Appendix A

ENVIRONMENTAL ASSESSMENT REQUIREMENTS

NSW GOVERNMENT
Department of Planning

Contact: Mark Turner
Phone: 02 9228 6339
Fax: 02 9228 6335
Email: mark.turner@planning.nsw.gov.au

Our ref: 9040628
Your ref: 060518 Keepit Major Project App

Mr David Watson
Keepit Dam Upgrade Project Manager
State Water Corporation
PO Box W16 Westfield
PARRAMATTA NSW 2150

Dear Mr Watson

Subject: Keepit Dam Upgrade – Director-General's Requirements

Reference is made to your request of 18 May 2006 for Director-General's requirements (DGRs) for the preparation of a Concept Plan to upgrade Keepit Dam. It is understood that you are seeking requirements for three upgrade options which will meet the following common operational criteria:

- Resolves the existing safety concerns and protects Keepit Dam from extreme floods and earthquakes;
- Has no affect on current flood operations or results in any different impacts than currently occurs, until a flood of less than 1:1 800 Annual Exceedance probability (or twice the largest flood over the last 108 years);
- Reduces the consequences of dam failure from 1:2 800 Annual Exceedance Probability to probable maximum flood event which, although cannot be converted to an Annual Exceedance Probability, would be at least 1:500 000 Annual Exceedance Probability;
- Maintains the current dam full supply level;
- Operates the existing gated spillway (main dam wall) first for all floods up to 1:1 800 Annual Exceedance Probability, then operates a proposed new additional right-hand abutment spillway up to around 1:10 000 Annual Exceedance Probability and then, as appropriate, the subsidiary dam wall, boat ramp and/or sailing club spillways (as appropriate to each option);
- Results in temporary additional inundation of upstream areas;
- Results in the reduction of the peak flood levels downstream of the dam during very large to extreme flood events, slightly reducing the magnitude and extend of flood damage on natural and anthropological values of the Namoi floodplain.

In preparing your Environmental Assessment report you should describe the project options and any staging in sufficient detail to allow a thorough assessment of each option. You should also be aware that the Minister, when determining a Concept Plan, may require further environmental assessments to be carried out, and may specify if and what environmental planning and assessment process is to apply to further stages of the project (e.g. no further approval, or further assessment under Part 3A or another part of the EP&A Act).

Any construction activities associated with an approval for this Concept Plan issued by the Minister for Planning that involves dredging works, extractive industries, concrete works, and crushing grinding and separating works may require an Environment Protection Licence (EPL)

from the Department of Environment and Conservation (DEC). The Proponent should refer to the following DEC website to determine whether an EPL is required:
http://www.environment.nsw.gov.au/licensing/licenceguide.htm.

It should be noted that the DGRs have been prepared based on the information provided to date. These requirements may be altered or supplemented, if necessary and in light of any additional information that may be provided (see Section 75F(3) of the *Environmental Planning and Assessment Act*).

Prior to exhibiting the Environmental Assessment, the Department will review the document to determine if it adequately addresses the DGRs. The Department will consult with other relevant government agencies in making this decision. You will be advised if it is necessary for you to revise the Environmental Assessment to address any matters that are not adequately addressed in the Environmental Assessment. Following this review period the Environmental Assessment will be made publicly available for a minimum period of 30 days.

It would be appreciated if you would contact the Department at least two weeks prior to submitting the Environmental Assessment for the project to determine:

- The fees applicable to the application;
- Relevant land owner notification requirements;
- Consultation and public exhibition arrangements that will apply;
- Options available in publishing the Environmental Assessment via the Internet; and
- Number and format (hard-copy and CD-ROM) of the Environmental Assessments that will be required.

The Director-General has decided that the matters specified in Table 1 (see attachment) will be required to be addressed in any Environmental Assessment report in accordance with Section 75F of the *Environmental Planning and Assessment Act*.

Please contact Mark Turner if you have any queries.

Chris Wilson
Acting Executive Director
Sustainable Development Assessments
As delegate for the Director-General

Attachment

NSW GOVERNMENT
Department of Planning

Table 1

Director-General Requirements for the Keepit Dam Upgrade

Project	A Concept Plan project to upgrade Keepit Dam by one of three options, B1, D2, or D3 as described in the report prepared for State Water Corporation by Parsons Brinckerhoff entitled *Keepit Dam Upgrade – Options Evaluation and Environmental Assessment – Options Comparison Report* (December, 2005). Each of the three options meet the following common criteria: • Protects the dam from large to extreme flooding and earthquakes; • Maintains current full supply level; • Operates existing gated spillway first; • Operates the right-hand abutment next, when floods exceed 2 times the 1955 flood of record; • Provides opportunities to review flood operation procedures; and • Includes a multi-level off-take.
Site	The Concept Plan project area is Keepit Dam, located between the townships of Gunnedah and Tamworth in the north-east of New South Wales on the Namoi River approximately 13 kilometres upstream of its confluence with the Peel River.
Proponent	State Water Corporation
Date of Expiration	These Director-General's Requirements expire two years from the date of issue.
General Requirements	The Environmental Assessment report must: • Address those matters raised at the Keepit Dam Upgrade Planning Focus Meeting held on 3 February 2006 and reported in the Minutes to that meeting; • Include an Executive Summary; • Describe the current statutory processes that apply to this Concept Plan; • Include details of the applicable environmental planning provisions; • Provide a relative ranking for each option based on the social and environmental costs and benefits; • Incorporate a draft Statement of Commitments which addresses environmental mitigation, management and monitoring elements <u>common</u> to each option; • For each option: – Provide a description of the option, including construction, operation, and any staging; – Include a discussion of the relative long term strategic benefits for flood mitigation, improved water storage integrity, and increased economic and social benefits for the regional community; – Assess the key environmental impacts specified below; – Incorporate a draft Statement of Commitments which addresses mitigation, management and monitoring elements <u>unique</u> to that specific option;

	• Be certified by the author of the Environmental Assessment report that the information contained in the Assessment is neither false nor misleading.
Key Assessment Requirements	The Environmental Assessment report must address the following key issues for each option: • Impacts on the terrestrial ecology, land uses/users including the adjacent State Park, caravan park, ski club, cultural environment, and geomorphologic features associated with the higher probability, smaller floods that are large enough to trigger operation of the proposed new spillways. The assessment should be undertaken using a risk-based methodology to allow a comparison of the options. • Visual impacts associated with the proposed new works. • Changes to downstream and upstream flooding impacts associated with the low frequency, large floods including the extent of flooding, floodwater velocities, erosion and deposition of sediments noting, in particular, impacts on: – Indigenous and non-indigenous cultural heritage; – Terrestrial ecology; and – Public infrastructure and private properties; • Construction and operational impacts (i.e. high and low frequency flood events which trigger the operation of the proposed new works) on fish and aquatic ecosystems from changes to the: – Flow regime and flood patterns; – Channel morphology; – Patterns of sedimentation; – In-stream habitats; – Fish migration and fish passage taking into account any requirement by the Minister for Primary Industries to construct a suitable fishway or fish by-pass consistent with Section 218 of the *Fisheries Management Act* and the NSW Weirs Policy; – Water quality i.e. nutrients, dissolved oxygen, temperature etc; – Riparian vegetation. • Biodiversity offset strategies that may be used to mitigate impacts on terrestrial and aquatic threatened species or endangered ecological communities that have been identified or are predicted to be present. (Principles for biodiversity offsets and banking schemes are currently under development by the Department of Environment and Conservation, and can be found at http://www.environment.nsw.gov.au/threatspec/biobankscheme.htm). • Relationship of the proposed works to the Namoi Water Sharing Plan and the Murray-Darling Basin CAP.
Relevant Guidelines	• Draft *Guidelines for Threatened Species Assessment* (July, 2005), prepared by the Department of Environment and Conservation and the Department of Primary Industries. • Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (July, 2005), prepared by the Department of Environment and Conservation.
Consultation	You must consult with the following parties during the preparation of the

Requirements	Environmental Assessment: • Department of Environment and Conservation; • Department of Primary Industries; • Department of Natural Resources; • Namoi Catchment Management Authority; • Department of Lands; • NSW Dams Safety Committee; • Tamworth Regional Council; • Gunnedah Shire Council; • Local community including Aboriginal land councils; and • Commonwealth Department of Environment and Heritage regarding the application of the *Environment Protection and Biodiversity Conservation Act.*
Exhibition of EA and notification requirements	Pursuant to Section 75H(3) of the EP&A Act, the Environmental Assessment report must be exhibited for a minimum of 30 days.
Deemed refusal period	Not applicable. However, consistent with clause 8E(2) of the EP&A Regulations, the Department's indicative assessment period will be 120 days.

NSW GOVERNMENT
Department of Planning

Contact: Mark Turner
Phone: (02) 9228 6351
Fax: (02) 9228 6355
Email: mark.turner@planning.nsw.gov.au

Our ref: 9040628

Mr David Watson
Keepit Dam Upgrade Program Manager
State Water Corporation
PO Box W16 Westfield
PARRAMATTA NSW 2150

Dear Mr Watson,

Lake Keepit Dam Upgrade – Supplement to the Director-General's Requirements

I refer to the Director-General's Requirements issued for the above project on 26 June 2006.

As you are aware, the project has now been declared to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). As a consequence, the Department of Planning has confirmed on behalf of the Minister for Planning that the NSW Assessment Bilateral under that Act will apply, and the Department will undertake an environmental impact assessment of the project to satisfy the requirements of both NSW and Commonwealth legislation.

To ensure that sufficient information is provided to enable an appropriate level of assessment of relevant controlling actions, the Director-General has issued supplementary requirements for the Environmental Assessment under section 75F(3) of the *Environmental Planning and Assessment Act 1979* (NSW). A copy of the supplementary Director-General's requirements is attached.

You must ensure that the Environmental Assessment adequately addresses the Director-General's requirements issues on 26 June 2006, and the supplementary requirements attached to this letter.

Should you have any further enquiries please do not hesitate to contact Mark Turner on (02) 9228-6351.

Yours sincerely

20.3.07

Chris Wilson
Executive Director
Major Project Assessments
As delegate for the Director-General

Supplementary Director General's Requirements

Section 75F(3) of the *Environmental Planning and Assessment Act 1979*

The Lake Keepit Dam upgrade project (reference: 06_0155, EPBC 2006/3186) has been declared to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Under the provisions of the bilateral agreement between New South Wales and the Commonwealth, the environmental impacts of the controlled action will be assessed under Part 3A of the *Environmental Planning & Assessment Act 1979.*

To enable the assessment of controlling actions under the EPBC Act, the Director-General's requirements issued for the project on 26 June 2006 are supplemented with the following additional requirements.

