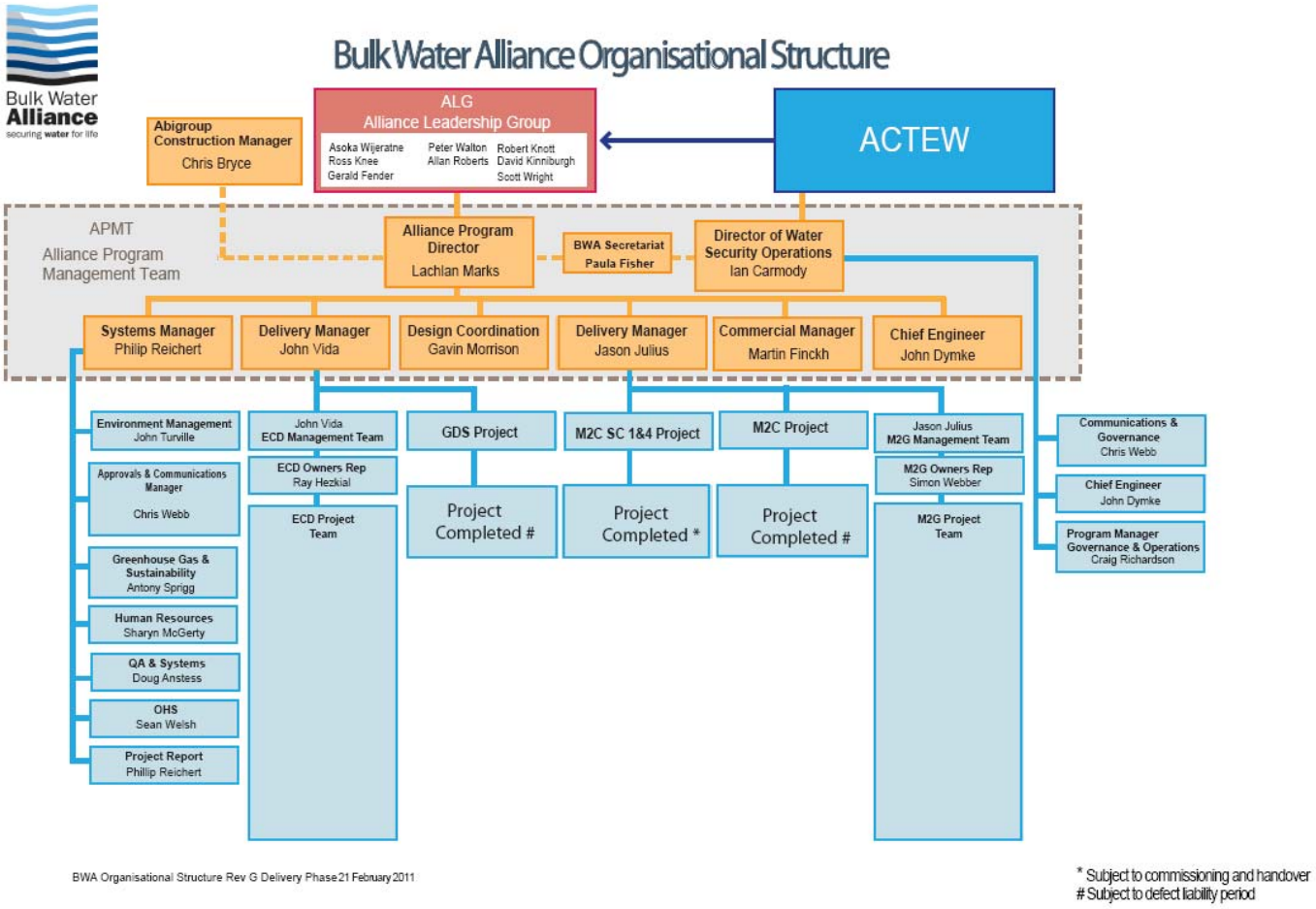
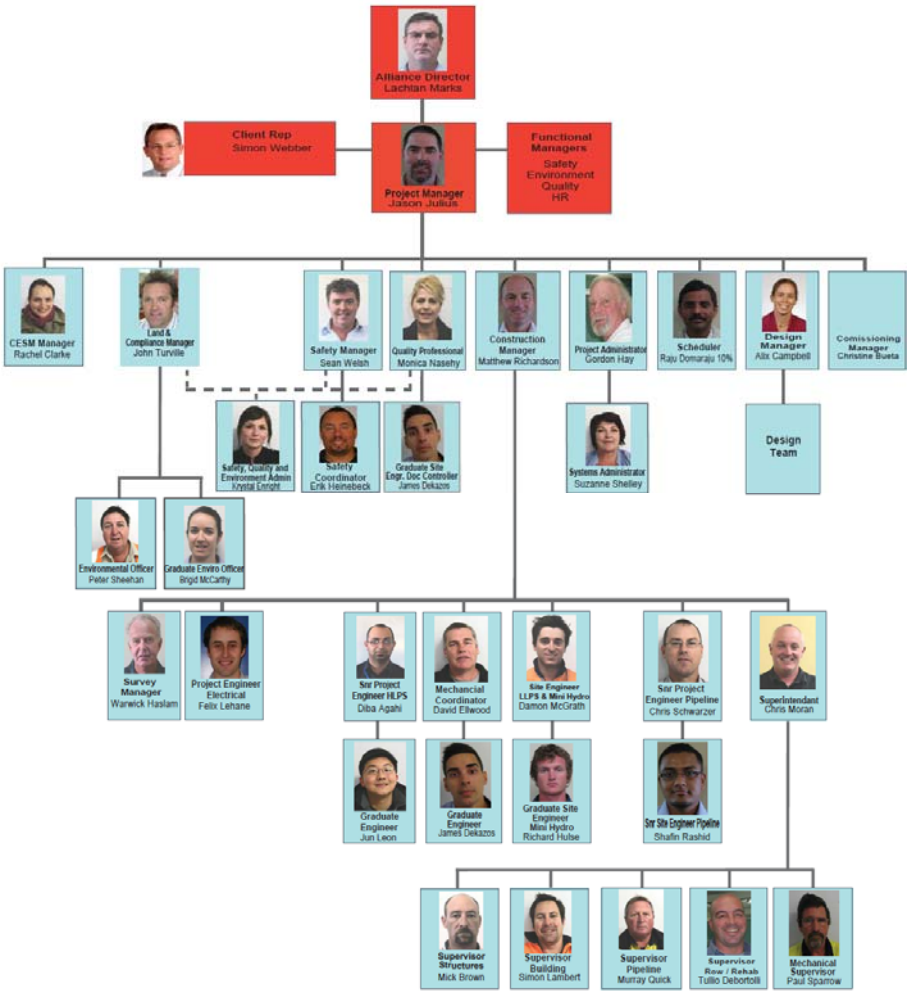


Figure 3.1 Bulk Water Alliance Organisational Structure

3.2 M2G Site Structure

The M2G management hierarchy is detailed in Figure 3.2 below.

Figure 3.2 Murrumbidgee to Googong (M2G) Organisational Structure



3.3 Roles and Responsibilities

The responsibility and authority pertaining to environmental performance of the M2G personnel, environmental specialists and subcontractors are detailed below.

3.3.1 M2G Project Manager

The M2G Project Manager has the role of ensuring that the project is delivered on time, within budget and is consistent with the aims and objectives of the BWA. This role is accountable for all aspects of the project including safety, meeting licence conditions and other conditions of approval, environment and heritage, quality, budget and overall delivery of the project.

3.3.2 M2G Owner's Project Manager (Client Representative)

The client representative works closely with the M2G Project Manager to ensure that the project is delivered on time, within budget and all aspects of the project including safety, environment, heritage, quality and cost are being delivered in accordance with client's expectations.

3.3.3 M2G Construction Manager

The M2G Construction Manager is responsible for delivery of the construction phase of the project to ensure that impacts are minimised and obligations are met. The M2G Land and Compliance Manager will be working in conjunction with the M2G Construction Manager to ensure that the BWA's prescribed environmental outcomes are achieved.

3.3.4 M2G Land and Compliance Manager

The M2G Land and Compliance Manager has overall responsibility for managing the environmental aspects of the M2G project and delivering the project in accordance with the approved environmental management plans and to relevant environmental legislation and to licence / approval conditions. This position reports to the M2G Project Manager.

3.3.5 M2G Environmental Officer

The M2G Environmental Officer has on-site responsibility for managing all aspects of environmental management and compliance for the construction phase of the project, as delegated by the M2G Land and Compliance Manager. This position reports directly to the M2G Land and Compliance Manager.

The key responsibilities of the M2G Land and Compliance Manager and M2G Environmental Officer will be to:

- liaise with designers and construction manager with regard to construction program and activities on site to plan environmental controls for risk mitigation;
- review the CEMP and sub-plans prior to the start of construction;
- maintain, assess and monitor the CEMP;
- ensure that all project environmental obligations are met;
- ensure no work requiring a licence or permit is undertaken without such documentation;
- complete environmental checklists as and when required;

- Provide input and advice to engineers on environmental work method statements (EWMS);
- identify and prepare environmental induction and training materials;
- liaise with government agencies and relevant stakeholders;
- provide a regular construction program identifying critical construction activities;
- manage the environmental budget;
- respond to environmental incidents;
- manage environmental sub-consultants;
- oversee the maintenance of environmental documents;
- prepare reports on compliance; and
- monitor revegetation activities within the project boundary.

3.3.6 M2G Community Engagement and Stakeholder Manager (CESM Manager)

The CESM Manager is responsible for implementation of the M2G CESM Plan and, in so doing, ensuring the community and stakeholders are informed of progress of the delivery of the M2G project and manage their expectations. The roles and responsibilities of the CESM Manager are detailed further in the CESM Plan.

3.3.7 Engineers

Project and Site Engineers are responsible for ensuring that environmental considerations are integral to the decision making for all construction Activities. Engineers will liaise closely with the M2G Land and Compliance Manager and/or Environmental Officer to ensure that the environmental controls and procedures contained in the CEMP are implemented. Engineers will conduct regular checks of the site to ensure environmental controls such as sediment fences and dust suppression are functioning effectively.

Roles and responsibilities for both the Project and Site Engineers, in respect to environmental matters, will differ depending on the activity being undertaken. Specific details on particular environmental responsibilities are included in each of the sub-plans.

Where applicable, the engineers will be responsible for ensuring that any work performed by external parties meets with the requirements of this CEMP and associated sub-plans, including identifying and documenting the environmental risks of the proposed works.

3.3.8 Superintendent and Supervisors

Superintendents and Supervisors report to the Construction Manager and will have a direct role in the compliance and implementation of environmental procedures and controls on site. They will also be responsible for checking the site on a regular basis and ensuring that regular maintenance is undertaken to minimise environmental impacts and that personnel are provided with appropriate environmental training, prepared by the Environmental Team.

Where applicable the Superintendents/Supervisors will be responsible for ensuring that any work performed by external parties meets with the requirements of this CEMP and sub-plans, including identifying and documenting the environmental risks of the proposed works.

3.3.9 Consultants

Consultants will be commissioned by the BWA (as required) to provide specialist input and advice on environmental matters, undertake surveys and inspections, implement monitoring programs or prepare environmental reports. These specialists will include the following:

Table 3.1 Environmental Consultants

Specialisation
Environmental Representative
Acoustic Consultant
Ecologist – Terrestrial
Ecologist – Aquatic
Native Seed Collection Contractor
Heritage
Soil Conservationist
Contaminated Soils and Groundwater
Geotechnical
Landscape Architecture Consultants

3.3.10 Subcontractors

The BWA recognises that it is often subcontractors that present the greatest environmental risks to a project due to:

- Their detachment from the main construction delivery teams, and therefore the potential for poor communication regarding environmental risks;
- The large number of subcontractors on site; and
- Subcontractors operating under a different management system from the BWA.

The BWA acknowledges its responsibility to ensure that all persons on the project including subcontractors and their employees comply with the relevant environmental requirements. As a minimum, subcontractors and their employees will be required to comply in full with the CEMP and sub-plans. All subcontractor personnel are considered equivalent to BWA personnel in all aspects of environmental management and control, and their responsibilities in this respect mirrors those of BWA personnel.

Environmental requirements will be included in the selection and management of subcontractors working on site. This will include appropriate references to site specific environmental management requirements within subcontract documentation.

Subcontractors working on the project will be required to:

- Undertake the on site induction and, where required, participate in relevant environmental training and toolbox sessions;
- Observe subcontract and statutory requirements relating to environmental protection and other environmental legislation and to follow instructions issued by the BWA management and supervisory personnel;

- Nominate site representatives to liaise with M2G site representatives with respect to environmental requirements associated with their activity. This representative must have the authority to administer and implement any outcomes/management strategies identified during such consultations;
- Adhere to the BWA management system as it applies to their operations on site;
- Co-operate fully with site emergency incident procedures and consultative arrangements;
- Be familiar with, and adhere to, procedures incorporated in the CEMP and associated sub-plans with regards to environmental management and legislative compliance; and
- Display a drive towards the implementation of "Best Management Practices" and the principles of sustainability during day-to-day operations.

The work of subcontractors will be monitored through the site inspection process detailed in Section 8 of this CEMP. Observations will be made by relevant personnel (listed above) to assess the effectiveness of the environmental protection measures being used by the subcontractors and to determine compliance with the requirements of the CEMP and associated sub-plans. Any non-conformances or improvements identified during these inspections will be documented on an Environmental Maintenance, Observation and Action List (Section 8.2.3) for minor non-conformances/improvements or an Environmental Improvement Notice (EIN) for significant non-conformances (Section 8.1).

3.4 Regulatory Authority Liaison Representatives

The authorised personnel responsible for liaising with the various Regulatory Authorities (i.e. ACT & NSW EPA) representatives include:

Table 3.2 Authorised Personnel to liaise with NSW and ACT Environment Protection Authorities

Name	Position	Contact Details
Jason Julius	M2G Project Manager	0404 812 008
Simon Webber	M2G Owner's Project Manager	0414 011 694
Matthew Richardson	M2G Construction Manager	0402 898 623
John Turville	M2G Land and Compliance Manager	0416 125 418

The ACT EPA will be informed of any changes to the information in table 3.2 within five (5) working days of the change in accordance with Condition 11.3 of EA 802.

4 Environmental Aspects and Impacts

4.1 Environmental Aspects, Impacts and Risks

Environmental aspects as referred to in this document are those Activities associated with the project that have the potential to cause, or result in, adverse environmental impacts. Due to the complexity of the M2G project, it is conceivable that various aspects of the project would carry a varying degree of environmental risk which needs to be managed accordingly.

Effective environmental management should be proactive rather than reactive. In order to facilitate a proactive style of environmental management, a risk management style of assessment has been utilised to identify and assess environmental aspects associated with the project, and to implement appropriate mitigation strategies to minimise the likelihood of environmental risks associated with each aspect. This process involves:

1. Identifying the risk/aspect
2. Analysing the risk/aspect (determining likelihood and consequence)
3. Evaluating the risk/aspect
4. Treating the risk

All identified aspects are assessed based on the risk assessment matrix displayed in Table 4.1. Risk assessment is based on (1) the likelihood of an impact occurring as a result of the aspect; and (2) the consequences of the impact if the event occurred. The definition of likelihood and consequence are detailed in Table 4.2 below. Following this assessment, each impact is assigned a risk category which range from “Low” (low likelihood and consequence) to “extreme” (high likelihood and consequence).

A risk category identified as having an extreme or high risk (a significant impact) may be downgraded if appropriate environmental controls and measures are implemented and maintained. Proactive planning, installation and maintenance of appropriate environmental controls and ongoing monitoring will reduce the risks associated with each environmental impact identified for the M2G project. Table 4.3 details the environmental aspects identified for the M2G project, the initial risk category prior to appropriate management strategies, and reference to the appropriate environmental sub-plan detailing proposed mitigation strategies.

Table 4.1 Risk Scoring Matrix

		Consequences				
	Likelihood	1	2	3	4	5
		Negligible discharge	Uncontrolled Discharges in minor quantities	Moderate breach of environmental Statutes (Potential Fine)	Major breach of environmental statutes (Potential prosecution)	Shutdown of project due to Environmental breach
A	Almost Certain	H	H	E	E	E
B	Likely	M	H	H	E	E
C	Moderate	L	M	H	E	E
D	Unlikely	L	L	M	H	E
E	Rare	L	L	M	H	H

Table 4.2 Risk Definition and Classification – Qualitative Measures and Likelihood Scale

Level	Categorisation Of likelihood	Description
A	Almost certain	Is expected to occur during the project, 90% or > probability
B	Likely	Will probably occur during the project, ~50% probability
C	Moderate	Might occur at sometime during the project, ~10% probability
D	Unlikely	Could occur at some time during the project, ~1% probability
E	Rare	Only occur in exceptional circumstances, < 1% probability

Negligible discharge	Uncontrolled Discharges in minor quantities	Moderate breach of environmental Statutes	Major breach of environmental statutes	Shutdown of project due to Environmental breach
Small environmental discharge that does not make to waterway and is dispersed on site.	Greater than 5,000 litres of water (Chemical spills to be assessed) environmental discharge that does not make to waterway and is dispersed on site.	Cause environmental discharges, environmental pollution or degradation which is fully reversible in the short term with no residual impacts on the community or environment.	Cause environmental discharges, environmental pollution or degradation which is fully reversible in the long term but has or may have some residual impacts on the community or environment in the short to medium term.	Causes environmental discharges, environmental pollution or degradation which has or may have irreversible detrimental effects on the community or environment

The identification of significant impacts associated with aspects of the M2G project is detailed in Table 4.3 below. The risk analysis within Table 4.3 is an internal assessment which takes into consideration the construction risks identified within the EIS/EA. Each environmental sub-plan will further identify specific aspects and impacts associated with each element of the project, including a detailed list of mitigation strategies and procedures to address each identified impact.

Table 4.3 Significant Environmental Aspects, Impacts And Risks

Aspect	Impact	Risk Analysis				Mitigation Measure
		Low	Medium	High	Extreme	
Vegetation Clearing	Clearing outside project boundary resulting in unnecessary vegetation removal			High		Terrestrial Ecology Management Plan (TEMP)
	Accidental clearing of protected vegetation including hollow bearing vegetation			High		TEMP
	Accidental impact to items of Heritage significance				Extreme	Heritage (Conservation) Management Plan (HMP)
	Injury or death of native fauna species (including threatened species) during vegetation clearing			High		TEMP / Aquatic Ecology Mgt Plan (AEMP)
	Propagation of weeds resulting in infestation offsite	Low				Landscape Rehabilitation Management Plan (LRMP)
	Excessive erosion and sedimentation of disturbed areas resulting in uncontrolled discharge offsite and affecting potable water supplies.			High		Soil and Water Mgt Plan (SWMP)
	Discovery of protected flora and fauna species during vegetation clearing.		Medium			TEMP / AEMP
	Fuel / Chemical spills and leaks resulting in environmental pollution or impacts on potable water supplies			High		SWMP Emergency Incident Response Mgt Plan (EIRMP)
	Bushfires as a result of construction activities or inappropriate mulch stockpiling			High		EIRMP
	Identification of previously unidentified object of heritage significance		Medium			HMP

Aspect	Impact	Risk Analysis				Mitigation Measure
		Low	Medium	High	Extreme	
Site Establishment & Operation	Unintentional impact to sensitive Heritage areas during fencing and site establishment.			High		HMP
	Air quality impacts with the potential to result in community disruptions	Low				Air Quality Mgt Plan (AQMP)
	Noise impacts with the potential to result in community disruptions	Low				Noise and Vibration Mgt Plan (NVMP)
	Mud trafficking at site access points	Low				SWMP
	Excessive usage of water and electricity	Low				Waste Management Plan (WMP)
	Excessive generation of waste	Low				WMP
Bulk Earthworks	Excessive erosion of disturbed areas resulting in uncontrolled discharge of sediment laden water offsite resulting in environmental degradation or impacts on potable water supplies			High		SWMP
	Unintentional injury/death of native fauna species			High		TEMP/ AEMP
	Propagation of noxious weeds due to construction activities	Low				TEMP/ SWMP / LRMP
	Pollution of waters as a result of uncontrolled discharge during rain/storm events impacting on water quality			High		SWMP / EIRMP
	Pollution of land or waters during sediment basin discharge impacting on environmental quality and potable water supplies			High		SWMP
	Excessive air quality impacts as a result of construction activities	Low				AQMP
	Excessive noise impacts associated with construction activities	Low				NVMP
	Storage/management of fuels and chemicals resulting in a spill event and subsequent water/land contamination impacting on sensitive aquatic species and potable water supplies.			High		SWMP / EIRMP
	Failure of erosion and sediment control devices resulting in significant pollution events which may impact on			High		SWMP

Aspect	Impact	Risk Analysis				Mitigation Measure
		Low	Medium	High	Extreme	
	environmental quality and potable water supplies					
Pipeline Construction	Water pollution resulting in environmental degradation and/or impact to potable water supply as a result of working within a waterway.			High		SWMP
	Water pollution as a result of inappropriate coffer dam management.			High		SWMP
	Disruption to environmental flows impacting downstream ecology			High		AEMP
	Downstream invasion of alien fish species and disease during construction process				Extreme	AEMP
	Water pollution due to storm/flooding events during construction Activities resulting in downstream pollution and impacts on potable drinking water			High		SWMP
	Major chemical or fuel spill impacting on water quality and potable water supply			High		SWMP / EIRMP
Site Rehabilitation	The propagation of weeds due to the use of weed infested topsoil.	Low				LRMP
	Water pollution due to excessive erosion of newly revegetated areas		Medium			SWMP

Table 4.4 Environmental Management Sub-Plan Abbreviations

Abbreviations			
SWMP	Soil and Water Management Plan	**LRMP**	Landscape Rehabilitation Management Plan
NVMP	Noise and Vibration Management Plan	**AQMP**	Air Quality Management Plan
TEMP	Terrestrial Ecology Management Plan	**HMP (NSW) / CMP (ACT)**	Heritage / Conservation Management Plan (covers Indigenous and non-Indigenous Heritage)
AEMP	Aquatic Ecology Management Plan	**WMP**	Waste Management Plan (including spoil management)
EIRMP	Emergency and Incident Response Management Plan (includes Bushfire Mgt Plan and Flood Mgt Plan)	**CESM Plan**	Community Engagement and Stakeholder Management Plan

4.2 Environmental Context of the Project

4.2.1 Topography, soils and groundwater

The project will involve extensive excavation along the length of the pipeline route, with additional excavation and earthworks being undertaken at the site of the LLPS, HLPS, outlet structure and mini-hydro power generator. Environmental protection works and implementation of the SWMP will mitigate any significant impacts on waterways. The potential for impacts to local geology, soils, groundwater and soil contamination during excavation works and other construction activities are considered to range from unlikely to moderate and can be managed with the implementation of the SWMP and accompanying Erosion and Sediment Control Plans (ESCPs) for the Project.