The Environmental Assessment must include:

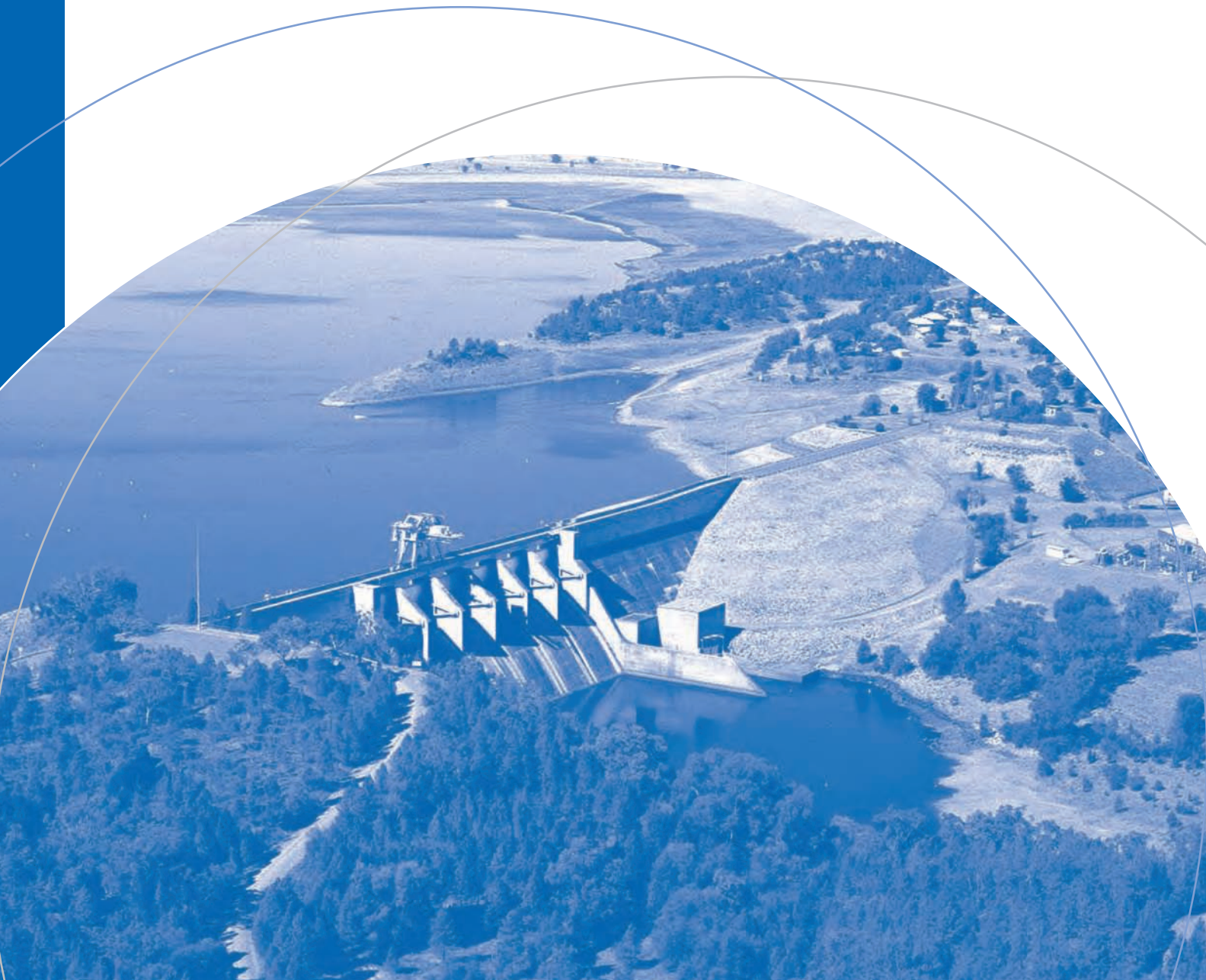
- a description of the controlled action;
- a description of the relevant impacts[1] of the controlled action;
- a description of feasible mitigation measures, changes to the controlled action or procedures, which have been proposed by the proponent or suggested in public submissions, and which are intended to prevent or minimise relevant impacts;
- to the extent practicable, a description of any feasible alternatives to the controlled action that have been identified through the assessment, and their likely impact;
- an assessment of all relevant impacts that the controlled action has, will have or is likely to have on the *Murray Cod (Maccullochella peelii peelii), Namoi River Turtle (elseya belli), White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, and other species potentially present and listed under sections 18 and 18A of the EPBC Act;
- sufficient information about the controlled action and its relevant impacts to allow an informed decision whether or not to approve the controlled action under the EPBC Act; and
- information to address the matters outlined in Schedule 4 of the Commonwealth *Environment Protection and Biodiversity Conservation Regulations 2000*.

The description and assessment of these issues in the Environmental Assessment must be integrated as far as is practicable with the description and assessment of the other flora and fauna impacts of the project.

[1] The term "relevant impact" is defined in section 82 of the EPBC Act.

Appendix B

CHECKLIST OF ENVIRONMENTAL ASSESSMENT REQUIREMENTS



Checklist of Environmental Assessment requirements

Table B.1 identifies the relevant Sections of the Environmental Assessment that address each of the environmental assessment requirements of the Director-General of the Department of Planning.

Table B.1 Checklist of the Director-General's environmental assessment requirements

Director-General's requirement	Relevant Section of the Environmental Assessment
General requirements	
The Environmental Assessment report must:	
▪ Address those matters raised at the Keepit Dam Upgrade Planning Focus Meeting held on 3 February 2006 and reported in the Minutes to that meeting;	See *Table B.2* below
▪ Include an Executive Summary;	Executive summary
▪ Describe the current statutory processes that apply to this Concept Plan;	Section 1.7 and Chapter 2
▪ Include details of the applicable environmental planning provisions;	Section 1.7.2 and Chapter 2
▪ Provide a relative ranking for each option based on the social and environmental costs and benefits;	Chapter 7
▪ Incorporate a draft Statement of Commitments which addresses environmental mitigation, management and monitoring elements common to each option;	Chapter 9 and Appendix D
▪ For each options:	
▸ Provide a description of the option, including construction, operation and any staging;	Sections 4.1, 4.3 and 4.4
▸ Include a discussion of the relative long term strategic benefits for flood mitigation, improved water storage integrity, and increased economic and social benefits for the regional community;	Sections 3.3, 3.4, 3.6, 3.7 and 10.1
▸ Assess the key environmental impacts specified below;	Chapters 5 and 6 and Technical Papers 1-4
▸ Incorporate a draft Statement of Commitments which addresses mitigation, management and monitoring elements unique to that specific option.	Appendix D
▪ Be certified by the author of the Environmental Assessment report that the information contained in the Assessment is neither false nor misleading.	Statement of Validity
Key assessment requirements	
The Environmental Assessment report must address the following key issues for each option:	
▪ Impacts on the terrestrial ecology, land uses/users including the adjacent State Park, caravan park, ski club, cultural environment, and geomorphologic features associated with the higher probability, smaller floods that are large enough to trigger operation of the proposed new spillways. The assessment should be undertaken using a risk-based methodology to allow a comparison of the options.	Sections 6.2.2, 6.3.3, Appendix D and Technical Paper 1

Director-General's requirement	Relevant Section of the Environmental Assessment
▪ Visual impacts associated with the proposed new works.	Section 5.4 and Technical Paper 4
▪ Changes to downstream and upstream flooding impacts associated with the low frequency, large floods including the extent of flooding, floodwater velocities, erosion and deposition of sediments noting, in particular, impacts on:	Sections 6.2.2, 6.2.3 and 6.3.3 and Appendix E
▸ Indigenous and non-Indigenous cultural heritage;	Sections 6.2.2, 6.2.3 and 6.3.3 and Appendix E
▸ Terrestrial ecology;	Sections 6.2.2, 6.2.3 and 6.3.3 and Appendix E
▸ Public infrastructure and private properties.	Sections 4.5, 6.2.2, 6.2.3 and 6.3.3
▪ Construction and operational impacts (i.e. high and low frequency flood events which trigger the operation of the proposed new works) on fish and aquatic ecosystems from changes to the:	Sections 5.2, 6.2 and 6.3, Appendix E and Technical Paper 2
▸ Flow regime and flood patterns;	Sections 5.2, 6.2 and 6.3, Appendix E and Technical Paper 2
▸ Channel morphology;	Sections 5.2, 6.2 and 6.3, Appendix E and Technical Paper 2
▸ Patterns of sedimentation;	Sections 5.2,6.2 and 6.3, Appendix E and Technical Paper 2
▸ In-stream habitats;	Sections 5.2, 6.2 and 6.3, Appendix E and Technical Paper 2
▸ Fish migration and fish passage taking into account any requirement by the Minister for Primary Industries to construct a suitable fishway or fish by-pass consistent with Section 218 of the Fisheries Management Act and the NSW Weirs Policy;	Section 8.2
▸ Water quality i.e. nutrients, dissolved oxygen, temperature etc;	Sections 5.2, 6.2, 6.3 and 8.1, Appendix E and Technical Paper 2
▸ Riparian vegetation.	Sections 5.1, 6.2 and 6.3, Appendix D and Technical Paper 1
▪ Biodiversity offset strategies that may be used to mitigate impacts on terrestrial and aquatic threatened species or endangered ecological communities that have been identified or are predicted to be present. (Principles for biodiversity offsets and banking schemes are currently under development by the Department of Environment and Climate Change, and can be found at http://www.environment.nsw.gov.au/threatspec/biobankscheme.htm).	Section 5.1.3
▪ Relationship of the proposed works to the Namoi Water Sharing Plan and the Murray-Darling Basin CAP.	Sections 2.5.1 and 2.5.2

Director-General's requirement	Relevant Section of the Environmental Assessment
Consultation	
You must consult with the following parties during the preparation of the Environmental Assessment:	
▪ Department of Environment and Conservation;	Section 1.7.3
▪ Department of Primary Industries;	Section 1.7.3
▪ Department of Natural Resources;	Section 1.7.3
▪ Namoi Catchment Management Authority;	Section 1.7.3
▪ Department of Lands;	Section 1.7.3
▪ NSW Dams Safety Committee;	Section 1.7.3
▪ Tamworth Regional Council;	Section 1.7.3
▪ Gunnedah Shire Council;	Section 1.7.3
▪ Local community including Aboriginal land councils; and	Sections 1.7.3 and 5.3 and Technical Paper 3
▪ Commonwealth Department of the Environment and Heritage regarding the application of the *Environment Protection and Biodiversity Conservation Act 1999*.	Section 2.4

On 20 March 2007, the Director-General of the Department of Planning issued supplementary environmental assessment requirements for the Keepit Dam Upgrade (refer *Appendix A*). These supplementary requirements were issued after the Department of Planning confirmed that the project is subject to the NSW Assessment Bilateral agreement with the Commonwealth Department of the Environment and Water Resources for the environmental assessment of controlled actions under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. The supplementary requirements ensure that the environmental impact assessment of the proposal meets the requirements of both NSW and Commonwealth legislation.

Table B.2 identifies the relevant Sections of the Environmental Assessment that address each of the supplementary environmental assessment requirements of the Director-General of the Department of Planning.

Table B.2 Checklist of the Director-General's supplementary environmental assessment requirements

Director-General's s requirement	Relevant Section of the Environmental Assessment
Supplementary requirements	
The Environmental Assessment must include:	
▪ a description of the controlled action;	Chapter 4
▪ a description of the relevant impacts[1] of the controlled action;	Sections 5.1.2, 6.2.2, 6.2.3 and 6.3.3 and Technical Papers 1 and 2

Director-General's s requirement	Relevant Section of the Environmental Assessment
▪ a description of feasible mitigation measures, changes to the controlled action or procedure, which have been proposed by the proponent or suggested in public submissions, and which are intended to prevent or minimise relevant impacts;	Sections 5.1.3, 6.2.4 and 6.3.4
▪ to the extent practicable, a description of any feasible alternatives to the controlled action that have been identified through the assessment, and their likely impact;	Sections 3.6 and 4.1
▪ an assessment of all relevant impacts that the controlled action has, will have or is likely to have on the Murray Cod (*Maccullochella peelii peelii*), Namoi River Turtle (*Elseya balli*), White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland, and other species potentially present and listed under Sections 18 and 18A of the *Environment Protection and Biodiversity Conservation Act 1999*;	Sections 5.1.2, 5.2.2, 6.2.2, 6.2.3 and 6.3.3 and Technical Papers 1 and 2
▪ sufficient information about the controlled action and its relevant impacts to allow an informed decision whether or not to approve the controlled action under the *Environment Protection and Biodiversity Conservation Act 1999*; and	Sections 5.1.2, 5.2.2, 6.2.2, 6.2.3 and 6.3.3 and Technical Papers 1 and 2
▪ information to address the matters outlined in Schedule 4 of the Commonwealth Environment Protection and Biodiversity Conservation Regulations 2000.	Appendix C
The description and assessment of these issues in the Environmental Assessment must be integrated as far is practicable with the description and assessment of the other flora and fauna impacts of the project.	The description and assessment of relevant impacts of the action is integrated with the description and assessment of the other flora and fauna impacts of the project. See Sections 5.1, 5.2, 6.2 and 6.3 and Technical Papers 1 and 2.

Notes:

1 The term 'relevant impact' is defined in Section 82 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Table B.3 identifies the relevant Sections of the Environmental Assessment that address each of the matters raised at the Keepit Dam Upgrade planning focus meeting held on 3 February 2006 and reported in the minutes to that meeting.

Table B.3 Checklist of matters raised at the planning focus meeting

Matters raised at the Keepit Dam Upgrade planning focus meeting and included in the minutes to that meeting	Relevant Section of the Environmental Assessment
State Water gave a brief overview and recap on the project status, during which the following matters were raised:	
▪ potential vegetation offsets associated with the auxiliary spillway clearing, particularly in the area of the right-hand abutment	Section 5.1.3
▪ location of the construction plant and equipment depot and office	Section 4.4 and Figures 4-1 – 4-3
▪ hydrology scenario modelling such that a probable maximum flood is occurring concurrently in the Namoi and Peel catchments	Sections 6.1 and 6.2.1 and Appendix E
Parsons Brinckerhoff presented the findings of the draft Options Comparison Report. The following matters were raised:	
▪ approach to defining or describing the probable maximum flood through Keepit Dam	Section 6.1
▪ use of armour to reduce erosion downstream of the auxiliary spillways	Section 6.3.4 and Appendix E
▪ approach of the economic analysis to costing restoration of erosion damaged areas immediately downstream of the new spillways	
▪ inclusion of replacement of release plugs in the financial assessment	
State Water outlined the outcomes of the pre-planning focus meeting held with key environmental agencies in 2005. The following matters were raised:	
▪ approach of the erosion and sedimentation impact assessment towards cultural heritage issues and consultation of Indigenous groups	Section 5.3, Appendix E and Technical Paper 3
State Water presented further details of the options' construction impacts and potential mitigation measures. The following matters were raised:	
▪ use of an 'ease of further upgrades' criteria in the options assessment	Section 7.1
▪ inclusion of 'loss of storage' in the economic analysis	
▪ aim of the planning focus meeting with regards to selection of a preferred option	Sections 1.7.3 and1.7.4
▪ number of landholders in the flow path below Option B1 subsidiary dam spillway	Section 4.5
▪ whether State Water would acquire properties from landholders in the flow path below Option B1 subsidiary dam spillway as part of the project	Section 4.5, Chapter 9 and Appendix D
▪ construction period of the project	Section 4.4.11

Matters raised at the Keepit Dam Upgrade planning focus meeting and included in the minutes to that meeting	Relevant Section of the Environmental Assessment
▪ approach to addressing impacts in the State Park during and after construction, particularly for Options D2 and D3	
▪ source of material for the release plugs, spillways and concrete	Section 4.4.6
▪ location of the batching plant/depot area	Section 4.4.8 and Figures 4-1 – 4-3
▪ protection of the spillways from cutback erosion	Sections 4.4.2, 4.4.4 and 4.4.5
▪ availability of the information obtained during the environmental investigations and economic analysis by Hassall and Associates to NSW Government stakeholders to assist in comparing options	
▪ putting forward the preferred option to the Budget Committee (given the proposal would require NSW Government funding)	Sections 1.7.4 and 1.7.5
The planning focus meeting included a general discussion of key issues, during which the following matters were raised:	
▪ affect of different options on the current flow regime including identification of impacts on downstream endangered ecological communities	Sections 6.2.2 and 6.3.3 and Appendix E
▪ relevance of Section 218 of the *Fisheries Management Act 1994* and, specifically, whether the proposal constitutes an alteration or modification of the structure and therefore whether fish passage would need to be considered and whether a fish passage program could be incorporated into the conditions of approval	Table 2.3, Sections 3.5.3, 8.2.1 and 8.2.5, Chapter 9 and Appendix D
▪ use of access roads during construction and road access impacts during extreme flooding	Sections 4.4 and 6.2.2
▪ social improvements/implications due to the proposal	Sections 3.7, 6.2.2 and 10.1
▪ link between committing to fish passage and fish passage proposals	Sections 8.2.1 and 8.2.5, Chapter 9 and Appendix D
▪ involvement of the Department of Lands in ongoing investigations into potential impacts to the State Park	Section 1.7.3
The following project requirements were raised and discussed by NSW Government agencies during the planning focus meeting:	
▪ role of Councils in approvals	Sections 2.1 and 2.6
▪ pathway/process for obtaining environmental assessment requirements from the Director-General of the Department of Planning	Section 1.7.2 and Appendix A
▪ circulation of the Project Application to government agencies prior to submission	Not applicable to the Environmental Assessment report
▪ process for government agencies providing their environmental assessment requirements to the Department of Planning	Not applicable to the Environmental Assessment report
▪ timing of licensing (e.g. for extraction) in the environmental assessment process	Section 2.5

Appendix C

CHECKLIST OF SCHEDULE 4 OF THE ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION REGULATIONS 2000

Checklist of Schedule 4 of the Environment Protection and Biodiversity Conservation Regulations 2000

Schedule 4 of the Environment Protection and Biodiversity Conservation Regulations 2000 identifies matters to be addressed by public environment reports and environmental impact statements. *Table C.1* identifies the relevant Section of the Environmental Assessment that address each of the matters identified in Schedule 4.

Table C.1 Checklist of matters identified in Schedule 4 of the Environment Protection and Biodiversity Conservation Regulations 2000

Description of matter	Relevant Section of the Environmental Assessment
1 General information	
1.01 The background of the action including:	
(a) the title of the action;	Executive Summary and Section 1.1
(b) the full name and postal address of the designated proponent;	State Water Corporation PO Box 1018 Dubbo NSW 2830
(c) a clear outline of the objective of the action;	Section 3.5
(d) the location of the action;	Section 1.2 and Figures 1-1 and 1-2
(e) the background to the development of the action;	Sections 1.1 and 1.5
(f) how the action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action;	Not applicable
(g) the current status of the action;	Sections 1.1, 1.7 and 10.3
(h) the consequences of not proceeding with the action.	Section 3.6.1
2 Description	
2.01 A description of the action, including:	
(a) all the components of the action;	Chapter 4 and Figures 4-1 to 4-3
(b) the precise location of any works to be undertaken, structures to be built or elements of the action that may have relevant impacts;	Section 4.4 and Figures 4-1 to 4-3
(c) how the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts;	Section 4.4
(d) relevant impacts of the action;	Chapters 5 and 6
(e) proposed safeguards and mitigation measures to deal with relevant impacts of the action;	Chapters 5, 6, 9 and Appendix D
(f) any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action;	Table 2.3, Chapter 9 and Appendix D

Description of matter	Relevant Section of the Environmental Assessment
(g) to the extent reasonably practicable, any feasible alternatives to the action, including:	
(i) if relevant, the alternative of taking no action;	Section 3.6.1
(ii) a comparative description of the impacts of each alternative on the matters protected by the controlling provisions for the action;	Section 7.1 and Table 7.1
(iii) sufficient detail to make clear why any alternative is preferred to another;	Section 7.2
(h) any consultation about the action, including:	
(i) any consultation that has already taken place;	Section 1.7.3
(ii) proposed consultation about relevant impacts of the action;	Section 1.7.4
(iii) if there has been consultation about the proposed action — any documented response to, or result of, the consultation;	Section 3.7
(i) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.	Section 4.5, Chapters 5 and 6
3 Relevant impacts	
3.01 Information given under paragraph 2.01 (d) must include:	
(a) a description of the relevant impacts of the action;	Chapters 5 and 6 and Technical Papers 1 and 2
(b) a detailed assessment of the nature and extent of the likely short term and long term relevant impacts;	Chapters 5 and 6 and Technical Papers 1 and 2
(c) a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;	Sections 1.6.1 and 6.3.2
(d) analysis of the significance of the relevant impacts;	Chapters 5 and 6 and Technical Papers 1 and 2
(e) any technical data and other information used or needed to make a detailed assessment of the relevant impacts.	Chapters 5 and 6 and Technical Papers 1 and 2
4 Proposed safeguards and mitigation measures	
4.01 Information given under paragraph 2.01 (e) must include:	
(a) a description, and an assessment of the expected or predicted effectiveness of, the mitigation measures;	Chapters 5 and 6
(b) any statutory or policy basis for the mitigation measures;	Chapters 5 and 6
(c) the cost of the mitigation measures;	The cost of the options and proposed environmental improvements are provided in Table 4.1. The cost of any biodiversity offset for the project cannot be determined until a biodiversity offset strategy is designed to

Description of matter	Relevant Section of the Environmental Assessment
	the satisfaction of the Director-General of the NSW Department of Planning (refer Section 5.1.3).
(d) an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;	Commitment nos. 11 to 18 in Appendix D
(e) the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program;	Commitment nos. 13 and 14 in Appendix D
(f) a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measures proposed to be taken by State governments, local governments or the proponent.	Commitment nos. 19 and 44 in Appendix D
5 Other approvals and conditions	
5.01 Information given under paragraph 2.01 (f) must include:	
(a) details of any local or State government planning scheme, or plan or policy under any local or State government planning system that deals with the proposed action, including:	
(i) what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy;	Section 2.3.2
(ii) how the scheme provides for the prevention, minimisation and management of any relevant impacts;	Sections 1.7.2 and 2.3.2 and Appendix A
(b) a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the Act), including any conditions that apply to the action;	Nil
(c) a statement identifying any additional approval that is required;	Table 2.3, Chapter 9 and Appendix D
(d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.	Chapter 9 and Appendix D
6 Environmental record of person proposing to take the action	
6.01 Details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:	
(a) the person proposing to take the action; and	There are no proceedings against State Water under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources.
(b) for an action for which a person has applied for a	Not applicable

Description of matter	Relevant Section of the Environmental Assessment
permit, the person making the application.	
6.02 If the person proposing to take the action is a corporation — details of the corporation's environmental policy and planning framework.	State Water operates in accordance with its Environmental Management Plan 2006 – 2010. The Plan identifies State Water's environmental objectives, initiatives, strategies and targets for the next five years. Copies of State Water's Environment Management Plan 2006 – 2010 can be downloaded from State Water's website: http://www.statewater.com.au/abouus/swcemp.pdf.
7 Information sources	
7.01 For information given in a draft public environment report or environmental impact statement, the draft must state:	
(a) the source of the information; and	References
(b) how recent the information is; and	References
(c) how the reliability of the information was tested; and	The information contained in the Environmental Assessment has been compiled and prepared by professional environmental consultants who are recognised experts in their fields. Additionally, Technical Paper 1 has been peer reviewed by Mr Philip Spark of North West Ecological Services who has extensive experience in undertaking biodiversity assessments in north-western NSW.
(d) what uncertainties (if any) are in the information.	As with any field- or desk-based surveys, there is uncertainty in the survey information presented. A precautionary approach has therefore been taken in the interpretation of these data (e.g. suggesting the presence of threatened species based on the suitability of habitat). Also refer to the declaration provided in the Statement of Validity.

Appendix D

DRAFT STATEMENT OF COMMITMENTS

SCHEDULE 1: DESCRIPTION OF ACTIVITY

The Activity is the Keepit Dam Upgrade as described in the Environmental Assessment (EA) for the Keepit Dam Upgrade prepared by Parsons Brinckerhoff, for State Water Corporation (State Water) dated September 2007.