4.2.2 Water Quality

Construction will involve excavation within the riparian zone of the Murrumbidgee Rivers at Angle Crossing and Burra Creek just upstream of Burra Road. Environmental protection works and implementation of the SWMP will mitigate any significant impacts associated with water quality within these riparian systems. The potential for impacts on the water quality at Burra Creek during construction is considered to be low to moderate and manageable as a result of the proposed measures to control erosion and sedimentation concerns.

The risk of working within the Murrumbidgee River and its banks to construct the low lift pump station (LLPS) as well as the eductor discharge outlet is considered to be high to extreme and will be managed in accordance with ACT EPA's expectations.

4.2.3 Terrestrial Ecology

The project corridor contains a wide range of vegetation and habitat types which vary from non-native pastures to high conservation value native grassland and woodland.

Of particular importance to the M2G project is the presence of two endangered ecological communities (EEC):

- White Box, Yellow Box, Red Gum Grassy Woodland (NSW – *Threatened Species Conservation ACT 1995* and Commonwealth *EPBC ACT 1999*)
- Natural Temperate Grassland (NSW *TSC ACT 1995*)

Snow Gum Grassy Woodland, a vegetation community that has recently been nominated for listing as an endangered ecological community (EEC) in NSW under the *TSC ACT 1995,* occurs along Burra Creek to the east.

Three threatened plant species have been recorded in the construction footprint; *Swainsona recta*, *Swainsona sericea* and *Leucochrysum albicans* var *tricolour* as well as one ROTAP[1] species (*Discaria pubescens*). A detailed survey of *Swainsona recta* and its presence within, and adjacent to, the pipeline corridor will be undertaken prior to the construction of the pipeline in accordance with both NSW and ACT planning conditions. Management actions relating to the conservation of this species is detailed in the Terrestrial Ecology Management Plan and the Ecological Monitoring sub-plan.

Eight threatened animal species have been recorded in the construction footprint: Pink-Tailed Worm Lizard, Gang Gang Cockatoo, Speckled Warbler, Diamond Firetail, White-winged Triller, Varied Sittella, Eastern Bent-wing Bat and Large-footed Myotis.

[1] *ROTAP = Rare or Threatened Australian Plant (Briggs and Leigh, 1985)*

The area of impact on terrestrial ecological systems has been limited by minimising the width of construction footprints in sensitive areas or by fencing and isolation of sensitive areas to prevent direct or indirect impacts during construction Activities. A Biodiversity Offsets Plan is being developed to offset impacts to flora and threatened species habitat.

A Landscape Rehabilitation Management Plan (LRMP) as well as a Terrestrial Ecology Management Plan (TEMP) will be prepared in consultation with regulatory authorities and other relevant stakeholders. Both of these plans aim to identify key risks and to highlight mitigation measures and strategies, including rehabilitation techniques, to minimise and prevent impacts to terrestrial ecology associated with the M2G project. An Ecological Monitoring Program has also been developed to monitor the impacts of the construction and operation of the M2G project on terrestrial ecology.

4.2.4 Aquatic Ecology

Burra Creek and the Murrumbidgee River is known, or is likely, to support a number of threatened fish species including Trout Cod, Macquarie Perch, Silver Perch, Murray Cod and Murray River Crayfish. None of the threatened aquatic species listed under the *NSW Fisheries Management ACT* 1994, the *ACT Nature Conservation ACT* 1980 and/or the *Commonwealth Environment Protection and Biodiversity Conservation ACT* 1999 were observed during field surveys undertaken by Biosis Research within the Murrumbidgee River (2008) and Burra Creek (2007). As a result, the impact of the project on the river's aquatic ecosystems is assessed as being low, especially since environmental flow will be maintained. The small change in depth at Angle Crossing causeway and downstream will have negligible impact on fish passage. Aquatic ecology of the river will be monitored during the duration of the project in accordance with the Aquatic Ecology Management Plan (AEMP) and the Ecological Monitoring Sub Plan.

4.2.5 Cultural Heritage

Indigenous Heritage

Tribal boundaries within Australia are largely based on linguistic evidence and as a result it is probable that tribal boundaries were dynamic in nature over time. A reconstruction of clan boundaries by previous studies indicates that the south Canberra area was close to the tribal boundaries of the Ngunnawal and Walgalu people.

An invitation to Aboriginal groups and individuals to register an interest in the cultural heritage assessment for the project was sent out in June 2008. Four Aboriginal stakeholder groups were engaged by the BWA. The site officers participated in the archaeological field survey and the sub-surface testing stage one program. These stakeholder groups were:

- Buru Ngunawal Aboriginal Corporation (Buru Ngunawal);
- Little Gudgenby River Tribal Council (LGRTC);
- Ngarigu Currawong Clan (Ngarigu); and
- Mogo Local Aboriginal Land Council (Mogo LALC).

The King Brown Tribal Group, although a registered Aboriginal organisation within the ACT under the ACT *Heritage Act 2004*, were invited to participate however, contractual arrangements prevented them from participating in the field survey program. It is likely that this group will participate in further Aboriginal investigations along the M2G pipeline.

The majority of the pipeline corridor has been variously impacted by clearing and pasture development, track, road and fencing construction. A field study identified 81 Aboriginal heritage sites in the construction footprint. From these sites a significance assessment was undertaken with the assessment identifying 23 sites located in NSW and 5 sites in the ACT of being of low to moderate significance. No areas of high

archaeological significance were identified during the stage one sub-surface testing program and no significant issues were identified.

The results of the impact assessment indicate that these 28 sites have the potential to be directly impacted by the project all of which are of low to moderate archaeological significance.

A Heritage (Conservation) Management Plan (covering both Indigenous and non-Indigenous Heritage) will be prepared as part of managing this aspect of the project. This plan will be forwarded to relevant government agencies and stakeholders for their review, information and/or approval.

Non-Indigenous Cultural Heritage

The proposed construction footprint has been subject to farming and rural residential occupation since the early mid 1800s. Two heritage listed sites, London Bridge Homestead and London Bridge Natural Arch, are located nearby to the construction area in NSW. A detailed assessment of the potential erosion impacts on London Bridge, a natural limestone arch concluded that there will not have any significant impact on this structure. The London Bridge homestead and outbuildings are situated greater than 6 kilometres from the works and will not be impacted by the project. Monitoring of the London Bridge Natural Arch will occur during operation and this is described in the Geo-Morphological Monitoring Sub-Plan.

5 Environmental Controls and Mitigation Measures

5.1 Environmental Control Measures and Procedures

5.1.1 General "Business as Usual" Approach

Specific mitigation measures and procedures have been identified and included in each environmental sub-plan to address environmental impacts and obligations associated with each aspect of construction activities. This process of assigning actions to identified impacts, in addition to assigning responsibility for each action, will ensure that project obligations are met during the construction process.

The timing and installation of control measures are critical to ensuring that environmental obligations are met within the required timeframes and that controls are effective in achieving their purpose. For example, the installation of controls or crossings in a watercourse must consider seasonal weather patterns (potential for flooding or scouring), fish migration times and general disturbance issues.

A program of routine maintenance will be conducted on environmental controls. Daily inspections of work areas by BWA personnel and the M2G construction team will provide a means for identifying maintenance requirements before they reach a critical stage.

5.1.2 Sensitive Area Diagrams (SADs)

Various sensitive areas have been identified along the project route. In order to identify the location of these sensitive areas, Sensitive Area Diagrams (SADs) will be developed and maintained during the course of construction activities. SADs will generally identify the location of sensitive areas and structures which are to be protected from construction activities.

These SADs will include the location of:

- protected vegetation communities along the construction route;
- hollow bearing vegetation retained along the construction route;
- habitat areas (if identified);
- construction corridor width;
- construction camps (offices and stockpile areas);
- archaeologically significant location (Indigenous and Non-Indigenous);
- inundation line (Intake & Outlet Structures);
- drainage lines and waterways;
- areas identified for rehabilitation;
- areas of high, moderate and low weed infestation; and
- sensitive receivers.

SADs will be distributed to the construction team (including subcontractors) for reference during construction activities to ensure that sensitive areas are identified and protected during the course of operation. The SADs are located in Appendix A of this CEMP.

5.1.3 Environmental Work Method Statements (EWMS')

EWMS' are documents detailing proposed work procedures and specific environmental control measures for activities which require more detailed attention than general mitigation measures detailed in the CEMP and associated sub-plans. EWMS' are developed at the planning phase prior to activities occurring in the field. Once approved, they provide a step by step assessment of work activities and appropriate mitigation measures to minimise potential environmental impacts. EWMS' are developed by the Project Engineer in consultation with the Superintendent and Environmental representatives.

Each EWMS will include:

- title, Date and Revision Number;
- summary of proposed Activities;
- location of the activity/site;
- timing of works and expected duration;
- details of any approvals/permits required;
- step-by-step description of work activities;
- assessment of the predicted level of environmental risk and community concern;
- detailed consultation requirements;
- environmental elements identified by the BWA during environmental due diligence investigations;
- implementation details such as:
  - measures to avoid and/or minimise negative environmental impacts;
  - the methods proposed to implement the EWMS such as plans, schedules and work instructions; and
  - site specific monitoring, inspection and test plans;
- relevant community and stakeholder requirements; and
- appropriate details of landholder agreements.

A procedure for the development of EWMS' (also referred to as Construction Method Statements, CMS') has been prepared and is available on Lotus Notes (Procedure No. BWA-2-810).

5.1.4 Erosion and Sediment Control Plans

Appropriate planning is crucial to effective management of erosion and sedimentation on site. Erosion and Sediment Control Plans (ESCPs) are planning documents which clearly show the site layout and the approximate location of erosion and sediment control structures on site.

ESCPs will be developed for all work areas prior to commencing activities. A preliminary ESCP for the M2G project will be incorporated into the SWMP and will form the basis of any future ESCPs. Prior to the commencement of works, all plans within the ACT will be reviewed by the ACT EPA prior to the commencement of their use on site.

Project Engineers, Superintendents, Supervisors, Soil Conservationists, and the M2G Environmental Officer (and Manager) will be jointly responsible for the development and implementation of ESCPs on-site. This will ensure that erosion and sediment management is incorporated into the planning phase of construction activities. However, it is expected that minor adjustments to ESCPs will be required on site to complement construction activities. Consultation will be undertaken with the ACT EPA for ACT plans prior to their use on site.

ESCPs will be regularly reviewed as site conditions change and flow paths are altered (e.g. the reshaping of drainage lines to direct sediment laden runoff to sediment traps and filters). Once approved all revisions will be controlled and allocated an appropriate revision number. ESCPs will be maintained in a site specific ESCP Register and available to site personnel for reference. This register will be maintained by the Environmental Admin Officer. A procedure for the preparation, review and auditing of erosion and sediment controls has been developed and is available on Lotus Notes (Procedure No. BWA-2-811) and in the SWMP.

ESCPs will generally be prepared on detailed drainage diagrams, however topographic maps (aerials) may also be utilised. Each ESCP will incorporate the following aspects:

- Title, Date and Revision Number
- Details regarding the implementation period and staging.
- A layout of the site, including the location of access roads, ancillary infrastructure, stockpile locations, protected vegetation and disturbed (cleared) areas.
- The location of temporary and permanent erosion and sediment control measures proposed to treat stormwater prior to discharge (including vegetated treatment systems).
- Design criteria for control measures.
- Approval and signoff from construction manager and soil conservationist.

ESCPs are designed for use as a practical guide and may be produced in conjunction with an EWMS for more detailed environmental mitigation measures (if deemed appropriate by the BWA).

5.1.5 Erosion and Sediment Control Crews and Resources

Effective erosion and sediment control on site is reliant on the effective installation and maintenance of erosion and sediment control structures as detailed in the ESCPs and EWMS'. Both human and physical resources will be required to install and maintain erosion and sediment controls on site. Erosion and Sediment Control Crews (ERSED Crews) will be responsible for implementing and maintaining erosion and sediment control measures such as sediment fences, temporary batter chutes and the geo-textile lining of drains on a day-to-day basis. Commitment will be strengthened prior to and following wet weather events. The number of ERSED crews provided will fluctuate throughout the project dependent on the level and risk of activities.

Physical resources such as sandbags, sediment fencing and stakes, geo-textile fabrics, crushed rock, gypsum (flocculant), silt curtains, water quality monitoring equipment and other related resources will be made available to both the ERSED crews and the M2G environmental team to enable them to adequately perform their roles and responsibilities.

Site supervisory personnel and ERSED Crews will undertake specialised training in the selection, installation and maintenance of erosion and sediment control devises as part of an overall environmental training program.

6 Communication and Consultation

6.1 Community Engagement and Stakeholder Management

Close community liaison will be maintained to ensure that local residents are aware of the times and durations when they may be affected by construction work and to provide an avenue for communication between the community and the Bulk Water Alliance.

All communication and consultation will be undertaken in accordance with the project Community Engagement and Stakeholder Management (CESM) Plan. The CESM Manager is responsible for the interface with the community. This includes (but is not limited to) notification of construction activity, notification of temporary road closures, community engagement regarding construction (including soil and water related activities) and the complaints process. The CESM Manager reports to the M2G Client representative whilst working in conjunction with the M2G Project Manager, M2G Construction Manager, Site Superintendent, M2G Land and Compliance Manager and Project Engineers.

In addition, consultation with government agencies will be undertaken regularly as described in the CEMP with the intention of reviewing the effectiveness of mitigation measures stipulated in the various sub-plans, site management practices, monitoring results and any other relevant issues.

Table 6.1 Communication Network

Communication	
Project personnel including sub-contractors/suppliers	• A site induction and environmental training will be provided to all personnel and sub-contractors engaged to work on the site. • Feedback on environmental matters, new legislation etc. will be provided and encouraged. • Close communication will be maintained between the Construction Manager, M2G Land and Compliance Manager, Supervisors and Environmental Officer.
Government agencies	**ACT** • Environment and Sustainable Development Directorate • Parks and Conservation Service (TAMS) • ACT Heritage Unit **NSW** • Environment Protection Authority (EPA) • Department of Planning (DoP) • Australian Rail Track Corporation (ARTC) • NSW Office of Water
Community and Landholders	• Individual Landholders will be informed in advance of construction activity affecting them in accordance with the CESM Plan • Project information will be made available to the community in accordance with the CESM Plan through advertisements, community notices and newsletters. • A protocol for registering and responding to complaints will be established as detailed in the Complaints Management Procedure and CESM Management Plan.

6.2 Complaints management strategy

The Bulk Water Alliance is committed to managing environmental related complaints from affected residents or stakeholders in a proactive and conciliatory manner.

Relevant community and stakeholder groups will be progressively informed of the various stages of construction by the Community Engagement and Stakeholder Management (CESM) team, particularly prior to significant construction generating activities related to soil and water management.

The community and stakeholder groups identified in the CESM Plan will be informed of the duration of the works, what impacts that they are likely to expect and they will be given a 1800 toll free number to contact the BWA CESM team should they wish to register a complaint regarding any aspect of the construction project.

The BWA CESM team will implement a process for registering and responding to the lodged complaint as per the Community Engagement and Stakeholder Management Plan Construction and Operation Section 10.2 Complaints management. The CESM Manager will report back to the project team on impact and mitigation effectiveness on a weekly basis.

The Water Security Hotline phone number (6248 3563) is available during business hours for general questions, project updates and to provide feedback. A toll free number (1800 211 242) is available 24 hours a day for emergencies. Complaints and comments can also be sent via email to watersecurity@actew.com.au

6.3 External Stakeholders

Consultation with a range of non-community, external stakeholders will be required throughout the project. This will include relevant state and territory regulatory agencies associated with the M2G project. The BWA will consult and co-operate with all relevant Regulatory Authorities in meeting the projects environmental requirements and will permit those agencies to audit project activities for regulatory compliance.

A list of relevant contact names, telephone numbers and fax numbers for project stakeholders will be maintained by the M2G CESM Manager.

6.4 Environmental Review Meeting

A regular Environmental Review Meeting (ERM) will be coordinated between the BWA and relevant Environmental Agencies to discuss and review environmental management during the course of construction. The ERM will provide a suitable forum to discuss up coming work, approval requirements and general environmental management on BWA projects.

These meetings will be undertaken as agreed between the BWA and relevant parties based on the nature and complexity of construction activities. Depending on the outcomes of the meeting, a site visit may also be initiated to inspect/observe environmental management measures onsite.

The outcomes/actions from these meetings will be minuted and distributed to all involved parties.

7 Training, Awareness and Competence

Three main forms of training will be implemented on site:

- site induction;
- environmental management training;
- project approvals and compliance; and
- “toolbox” training

Records of all site inductions and on site training will be kept on a database, including details of the training topic(s) presented, participants and training dates. All participants will be required to “sign-off” that they have been informed and understand their environmental obligations at the conclusion of each training session.

Training will generally be prepared and delivered by the M2G Land and Compliance Manager or M2G Environmental Officer, or by a delegated person.

7.1 Site Induction

Prior to working on site, all personnel and subcontractors will undertake a site induction detailing significant environmental and OHS requirements associated with the M2G project. The will include, but not be limited to, the following environmental components.

- the EMS and CEMP (purpose, objectives, etc);
- legal requirements including due diligence, duty of care and potential consequences of infringements;
- environmental responsibilities;
- conditions of licences, permits and approvals;
- BWA policies;
- significant environmental issues and areas of the site, including the identification of project boundaries, location of refuse bins, washing, refuelling and maintenance of vehicles, plant and equipment;
- environmental management techniques for key environmental elements (soil and water, waste and recycling, flora and fauna, heritage etc) e.g. EWMS’, ESCPs;
- incident management and emergency plans;
- reporting process for environmental harm/incidents;
- protection and maintenance of environmental controls;
- BWA sustainability objectives; and
- community engagement and stakeholder management requirements.

7.2 Environment Management Training

Targeted environmental management training will be provided to individuals responsible for environmental management on site, or groups who are undertaking activities which have been identified as “high risk”. This environmental training is designed to achieve a level of awareness and competence appropriate to their assigned activities.

Specific links will be made between environmental objectives and sustainability principles during training sessions (where possible). A comprehensive overview of sustainability may also need to be included (i.e. social, economic and environmental aspects, and inter-generational equity).

The target groups and suggested topics for training are shown in Table 7.1.

Table 7.1 Potential Environmental Training Topics and their corresponding target group

Target Group	Topic
M2G Managers	• Content & requirement of the CEMP and sub-plans • Environmental risk management • Project approvals and legislative requirements • Community Engagement
Superintendent/s	• Content & requirement of the CEMP and sub-plans • Environmental risk management • Project approvals and legislative requirements • Benefits of erosion and sediment control on site • Management of topsoil and stockpiles • Environmental incident reporting • Community Engagement and Stakeholder Management
Project/Site Engineers	• Content & requirement of the CEMP and sub-plans • Environmental risk management • Project approvals and legislative requirements • Working within waterways • Environmental incident reporting • Community Engagement and Stakeholder Management
Erosion and Sediment Control Crews	• ESCPs • Selection, installation and maintenance of erosion and sediment control structures • Environmental risk management • Project approvals and legislative requirements • Coffer dam management (monitoring and flocculation) • Community Engagement and Stakeholder Management
Supervisors and Leading Hands	• ESCPs • Selection, installation and maintenance of erosion and sediment control structures • Coffer dam management (monitoring and flocculation) • Working near sensitive receivers • Environmental risk management • Project approvals and legislative requirements • Working near protected areas and waterways • Incident response • Waste classification and management • Environmental incident reporting

Target Group	Topic
	• Management of topsoil and site rehabilitation • Community Engagement and Stakeholder Management
Emergency Response Crew	• The location and correct application of emergency response equipment • Safety concerns during emergency situations • Environmental risk management • Project approvals and legislative requirements • Internal notification and reporting procedures • Cleanup and disposal procedures

7.3 Toolbox Training

Toolbox training will help to ensure that relevant information is communicated to the workforce and that feedback can be provided on issues of interest or concern. Toolbox training will generally be prepared and delivered by the Project Engineers, Superintendent, Supervisors, CESM Manager and/or the M2G Environmental Officer and will reflect risks and concerns associated with construction Activities occurring on site.

EWMS' will draw reference to specific toolboxes based on risks associated with the proposed construction Activity. The toolboxes will complement the CEMP by providing additional details on the management and mitigation of identified environmental impacts. Environmental toolbox training topics may include but are not limited to:

- Protection of heritage items;
- Working within or in close proximity to waterways;
- Clearing and grubbing procedures;
- Waste management (minimisation, classification and recycling);
- Noise and vibration minimisation;
- Flora and fauna protection;
- Threatened species conservation;
- Habitat preservation and relocation;
- Concrete washout procedures;
- Dust control;
- Protecting waterways and riparian zones;
- Wastewater control;
- Coffer dam management and flocculation;
- Spills and leaks (including the application of remediation products);
- Emergency response procedures;
- Wet weather procedures and inspections;
- Community Engagement and Stakeholder Management, and
- Other general site issues.

8 Inspection, Auditing and Monitoring

8.1 Environmental Monitoring

Environmental monitoring will involve collecting and interpreting data to provide quantification of the effectiveness of the CEMP, associated sub plans, and mitigation measures implemented on site. Environmental monitoring facilitates the early identification of environmental impacts during construction activities and assists in determining the effectiveness of additional management strategies adopted.

In addition, environmental monitoring prior to the commencement of construction activities provides quantitative background data of environmental parameters which can be used as a comparison against construction environmental monitoring.

Environmental monitoring that will be undertaken during construction activities include:

- Noise and Vibration monitoring;
- Air quality monitoring;
- Water Quality monitoring (including coffer dam discharge monitoring);
- Monitoring of activities with the potential to impact Heritage areas;
- Monitoring of rehabilitation activities; and
- Monitoring of works with the potential to impact the ecology of the area.

Air quality, water quality, noise and vibration monitoring will be undertaken prior to construction commencing to gauge baseline or background data.

The timing, frequency, methodology, location and responsibilities for the proposed environmental monitoring programs are specified in each relevant sub-plan (e.g. SWMP will detail specific water monitoring requirements). These will be in accordance with the relevant Environmental Authorisation (ACT) or Environmental Protection Licence (NSW).

Irrespective of the type of monitoring conducted, the results will be used to identify potential or actual problems arising from construction processes. Where monitoring methods permit, results will be obtained at the time of assessment and analysed immediately by the M2G Land and Compliance Manager or the M2G Environmental Officer. This will allow a prompt response to be initiated should an exceedance of accepted levels/criteria or an impact to heritage/local ecology be identified. Where this cannot be achieved, preliminary results will be requested within one (1) week of monitoring with a full report within two (2) weeks of the monitoring event.

Where monitoring results exceed expected levels/criteria or identify an impact:

- the results will be analysed by the M2G Land and Compliance Manager and/or M2G Environmental Officer in more detail with the view of determining possible causes of the exceedance;
- a site inspection will be undertaken by the M2G Land and Compliance Manager and/or Environmental Officer;
- relevant personnel (such as the Site Superintendent, Supervisors, Site Engineer) will be contacted and advised of the issue;
- an agreed action will be identified;
- actions will be implemented to rectify the issue; and
- M2G Land and Compliance Manager, or their delegate, will notify the relevant Regulatory Authority or ACTEW/ActewAGL of any exceedances as specified in M2G's licence requirements.

An Environmental Improvement Notice (EIN) may be issued by the M2G Land and Compliance Manager, or their delegate, in responses to any exceedance if it is found to be construction related. The timing for any improvements will be agreed between the M2G Construction Manager and M2G Land and Compliance Manager based on the retained level of risk.

A weekly report, or other period agreed by the ACT EPA, regarding compliance with all conditions of the ACT EPA Authorisation 802 will be provided to the ACT EPA on the Monday of the following week. The report will include but is not limited to:

- air monitoring results;
- water monitoring results;
- noise monitoring results;
- blasting monitoring results;
- controlled discharges from sediment control ponds; and
- weekly field inspection results of all controls used in the management of pollutants to the environment.

8.2 Environmental Monitoring Sub-Plans

Three environmental monitoring sub-plans have been prepared to fulfil Condition 3 of NSW Department of Planning Approval (08_0160). These plans are referenced in Figure 1.2 as monitoring sub-plans and include:

- Geomorphological Monitoring sub-plan
- Stream Flow and Water Quality Monitoring sub-plan
- Ecological Monitoring sub-plan.

Monitoring reports related to these sub-plans will be provided to the Director-General, DoP, DECCW and DII (as necessary) as follows:

- Prior to start up of operation (baseline data);
- 6 monthly for the first two years, and
- At 2 yearly intervals thereafter.

8.3 Inspections and Surveillance

8.3.1 Site Inspections and Surveillance

Inspection and surveillance of construction activities (including subcontractors) will be undertaken on a day-to-day basis by the Superintendent and/or Supervisors and/or Project Engineer and/or the Environmental Officer. These inspections will not be documented unless significant non-conformances are identified. As part of daily activities, Supervisors and/or the Superintendent will be required to maintain a site diary detailing the day's activities and any issues (including environmental issues) which may have arisen during the course of operations.

8.3.2 Site Environmental Inspection Checklist

The effectiveness of environmental protection measures will be assessed weekly by the M2G Environmental Officer and nominated construction personnel (e.g. Superintendent, Supervisors, etc). A site environmental inspection checklist has been developed addressing the key environmental impacts which have the potential to arise during construction activities. As the Site Environmental Inspection Checklist is a continually developing document, the latest copy can be located on Lotus Notes (Form No. BWA-2F-820).

The purpose of this checklist is to:

- promote a proactive style of environmental management;
- provide a surveillance tool ensuring that environmental safeguards are being implemented effectively;
- identify where site issues may be occurring and any reoccurring issues; and
- facilitate the early resolution and actioning of identified issues.

8.3.3 SQE Inspection/Site Instruction

- Any actions that are identified as a result of the site inspections will be documented in an SQE checklist (refer to Appendix B) and issued to the Superintendent and/or Supervisors for rectification. Actions contained in this list are prioritised based on associated risk and will remain "open" until the Supervisor has completed the works to a satisfactory level.

The M2G Land and Compliance Manager or Environmental Officer will issue an SQE action checklist as required during the course of construction. Further to this, SQE checklists are utilised by Senior Managers, Engineers and Supervisors to identify and correct any activity that is deemed to be a risk to the environment.

8.4 Auditing

8.4.1 Internal Audits

Internal Audits will be conducted by the M2G Land and Compliance Manager and/or M2G Environmental Officer, or their delegate on a regular basis. Elements that may be audited include but are not limited to:

- compliance with the BWA Project Alliance Agreement (PAA);
- compliance with the Conditions of Approval (CoA);
- compliance with the CEMP and associated sub-plans;
- compliance with ACT / NSW / Commonwealth approvals, permits and licence obligations;
- compliance with EWMS' and ESCPs;
- complaint responses;
- sub-contractor activities;
- training records;
- non-conformances and subsequent Actions/closures;
- quality Assurance (QA) audits to demonstrate systems compliance;
- environmental monitoring results;
- system documentation;
- compliance with landholder agreements and commitments, and
- quarterly environmental performance review by Environment Performance Review Group (EPRG).

Table 8.1 Suggested Internal Audit Schedule

Document	March 2011	July 2011	October 2011	January 2012
Environmental Systems Compliance				
CEMP				
Soil and Water Management Plan				
Terrestrial Ecology Management Plan				
Aquatic Ecology Management Plan				
Noise and Vibration Management Plans				
Air Quality Management Plan				
Waste Management Plan				
Heritage (Conservation) Management Plan				
Emergency and Incident Response Management Plan				
Landscape Rehabilitation Management Plan				
Community Engagement and Stakeholder Management Plan				

Internal audits will occur every quarter to ensure the CEMP and associated sub-plans are audited at least once a year. A suggested audit schedule is displayed in Table 8.1. Any non-conformances identified during audits will be recorded within the audit report and may result in a non-conformance report (NCR) being issued to the project. Internal audits will adhere to *AS/NZS ISO 19011: 2003 Guidelines for Quality and/or Environmental Management Systems Auditing*.

8.4.2 External Audits

External (third party) audits may be conducted by ACTEW, accreditation agencies and/or Regulatory Authorities during the course of construction. Following each audit, audit reports will be provided detailing the scope of the audit and subsequent findings. These reports will be reviewed by the M2G Land and Compliance Manager and all Corrective Action Requests (CAR) and Observations of Concern (OOC) will be addressed. Details of all actions undertaken as a result of the audit will be documented and filed on site for reference.

Third party compliance audits may be carried out on the M2G project as part of a third party systems compliance audit undertaken by either of the Bulk Water Alliance non-owner participants (Abigroup, John Holland or GHD). The selection of M2G as a project to be audited by a third party is not guaranteed but could be selected during the course of the project.

External audits will adhere to *AS/NZS ISO 19011: 2003 Guidelines for Quality and/or Environmental Management Systems Auditing*.

8.5 Compliance Tracking and Auditing of Compliance

In accordance with both the NSW and ACT Conditions of Approval for the project, a Compliance Tracking Plan (BWA-M2G-EN-PLN-009-2) and compliance tracking program (Lotus Notes) has been developed to assist the M2G project team track their compliance to all conditions of approval as well as licence and permit conditions.

As required under both jurisdictions, a 6 monthly periodic report will be provided to the NSW Department of Planning (DoP) and ACT Planning and Land Authority (ACTPLA) outlining the status of compliance. This will occur just prior to construction commencement and at 6 monthly intervals thereafter during the course of construction. A final report at the completion of the project summarising the overarching compliance to NSW and ACT planning conditions will also be forwarded to DoP and ACTPLA.

8.5.1 Obligations Register

The BWA have established an electronic obligation register which will track the compliance of all licence and approval conditions. This register will be maintained by the M2G Environmental Management Team and updated regularly or as new licences are acquired or amended. This obligation register will also be utilised by any independent authority or agency to monitor and verify compliance during construction.

8.5.2 Independent Environmental Representative (IER)

A requirement of both the ACT and NSW Planning authorities is for the proponent to engage a suitably qualified, independent environmental auditor/representative to ensure that the BWA is meeting its obligations and commitments associated with the delivery of the M2G project.

The primary role of the IER is to:

- oversee the implementation of all environmental management plans and monitoring programs;
- advise the M2G project team on its compliance obligations against ACT DA conditions, NSW Conditions of Approval, Statement of Commitments and licences and permits;
- provide compliance reports to the BWA and to external authorities;
- provide recommendations to the M2G project team to take reasonable steps to avoid or minimise unintended or adverse environmental impacts, or to cease work should such steps be ineffective and if the risk is significant that an adverse impact is likely to occur.

The appointed IER will cover both NSW and ACT jurisdictions as part of their scope of work in accordance with ACT and NSW Agency requirements.

8.6 Environmental Non-conformance, Preventative and Corrective Action Systems

8.6.1 Resolving Non-conformances and implementing Corrective Actions

The process for managing environmental non-conformances will be as follows:

- When an environmental non-conformance is detected, the nature of the issue will be evaluated by the M2G Land and Compliance Manager and/or M2G Environmental Officer and the requirement for new or additional controls will be discussed to prevent recurrences. Corrective actions will subsequently be identified and entered into the Environmental Action Register (EAR) for reference. This EAR (Appendix C) will detail the non-conformance, corrective and/or preventative action, timing and the personnel responsible for implementing the action. The non-conformance will remain “Open” until corrective actions have been implemented.

- Once the corrective action has been implemented, the EAR will be updated to “Closed” status with details of the closure date attached.
- The EAR will be reviewed regularly by the Environmental Team and the Project Management Team to ensure actions are being completed in an acceptable and timely manner. Any issues arising from these reviews will be discussed between the M2G Land and Compliance Manager, or their delegate and relevant construction personnel.

8.7 Environmental Records

The M2G Land and Compliance Manager with the assistance from the M2G Environmental Officer will maintain the following records:

- the CEMP and associated sub-plans;
- relevant approvals, regulatory licences and permits;
- inspection records and checklists;
- environmental monitoring results and chain-of-custody forms;
- environmental accident/incident/emergency reports;
- reconciliation records for all fuels, oils and hazardous materials and wastes utilised and stored on site;
- environmental Non-conformance and EIN documentation;
- GHG emission source records (e.g. concrete and diesel quantities);
- waste and recycling reports;
- non-conformance reports (NCRs) and Corrective Action Requests (CARs);
- environment Action Register (EAR);
- audit reports, and
- management review minutes and action taken.

Where hard copy records are provided they will be scanned and made available electronically. Each set of records will be allocated a register/index for easy reference and filing. Records will be maintained for at least 5 years after the date of final completion and will be available to ACTEW Representatives and Regulatory Agencies as required.

In addition to above, the following records will be maintained in accordance with the ACT Environmental Authorisation 802 for a period of 2 years:

- Material extracted from a waterway (except water) in tonnes (Condition 9.1a)
- Material extracted from land outside of a waterway in tonnes (Condition 9.1 b);
- Maintenance and repairs performed on pollution control equipment (as defined in the Environmental Authorisation 802 – condition 3.2); and
- Virgin excavated material (VENM) accepted for placement in accordance with Schedule 2, Table 8 (Condition 9.1 c).

8.8 Document and Data Control

The M2G Land and Compliance Manager, with assistance from the M2G Environmental Officer, will coordinate the preparation, review and distribution of environmental documents as required. A document and data control procedure has been implemented to control the flow of documents and data within the BWA and between the BWA, ACTEW (Owner Participant), stakeholders and sub-contractors.

Documents and data that are to be issued will be controlled to ensure that they are approved prior to issuing and that the current issue or revision is known to relevant personnel. The distribution of controlled documents will be in accordance with the distribution list contained within each document. Controlled documents will be distributed on a revision basis only, with obsolete documents clearly marked as "superseded". Obsolete documents will be maintained and filed for contractual purposes on site. Controlled documents will be uniquely identified with a defined revision number recorded on each page. All controlled document revision numbers will be included into a register for reference.

During the course of construction, environmental documents will be stored at the main site office, on a specifically dedicated public access website www.actew.com.au/ and can be accessed on request to the M2G Land and Compliance Manager.

8.9 Emergency Notification

All environmental emergencies will be managed in accordance with the Emergency and Incident Response Management Plan (EIRMP).

In the event that an incident has caused, is causing, or is likely to cause material or serious environmental harm, whether the harm occurs on or off the site, the M2G Land and Compliance Manager will to report the incident to the relevant Environment Protection Authority (EPA) and ActewAGL in the following manner:

- Notify ACT EPA by telephoning Canberra Connect on 13 22 81 or NSW EPA by telephoning 13 15 55 during and outside business hours.
- Notify ActewAGL on either of the following numbers in order of priority. It is vital that personal communication is attained to initiate immediate shutdown of the Cotter Pumping Station supplying water to Mount Stromlo Water Treatment Plant (WTP) for subsequent potable water to Canberra.

NOTE: Do not leave a phone message or email which may not be acted upon immediately.

1. Stromlo WTP – 6248 3642
2. Water Distribution Services – 0414 511 719
3. Lower Molonglo – 6248 3457
4. Googong WTP – 6248 3212

9 Review and Improvement of CEMP

The M2G Land and Compliance Manager will review the CEMP and its operation and implementation at least every twelve months. Between the scheduled reviews, a register of issues will be maintained to ensure that any issue raised by internal and external personnel associated with the project are recorded for later inclusion to the CEMP. This register is displayed in Table 9.1.

The purpose of the review is to ensure that the system is meeting the requirements of the standards, policies and objectives and if not, to amend the CEMP to facilitate continuous improvement. A report will be provided to the M2G Project Manager with any recommendations for change to the system.

The review will consider:

- client's comments;
- site personnel comments;
- agency comments;
- audit findings;
- environmental monitoring records;
- complaints;
- details of corrective and preventative actions taken;
- environmental non-conformances;
- incident reports;
- changes in organisation structures and responsibilities;
- the extent of compliance with objectives and targets; and
- the effect of changes in standards and legislation.

9.1 NSW Approvals, Permits and Licences

It is imperative that all NSW government agencies providing approvals for the M2G project with an inherent interest or condition relating to the development and implementation of the Construction EMP are kept abreast of reviews of this CEMP. Liaison with the NSW Department of Planning (DoP), NSW Department of Environment, Climate Change and Water (DECCW) and the NSW Office of Water (NoW) for all reviews and distribution of amended CEMPs and/or sub-plans is critical to keep these agencies aware of developments on the M2G project.

9.2 ACT Approvals, Permits and Licences

Similarly to NSW, the M2G Land and Compliance Manager will keep the ACT government agencies with a vested interest in ensuring that the M2G project conducts their operations in an environmentally sensitive manner abreast of changes to the CEMP and/or sub-plans as the project evolves and the need to update plans arises. Specifically, under the ACT Environmental Authorisation 802, the Authorisation holder (John Holland Pty Ltd) must seek endorsement from the Authority (DECCEW) for any variations to EMPs prior to implementation onsite.

Both NSW and ACT government agencies will be informed of any impending changes to this CEMP and /or sub-plans prior to issuing of the revised documents.