Schedule 2: DRAFT STATEMENT OF COMMITMENTS - ACTIVITY

TABLE OF CONTENTS

DEFINITIONS

Activity	The activity described in Schedule 1
Ancillary Facility	Temporary facility for Construction that does not form part of the Activity. Examples are an office and amenities compound, batch plant (concrete or bitumen), materials storage compound
Building	A residence, farm shed or other building.
Construction	Includes all work in respect of the Activity other than survey, acquisitions, fencing, investigative drilling or excavation, building/road dilapidation surveys, minor clearing (except where threatened species, populations or ecological communities would be affected), establishing site compounds (in locations meeting the criteria of the Conditions), or other activities determined by the EMR to have minimal environmental impact (e.g. minor access roads, minor adjustments to services/utilities, relocation of recreational facilities).
Department, the	Department of Planning
Director-General, the	Director-General of the Department (or delegate)
Director-General's Agreement	A written advice from the Director-General (or delegate)
Director-General's Approval	A written approval from the Director-General (or delegate) Where the Director-General's Approval is required under a Condition the Director-General will endeavour to provide a response within one month of receiving an approval request. The Director-General may ask for additional information if the approval request is considered incomplete. When further information is requested the time taken for State Water to respond in writing will be added to the one month period.
Director-General's Report	The report provided to the Minister by the Director-General of the Department under section 115C of the *Environmental Planning and Assessment Act 1979*.
Draft Statement of Commitments	The draft Statement of Commitments for the Activity (this document)
Environmental Assessment	Means the Keepit Dam Upgrade Environmental Assessment dated September 2007
Minister, the	Minister for Infrastructure and Planning
Operation	Means the Operation of the Activity, but **does not** include commissioning trials of equipment or facilities or temporary use of parts of the Activity during Construction.

Publicly Available	Available for inspection by a member of the general public (for example available on an internet site or at a display centre)
Reasonable and Feasible	Consideration of best practice taking into account the benefit of proposed measures and their technological and associated operational application in the NSW and Australian context. The term **Feasible** relates to engineering considerations and what is practical to build. The term **Reasonable** relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and nature and extent of potential improvements.
Relevant Councils	Either or both of Gunnedah Shire Council and Tamworth Regional Council, as appropriate.
Relevant Government Departments	A government department with a licensing or approval role for the Activity's Construction or Operation. Generally one or more of the DEC (including Environment Protection Authority and National Parks and Wildlife Service functions), Department of Natural Resources, Department of Primary Industries (including NSW Fisheries and NSW Agriculture functions), NSW Heritage Office and the Department of Planning.
River	Has the meaning given under the *Water Management Act 2002.* In summary, this is "any watercourse, whether perennial or intermittent and whether comprising a natural channel or a natural channel artificially improved".
Sensitive Receiver	Residence, education institution (e.g. school, TAFE college), health care facility (e.g. nursing home, hospital) and religious facility (e.g. church)
Stages	Stages refers to the: ▪ division of an Activity into multiple contract packages; and/or ▪ Construction or Operation of an Activity in discrete sections.

ABBREVIATIONS

ARI	Average Recurrence Interval
ASS	Acid Sulfate Soils
CLG	Community Liaison Group
CMS	Construction Method Statement
CEMP	Construction Environmental Management Plan
CFEMP	Construction Framework Environmental Management Plan
dB(A)	Decibel, "A" weighted scale
DEC	Department of Environment and Conservation. Also includes the Environment Protection Authority and the National Parks and Wildlife Service
DoP	Department of Planning (the former Department of Infrastructure, Planning and Natural Resources)
DNR	Department of Natural Resources
DPI	Department of Primary Industries
EA	Environmental Assessment
EMP	Environmental Management Plan
EMR	Environmental Management Representative
EP&A Act	*Environmental Planning and Assessment Act 1979*
ICLR	Independent Community Liaison Representative
L_{A90}	The noise level exceeded for 90% of a monitoring period, also referred to as the background noise level
$L_{Aeq\ (9hour)}$	Equivalent continuous (constant) sound pressure level over a 9 hour period from 10pm to 7am
$L_{Aeq\ (15\ hour)}$	Equivalent continuous (constant) sound pressure level over a 15 hour period from 7am to 10pm
$L_{Aeq\ (15\ mins)}$	Equivalent sound pressure level over a 15 minute interval
$L_{A1\ (1\ minute)}$	Sound pressure level exceeded for 1 per cent of the time measured over a 1 minute interval
$L_{A10\ (15\ mins)}$	Sound pressure level exceeded for 10 per cent of the time over a 15 minute period
OEMP	Operation Environmental Management Plan
POEO Act	*Protection of the Environment Operations Act 1997*
RTA	Roads and Traffic Authority

REPORTING REQUIREMENTS

The table below lists all the reports required by this draft Statement of Commitments to be provided to the Director-General. The table also identifies whether the report requires approval from the Director-General.

Draft Commitment	Report to be provided to the Director-General	Does the report require Director-General approval?
Administrative Commitments		
3	Advise of Construction and Operation commencing	No
7	Staging Report	No
8	Pre-Construction Compliance Report	No
9	Pre-Operation Compliance Report	No
10	Construction Compliance Reports	No
11	Environmental Impact Audit Report - Construction	No
12	Environmental Impact Audit Report - Operation	No
Environmental Management		
13	Construction Environmental Management Plan	Yes
14	Operation Environmental Management Plan	Yes
15	Request for EMR Approval	Yes
Communication and Consultation		
21.4	Request to dissolve CLG	Yes

ADMINISTRATION

The Activity

1. The Activity will be carried out consistent with:

    a) the description of the Activity contained in Chapter 4 of the Keepit Dam Upgrade EA dated September 2007
    b) the procedures, safeguards and mitigation measures identified in the Keepit Dam Upgrade EA, and
    c) this draft Statement of Commitments.

2. This draft Statement of Commitments does not relieve State Water of its obligations under any other Act.

Compliance

General

3. The Director-General and the Relevant Councils will be notified in writing of the start of the Activity's Construction and Operation. Such notification will be provided at least four weeks before the relevant start date unless otherwise agreed to by the Director-General.

4. State Water will ensure (as Reasonably practical) compliance with all of its commitments and to implement any measures arising from the EA.

5. State Water will (as Reasonably practical) bring to the Director-General's attention any matter that may require further assessment by the Director-General.

6. State Water will ensure (as Reasonably practical) compliance with any requirements of the Director-General arising from the Department's assessment of:

    a) any reports, plans or correspondence that are submitted to satisfy this draft Statement of Commitments; and
    b) the implementation of any actions or measures contained in such reports, plans or correspondence.

Staging Report

7. State Water may elect to construct the Activity in discrete work packages or defined stages provided that such stages or work packages are consistent with this draft Statement of Commitments. Where discrete work packages or defined stages are proposed, a *Staging Report* will be submitted to the Director-General at least four weeks before Construction commences (or within any other time agreed to by the Director-General). The *Staging Report* will:

    a) describe the work packages or defined stages; and

b) identify how this draft Statement of Commitments will be addressed in each work package or defined stage.

Pre-Construction Compliance Report

8. A *Pre-Construction Compliance Rep*ort will be submitted to the Director-General at least four weeks before Construction commences (or within any other time agreed to by the Director-General).

The *Pre-Construction Compliance Report* will include:

a) details of how the Commitments required to be addressed before Construction were complied with;
b) the time when each relevant commitment was complied with, including dates of submission of any required reports and/or approval dates; and
c) details of any approvals or licences required to be issued by any Relevant Government Departments and/or Councils before Construction commences.

Pre-Operation Compliance Report

9. A *Pre-Operation Compliance Report* will be submitted to the Director-General at least four weeks before Operation (or within any other time agreed to by the Director-General).

The *Pre-Operation Compliance Report* will include:

a) details of how the Commitments required to be addressed before Operation were complied with;
b) the time when each relevant Commitment was complied with, including dates of submission of any required reports and/or approval dates; and
c) details of any approvals or licences issued by any Relevant Government Departments and/or Council for the Activity's Operation.

Construction Compliance Reports

10. The Director-General, Relevant Councils, and any other government departments nominated by the Director-General will be provided with *Construction Compliance Reports*. The EMR will review the *Construction Compliance Reports* before they are submitted to the Director-General and bring to the Director-General's attention any shortcomings.

The first *Construction Compliance Report* will report on the first six months of Construction and be submitted a maximum six weeks after expiry of that period. The second, and subsequent, *Construction Compliance Reports* will be submitted at maximum intervals of six months from the date of submission of the first *Construction Compliance Report* (or at any other time interval agreed to by the Director-General) for the duration of Construction.

The *Construction Compliance Reports* will include information on:

a) compliance with the CEMP and this draft Statement of Commitments;
b) compliance with any approvals or licences issued by Relevant Government Departments and Relevant Councils for the Construction phase of the Activity;
c) the implementation and effectiveness of environmental controls. The assessment of effectiveness should be based on a comparison of actual impacts against performance criteria identified in the CEMP;
d) environmental monitoring results, presented as a results summary and analysis;
e) the number and details of any complaints, including a summary of main areas of complaint, action taken, response given and intended strategies to reduce recurring complaints;
f) details of any review and amendments to the CEMP resulting from Construction during the reporting period; and
g) any other matter relating to compliance with this draft Statement of Commitments or as requested by the Director-General.

The *Construction Compliance Reports* will also be made Publicly Available.

Environmental Impact Audits

Environmental Impact Audit Report - Construction

11. An *Environmental Impact Audit Report - Construction* will be prepared and submitted to the Director-General a maximum three months after Construction is complete (or at any other time interval agreed to by the Director-General). The *Environmental Impact Audit Report – Construction* will also be submitted to the Relevant Councils and other government departments upon the request of the Director-General.

The *Environmental Impact Audit Report – Construction* will:

a) identify the major environmental controls used during Construction and assess their effectiveness;
b) summarise the main environmental management plans and processes implemented during Construction and assess their effectiveness;
c) identify any innovations in Construction methodology used to improve environmental management; and
d) discuss the lessons learnt during Construction, including recommendations for future Activities.

Environmental Impact Audit Report - Operation

12. An *Environmental Impact Audit Report - Operation* will be submitted to the Director-General a maximum 24 months after the Activity begins Operation and at any additional periods that the Director-General may require. The *Environmental Impact Audit Report - Operation* will also be submitted to the Relevant Councils and other government departments upon the request of the Director-General.

The *Environmental Impact Audit Report - Operation* will:

a) be certified by an independent person at State Water's expense. The certifier will be advised to the Director-General before the *Environmental Impact Audit Report – Operation* is prepared;
b) assess the effectiveness of implemented mitigation measures and safeguards;
c) assess compliance with the systems for Operation maintenance and monitoring;
d) discuss the results of consultation with the local community particularly any feedback or complaints; and
e) be made Publicly Available.

ENVIRONMENTAL MANAGEMENT

Construction Environmental Management Plan

13. A Construction Environmental Management Plan (CEMP) will be prepared and implemented in accordance with this draft Statement of Commitments. The CEMP will be prepared in accordance with the Department of Planning (DoP) *Guideline for the Preparation of Environmental Management Plans.* The Director-General's Approval will be obtained for the CEMP before Construction commences or within any other time agreed to by the Director-General. The CEMP will be reviewed by the EMR before State Water seeks the Director-General's approval for the CEMP. The EMR will bring to the Director-General's attention any shortcomings.

The mitigation measures identified in the EA will be incorporated into the CEMP.