Table 9.1 Register of significant revisions/amendments

Section	Revision/Amendment	Date Amended	Status
Section 8.2	New section created to provide information regarding reporting of monitoring results (DoP request, 10.12.10). *Note: DoP request of the same date to undertake a summary of existing vegetation condition to be presented in the CEMP despite being outlined in the environmental assessment has been included in the M2G Landscape Rehabilitation Management Plan rather than the CEMP.*	11.03.11	Closed
Figure 3.1	BWA organisation chart updated to reflect current status	11.03.11	Closed
Figure 3.2	M2G organisation chart updated to reflect current status	19.01.12	Closed
Appendix A	Include updated Approvals in Compliance Tracking Plan	19.01.12	Closed
Appendix B	Sensitive Area Diagrams updated to reflect changes in alignment	11.03.11	Closed
Appendix A	Compliance Tracking Plan updated to incorporate revised approvals, permits and licences	11.03.11	Closed
Table 3.2	Updated	11.03.11	Closed
Section 3.3.4	Changed from M2G Environmental Manager to M2G Land and Compliance Manager	11.03.11	Closed
Section 5.1.2	Site Environmental Plans no longer being used as an environmental management tool – this section deleted and reference to SEPs removed from CEMP	11.03.11	Closed
CEMP	Removal of M2G Environmental Manager and replace with M2G Land and Compliance Manager	11.03.11	Closed
Section 8.3.3	Remove Environment and Observation Action Checklist and replace with SQE Checklist	19.01.11	Closed
Appendix A	Compliance Tracking Plan removed to become separate document	16.01.12	Closed

Appendix A **Sensitive Area Diagrams**

Monitoring Location 1
(approximately 1.4km to
the North West)

Eductor pipes

Site to be fenced off
until salvaged

LLPS

Note: Turning area to be
maintained for public use

01

1003

25m microwave tower

Note: Parking area
closed to public

02

1003

Site to be fenced off
until salvaged

1

HLPS

Site to be fenced off
during construction

Site to be fenced off
until salvaged

1003

Angle Crossing Road

Note: Angle CrossingRoad
will remain open unless
closure is approved by TAMS

Works in waterways to be carried out in
accordance with "Working in Waterway - EWMS"
(BWA-M2G-EN-EWMS-006) and relevant drawings

Legend

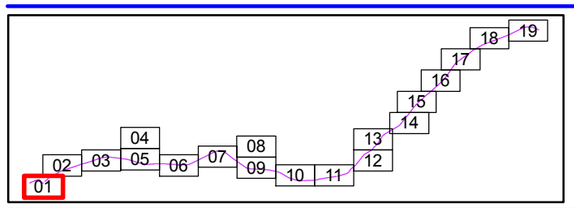
- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box
- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)
- Arthropodium fimbriatus
- Discaria pubescens
- Leucochrysum albicans var. tricolor
- Linum marginale
- Lotus australis
- Microseris lanceolata
- Pterostylis sp.
- Swainsona recta
- Swainsona sericea
- Zornia dyctiocarpa
- Diamond Firetail
- Eastern Bentwing-bat
- Gang-gang Cockatoo
- Jacky Winter
- Large-footed Myotis
- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller
- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)
- Vehicle access and movement direction



N

0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams
Landholder Constraints

Map 1 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

1003B

1002A

1003B

02

1003B

Pipe Laydown Area 1

4200m^2

1002A

Site to be fenced off until salvaged

1003B

1003

1003

01

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

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- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

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- Swainsona sericea
- Zornia dyctiocarpa
- Diamond Firetail
- Eastern Bentwing-bat
- Gang-gang Cockatoo

- Jacky Winter
- Large-footed Myotis
- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin

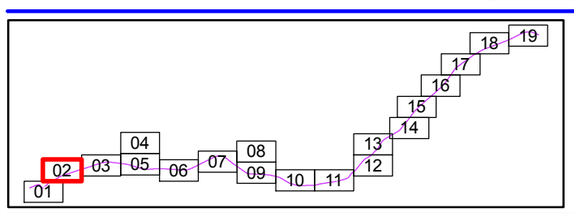
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)

Vehicle access and movement direction



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Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams
Landholder Constraints

Map 2 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

1003A

1003A

1003B

1003B

1003B

Access restricted during construction

Site to be fenced off until salvaged

03

05

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
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- Swainsona sericea
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- Gang-gang Cockatoo

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- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin

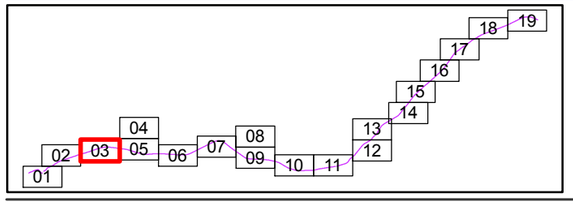
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)

- Vehicle access and movement direction



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Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 3 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Site to be fenced off until salvaged

Main Office

1003A

04

Monaro Highway

Monitoring Location 3

1003A

1003A

1003B

05

Subject to further investigations by Ecological Asutralia

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
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- Driveway
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- Historical (European) Recording
- Surface Artefacts and PAD
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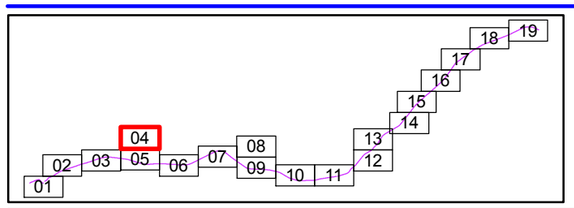
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)
- Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 4 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Site to be archivally recorded and fenced off during construction

Note: Access to be provided for stock to cross corridor

1003A

1003B

1003B

1003B

1003B

1006

1006

Monaro Highway

04

05

03

2

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
- Discaria pubescens
- Leucochrysum albicans var. tricolor
- Linum marginale
- Lotus australis
- Microseris lanceolata
- Pterostylis sp.
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- Swainsona sericea
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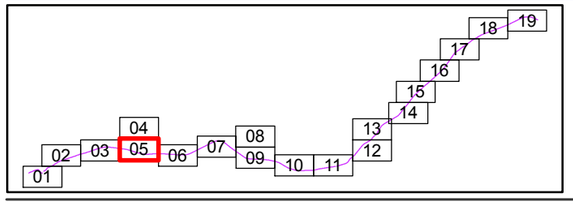
- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)

Vehicle access and movement direction



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Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 5 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Significant threatened species - to be identified and fenced off prior to construction commencing

Note: Access to be provided for stock to cross corridor

Soil contamination assessment to be undertaken prior to construction commencement

Erosion gully adjacent construction corridor

1102

1103

1006

DISUSED RAILWAY

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box
- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)
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- Discaria pubescens
- Leucochrysum albicans var. tricolor
- Linum marginale
- Lotus australis
- Microseris lanceolata
- Pterostylis sp.
- Swainsona recta
- Swainsona sericea
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- Gang-gang Cockatoo
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- Large-footed Myotis
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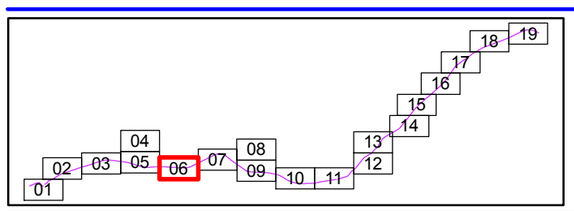
- Restless Flycatcher
- Scarlet Robin
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller
- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)
- Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 6 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

08

07

1102

1104

1104

1106

Site to be fenced off during construction

Note: Access to be provided for stock to cross construction corridor

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

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- Lotus australis
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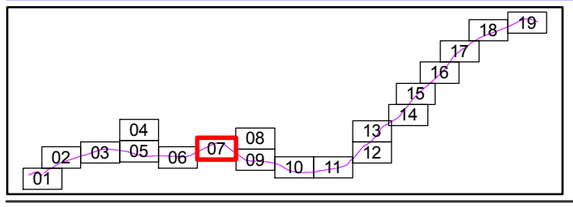
Vehicle access and movement direction



N

0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 7 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

08

07

09

1107

1107

1106

Property Access Track

Williamsdale Road

Works in waterways to be carried out in

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

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- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

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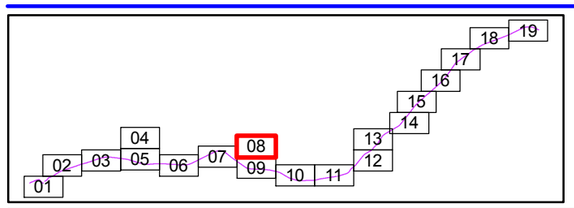
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller
- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)
- Vehicle access and movement direction



N

0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 8 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

08

09

Williamsdale Road

Site to be fenced off until salvaged

Site to be fenced off until salvaged

Pipe Laydown Area 2 10,000m^2

Site to be fenced off until salvaged

Site to be fenced off until salvaged

Property Access Track

Access to be restricted during construction following subsurface testing

Note: Access to be provided for stock to cross construction corridor

Access to be restricted during construction

1106

1107

1107

1107

1107

1107

1107

1106

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1107

1107

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
- Discaria pubescens
- Leucochrysum albicans var. tricolor
- Linum marginale

- Lotus australis
- Microseris lanceolata
- Pterostylis sp.
- Swainsona recta

- Swainsona sericea
- Zornia dyctiocarpa
- Diamond Firetail
- Eastern Bentwing-bat
- Gang-gang Cockatoo

- Jacky Winter
- Large-footed Myotis
- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin

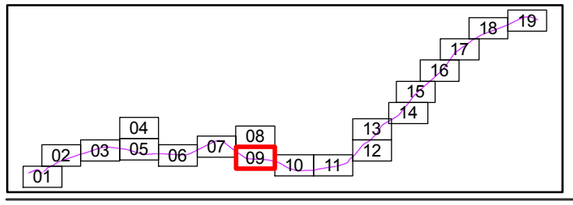
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)

- Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

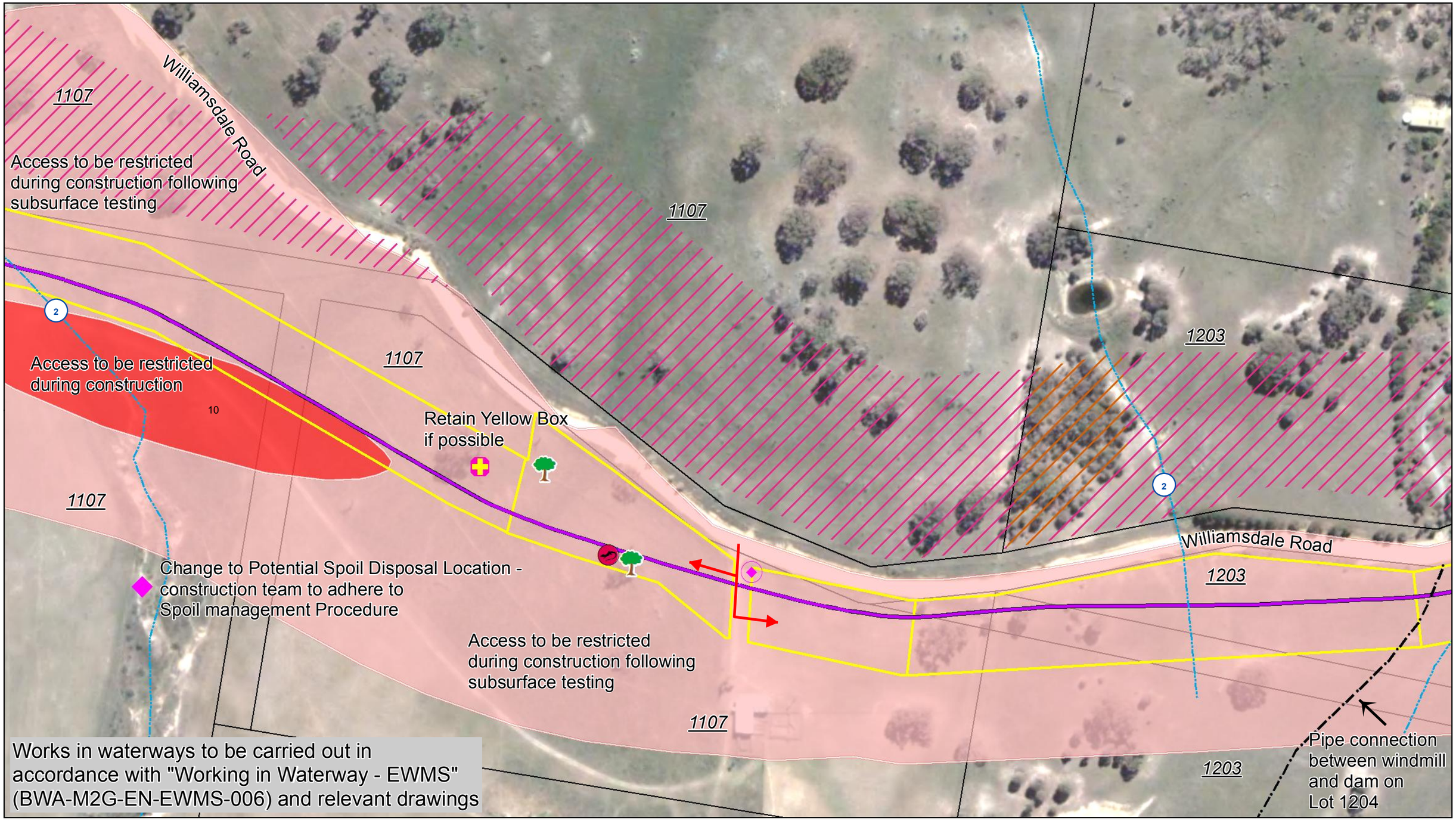
ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 9 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:



Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

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- Linum marginale

- Lotus australis
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- Swainsona sericea
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- Eastern Bentwing-bat
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- Scarlet Robin

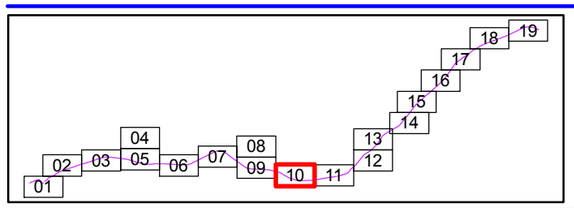
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

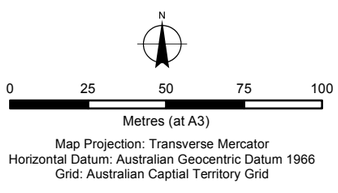
- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)

- Vehicle access and movement direction





Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 10 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Monitoring Location 4

Reinstate gravity feed from dam post construction

Access to be restricted during construction

Site to be fenced off during construction

Access to be restricted during construction following subsurface testing

Protect downslope dam from sediment

Site to be fenced off during construction

Owners requested felled timber be stockpiled for firewood

1203 1203 1203 1205 2002

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
- Discaria pubescens
- Leucochrysum albicans var. tricolor
- Linum marginale

- Lotus australis
- Microseris lanceolata
- Pterostylis sp.
- Swainsona recta

- Swainsona sericea
- Zornia dyctiocarpa
- Diamond Firetail
- Eastern Bentwing-bat
- Gang-gang Cockatoo

- Jacky Winter
- Large-footed Myotis
- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin

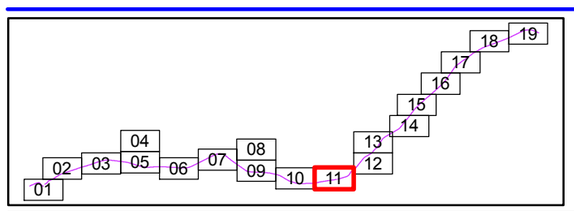
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)

- Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

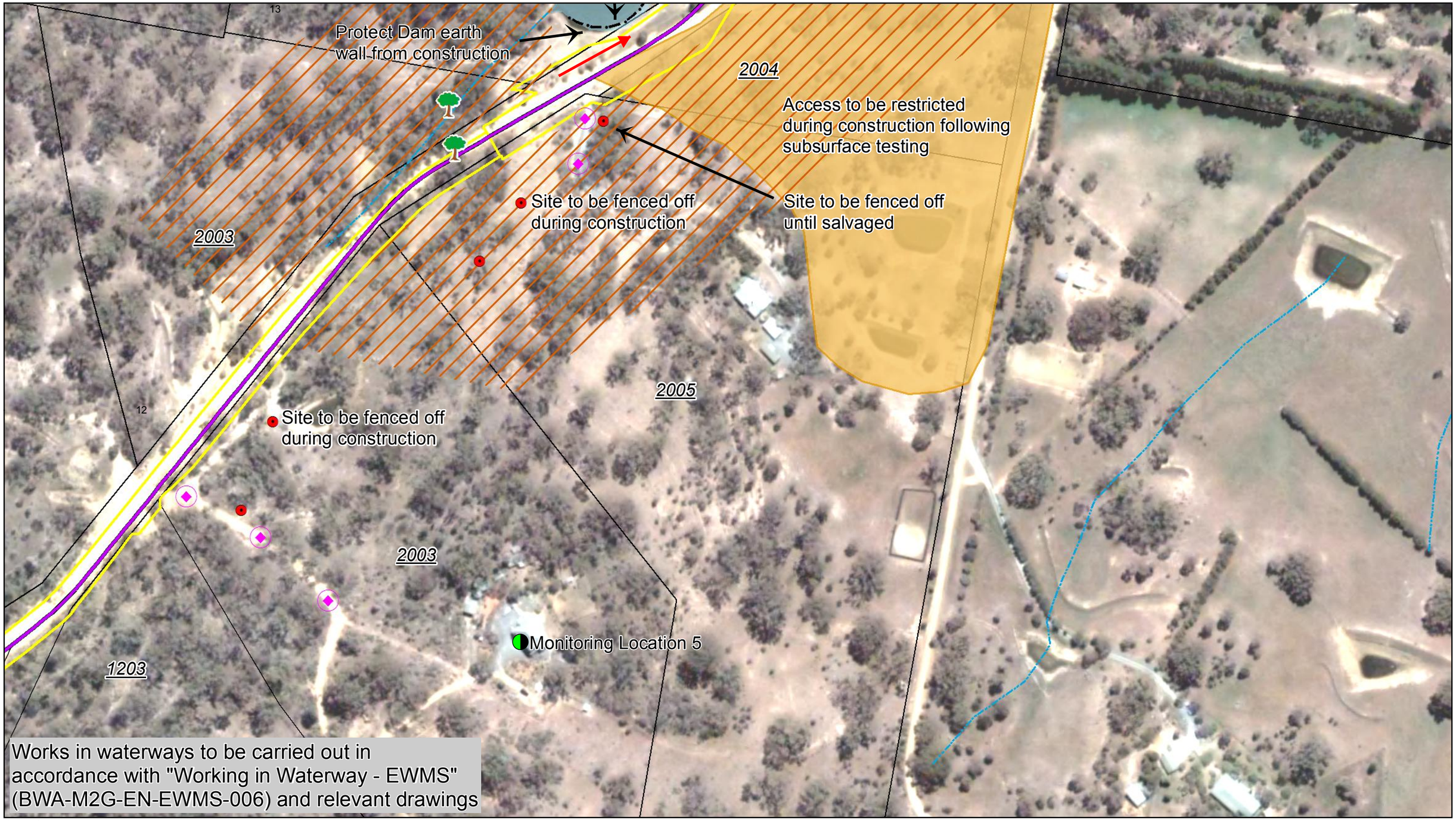
ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams
Landholder Constraints

Map 11 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:



Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
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- Linum marginale

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- Pterostylis sp.
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- Swainsona sericea
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- Eastern Bentwing-bat
- Gang-gang Cockatoo

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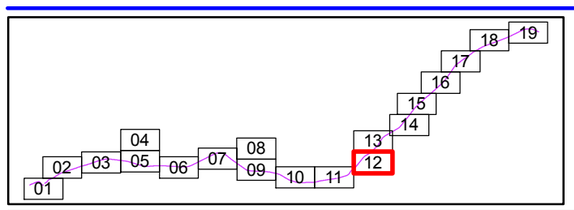
- Restless Flycatcher
- Scarlet Robin

- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)
- Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 12 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Pine Trees - to be preserved. Only overhanging limbs to be removed

Access to be restricted during construction

Monitoring Location 6

Access to be restricted during construction following subsurface testing

Protect Dam earth wall from construction

Be aware of drainage line gully

Access to be restricted during construction following subsurface testing

1223
2006
2006
2006
1217
1217
2004
2004
13
14
12
1
2

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
- Discaria pubescens
- Leucochrysum albicans var. tricolor
- Linum marginale

- Lotus australis
- Microseris lanceolata
- Pterostylis sp.
- Swainsona recta

- Swainsona sericea
- Zornia dyctiocarpa
- Diamond Firetail
- Eastern Bentwing-bat
- Gang-gang Cockatoo

- Jacky Winter
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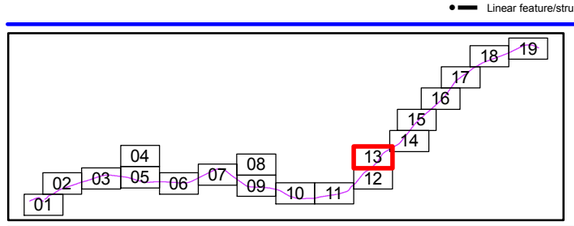
- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin

- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)
- Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams
Landholder Constraints

Map 13 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Access to be restricted during construction following subsurface testing

Site to be fenced off until salvaged

Reinstatement of pipework to dam not required

Access to be restricted during construction following surface collection and subsurface testing

1222A
1223
1225
2006

13
14
15

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

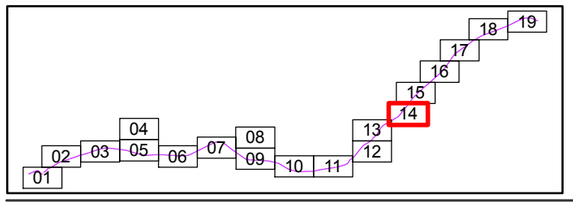
- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
- Discaria pubescens
- Leucochrysum albicans var. tricolor
- Linum marginale
- Lotus australis
- Microseris lanceolata
- Pterostylis sp.
- Swainsona recta
- Swainsona sericea
- Zornia dyctiocarpa
- Diamond Firetail
- Eastern Bentwing-bat
- Gang-gang Cockatoo
- Jacky Winter
- Large-footed Myotis
- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)

Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 14 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Reinstate roadside verge with either rock armouring or hyrdomulch.
Netting fence on roadside needs repair

Site to be fenced off until salvaged

Site to be fenced off during construction

Access to be restricted during construction

Access to be restricted during construction following subsurface testing

1303

1302

1302

1302

1223

1225

1225

16

15

14

Monitoring Location 7

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
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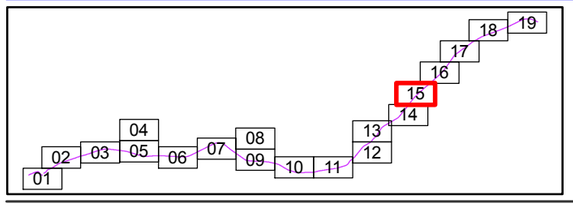
- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)

Vehicle access and movement direction



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Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 15 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Monitoring Location 8

Site to be fenced off until salvaged

Site to be fenced off until salvaged

Access to be restricted during construction following subsurface testing

Change to "Drainage Line" - refer to Enviro report for erosion and sediment controls and rehabilitation of waterways

Williamsdale Road

Badgery Road

1309

1305

1303

16

17

15

3

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

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- Scarlet Robin
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

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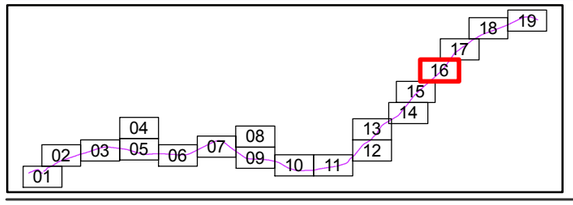
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)

Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 16 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

High Value Trees - Poplar species - DO NOT REMOVE

Site to be fenced off until salvaged

Monitoring Location 9

Access to be restricted during construction following subsurface testing

Site to be fenced off until salvaged

1312

1310

1309

17

18

16

4

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
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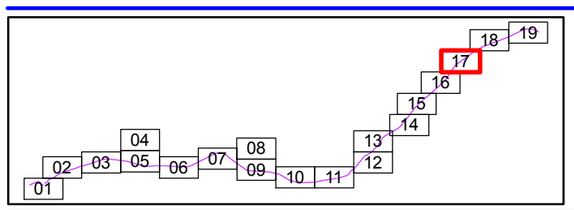
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)

Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 17 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

18

17

Site to be fenced off during construction

Trees to be preserved

1315

1315

1312

Access to be rrestricted during construction following subsurface testing

Do not prevent landholder retaining access to cattle yards. DO NOT FENCE OFF

2

4

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
- Discaria pubescens
- Leucochrysum albicans var. tricolor
- Linum marginale
- Lotus australis
- Microseris lanceolata
- Pterostylis sp.
- Swainsona recta
- Swainsona sericea
- Zornia dyctiocarpa
- Diamond Firetail
- Eastern Bentwing-bat
- Gang-gang Cockatoo
- Jacky Winter
- Large-footed Myotis
- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
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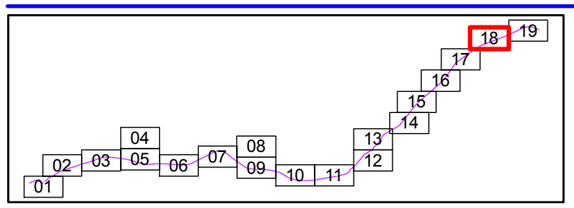
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)

Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 18 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Site to be fenced off during construction

Williamsdale Road

Macdiarmid Rd

Williamsdale Road

1317

Be aware of Burra Creek waterway

1317

1317

Possible old sheep dip in construction corridor. Soil contamination assessment to be undertaken prior to construction commencement

Mini-Hydro

Discharge structure

Pipe Laydown Area 3 5000m^2

Trees to be preserved

1315

Monitoring Location 10

BURRA CREEK

Monitoring Location 11

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
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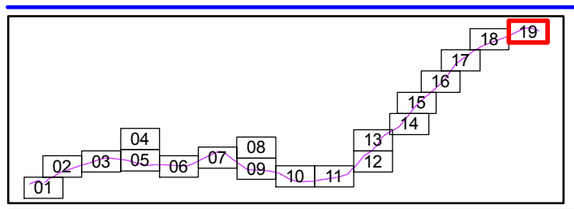
- Vehicle access and movement direction



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Metres (at A3)

Map Projection: Transverse Mercator
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BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

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Map 19 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
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Appendix B **SQE Inspection / Site Instruction**

Form: BWA-2F-030-2B	BULK WATER ALLIANCE	Bulk Water Alliance securing water for life
Revision: 5	SQE INSPECTION / SITE INSTRUCTION	

GDS ☐ M2C ☐ ECD ☐ M2G ☐ S_{afety} ☐ Q_{uality} ☐ $E_{nvir.}$ ☐ Inspection ☐ Site Instruction ☐

Supervisor: _____ Subcontractor: _____ Date: _____

Work Activity: _____ **Inspection / Instruction by:** 1. _____

_____ 2. _____ 3. _____

Location	Description	Time Frame	Action by	Date Actioned	Sign off

Time Frames: SQE Class 1 (C1) = Hazard/Risk must be addressed immediately; Class 2 (C2) = Action required within the shift; Class 3 (C3) = Action required within 5 days.

White Copy – To supervisor, engineer or subcontractor and return on completion to BWA Safety where an inspection and/or the Author when a site instruction.

Pink Copy – To BWA Safety at completion of the inspection and/or entered on to project file by Author when issued as a Site Instruction

All hazards should be remedied on a see & fix basis, where this is not practical the hazard should be barricade, sign posted or otherwise protected until remedial actions are implemented.

White Copy to supervisor / subcontractor for Close-out Pink Copy to BWA Safety or Author Yellow Copy remains in book

Appendix C **Environmental Action Register**

ENVIRONMENTAL ACTION REGISTER

Murrumbidgee to Googong Project

DATE	ISSUE	PRIORITY	ACTION	RESPONSIBILITY FOR ACTION	DATE TO BE COMPLETED	SIGN OFF

Appendix D **Works Boundary Plan**

Bulk Water Alliance

BWA - Works Boundary Plan

BWA-M2G-SY-PLN-001

January 2011

securing **water** for life

Certificate of approval for issue of documents

Document number	BWA-M2G-SY-PLN-001
DM5 number	
Title	BWA - Works Boundary Plan
Revision	4
Document status	Final
Date of issue	January 2011

	Position	Name	Signature	Date
Prepared by	Site Engineer	Shafin Rashid		24.02.2011
Reviewed by	Construction Manager	Matthew Richardson		25.2.2011
Approved by	Project Manager	Jason Julius		25.2.2011.

Document revision control

Version	Author	Date	Description	Approval
A	Linda Garlick	22 April 2010	Issued for Review	
0	Linda Garlick	18 May 2010	Issued for Approval	
1	Linda Garlick	11 June 2010	Section 3.6 Block Number correction	
2	Linda Garlick	25 August 2010	Section 3.2 Update easement layout	
3	Matthew Richardson	17 January 2010	Table 3.1 in section 3 updated, and other minor amendments	
4	Matthew Richardson	23 February 201	Revised Property construction Drawings	

Contents

1 PURPOSE

The purpose of this plan is to delineate the construction boundaries for the Murrumbidgee to Googong Transfer (M2G) project in accordance with the planning approvals.

Clause 16.5 of the Project Alliance Agreement States that:

The Alliance must develop and maintain at all times a Works Boundary Plan which specifies the boundaries of the Active Work Site for each Project at any time during the Program from the purpose of clause 10, this clause 16 and clause 28. The plan and all updates to the plan must be submitted to the APMT for agreement in accordance with clause 8.

1.1 Reference Documents

This Document shall be read in conjunction with the *Program Works Boundary Plan* (BWA-PRW-SY-PLN-005).

2 Murrumbidgee to Googong Project

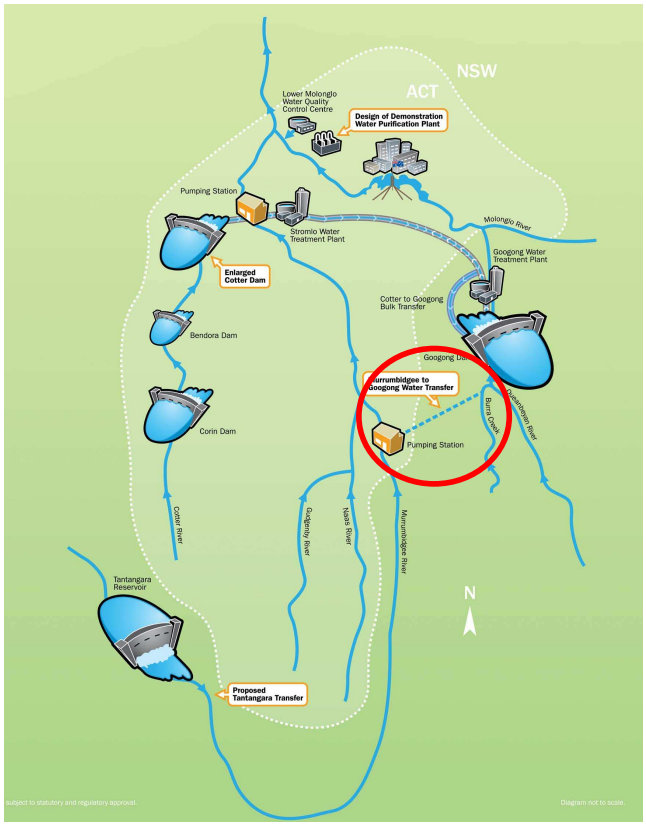
2.1 Scope of Works

The Murrumbidgee to Googong Water Transfer encompasses the construction and operation of pumping and pipeline infrastructure to transfer up to 100 ML/day of water approximately 12 km from the Murrumbidgee River at Angle Crossing (ACT), to the Googong Reservoir via run-of-river flow in Burra Creek (NSW).

The project incorporates:

- a one metre diameter underground pipeline from the Murrumbidgee River over Gibraltar Pass to Burra Creek at Williamsdale Rd;
- a combined intake and low lift pump station at Murrumbidgee River;
- a high lift pump station;
- an 11 kV power supply;
- an outlet structure (within Burra Creek); and
- a mini-hydro power generator located near the outlet structure. The mini-hydro power generator will recover and reuse 25-30% of the pumping energy required to lift the water over the Gibraltar Range. The power generated will be transferred back to the high lift pump station through an underground cable in the same trench as the transfer pipeline.

The project crosses the ACT / NSW Boarder just east of the Monaro Highway.



3 PHYSICAL BOUNDARIES

The Physical Boundaries of each area vary dependant on the phase of the project. The table below shows the areas required in the final configuration and during the construction phase. These figures are taken from the EIS document (where detailed).

Table 3.1 Area of Works

Area of Works	Jurisdiction	Final	Construction
Permanent Structures			
Low Lift Pump Station Section A: Section B: Section C:	ACT	 750 m^2 40 m^2 250 m^2	 3530 m^2 160 m^2 450 m^2
High Lift Pump Station	ACT	4200 m^2	5500 m^2
Discharge Structure	NSW	1200 m^2	2600 m^2
Mini hydro	NSW	250 m^2	5800 m^2
HLPS Roadwork Upgrade (Angle Crossing Road)	ACT	NA	5400 m^2
Angle Crossing Road and Monaro Highway Intersection Upgrade	ACT	NA	1100 m^2
Pipework Easements			
Chainage 0-94	ACT	Easement	40m width
Chainage 94-300	ACT	Easement	35m width
Chainage 450-692	ACT	Easement	35m width
Chainage 692-780	ACT	Easement	40m width
Chainage 780-875	ACT	Easement	15m width
Chainage 875-990	ACT	Easement	20m width
Chainage 990-1065	ACT	Easement	35m width
Chainage 1065-1090	ACT	Easement	20m width
Chainage 1090- 1750	ACT	Easement	35m width
Chainage 1750-2650	ACT	Easement	25m width
Chainage 2650-2720	ACT	Easement	20m width
Chainage 2720-2865	ACT	Easement	25m width
Chainage 2865-2905	NSW	Easement	15m width
Chainage 2905-3290	NSW	Easement	25m width

Area of Works	Jurisdiction	Final	Construction
Chainage 3290-4855	NSW	Easement	40m width
Chainage 4855-4890	NSW	Easement	15m width
Chainage 4890-5220	NSW	Easement	30m width
Chainage 5220-6610	NSW	Easement	40m width
Chainage 6610-7515	NSW	Easement	Road Easement
Chainage 7515-7610	NSW	Easement	Varies to max 40
Chainage 7610-7800	NSW	Easement	30 m width (part road easement)
Chainage 7800-8200	NSW	Easement	Varies (Part Road Easement)
Chainage 8200-8510	NSW	Easement	30m width
Chainage 8510-9000	NSW	Easement	40m width
Chainage 9000-9300	NSW	Easement	40m (Part Road Easement)
Chainage 9300-10950	NSW	Easement	40m width
Chainage 10950-11370	NSW	Easement	Road Easement
Chainage 11370-11700	NSW	Easement	25m width (part road easement)
Electrical Easement Chainage 0 – 400	ACT	Easement	20m width
Temporary Areas			
M2G Laydown Area 1 (Angle Crossing) (near CH 600)	ACT	Temp Only	1500 m^2
M2G Laydown Area 2 (Angle xing rd Cattle grid) (near CH 800)	ACT	Temp Only	4300 m^2
M2G Laydown Area 3 (Monaro Hwy) (near CH 2620)	ACT	Temp Only	650 m^2
M2G Laydown Area 4 (Monaro Hwy) (near CH 2720)	ACT	Temp Only	500 m^2
M2G Laydown Area 5 (DP 754889 Property – near CH 4950)	NSW	Temp Only	10,000 m^2
M2G Laydown Area 6 (Palerang Council) (near CH 11250)	NSW	Temp Only	5000 m^2
Main Site Office (Angle Crossing) Incl Storage Facility and Pipe storage area	ACT	Temp Only	9500 m^2

Area of Works	Jurisdiction	Final	Construction
Low Lift Pump Station – compound area 1 (angle xing recreational area)	ACT	Temp Only	2600 m^2
Low Lift Pump Station – compound area 2 (angle xing recreational area)	ACT	Temp Only	900 m^2
Temporary storage area adjacent to corridor (CH 5650 – CH 5700)	NSW	Temp Only	800 m^2
Temporary storage area adjacent to corridor (CH 5920 – CH 6120)	NSW	Temp Only	1400 m^2
Temporary storage area adjacent to corridor (CH 6215 – CH 6325)	NSW	Temp Only	250 m^2
Temporary storage area adjacent to corridor (CH 6400 – CH 6500)	NSW	Temp Only	1600 m^2
Temporary storage area adjacent to corridor (CH 8700 – CH 8930)	NSW	Temp Only	1000 m^2
Temporary storage area adjacent to corridor (CH 9800 – CH 9900)	NSW	Temp Only	250 m^2
Temporary storage area adjacent to corridor (CH 9950 – CH 10150)	NSW	Temp Only	400 m^2

3.2 Pipeline Easements

Figure 3.1 shows typical layouts across each easement width. These layouts are indicative only, with the exact layout in each area determined on site as appropriate according to the site conditions. Appendix A gives the pipeline plans showing the designated easement widths in each area.

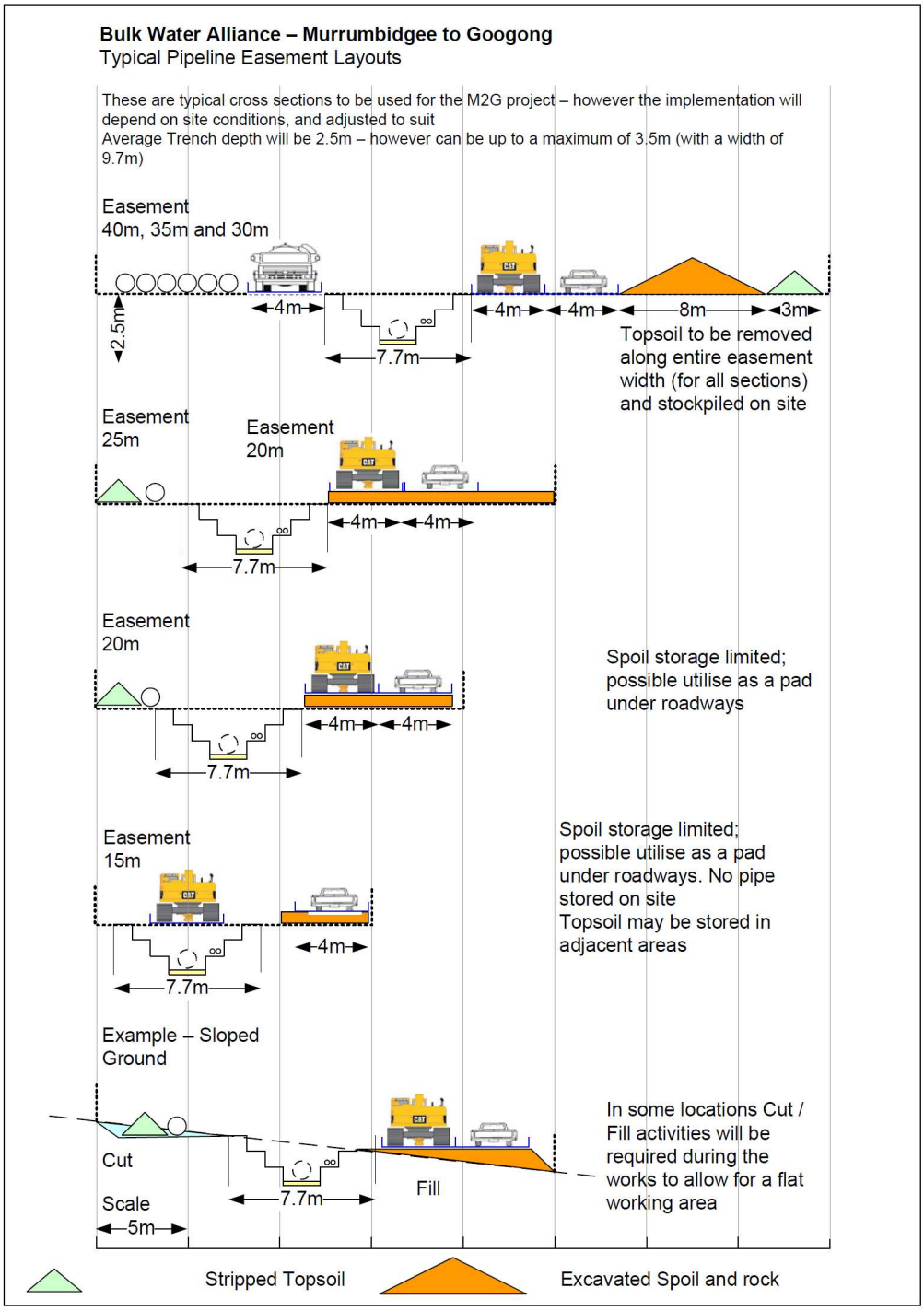


Figure 3.1 Construction Corridor Cross-Section

3.3 Electrical Line Easement

For the majority of the construction alignment, the electrical line will be laid within the same corridor as the pipeline (between the High Lift Pump Station and the Mini-Hydro Plant). However, In the first section of the works (between the Low Lift and High Lift Pump Stations) the construction corridors of the pipeline and the electrical easement will diverge. This will be within a 20 wide corridor as shown in Figure 3.2.

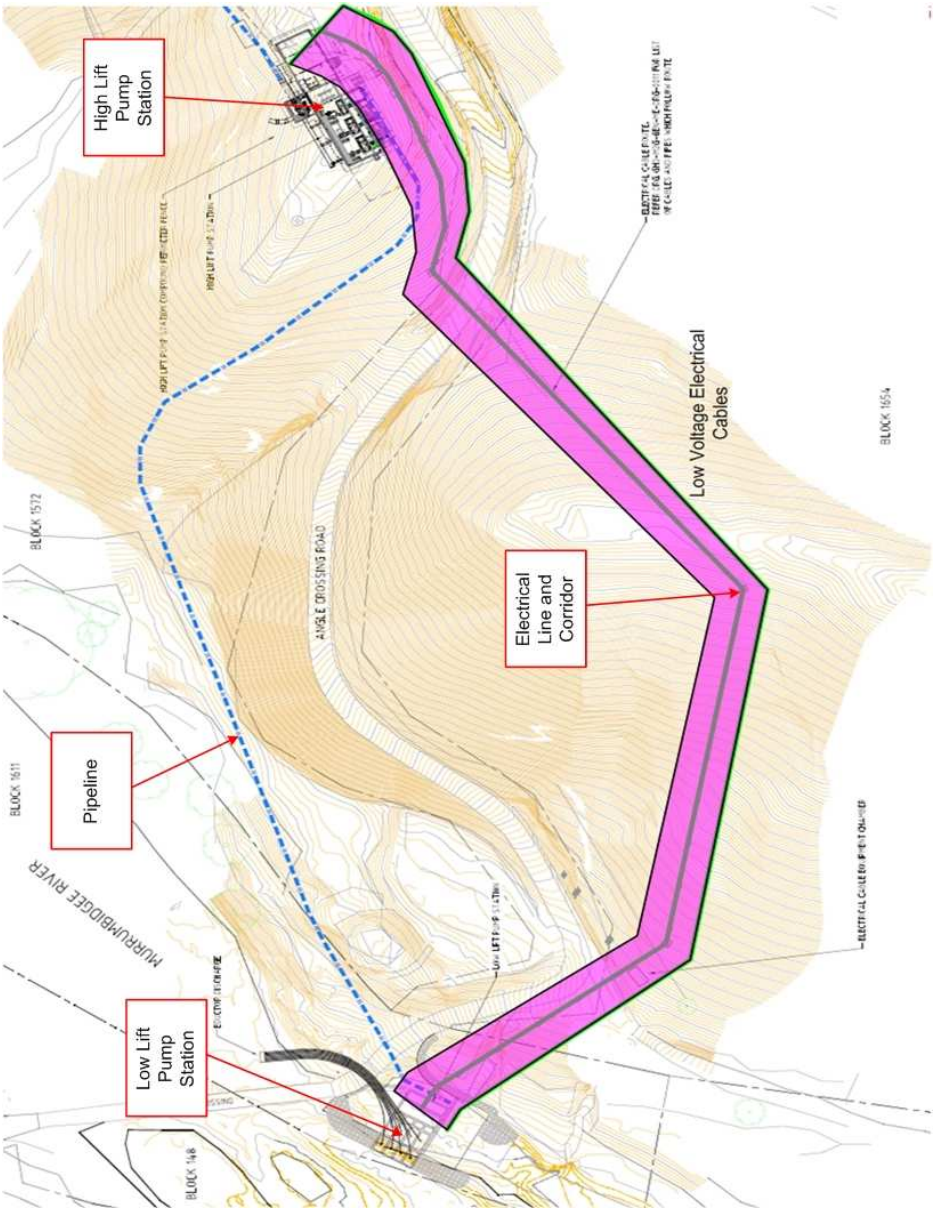


Figure 3.2 Construction Activities in the ACT

3.4 Low Lift Pump Station

Works in the area of Angle Crossing are divided into two areas: the construction area for the Low Lift Pump Station and the associated Low Lift Pump Station Compound area (Temporary works area). Low Lift Pump Station Area is further subdivided into section A (Low Lift Pump Station), section B (Eductor Pipework) and section C (Electrical Bunker). The other Low Lift Pump Station Compound area will primarily be used for the fabrication of formwork shutters and storage for materials and equipment. These areas are shown in Figures 3.3 through 3.6.

The Low Lift Pump Station will be accessed via three routes, they are:

- an existing access road will be upgraded and extended to connect it to the southern side of the building
- A ramp from – off Angle crossing road approach to the river
- A steep (tracked vehicle only) ramp at the rear

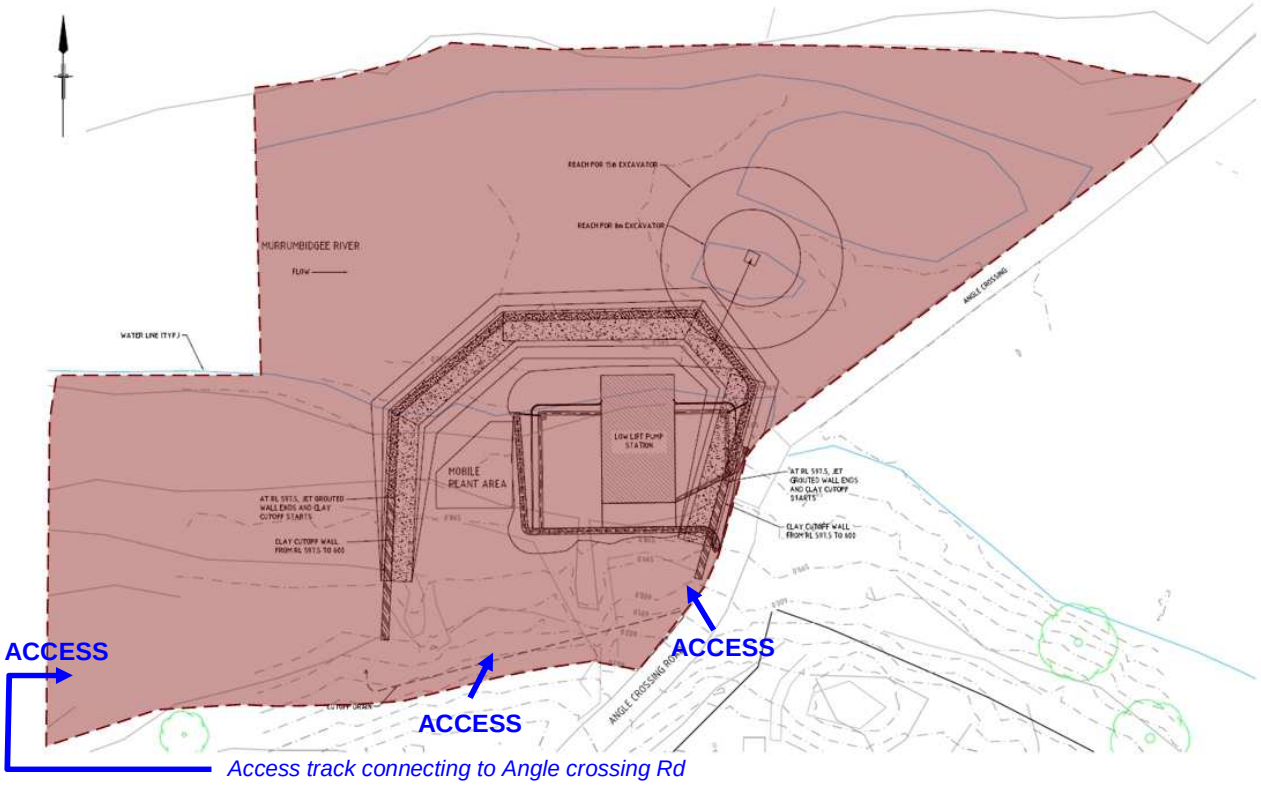


Figure 3.3 Section A – Low Lift Pump Station

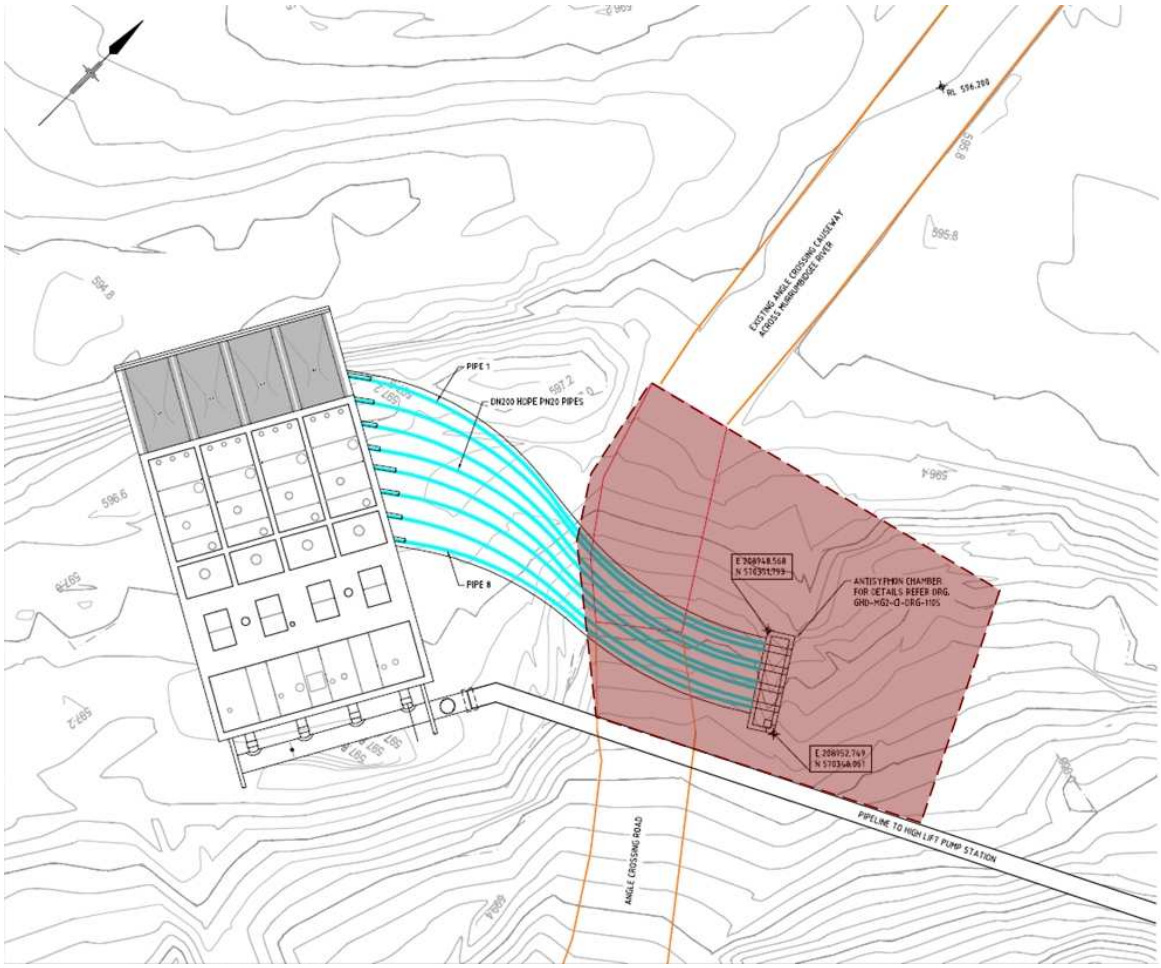


Figure 3.4 Section B – Eductor Pipe Work

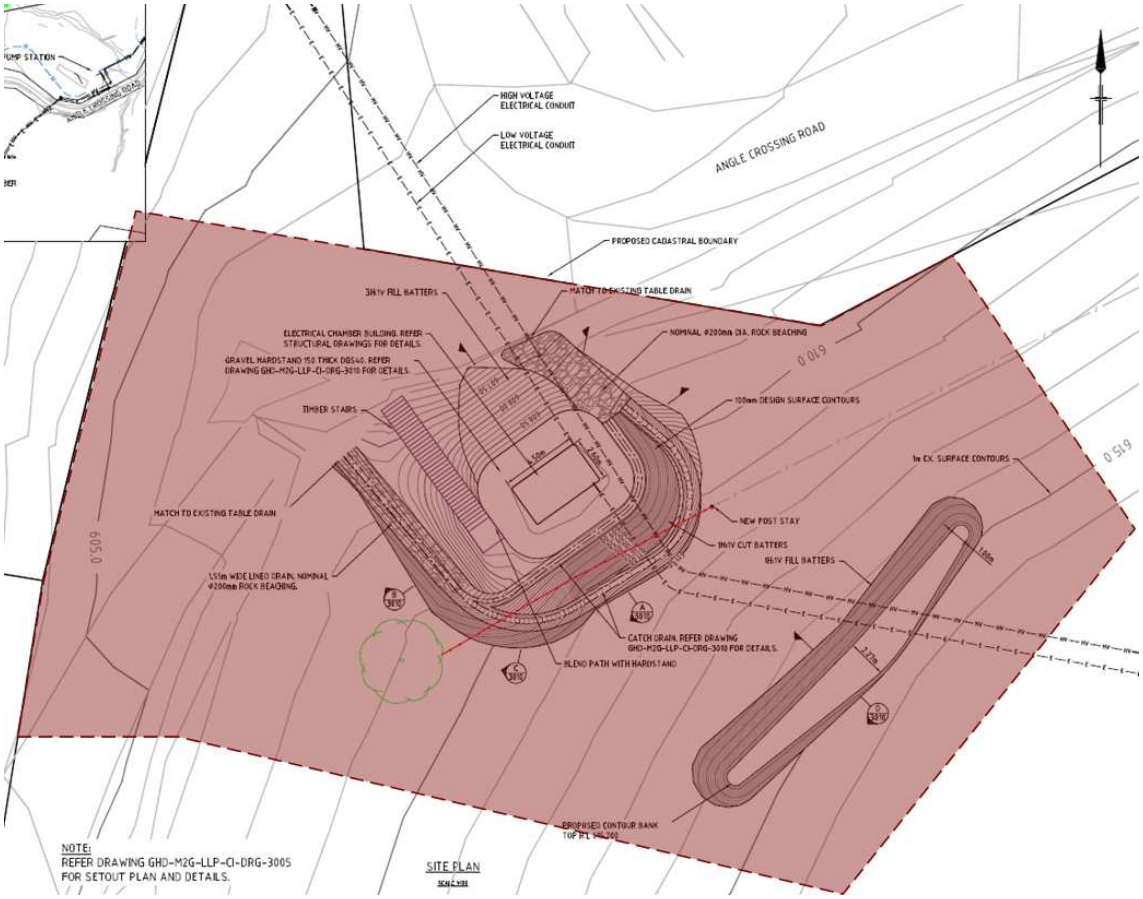


Figure 3.5 Section C – Electrical Bunker

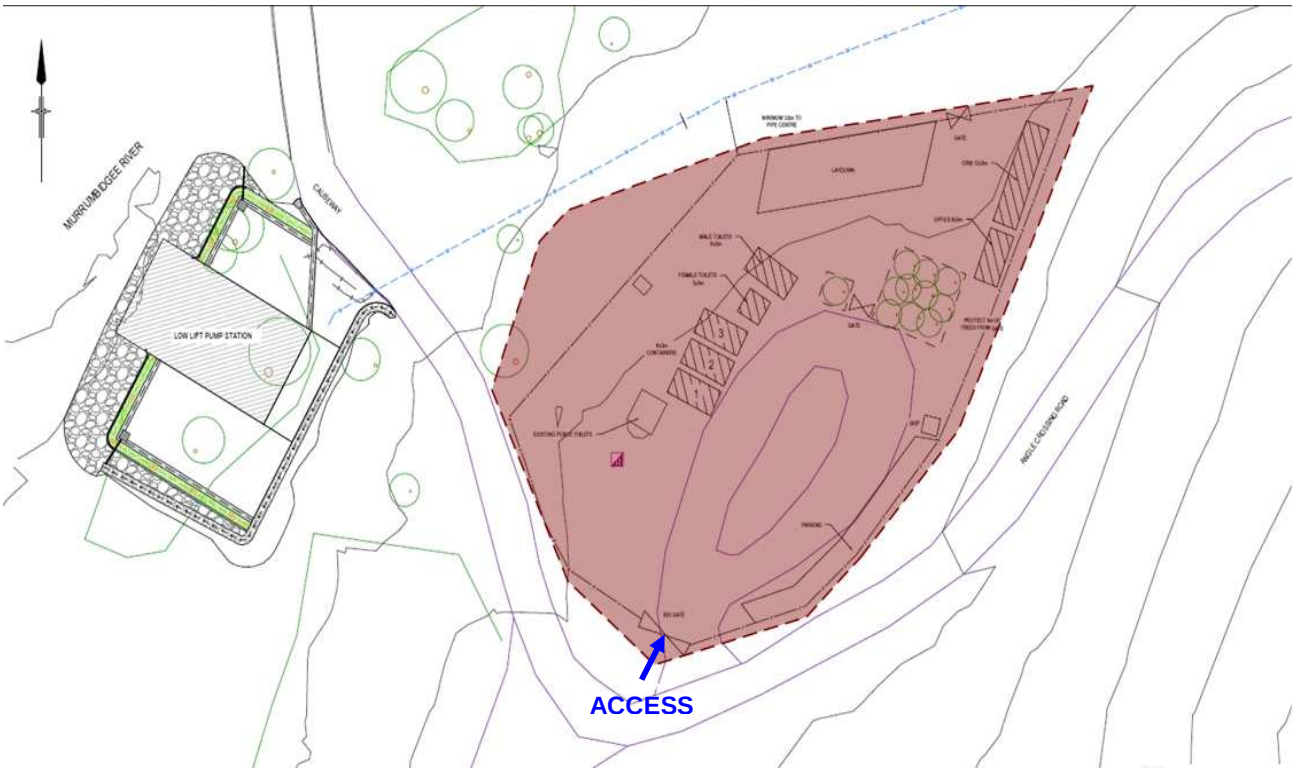


Figure 3.6 Low Lift Pump Station Compound Area 1

Figure 3.7 Low Lift Pump Station Compound Area 2

3.5 High Lift Pump Station

The High Lift pump station is located on the North side of Angle Crossing Road before the descent to the Murrumbidgee River Crossing. Figure 3.7 shows the construction easement for the construction of the High Lift Pump Station.

Figure 3.8 High Lift Pump Station Construction Boundary

3.6 Angle Crossing Road – M2G Laydown Area 1

A laydown area will be located on Angle Crossing Road as shown on Figure 3.8. This area will be used for storage of materials prior to installation.

Figure 3.9 Angle Crossing Rd - M2G Laydown Area 1

3.7 Angle Crossing Road – M2G Laydown Area 2

A pipe laydown area will be located on the property (Block 1470 Tuggeranong) to the north west of the pipeline route crossing the road as shown on Figure 3.10. This area will be used as a satellite compound including for the storage of materials prior to installation as well as accommodating toilet facilities and crib sheds.

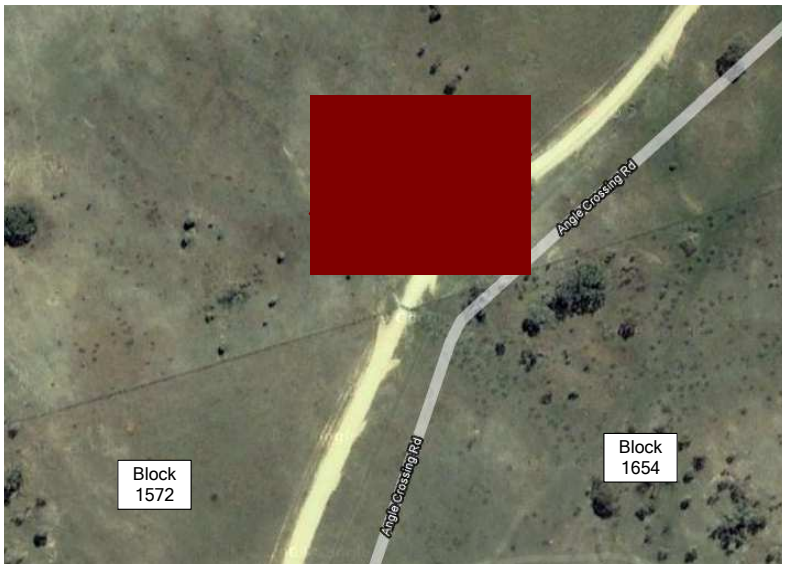


Figure 3.10 Angle Crossing - M2G Laydown Area 2

3.8 Main Site Office Building Layout

This area is the main compound for the construction of the M2G project and as such includes the offices and crib rooms as well as a storage area. In addition, two soil stockpiles are present outside of the hardstand area designated for the office and laydown areas as shown in Figure 3.11.

Figure 3.11 Main Site Office Layout

3.9 M2G Laydown Area 3 & 4

Near Monaro Highway, 2 no's Pipe laydown areas will be located adjacent to the pipeline corridor as shown on Figure 3.12.

Figure 3.12 M2G Laydown Areas 3 and 4

3.10 M2G Laydown Area 5

A pipe laydown area will be located on Lot DP 754889 adjacent to the pipeline route as shown on Figure 3.13. This area will also have toilet and crib shed facilities while in use.

Figure 3.13 M2G Laydown Area 5

3.11 M2G Laydown Area 6

A laydown area will be located at Borrow Pit (on Williamsdale Road), as shown of Figure 3.14. This area will be used to store materials for construction works as well as toilet and crib shed facilities.

Figure 3.14 M2G Laydown Area 6

3.12 Mini Hydro Area

The Mini-Hydro facility will be located adjacent to the realigned Williamsdale Road as shown in Figure 3.15. This area will also be utilised as a storage area for materials required for the construction of the Mini-Hydro facility. In addition this area will also include toilet facilities and crib sheds.