The CEMP will:

a) incorporate the mitigation measures identified in this draft Statement of Commitments for:
    i Flora and Fauna
    ii Heritage
    iii Noise and Vibration
    iv Soil and Water Quality Management
    v Air Quality
    vi Greenhouse Gases and Sustainable Energy
    vii Traffic
    viii Visual Impact and Landscaping
    ix Hazards and Risk Management
    x Waste Management and Recycling
    xi Utilities and Services

as relevant to the Pre-construction and Construction phases of the Activity, and state how they will be implemented;

a) include a Construction program, identifying Construction activities and their location and timing;

b) cover any relevant environmental elements identified by State Water, or its contractor, from their environmental due diligence investigations;
c) contain the Construction Sub Plans required by this draft Statement of Commitments;
d) be prepared following consultation with Relevant Councils and Relevant Government Departments;
e) be Publicly Available;
f) include a community consultation and notification strategy (including local community, Relevant Councils and Relevant Government Departments), and Construction complaints management system;
g) include environmental management details such as:
    i identification of statutory obligations which State Water is required to fulfil during Construction, including all approvals and licences;
    ii an environmental management structure indicating the responsibility, authority and accountability for personnel relevant to the CEMP;
    iii the role of the EMR and identification of Construction activities requiring EMR attendance;
    iv details of the Construction personnel induction and training program;
    v emergency response procedures;
h) include implementation details such as:
    i identification of relevant environmental elements;
    ii measures to avoid and/or control environmental impacts;
    iii the tools to be used to implement the CEMP such as plans, schedules and work instructions;
i) include monitoring and review details such as:
    i performance criteria;
    ii performance monitoring methods;
    iii auditing and corrective actions procedures;
    iv CEMP review procedures.

Operation Environmental Management Plan

14. An Operation Environmental Management Plan (OEMP) will be prepared and implemented in accordance with this draft Statement of Commitments and all relevant Acts and Regulations. The OEMP will be prepared in accordance with the DoP's *Guideline for the Preparation of Environmental Management Plans.* The approval of the Director-General will be obtained for the OEMP before Operation commences or within any other time agreed to by the Director-General.

    The OEMP will:

    a) identify the Operation activities;
    b) incorporate monitoring and reporting measures identified in this draft Statement of Commitments for:
        i implementing and managing the elements of the Biodiversity Offset Strategy; and
        ii optimising the performance of the multi-level offtake (This is subject to confirmation of the cost effectiveness of multi-level offtake.)

as relevant to Operation phase of the Activity, and state how they will be implemented;

c) cover relevant environmental elements identified by State Water either from its environmental due diligence investigations or required to satisfy any other licence or approval;
d) be prepared in consultation with Relevant Government Departments and Relevant Councils;
e) be made Publicly Available;
f) identification of statutory obligations which State Water is required to fulfil during the Activity's Operation, including all approvals and licences.

Environmental Management Representative

15. The Director-General's Approval will be sought for the appointment of an Environmental Management Representative (EMR) at least eight weeks before Construction commences (or within any other time agreed to by the Director-General). The following information will be provided to the Director-General:

a) qualifications and experience of the EMR including demonstration of general compliance with relevant Australian Standards for environmental auditors;
b) authority and independence (from State Water or its contractors) of the EMR including details of State Water's internal reporting structure; and
c) resourcing of the EMR role. The EMR will be available:
    i for sufficient time to undertake the EMR role. This timing shall be agreed between State Water and the EMR and advised to the Director-General in the request for approval;
    ii at any other time requested by the Director-General;
    iii during any Construction activities identified in the CEMP to require the EMR's attendance; and
    iv for the duration of Construction.

16. The Director-General may at any time immediately revoke the approval of an EMR appointment by providing written notice to State Water. Interim arrangements for EMR responsibility following the revocation will be agreed in writing between the Director-General and State Water.

17. The Director-General may at any time conduct an audit of any actions undertaken by the EMR. State Water will (as Reasonably practical):

a) facilitate and assist the Director-General in any such audit; and
b) include in the conditions of the EMR's appointment the need to facilitate and assist the Director-General in any such audit.

18. The EMR is authorised to :

a) consider and advise the Director-General and State Water on matters specified in this draft Statement of Commitments and compliance with such;

b) determine whether work falls within the definition of Construction where clarification is requested by State Water;
c) review the CEMP;
d) periodically monitor State Water's activities to evaluate compliance with the CEMP. Periodic monitoring will involve site inspections of active work sites at least fortnightly;
e) provide a written report to State Water of any non-compliance with the CEMP observed or identified by the EMR. Non compliance will be managed as identified in the CEMP;
f) issue a recommendation to State Water to stop work immediately if in the view of the EMR an unacceptable impact on the environment is occurring or is likely to occur. The stop work recommendation may be limited to specific activities causing an impact if the EMR can easily identify those activities. The EMR may also recommend that State Water initiate reasonable actions to avoid or minimise adverse impacts;
g) review corrective and preventative actions to monitor the implementation of recommendations made from audits and site inspections;
h) certify that minor revisions to the CEMP are consistent with the approved CEMP; and
i) provide regular (as agreed with the Director-General) reports to the Director-General on matters relevant to carrying out the EMR role including notifying the Director-General of any stop work recommendations.

The EMR will immediately advise State Water and the Director-General of any incidents relevant to these Commitments resulting from Construction that were not dealt with expediently or adequately by State Water.

Issue Specific Commitments

Table of Contents

Communication and Consultation

Objective	Commitment		Timing
Advice of Construction Activities			
Inform the local community of upcoming Construction activities	19.1	Advertisements will be placed in relevant local newspapers to advertise the: nature of the works proposed for the next three months; areas in which these works are proposed; Construction hours; and a contact telephone number.	Before Construction commences, and then at maximum three monthly intervals during Construction
	19.2	The local community and businesses will be advised of Construction activities that could cause disruption. Methods to disseminate this information will be identified in the CEMP. Information to be provided will include: a) details of any traffic disruptions and controls; b) construction of temporary detours; and c) work approved to be undertaken outside standard Construction hours, in particular noisy works, before such works are undertaken.	During Construction
Make Construction information Publicly Accessible	20.1	An Activity internet site will be established. This internet site will contain: a) periodic updates of work progress, consultation activities and planned work schedules. The site will indicate the date of the last update and the frequency of the internet site updates; b) a description of relevant approval authorities and their areas of	Before Construction commences

Objective	Commitment		Timing
		responsibility; c) a list of reports and plans that are Publicly Available under this Approval and details of how these can be accessed; d) contact names and phone numbers of relevant communications staff; and e) the 24 hour toll-free complaints contact telephone number.	
	20.2	The Activity internet site will be maintained until Construction ends. Updates of work progress, Construction activities and planned work schedules will be provided where significant changes in noise or traffic impacts are expected.	During Construction
Community Liaison Group			
Engage and consult with community representatives during Construction	21.1	A Community Liaison Group (CLG) will be formed and hold its first meeting during detailed design. The CLG will include the EMR and representatives from State Water and its head contractor. Community representatives will be identified and selected from relevant community and business groups, individual members of the community adjoining the Activity and representatives from Relevant Councils.	During detailed design
	21.2	State Water will, at its own expense (as Reasonably practical): a) maintain the CLG for the duration of Construction unless otherwise approved by the Director-General; b) provide a chairperson for the CLG. The chairperson will be independent of State Water and may be elected from the CLG membership; c) nominate two representatives to attend all CLG meetings;	During detailed design and Construction

Objective	Commitment		Timing
		d) provide to the CLG regular information on the progress of Construction and related environmental performance; e) promptly provide to the CLG information that the CLG Chair may reasonably request concerning the Activity's environmental performance; f) provide access for site inspections by the CLG; g) provide meeting facilities for the CLG, and take notes of CLG meetings. These meeting notes will be available to CLG members within 14 days of the meeting and should be endorsed by the Chair; h) where reasonably required by the Chair, arrange consultant(s) to explain technical information to the CLG; and i) where reasonably required by the Chair, invite representatives from relevant government departments or other individuals to attend CLG meetings.	
	21.3	Issues for discussion by the CLG include the dissemination of information to the community, design issues related to the Commitments or mitigation measures, the CEMP and Construction activities. The CLG may make comments about these issues which will be considered by State Water. State Water will (as Reasonably practical) report back to the CLG on its considerations of the comments.	During detailed design and Construction
	21.4	State Water may review a CLG's membership and/or the need for the CLG at any time during detailed design and Construction. The Director-General's approval will be sought to dissolve a CLG. Any request for dissolution will demonstrate why the CLG is no longer required.	During detailed design and Construction

Objective	Commitment		Timing
	21.5	In the event of any dispute between the CLG and State Water, State Water's decision is final provided it is consistent with this draft Statement of Commitments.	During detailed design and Construction
Consult property owners directly affected by the mitigation measures	22.1	The owners of properties affected by implementing mitigation measures will be consulted. Mitigation measures will be implemented according to a program derived from that consultation if consistent with this draft Statement of Commitments.	During Construction
Construction Complaints Management System			
Have a system for managing community complaints regarding Construction	23.1	A *Construction Complaints Management System* will be prepared and implemented before Construction commences. The *Construction Complaints Management System* will be consistent with AS 4269 "Complaints Handling" and include: a) a 24 hour, toll free telephone number listed with a telephone company and advertised; b) a system to receive, record, track and respond to complaints within a specified timeframe. When a complaint cannot be responded to immediately, a follow-up verbal response on what action is proposed will be provided to the complainant within two hours during night-time works and 24 hours at other times; c) a process for the provision of a written response to the complainant within 10 days, if the complaint cannot be resolved by the initial or follow-up verbal response; and d) a mediation system for complaints unable to be resolved.	Before Construction commences

Objective	Commitment		Timing
	23.2	The *Construction Complaints Management System* will be maintained for the duration of Construction.	During Construction
	23.3	Information on all complaints received, including the means by which they were addressed and whether resolution was reached with or without mediation, will be included in the Construction Compliance Reports and will be made available to the Director-General on request.	During Construction

Flora and Fauna

Objective	Commitment		Timing
Construction			
Manage and minimise Construction impacts to flora and fauna	24.1	A Flora and Fauna Management Sub Plan will be prepared as part of the CEMP. The Sub Plan will be prepared in consultation with the DEC, DPI (Fisheries) and Relevant Councils and include: a) plans showing: i. terrestrial vegetation communities; important flora and fauna habitat areas; locations where threatened species, populations or ecological communities were recorded; and areas to be cleared. The plans will also identify vegetation adjoining the Activity where this contains important habitat areas and/or threatened species, populations or ecological communities; ii. aquatic vegetation communities; important habitat areas; locations where threatened species, populations or ecological communities were recorded; and areas to be cleared. The plans will also identify vegetation adjoining the Activity where this contains important habitat areas and/or threatened species, populations or ecological communities; b) methods to manage impacts on flora and fauna species (terrestrial and aquatic) and their habitat which may be directly or indirectly affected by the Activity. These will include: i. procedures for vegetation clearing, soil management and managing other habitat damage (terrestrial and aquatic) during Construction; ii. methods to protect vegetation both retained within, and also adjoining, the Activity from damage during Construction; iii. a habitat tree management program including fauna recovery procedures and habitat maintenance (e.g. relocating hollows or	Before Construction commences

Objective	Commitment		Timing
		installing nesting boxes); iv. methods to minimise damage to aquatic habitats; v. where possible, and where consistent with DEC requirements, strategies for re-using in rehabilitation works individuals of any threatened plant species that would otherwise be destroyed by the Activity; vi. performance criteria against which to measure the success of the methods c) rehabilitation details including: i. identification of locally native species to be used in rehabilitation and landscaping works, including flora species suitable as a food resource for threatened fauna species; ii. methods to remediate affected aquatic habitats or fish passages; iii. the source of all seed or tube stock to be used in rehabilitation and landscaping works including the identification of seed sources within the Activity. Seed of locally native species within the Activity should be collected before Construction commences to provide seed stock for revegetation; iv. methods to re-use topsoil (and where relevant subsoils) and cleared vegetation; v. measures for the management and maintenance of all preserved, planted and rehabilitated vegetation (including aquatic vegetation); d) a Weed Management Strategy including: i. identification of weeds within the Activity and adjoining areas; ii. weed eradication methods and protocols for the use of herbicides; iii. methods to treat and re-use weed infested topsoil; iv. strategies to control the spread of weeds during Construction; e) a program for reporting on the effectiveness of terrestrial and aquatic flora and fauna management measures against the identified performance criteria. Management methods will be reviewed where found to be ineffective.	