Figure 3.15 Mini-Hydro Facility

3.13 Discharge Structure Area

The Discharge Structure for the M2G pipeline is to be constructed so as to allow discharge directly into Burra Creek, as shown in Figure 3.16. It is expected that material storage will be take place in the same area used for the construction of the Mini-Hydro facility.

Figure 3.16 Discharge Structure

3.14 High Lift Pump Station Roadworks Upgrade

Roadworks to upgrade Angle Crossing Road near the High Lift Pump Station, the Area shown in Figure 3.17 will be carried out as part of the M2G project. A Traffic Management Plan will be developed and implemented ensure that Angle Crossing Road remains open to traffic during the upgrade works.

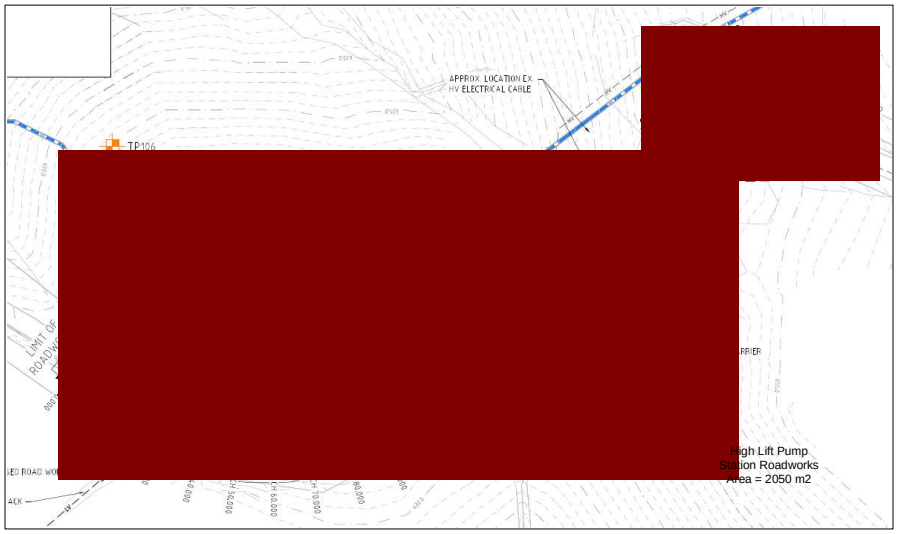


Figure 3.17 High Lift Pump Station Roadworks

3.15 Monaro Highway and Angles Crossing Intersection Upgrade

The intersection of the Monaro Highway and Angle Crossing Road will be upgraded prior to the commencement of construction as shown in Figure 3.18. The design of this upgrade has been reviewed and approved by the National Capital Authority.

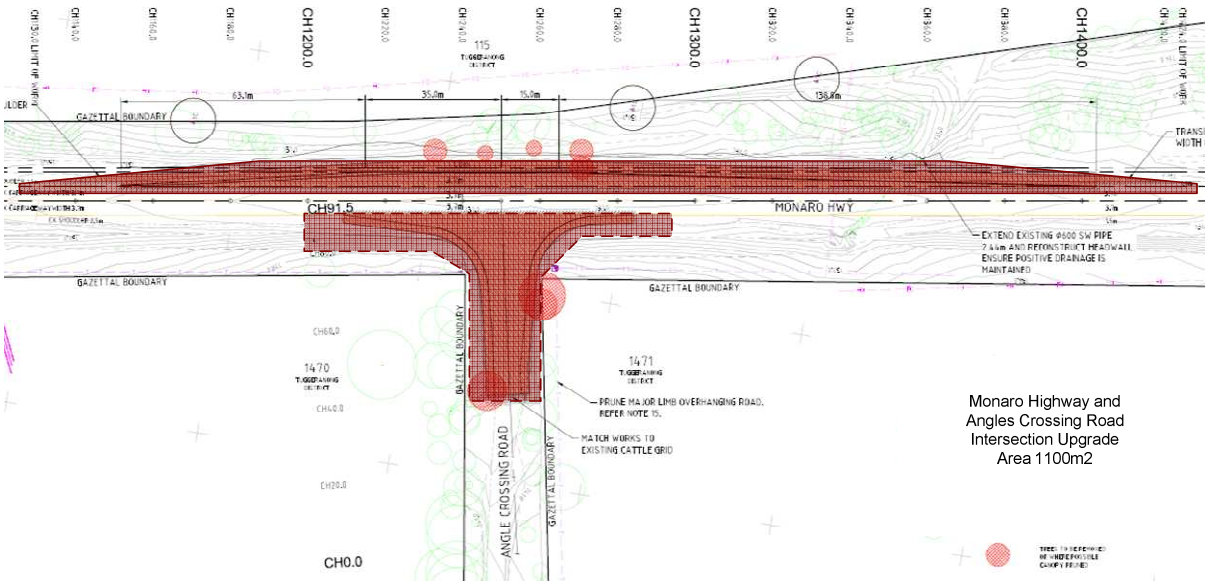


Figure 3.18 Intersection of Monaro Highway and Angle Crossing Road

4 Fencing

Each area of work will be isolated from the surrounding area utilising boundary fences. A combination of these 3 types of fencing will be used in each area.

4.1 Temporary Fencing

Temporary fencing will be on this project. It may be used around Pipe storage areas and other areas as deemed appropriate.

Figure 4.1 Temporary Fencing

4.2 Chainwire Fencing

This type of fence, although permanent can be removed with ease at the completion of the project. This type of fence will be used around the Main Office complex and other crib and storage facilities.

Figure 4.2 Chainwire Fencing

4.3 Stock Fencing

To be used along the construction corridor, in conjunction with temporary and permanent gates to be installed as per agreements with the land owners.

Figure 4.3 Stock Fencing

Appendix A **Drawings**

Monitoring Location 1
(approximately 1.4km to
the North West)

Eductor pipes

Site to be fenced off
until salvaged

LLPS

Note: Turning area to be
maintained for public use

01

1003

25m microwave tower

Note: Parking area
closed to public

02

1003

Site to be fenced off
until salvaged

1

HLPS

Site to be fenced off
during construction

Site to be fenced off
until salvaged

1003

Angle Crossing Road

Note: Angle CrossingRoad
will remain open unless
closure is approved by TAMS

Works in waterways to be carried out in
accordance with "Working in Waterway - EWMS"
(BWA-M2G-EN-EWMS-006) and relevant drawings

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
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- Pipeline Structures
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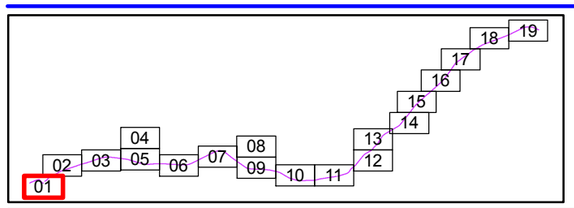

N

0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams
Landholder Constraints

Map 1 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
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Date: 11 Mar 2011
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1003B

1002A

1003B

02

1003B

Pipe Laydown Area 1

4200m^2

1002A

Site to be fenced off until salvaged

1003B

1003

1003

01

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
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- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
- Discaria pubescens
- Leucochrysum albicans var. tricolor
- Linum marginale

- Lotus australis
- Microseris lanceolata
- Pterostylis sp.
- Swainsona recta

- Swainsona sericea
- Zornia dyctiocarpa
- Diamond Firetail
- Eastern Bentwing-bat
- Gang-gang Cockatoo

- Jacky Winter
- Large-footed Myotis
- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin

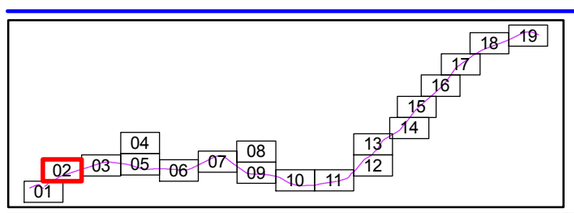
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)

Vehicle access and movement direction



N

0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams
Landholder Constraints

Map 2 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

1003A

1003A

1003B

1003B

1003B

Access restricted during construction

Site to be fenced off until salvaged

03

05

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

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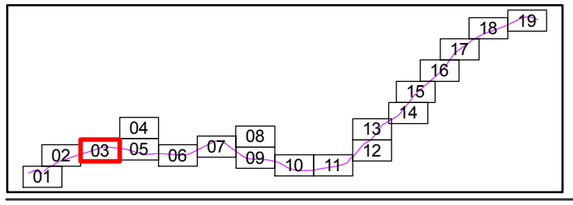
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)

- Vehicle access and movement direction



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Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 3 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Site to be fenced off until salvaged

Main Office

1003A

04

Monaro Highway

Monitoring Location 3

1003A

1003A

1003B

05

Subject to further investigations by Ecological Asutralia

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
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- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

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- EPBC/TSC
- Nominal TSC
- TSC
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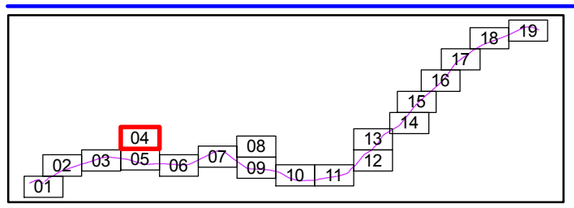
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)
- Vehicle access and movement direction



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Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 4 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
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Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Site to be archivally recorded and fenced off during construction

Note: Access to be provided for stock to cross corridor

1003A

1003B

1003B

1003B

1003B

1006

1006

Monaro Highway

04

05

03

2

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
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- Previous Cultural Heritage Recording
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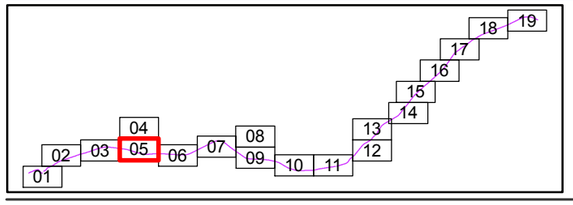
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)

Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 5 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Significant threatened species - to be identified and fenced off prior to construction commencing

Note: Access to be provided for stock to cross corridor

Soil contamination assessment to be undertaken prior to construction commencement

Erosion gully adjacent construction corridor

1102

1103

1006

DISUSED RAILWAY

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box
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- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)
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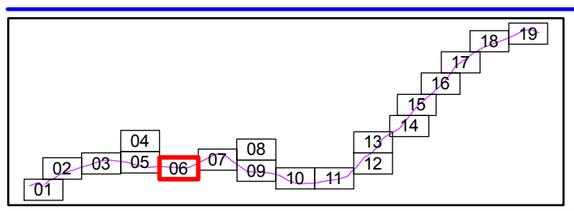
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)
- Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 6 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
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Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

08

07

1102

1104

1104

1106

Site to be fenced off during construction

Note: Access to be provided for stock to cross construction corridor

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
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- Driveway
- Tree to be preserved
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- Previous Cultural Heritage Recording
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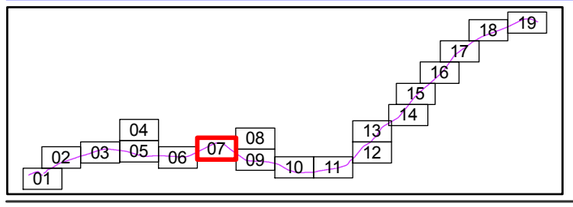
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)

Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 7 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

08

07

09

1107

1107

1106

Property Access Track

Williamsdale Road

Works in waterways to be carried out in

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
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- Previous Cultural Heritage Recording
- New Navin Data (TBC)

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- Swainsona sericea
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- Scarlet Robin
- Southern Whiteface
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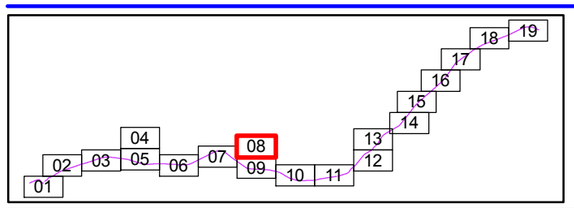
- Varied Sittella
- White-winged Triller
- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)
- Vehicle access and movement direction



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Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 8 of 19

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Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

08

09

Williamsdale Road

Site to be fenced off until salvaged

Site to be fenced off until salvaged

Pipe Laydown Area 2 10,000m^2

Site to be fenced off until salvaged

Site to be fenced off until salvaged

Property Access Track

Access to be restricted during construction following subsurface testing

Note: Access to be provided for stock to cross construction corridor

Access to be restricted during construction

1106

1107

1107

1107

1107

1107

1107

1106

1107

1107

1107

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

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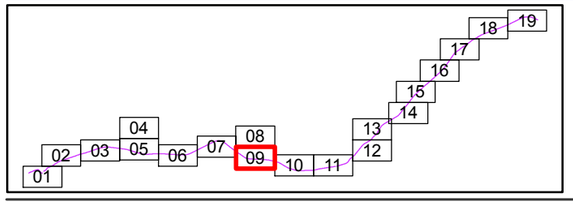
- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)

- Vehicle access and movement direction



N

0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

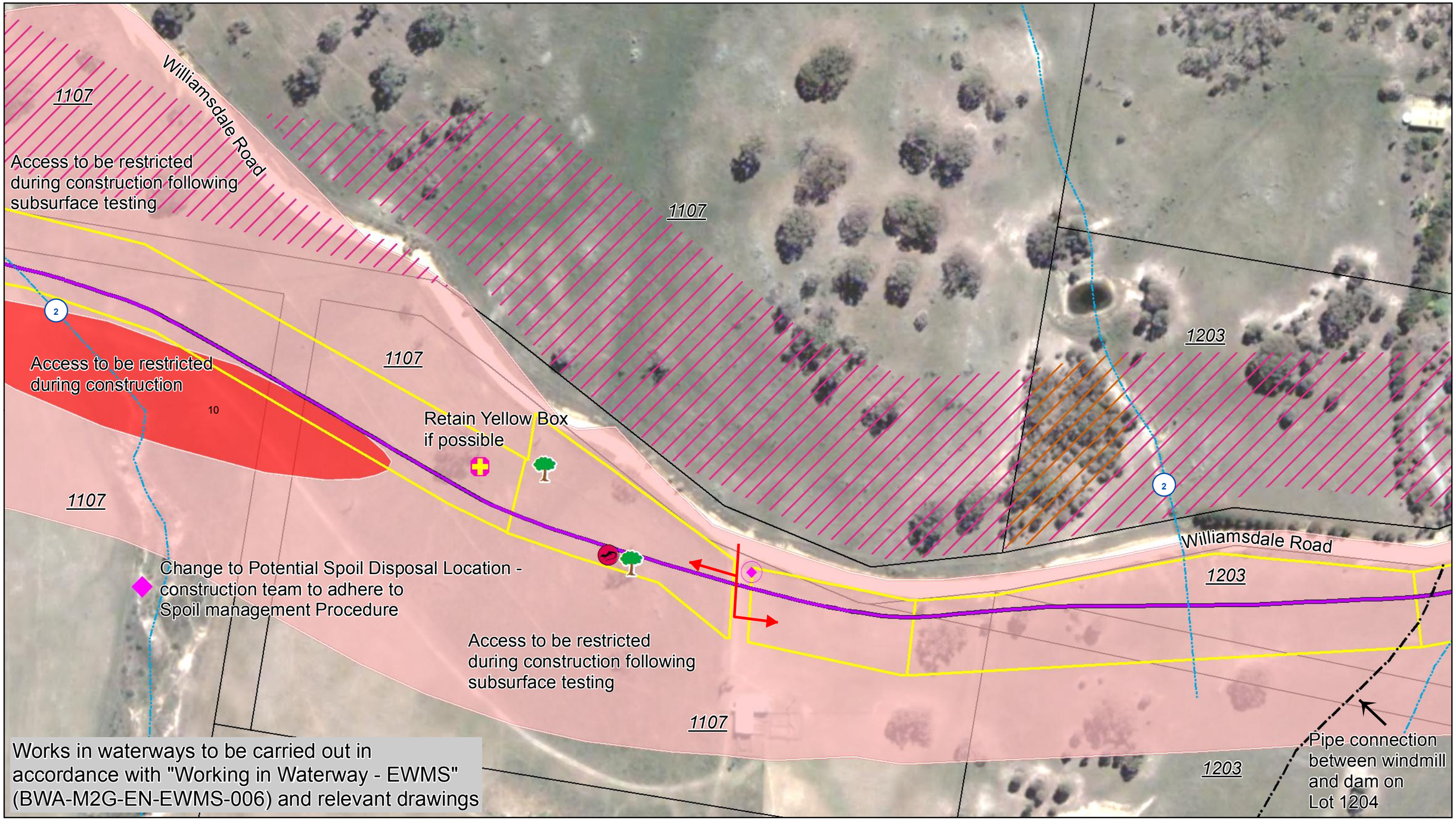
ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 9 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:



Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
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- Driveway
- Tree to be preserved
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- Previous Cultural Heritage Recording
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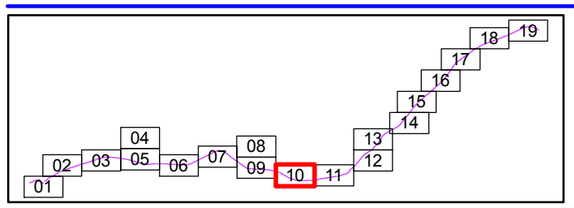
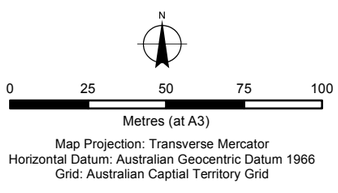
- Construction Corridor (Variable width)

- Vehicle access and movement direction





Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 10 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
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Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Monitoring Location 4

Reinstate gravity feed from dam post construction

Access to be restricted during construction

Site to be fenced off during construction

Access to be restricted during construction following subsurface testing

Protect downslope dam from sediment

Site to be fenced off during construction

Owners requested felled timber be stockpiled for firewood

1203 1203 1203 1205 2002

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

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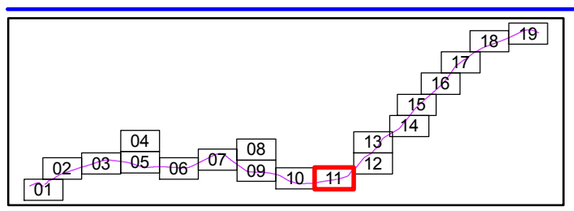
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)

- Vehicle access and movement direction



N

0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

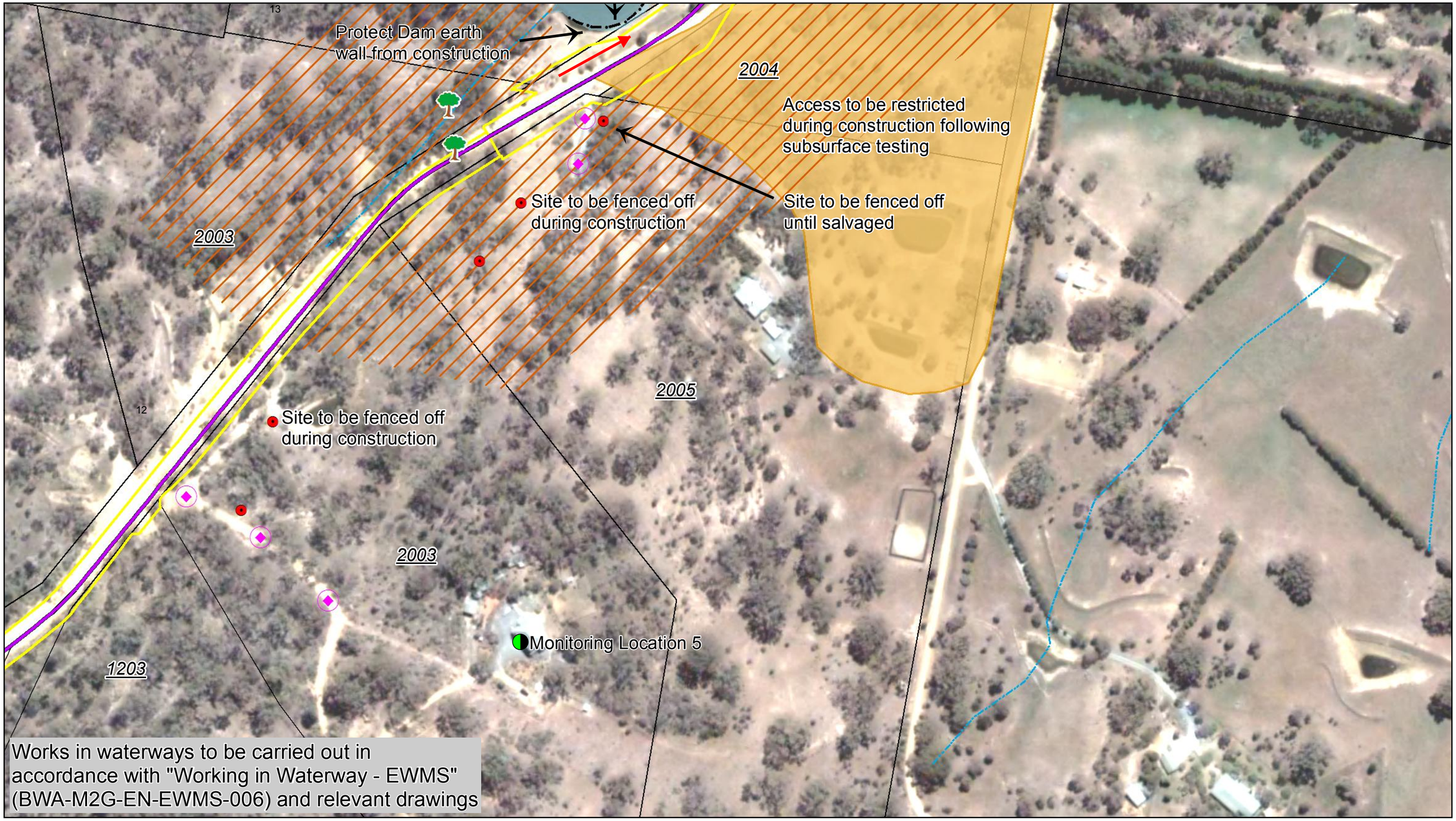
ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams
Landholder Constraints