Objective	Commitment		Timing
Biodiversity Offset Strategy			
Offset the biodiversity impacts of the Activity	25.1	A Biodiversity Offset Strategy will be designed for the Activity in accordance with the principles in section 5.	During detailed design
	25.2	The Biodiversity Offset Strategy will be developed in conjunction with the Department of Environment and Climate Change and details provided to the Director General of the Department of Planning.	Before Construction commences
	25.3	The Director-General will be provided with annual reports on the implementation and management of the elements of the Biodiversity Offset Strategy as part of the OEMP for a period of five years following completion of Construction.	During Operation
Fish Passage			
Comply with any requirements of Section 218 of the *Fisheries Management Act 1994*	26.1	Undertake the requirements of the DPI in a letter dated 12 April 2006 to: a) evaluate the level of risk to fish passage attributable to Keepit Dam and potential ameliorative measures; b) consider potential ameliorative measures which might involve either the construction of fish lift at Keepit Dam or a strategy (including a works program) to improve fish passage elsewhere in the Namoi catchment to achieve an equivalent outcome; and c) assess the comparative feasibility and cost effectiveness of these options (ameliorative measures) as part of the EA or in a time frame otherwise agreed with the DPI.	During the environmental assessment process
	26.2	The assessment of the comparative feasibility and cost effectiveness of fish passage options will be provided to the DPI. The Director-General will be notified when the assessment is forwarded to DPI.	During the environmental assessment

Objective	Commitment		Timing
			process
Cold Water Pollution			
Mitigate the impacts of Keepit Dam on downstream water quality	27.1	The cost effectiveness of providing the preferred option for multi-level offtake identified in the EA will be evaluated and the results of the assessment provided to the Director-General.	During the environmental assessment process
	27.2	Subject to confirming the cost effectiveness of multi-level offtake, an in-storage and downstream monitoring system will be implemented to support the Operation of the multi-level offtake. The results of its Operation will be included in the OEMP. The Operation of the multi-level offtake will be optimised to improve performance based on operational experience and where necessary, improvements to the supporting monitoring system.	During Operation

Heritage

Objective	Commitment		Timing
Indigenous Heritage Management			
Manage and minimise Construction impacts to Indigenous heritage items	28.1	An Indigenous Heritage Management Sub Plan will be prepared as part of the CEMP. The Sub Plan will be prepared in consultation with all relevant Aboriginal groups and the DEC and include: a) details of the archaeological investigations to be undertaken and any associated licences or approvals required; b) procedures to be implemented if previously unidentified Aboriginal objects are discovered during Construction. If such objects are discovered all work likely to affect the object(s) will cease immediately and the DEC informed in accordance with the *National Parks and Wildlife Act 1974*; c) an education program for Construction personnel on their obligations for Aboriginal cultural materials; and d) the following specific measures to avoid impacts to the Aboriginal stone procurement source #20-5-21: i. fencing off the crest area of the ridge on which the site is situated; ii. avoiding excavation of ridge deposits for fill in the boat ramp saddle dam wall; iii. avoiding excavation of ridge deposits and rock for the boat ramp saddle spillway; iv. if Option D2 or D3 is adopted, an archaeological survey of the proposed boat ramp road alignment to determine if there would be impacts to the stone procurement source site; and v. archaeological salvage of the Aboriginal stone procurement site #20-5-21 if impact cannot be avoided.	Before Construction commences

Objective		Commitment	Timing
Historical Relics			
Manage and minimise Construction impacts to historical relics	29.1	A Historical Heritage Management Sub Plan will be prepared as part of the CEMP. The Sub Plan will be prepared in consultation with the Heritage Office and include: a) procedures to be implemented if previously unidentified historical relics are discovered during Construction; b) an education program for Construction personnel on their obligations for historic relics; and c) the following specific measures in relation to the main dam wall, subject to detailed design: i. use of materials that are sympathetic to those that are present in the existing main dam wall; ii. reuse of the existing spillway gate lifting gear; iii. the removal and refurbishment, as necessary, of the gantry crane on top of the existing main dam wall and its replacement on top of the raised main dam wall; iv. the removal and secure storage of historic items located on the top of the existing main dam wall, including the metal dedication and commemorative plaques and the metal 'Water Conservation and Irrigation Commission, NSW', insignia, and their relocation to similar locations on top of the raised main dam wall; and v. archival recording of the existing main dam wall in accordance with best practice outlined in the NSW Heritage Office (1998) guidelines 'How to Prepare Archival Records of Heritage Items' before Construction work begins.	Before Construction commences

Noise and Vibration

Objective	Commitment		Timing
Construction Noise and Vibration Management Sub Plan			
Manage and minimise the noise and vibration impacts of the Activity	30.1	A Construction Noise and Vibration Management Sub Plan will be prepared as part of the CEMP. The Sub Plan will be prepared in consultation with the Relevant Councils and the CLG and include: a) an education program for Construction personnel about noise minimisation; b) identification of each Construction activity, including Ancillary Facilities, and their associated noise sources; c) identification of all potentially affected Sensitive Receivers; d) the Construction noise objective specified in this draft Statement of Commitments; e) the Construction vibration criteria specified in this draft Statement of Commitments; f) determination of appropriate noise and vibration objectives for each identified Sensitive Receiver; g) noise and vibration monitoring, reporting and response procedures; h) assessment of potential noise and vibration from each Construction activity including noise from Construction vehicles and any traffic diversions; i) a description of management methods and procedures and specific noise mitigation treatments that will be implemented to control noise and vibration during Construction; j) justification for any activities outside the Construction hours specified in this draft Statement of Commitments. This includes identifying areas	Before Construction commences

Objective	Commitment		Timing
		where Construction noise would not be audible at any Sensitive Receiver; k) procedures for notifying residents of Construction activities that are likely to affect their noise and vibration amenity; and l) contingency plans to be implemented in the event of non-compliances and/or noise complaints.	
Construction Hours			
Minimise noise and vibration disturbance to the local community	31.1	Construction will be restricted to between the hours of 7:00 am to 6:00 pm (Monday to Friday), 8:00 am to 1:00 pm (Saturday) and at no time on Sundays and public holidays except: a) for the delivery of materials required outside these hours by the Police or other authorities for safety reasons; or b) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; or c) where the work is identified in the Construction Noise and Vibration Management Sub Plan and approved as part of the CEMP.	During Construction
	30.2	Local residents will be informed of the timing and duration of work approved under item (c) at least 48 hours before that work commences.	During Construction

Objective	Commitment		Timing
Construction Noise Objective			
Manage Construction noise impacts to the local community	32.1	The Construction noise objective for the Activity is to manage noise from Construction activities (as measured by a $L_{A10\ (15minute)}$ descriptor) so it does not exceed the background L_{A90} noise level by more than 5 dB(A). Background noise levels are those identified in the Construction Noise and Vibration Management Sub Plan. Any activities that have the potential for noise emissions that exceed the objective will be identified and managed in accordance with the Construction Noise and Vibration Management Sub Plan. All Reasonable and Feasible noise mitigation and management measures will be implemented with the aim of achieving the Construction noise objective.	During Construction
	32.2	If the noise from a Construction activity is substantially tonal or impulsive in nature (as described in Chapter 4 of the NSW Industrial Noise Policy), 5dB(A) will be added to the measured Construction noise level when comparing the measured noise with the Construction noise objective.	During Construction
Construction Noise Management			
Manage Construction noise impacts to the local community	33.1	Public address systems used at any Construction site will not be used outside the Construction hours detailed in this draft Statement of Commitments unless otherwise approved through the Construction Noise and Vibration Management Sub Plan. Public address systems will be designed to minimise noise spillage off-site.	During Construction

Objective	Commitment		Timing
	33.2	No rock breaking, rock hammering, and any similar activities will be undertaken unless otherwise identified in the Construction Noise and Vibration Management Sub Plan, and approved as part of the CEMP.	During Construction
	33.3	Where Reasonable and Feasible, noise mitigation measures will be erected at the start of Construction (or at other times during Construction) to minimise Construction noise impacts.	During Construction
Vibration Criteria			
Achieve industry standards for vibration impacts	34.1	Vibration caused by Construction and received at any Structure outside the Activity will: a) for structural damage vibration be limited to German Standard DIN 4150 Part 3 Structural Vibration in Buildings. Effects on Structures; and b) for human exposure to vibration be limited to the evaluation criteria presented in British Standard BS 6472 - Guide to Evaluate Human Exposure to Vibration in Buildings (1Hz to 80 Hz) for low probability of adverse comment. These limits apply unless otherwise identified in the Construction Noise and Vibration Management Sub Plan, and approved as part of the CEMP.	During Construction
Blasting			
Minimise blasting annoyance to the local community	35.1	Blasting will only be undertaken between the hours of 9.00am and 3.00pm, Monday to Friday, and 9.00am to 12pm on Saturday, except where the work is identified in the Construction Noise and Vibration Management Sub Plan and approved as part of the CEMP.	During Construction

Objective	Commitment		Timing
Achieve industry standards for minimising blasting annoyance	35.2	The vibration level due to blasting activities will meet the requirements of any relevant DEC Licence. The guideline "Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration" prepared by the Australian and New Zealand Environment and Conservation Council (ANZECC) would generally apply to blasting.	During Construction
Prepare site-specific blast designs	35.3	Blasting trials will be undertaken if blasting is to be used. Results from the trials will be used to determine site-specific blast designs that will enable the performance criteria specified in the Construction Noise and Vibration Sub Plan to be satisfied.	During detailed design
Manage blasting annoyance to the local community	35.4	All Reasonable attempts will be made to advise occupants of residences located within 500 metres of a blast, of blasting. The advice will be provided at least 48 hours before a blast and include a schedule of blast time(s) and a telephone number and contact name.	During Construction
Manage risk associated with blasting	35.5	Prior to the storage and use of explosives on site, a risk assessment of the magazine location will be undertaken and the type and quantity of explosives expected to be stored. The assessment will be undertaken in accordance with the guidelines in SEPP 33 – Hazardous and Offensive Development. The results of the assessment will be outlined in the CEMP.	Before Construction commences

Physical Issues

Objective		Commitment	Timing
Soil and Water Quality Management			
Manage and minimise Construction impacts to soil and water	36.1	A Soil and Water Quality Management Sub Plan will be prepared as part of the CEMP. The Sub Plan will be prepared in consultation with the DEC, Department of Natural Resources and Relevant Councils. The Sub Plan will: a) where relevant, be consistent with the Department of Housing's guideline "Managing Urban Stormwater - Soils and Construction" and the RTA's "Guidelines for the Control of Erosion and Sedimentation in Roadworks"; b) identify the Construction activities that could cause soil erosion or discharge sediment or water pollutants from the site; c) describe management methods to minimise soil erosion or discharge of sediment or water pollutants from the site including; i. a strategy to minimise the area of bare surfaces during construction; ii. placing sediment fences or bunding or other erosion prevention devices between construction work areas and waterbodies to prevent sediment runoff; iii. using a floating silt curtain or other techniques to prevent sediment dispersal for works occurring below the waterline of Lake Keepit; iv. revegetation of disturbed areas following the completion of construction; d) describe the location and capacity of erosion and sediment control measures; e) identify the timing and conditions under which Construction stage controls will be decommissioned;	Before Construction commences

Objective	Commitment		Timing
		f) include contingency plans to be implemented for events such as fuel spills; and g) identify how the effectiveness of the sediment and erosion control system will be monitored, reviewed and updated.	
	36.2	An appropriately qualified soil scientist or person with similar expertise in soil and water management will be consulted according to a schedule identified in the Soil and Water Management Sub Plan to: a) undertake inspections of temporary and permanent erosion and sedimentation control devices; b) ensure that the most appropriate controls are being implemented; c) check that controls are being maintained in an efficient condition; and d) check that controls meet the requirements of any relevant approval and/or licence condition. The results of these inspections and any follow-up actions will be reported in the Construction Compliance Reports.	During Construction
Air Quality			
Manage and minimise Construction impacts to air quality	37.1	A Dust Management Sub Plan will be prepared as part of the CEMP. The Sub Plan will identify: a) potential sources of dust; b) dust management objectives consistent with DEC guidelines; c) a monitoring program to assess compliance with the identified objectives. Monitoring for dust deposition and particulate concentration will be undertaken according to the DEC Guideline “Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales”; d) mitigation measures to be implemented, including measures during	Before Construction commences

Objective	Commitment		Timing
		weather conditions where high level dust episodes are probable (such as strong winds in dry weather); and e) a progressive rehabilitation strategy for exposed surfaces with the aim of minimising exposed surfaces.	
	37.2	Construction vehicles using public roads will be maintained to prevent any loss of load, whether dust, liquid or soils. Facilities will be provided at exit points of all Construction sites/compounds to minimise tracking mud, dirt or other material onto a public road or footpath. In the event of any spillage, the spilled material will be removed as soon as practicable within the same working day as the spillage.	During Construction
	37.3	All plant and equipment used in connection with the Activity will be: a) maintained in a proper and efficient condition; and b) operated in a proper and efficient manner.	During Construction
Greenhouse Gases and Sustainable Energy			
Minimise greenhouse gas emissions	38.1	Procedures to minimise energy use will be implemented to promote reduction of greenhouse gases.	During detailed design
	38.2	Awareness programs will be conducted for all site personnel regarding energy conservation methods.	During Construction
	38.3	Energy audits will be conducted during Construction to identify and address energy waste.	During Construction
	38.4	Power consumption will be managed during Operation of the Activity in accordance with the relevant environmental objectives contained in State Water's (2006) *Environmental Management Plan 2006 – 2010*.	During Operation

Social and Economic Issues

Objective	Commitment		Timing
Property Damage, Acquisition and Compensation			
Monitor Construction damage to property	39.1	Subject to landowner agreement, property inspections will be conducted on all Structures (other than structures owned by State Water) within: a) 200 metres of blasting; b) 50 metres of Construction activities that generate vibration impacts; c) any other locations identified by State Water; and d) any other locations identified by the EMR. The property inspections will be undertaken consistent with AS 4349.1 "Inspection of Buildings". Property inspections need not be undertaken if a risk assessment indicates Structures will not be affected. The risk assessment will be undertaken before Construction commences by a suitably experienced and qualified geotechnical and construction engineer. The owners of all properties on which property inspections are to be conducted will be advised at least two weeks before the inspection of its scope and methodology and of the process for making a property damage claim. A copy of the property inspection report will be given to the owner of each property inspected at least three weeks before Construction that could affect the property commences. A register of all properties inspected will be maintained by State Water indicating whether the owner accepted or refused the property inspection offer. A copy of the register will be provided to the Director-General upon request.	During Construction

Objective	Commitment		Timing
Rectify Construction damage to property	39.2	State Water, where liable, will rectify any property or building damage caused directly or indirectly (for example from vibration) by the Activity's Construction at no cost to the property owner(s). Alternatively State Water may negotiate just compensation for the property damage with the property owner.	During Construction
Compensate for Operation damage to property	39.3	State Water, where liable, will rectify any property or building damage caused directly or indirectly (for example from vibration or from groundwater change) by the Activity's Operation at no cost to the property owner(s). Alternatively State Water may negotiate just compensation for the property damage with the property owner.	During Operation
Manage Activity Construction and Operational impacts to recreational entities such as the Lake Keepit State Park Trust and sailing club	39.4	A Master Plan and Sub Plans will be prepared for affected areas in conjunction with the affected recreational entities. The Plans will be prepared at the cost of State Water and their implementation agreed between State Water and the affected recreational entity. The Master Plan will contain measures as appropriate to: a) program Construction to minimise impacts to local entities; b) relocate facilities and services that would be either directly or indirectly affected by Construction such as the sailing club and boat ramp and impacts to caravans in The Gums Caravan Park and other identified recreational facilities affected; and c) identify all other actions including reinstatement of facilities and services affected, impact offsets including any compensation negotiated, emergency management facilities and plans, land tenure issues and overall strategic approach.	During planning assessment and detailed design

Objective	Commitment		Timing
Traffic			
Monitor and rectify Construction damage to roads	40.1	Road dilapidation reports will be prepared before Construction commences for all public roads likely to be used by Construction traffic. Copies of the reports will be provided to the relevant roads authority.	Before Construction commences
	40.2	Road dilapidation reports will be prepared after Construction is complete for all public roads likely to be used by Construction traffic. Copies of the reports will be provided to the relevant roads authority. Any damage resulting from Construction, except that resulting from normal wear and tear, will be repaired at State Water's cost. Alternatively State Water may negotiate an alternative arrangement for road damage with the relevant roads authority.	Before Construction commences
Manage and minimise Construction impacts to traffic	40.3	A Construction Traffic Management Sub Plan will be prepared as part of the CEMP. The Sub Plan will be prepared in consultation with the relevant roads authority and include: a) identification of all roads to be used by Construction traffic, in particular roads proposed to transport large quantities of Construction materials. The expected timing and duration of road usage will be stated; b) management methods to ensure Construction traffic uses identified roads; c) identification of all roads that may be partially or completely closed during Construction and the expected timing and duration of these closures. Consideration will be given to programming Construction works to minimise road closures during peak hours and/or holiday periods; d) impacts on all types of existing traffic including pedestrians, vehicles, cyclists, and disabled persons; e) temporary traffic arrangements including property access;	Before Construction commences

Objective	Commitment		Timing
		f) access to Construction sites including entry and exit locations and measures to prevent Construction vehicles queuing on public roads; g) a response plan for any Construction traffic incident; and h) monitoring, review and amendment mechanisms.	
Visual Impact and Landscaping			
Minimise the visual impacts of the Activity	41.1	A Visual Impact, Landscaping and Revegetation Sub Plan will be prepared as part of the CEMP. The Sub Plan will be prepared in consultation with the CLG and Lake Keepit State Park Trust. The Sub Plan will present an integrated landscaping and revegetation design for the Activity and will be consistent with the Master Plan prepared for affected areas of recreational entities. The Sub Plan will include design treatments for: a) location and identification of existing vegetation and proposed landscaped and revegetation areas; and b) fixtures such as lighting, fencing and signs. The Sub Plan will also include the following information: a) graphics for key elements such as sections, sketches and perspective views; b) a schedule of species to be used in landscaping. The derivation of the schedule will be explained including its relationship with the Activity's ecological studies; c) details of the timing and progressive implementation of landscape works considering related environmental controls such as erosion and sedimentation controls and drainage; and procedures and methods to monitor and maintain landscaped or rehabilitated areas.	Before Construction commences

Miscellaneous Requirements

Objective	Commitment		Timing
Hazards and Risk Management			
Manage and minimise Construction hazards and risks	42.1	A Hazards and Risk Management Sub Plan will be prepared as part of the CEMP. The Sub Plan will include: a) details of the hazards and risks associated with the Activity during Construction; and b) mitigation measures including contingency plans.	Before Construction commences
Waste Management and Recycling			
Manage and minimise Construction waste and maximise recycling of waste	43.1	A Waste Management and Re-use Sub Plan will be prepared as part of the CEMP. The Sub Plan will address the management of wastes during Construction in accordance with the NSW Government's Waste Reduction and Purchasing Policy. The Sub Plan will identify requirements for: a) the application of the waste minimisation hierarchy principles of avoid/reduce/re-use/recycle/dispose; b) waste handling and storage; c) disposal of wastes. Specific details will be provided for cleared vegetation, contaminated materials, glass, metals and plastics, hydrocarbons (lubricants and fuels) and sanitary wastes; and d) any waste material that is unable to be re-used, re-processed or recycled will be disposed at a facility approved to receive that type of waste.	Before Construction commences

Objective	Commitment		Timing
Utilities and Services			
Manage and minimise Construction impacts of utilities and services	44.1	Utilities and services (hereafter "services") potentially affected by Construction will be identified to determine requirements for diversion, protection and/or support. Alterations to services will be determined by negotiation between State Water and the service providers. State Water in consultation with service providers will ensure that disruption to services resulting from the Activity are minimised and advised to customers.	During detailed design

Appendix E

SUMMARY OF EROSION AND SEDIMENTATION EXPERT PANEL WORKSHOP

Preface

In 2006, State Water convened a panel of experts to gauge the relative level of environmental impact resulting from implementation of the three dam safety upgrade options.

Investigations of erosion in both the Namoi and Peel valleys undertaken prior to the workshop found that erosion resulting from the proposal in the Namoi valley would be negligible relative to a base case of dam failure because of the existing river valley and flood history, presence of rock, soil stability, and generally lower soil depth. Most of these conditions are not present below the subsidiary dam wall, particularly in the 2.5 kilometres between the wall and Peel River where there is virgin ground that has no history of channel flow. For these reasons, the primary focus of the expert panel workshop was the downstream erosion of the lower Peel River resulting from operation of the proposed subsidiary dam spillway for Option B1 and the potential environmental impacts of sediment deposit on the Carroll's Gap floodplain.

Section 6.3 of the Environmental Assessment provides a discussion and comparison of the erosion and sedimentation from spillway releases into the Namoi and Peel Rivers for all three upgrade options.

Introduction

Background

In 2003, Parsons Brinckerhoff (PB) conducted a desktop study of the geology and soil conditions surrounding the various locations of proposed spillway structures as part of an assessment of four short-listed options for the upgrade of Keepit Dam. This work identified that the area below the subsidiary dam wall comprises alluvial soils that are highly erodible – far more so than at other locations. Therefore, operation of this new spillway would result in a high level of erosion between the subsidiary dam wall and the Peel River which might be avoided by the selection of another option. This option is however substantially cheaper than the others.

A further investigation of the potential erosion downstream of the subsidiary dam wall and its consequent environmental impacts was undertaken to more accurately determine its significance. The additional investigation was conducted in 2005 (PB 2005). This confirmed the results of the earlier study and indicted that the operation of a spillway at the subsidiary dam wall would result in erosion of some 3 million cubic metres of rock and soil during a 1:10,000 annual exceedance probability (AEP) flood event in the Namoi catchment. A simultaneous large flood of approximately 1:200 AEP is expected to occur in the Peel catchment at the time of a 1:10,000 AEP event in the Namoi catchment.

While this volume of material might be considered very large in the context of normal rainfall/ runoff processes, it was not known whether in the context of a large flood along the Peel River it would be significant. The additional investigations recommended that a more rigorous estimation of erosion be carried out and considered within the context of rare and extreme flood events and their consequent effects on heritage, ecology, agriculture and rural development.

There is a paucity of literature regarding the conceptual erosion and sedimentation processes which would accompany a very large (1:10,000 AEP) to an extreme storm such as a probable maximum flood (PMF). However, all indications are that the effects would be catastrophic and permanent. The frequency likely to be attributed to a PMF storm over the Namoi catchment would be less than 1:500,000 AEP. The largest known storms in Australia are estimated at 1:1,000 AEP with a couple of very small localised storms approaching an estimated 1:10,000 AEP. There is no experience, and therefore inherent difficulties, in estimating the magnitude of erosion of large area catchment storms associated with very rare to extreme events. The catastrophic nature of storms of this size also makes the determination of environmental impacts problematic.

The adopted approach was to assemble a panel of experts from across a number of fields to consider the issue in a workshop environment and facilitate a collaborative response to the problem. A consultancy firm, Sinclair

Knight Merz, was commissioned to estimate the erosion budget from the catchment upstream of Keepit Dam during a 1:10,000 AEP flood event and consider relative implications from even more extreme events.

The panel members were identified through recommendations made by NSW Government agencies associated with the Keepit Dam project including the Department of Environment and Conservation and the Department of Primary Industries (Fisheries).