Map 11 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:



Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
- Discaria pubescens
- Leucochrysum albicans var. tricolor
- Linum marginale

- Lotus australis
- Microseris lanceolata
- Pterostylis sp.
- Swainsona recta

- Swainsona sericea
- Zornia dyctiocarpa
- Diamond Firetail
- Eastern Bentwing-bat
- Gang-gang Cockatoo

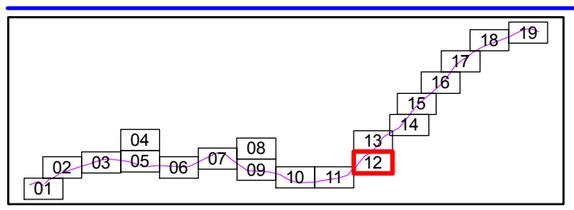
- Jacky Winter
- Large-footed Myotis
- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin

- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)
- Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 12 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Pine Trees - to be preserved. Only overhanging limbs to be removed

Access to be restricted during construction

Monitoring Location 6

Access to be restricted during construction following subsurface testing

Protect Dam earth wall from construction

Be aware of drainage line gully

Access to be restricted during construction following subsurface testing

1223
2006
2006
2006
1217
1217
2004
2004
13
14
12
1
2

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

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- Driveway
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- Previous Cultural Heritage Recording
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- Pink-tailed Worm Lizard
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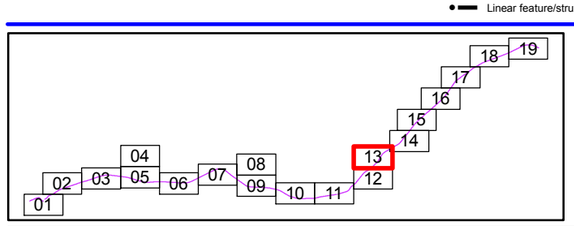
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC

- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)
- Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams
Landholder Constraints

Map 13 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Access to be restricted during construction following subsurface testing

Site to be fenced off until salvaged

Reinstatement of pipework to dam not required

Access to be restricted during construction following surface collection and subsurface testing

1222A
1223
1225
2006

13
14
15

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

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- Pterostylis sp.
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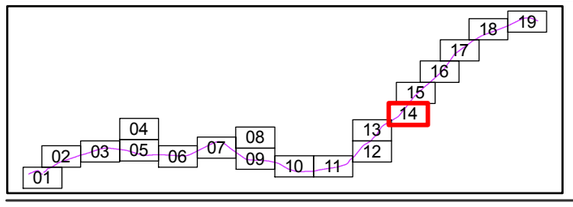
- Restless Flycatcher
- Scarlet Robin
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)

Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 14 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Reinstate roadside verge with either rock armouring or hyrdomulch.
Netting fence on roadside needs repair

Site to be fenced off until salvaged

Site to be fenced off during construction

Access to be restricted during construction

Access to be restricted during construction following subsurface testing

1303

1302

1302

1302

1223

1225

1225

16

15

14

Monitoring Location 7

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

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- Eastern Bentwing-bat
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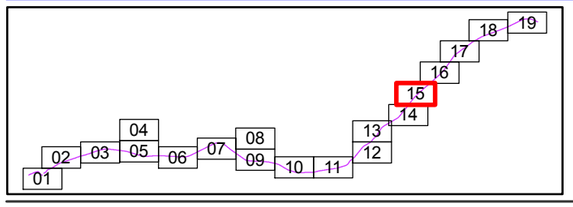
- Pink-tailed Worm Lizard
- Restless Flycatcher
- Scarlet Robin
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)

Vehicle access and movement direction



N

0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 15 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Monitoring Location 8

Site to be fenced off until salvaged

Site to be fenced off until salvaged

Access to be restricted during construction following subsurface testing

Change to "Drainage Line" - refer to Enviro report for erosion and sediment controls and rehabilitation of waterways

Williamsdale Road

Badgery Road

1309

1305

1303

16

17

15

3

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
- Discaria pubescens
- Leucochrysum albicans var. tricolor
- Linum marginale
- Lotus australis
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- Diamond Firetail
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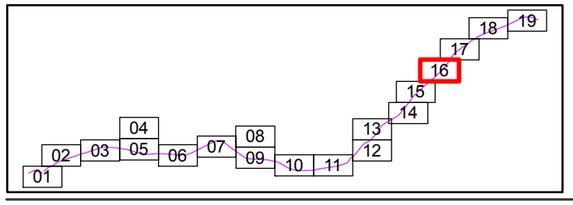
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)

Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 16 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

High Value Trees - Poplar species - DO NOT REMOVE

Site to be fenced off until salvaged

Monitoring Location 9

Access to be restricted during construction following subsurface testing

Site to be fenced off until salvaged

1312

1310

1309

17

18

16

4

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved
- Yellow box

- Surface Aboriginal Artefacts
- Historical (European) Recording
- Previous Cultural Heritage Recording
- New Navin Data (TBC)

- Arthropodium fimbriatus
- Discaria pubescens
- Leucochrysum albicans var. tricolor
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- Lotus australis
- Microseris lanceolata
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- Swainsona recta
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- Eastern Bentwing-bat
- Gang-gang Cockatoo
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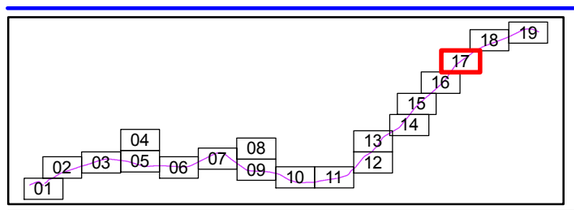
- Scarlet Robin
- Southern Whiteface
- Speckled Warbler
- Varied Sittella
- White-winged Triller

- EPBC/NC
- EPBC/TSC
- Nominal TSC
- TSC
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)
- Construction Corridor (Variable width)

Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 17 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
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Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

18

17

Site to be fenced off during construction

Trees to be preserved

1315

1315

1312

Access to be rrestricted during construction following subsurface testing

Do not prevent landholder retaining access to cattle yards. DO NOT FENCE OFF

2

4

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
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- Linear feature/structure

Land owner constraint/feature

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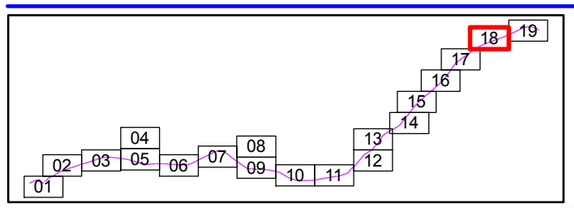
- Construction Corridor (Variable width)

Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

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Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

Map 18 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
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Works in waterways to be carried out in accordance with "Working in Waterway - EWMS" (BWA-M2G-EN-EWMS-006) and relevant drawings

Site to be fenced off during construction

Williamsdale Road

Macdiarmid Rd

Williamsdale Road

1317

Be aware of Burra Creek waterway

1317

1317

Possible old sheep dip in construction corridor. Soil contamination assessment to be undertaken prior to construction commencement

Mini-Hydro

Discharge structure

Pipe Laydown Area 3 5000m^2

Trees to be preserved

1315

Monitoring Location 10

BURRA CREEK

Monitoring Location 11

Legend

- Monitoring Location
- Electrical Transmission Line
- New Electrical Alignment
- River/Creek
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- New Electrical Easement
- Waterbody

Pre-clearance survey data

- Hollow Bearing Tree
- Pink Tail Worm Lizard
- Swansonia Recta
- Wombat Burrow
- Linear feature/structure

Land owner constraint/feature

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- Driveway
- Tree to be preserved
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- EPBC/TSC
- Nominal TSC
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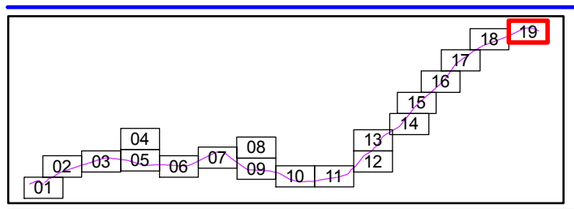
- Historical (European) Recording
- Surface Artefacts and PAD
- Surface Aboriginal Artefacts and PAD
- Potential Archeological Deposits (PAD)

- Construction Corridor (Variable width)

- Vehicle access and movement direction



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0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

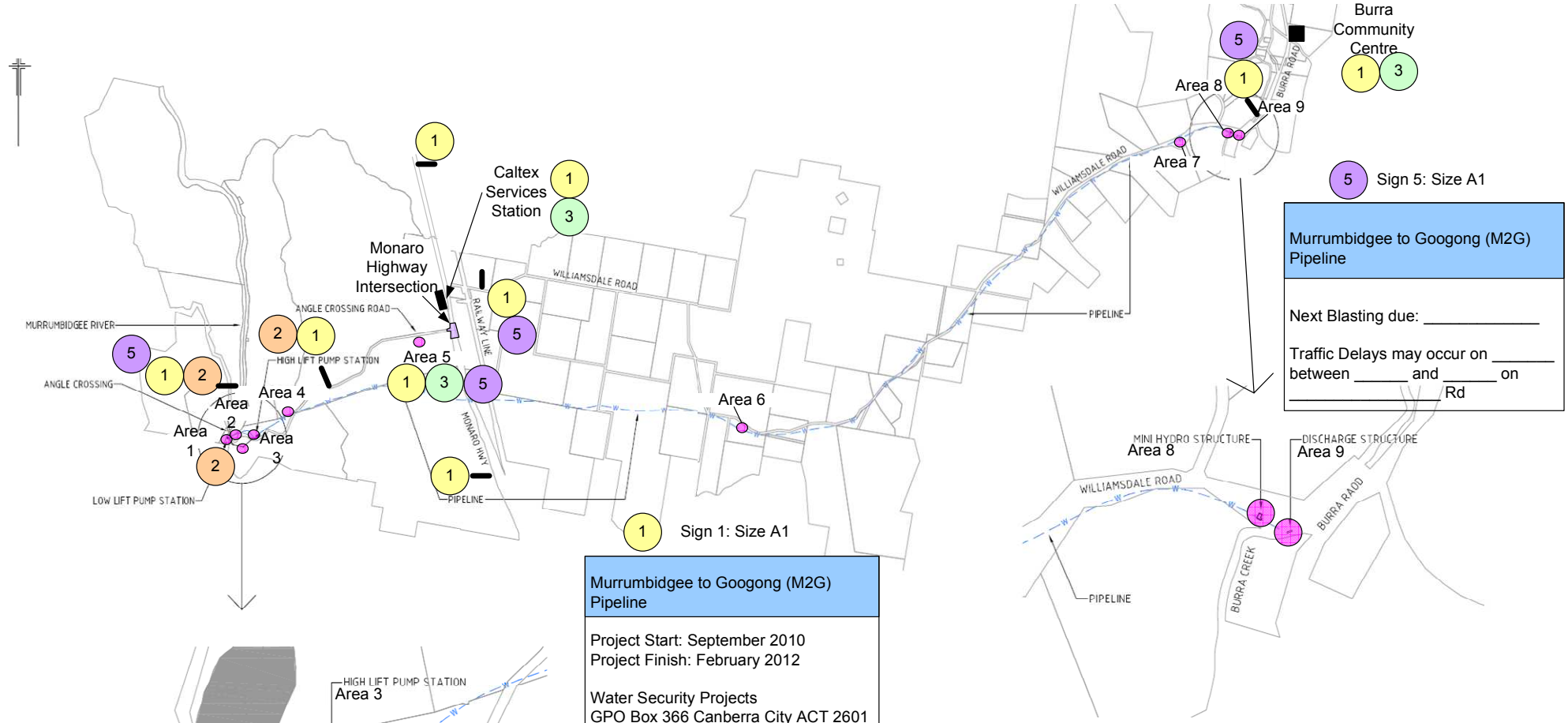
Murrumbidgee to Googong Water Transfer Project

Sensitive Area Diagrams Landholder Constraints

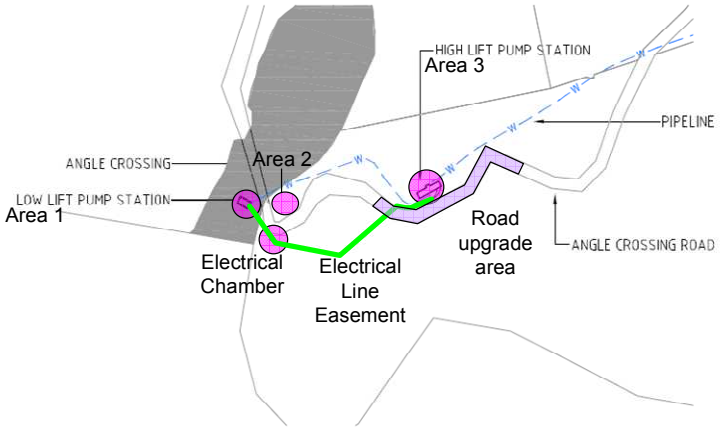
Map 19 of 19

Project Reference: GHD_M2G_GEN_EN_SAD_001_A_3
Revision: F
Date: 11 Mar 2011
Peer review:
Technical review:

Appendix E **Public Signage Plan**



MINI HYDRO & DISCHARGE LOCALITY PLAN



LOW & HIGH LIFT PUMP STATION LOCALITY PLAN

1 Sign 1: Size A1

Murrumbidgee to Googong (M2G) Pipeline

Project Start: September 2010
Project Finish: February 2012

Water Security Projects
GPO Box 366 Canberra City ACT 2601
watersecurity@actew.com.au
1800 211 242

2 Sign 2: Size A1

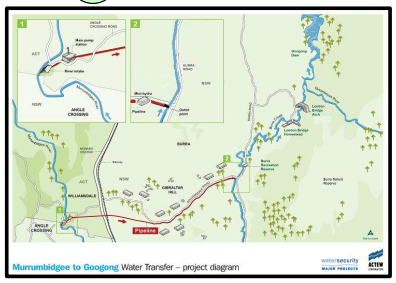
Murrumbidgee to Googong (M2G) Pipeline

Angle Crossing Recreation Area CLOSED

Alternative Recreation Area at Tharwa Sand Wash

Toilet Facilities at Tharwa

3 Sign 3: Size A1



5 Sign 5: Size A1

Murrumbidgee to Googong (M2G) Pipeline

Next Blasting due: _____

Traffic Delays may occur on _____ between _____ and _____ on _____ Rd

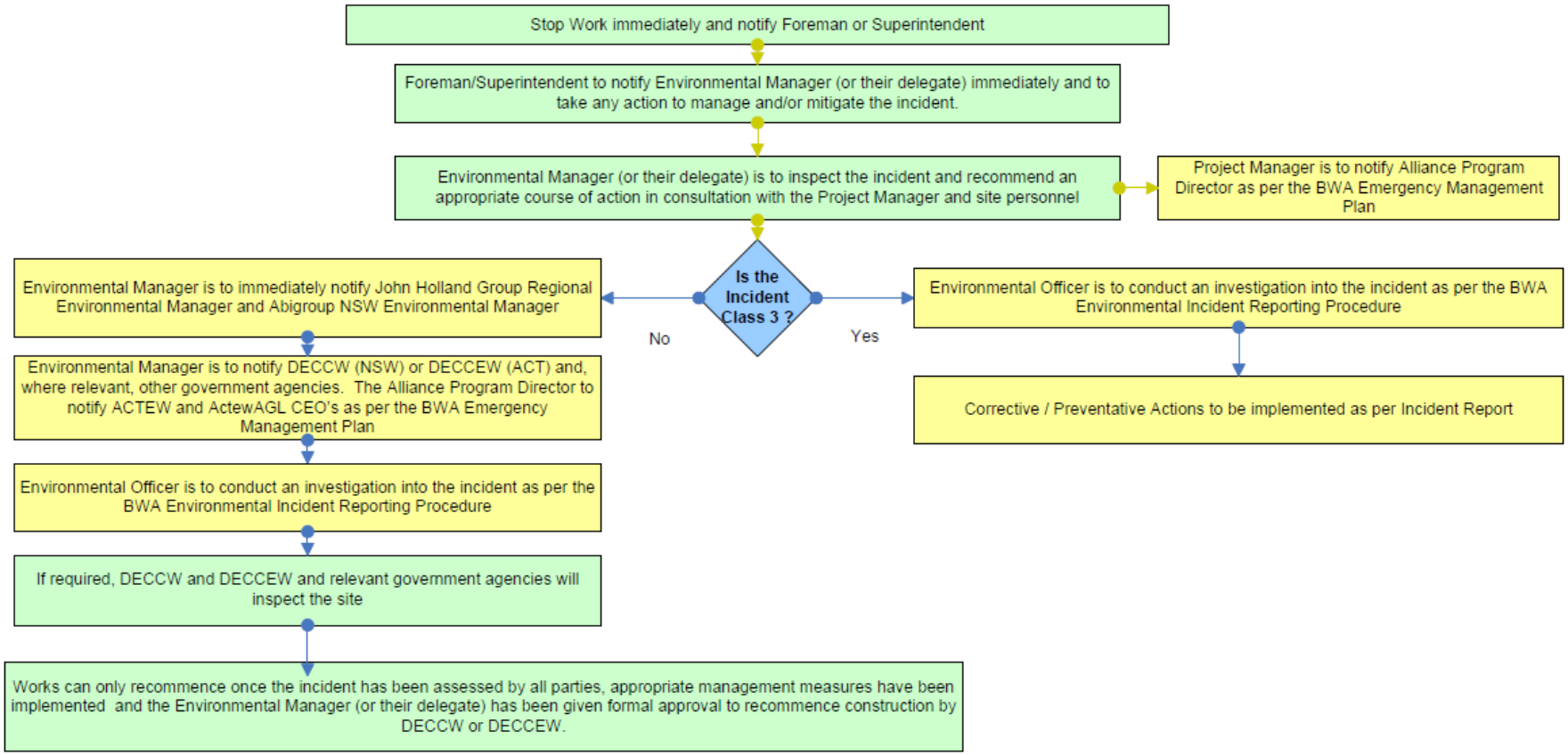
Sign 4: Size A3
Located on Construction Fences and laydown areas

DANGER

CONSTRUCTION ZONE
AUTHORISED PERSONNEL ONLY

Appendix F **Procedure in Dealing with Environmental Incidents**

Procedure in dealing with Environmental Incidents*



NOTES

* An environmental incident is
"An unexpected event that may result in harm to the environment and requires some action to minimise the impact or restore the environment".
This includes any potential or actual impacts to cultural heritage items and may include excavation of bones, pollution of waterways and impacts to threatened species.

Note: Any incident which has the potential to impact on Canberra's potable water supply MUST be reported to ActewAGL (6248-3212) immediately to initiate appropriate mitigation measures to ensure contaminated water does not pose a human health risk to the greater community

Environmental Incident Classes
Class 1 - Causes or has the potential to cause permanent environmental damage and results in remediation costs of > $100,000
Class 2 – Causes or has the potential to cause damage to the environment which can be rectified and results in remediation costs of > $5,000 < $100,000
Class 3 – Causes or has the potential to cause damage to the environment which can be easily rectified and results in remediation costs of < $5,000