The expert panel comprised:

- Ross Hardie (EarthTech) – Fluvial geomorphologist
- Darren Baldwin (Murray-Darling Freshwater Research Centre) – Riverine and aquatic ecology
- Martin Predavec (Parsons Brinckerhoff) – Terrestrial ecology
- Bill Manning (Department of Primary Industries) – Rural development
- Des Lang (Department of Natural Resources) – Soils and agriculture
- Phil Purcell (Department of Environment and Conservation) – Heritage.

Other participants included:

- David Watson (State Water) – Keepit Dam Upgrade Project Manager
- Jocelyn Karsten (State Water) – Environmental Projects Officer
- Peter Hill (Sinclair Knight Merz) – Hydrology and hydraulics
- Bruce Abernathy (Sinclair Knight Merz) – Fluvial geomorphologist
- Greg Marshall (Parsons Brinckerhoff) – Environmental Assessment Project Director.

Workshop format and aims

A two-day workshop was conducted onsite at Keepit Dam and comprised the following elements:

- Site visit to the dam and surrounding areas.
- Review of background information including dam upgrade options, extreme flood hydrology and catchment erosion.
- Site visit to the area below the subsidiary dam wall.
- Discussion of the results in the context of the total erosion and sediment expected during a 1:10,000 AEP flood event and the existing environmental conditions.
- Outcomes from the workshop.

The aim of the workshop was to estimate the relative scale of erosion resulting from the operation of Option B1 in the context of the overall erosion occurring in the catchment upstream of Lake Keepit during a very large 1:10,000 AEP or less frequent flood in the Namoi River. The consequent (relative) environmental impacts resulting from this erosion and deposition are also to be discussed to determine the relative impact of Option B1. The following presents a summary of discussions at the workshop and the main findings.

Summary of workshop discussions

Catchment characterisation

1. The method for classifying upstream landform units comprised aerial observations, analysis of topographic and geologic maps and field inspections at key locations.

2. For each landform unit, an approximate depth of soil, percentage of rock and depth to bedrock was estimated.

3. The upstream sediment budget was estimated by multiplying the soil depth mobilised by a 'delivery ratio'.

4. The available soil depth and delivery ratios were modified by the workshop group to investigate less conservative scenarios.

Key inputs and assumptions

5. The hydraulic inundation and velocity modelling conducted for the dam upgrade is a fixed boundary water flow model only and does not take into account changes that would result from erosion and sedimentation during a very large to PMF storm.

6. The hydraulic model identifies the additional area inundated and eroded from activation of the subsidiary dam spillway associated with 1:10,000 AEP and less frequent storms.

7. The model assumes that the shape of the flood hydrograph would not change as a result of the large amount of sediment mobilised during a storm.

8. A PMF is equal to approximately 600 millimetres rainfall in 24 hours over the entire Keepit catchment (estimated to be approximately 4,600 square kilometres). The assumption of a PMF down to a large flood of frequency greater than 1:10,000 AEP, is that the catchment is already wet leading to immense volumes of runoff and extreme depth of soils being mobilised.

9. Erosion of the catchment would depend on a variety of factors including type and depth of soils, percentage of rock, ground slope and energy of storm flows. Vegetation coverage would not affect the erosion potential.

10. The concept of erosion discussed under very large (1:10,000 AEP) to extreme (PMF) flood conditions is atypical of normal erosion/sedimentation processes. The very large to extreme flood process was conceptually described as a 'conveyor belt' in which it would be difficult to distinguish between the bedload, suspended load and the floodwaters themselves and which would have increasing

energy over distance as a result of the additional mud and debris mobilised.

11. For very large (1:10,000 AEP) to extreme floods (PMF) in the Namoi catchment, it is thought that a very large debris and eroded material conveyor belt would be formed. Once gullies fill with water the hill slides would begin to undercut and erosion would continue up the slopes resulting in bank slumping which would be carried away by the main body of the flood flow.

12. Prior to the workshop, it was suggested that a 1:10,000 AEP flood in the Namoi catchment that triggered the subsidiary dam would result in the 'worst case' erosion beneath the subsidiary dam wall on the assumption that the high velocity of floodwaters exiting the dam would increase the flow velocities in the lower Peel River resulting in increased impacts.

13. Floods larger than 1:10,000 AEP in the Namoi up to PMF would see velocities in the lower Peel River increasing to well over 4 metres per second resulting in considerable additional erosion in the lower Peel River.

14. The commensurate flood in the lower Peel River under this scenario was estimated to be 1:300 AEP.

Catchment modelling results and sensitivity testing

15. Different approaches were investigated by the group including estimation of:

    - the cumulative volume or material eroded from the Namoi catchment in addition to that from below the subsidiary dam wall in the Peel River
    - the volume of material eroded only from below the subsidiary dam wall in the Peel River as an average depth of sediment deposited on the floodplain
    - the volume of material eroded from a storm in the Peel River only.

16. Erosion between the subsidiary dam wall and the Namoi/ Peel River confluence was estimated to be approximately 3 million cubic metres for a 1:10,000 AEP flood.

17. An initial 'worst case' estimate (from a 1:10,000 AEP event) of erosion from the upstream Namoi catchment was approximately 600 million cubic metres. The magnitude of erosion from below the subsidiary dam wall represents a very small fraction of approximately 0.5% of this total amount.

18. This equates to an average depth of erosion of approximately 140 millimetres across the entire upstream catchment and is based on looking at the various soil and terrain conditions/areas in the catchment

and estimating the potential depth of soil able to be mobilised under a very large to extreme rainfall event.

19. Some members of the group thought that the soil mobilised and the delivery ratios used in the previous estimate were too high.

20. The group therefore investigated the scenario that only 10 millimetres depth of sediment (considered a conservative figure) was deposited over the Carroll floodplain. This equates to a total eroded volume of 63 million cubic metres passing through Keepit Dam from the upstream catchment.

21. The relative contribution of erosion from below the subsidiary dam wall (3 million cubic metres) is less than 5% of 63 million cubic metres.

22. In reviewing the initial worst case scenario, the group concluded that potentially a more realistic estimate was 25% of the 600 million cubic metres would be sufficiently mobilised to flow from the catchment through Keepit Dam and downstream onto the flood plain around Carroll.

23. 25% of 600 million cubic metres of sediment equates to approximately 150 million cubic metres. The relative contribution of 3 million cubic metres from below the subsidiary dam wall is approximately 2% of this total amount.

24. Considering erosion below the subsidiary dam wall in isolation, the deposition of 3 million cubic metres of sediment on the Carroll floodplain would represent approximately 0.5 millimetres of sediment.

Review and discussion of modelling results

25. Calculations of erosion and resulting sedimentation indicated the volume of sediment mobilised by Option B1 during a 1:10,000 flood or less frequent flood event is a very small percentage (between 0.5-5%) relative to the total sediment load from the upstream Namoi River catchment.

26. The general consensus of opinion was that the effect of a release from the subsidiary dam wall was very small / insignificant in a regional sense given the scale of flooding and erosion processes which would occur in both the Namoi and Peel Rivers.

27. It was also agreed that the operation of the subsidiary dam wall would have a highly detrimental and avoidable (if another option was selected) effect on the area immediately below the subsidiary dam wall over a length of up to 2.5 kilometres.

28. A further 5 kilometres of the Peel River down to the confluence would be effected only for floods less frequent than 1:10,000 AEP where substantially higher velocities would be generated during a flood event.

There would be increased erosion and loss of riparian vegetation in conjunction with these events.

29. There would be massive scouring in the area below the subsidiary dam wall down to the Peel River which would fundamentally change the existing landscape and habitat, and increased impact in the Peel River down to the confluence due to increased flood velocities.

30. Beyond the confluence of the Namoi/ Peel River, the marginal affect of erosion from below the subsidiary dam wall would be insignificant and effectively indistinguishable from the affect of erosion from the Namoi and Peel River catchments.

31. While dependent on how the floodwaters are allowed to pass through Keepit Dam, as flood flows reduce there is potential for significant sedimentation within the storage. The group considered there was the potential for up to 30% of storage which might be lost due to sedimentation within the dam during a PMF event. However, actual sedimentation within the dam is highly speculative with much lower amounts discussed. It was agreed that the sill level of the gates would likely act as some form of control to how much sedimentation occurred. It was also commented that closure of the gates should be left as late as possible to limit sedimentation within the storage.

32. Apart from scouring there would also be some sedimentation occurring within the eroded areas on the down side of the hydrograph, although the volume and location could not be estimated. The main area of sediment deposition from both the catchment and the subsidiary dam wall flood flow erosion is likely to be downstream of the gorge near the Namoi/ Peel River confluence and on the Carroll floodplain but with fines travelling much further down the floodplain.

Discussion of downstream environmental effects

Terrestrial and aquatic ecology

33. In terms of relative effects on the *Hakea pulvinifera*, Option B1 is a better option based on the hydraulic modelling results.

34. Activation of the subsidiary dam spillway would result in a major but avoidable impact to the area below the subsidiary dam wall, albeit at a very low frequency of occurrence.

35. There would be loss of riparian vegetation in the lower Peel, between the subsidiary dam wall and the Namoi River confluence, for flood events less frequent than 1:10,000 AEP.

36. The currently available information suggests that the Peel River in-stream habitat is highly degraded.

37. The operation of Option B1 would fundamentally change the local terrestrial and aquatic environments which is unnecessary and avoidable through the selection of another option. The aquatic environment would

be unlikely to be materially effected in a flood more frequent than 1:10,000 AEP.

Aboriginal heritage

38. Need to look at impacts in a regional context. The cumulative loss of sites could be an issue with Option B1. Not all sites in this area may be currently identified.

39. Need to consult with the Aboriginal community to address the question of the significance of any impacts which has to include the question of the frequency of occurrence

40. Sites / items of Aboriginal heritage are often linked to geomorphic landform units. Mapping the flow paths of all of the options may help to identify significance of areas and determine the extent of marginal impacts from Option B1.

41. The confluence of the Namoi and Peel Rivers may be a significant area for Aboriginal sites and should be investigated.

42. Potential heritage sites immediately below the subsidiary dam wall may be lost due to the operation of Option B1. Further investigation of the geomorphologic setting of the lower Peel and Namoi Rivers is required to better understand archaeological potential.

Rural development

43. The area below the subsidiary dam wall likely to be affected by either erosion or deposition of sediment, is cleared, generally lower quality agricultural land.

44. The impacts from operation of Option B1 would result in adverse visual impacts between the subsidiary dam wall and the Peel River which will be long-lasting. It would be visible from Rushes Creek Road and Keepit Dam Road.

45. In the Peel River gorge, the existing channel would be made deeper by operation of Option B1.

46. There would be some sediment deposition at the tail of the hydrograph.

Soils and agriculture

47. The temporary loss of storage associated with Option B1 may be exacerbated by the capture of sediment within Keepit Dam. Sedimentation potential from very large floods to PMF means investigation into appropriate changes in operating procedures to manage a PMF event should be undertaken.

48. The area immediately below the subsidiary dam wall would be unusable for agriculture and likely to remain an erosion scar indefinitely even if rehabilitation was attempted.

49. The proposed arrangements for compensation of landowners below the subsidiary dam wall for adverse effects resulting from operation of Option B1 would be improved if they compensated on an event basis rather than purchased outright. This would ensure that the land owner at the time of the event is compensated, rather than the current owner (who may have on sold the property at a future time when an extreme flood occurs).

50. Compensation of landholders should be at fair market values.

51. There would be limited loss of grazing land along the gorge country including Carroll Gap and overall there will be some additional loss of grazing land down to the confluence with the Namoi, however, this is not significant in a regional context.

Conclusions

52. The relative contribution of erosion from the operation of the subsidiary dam spillway would be insignificant at a regional scale in the context of the estimated erosion and sediment load from a very large to extreme flood event which may occur in the Namoi and Peel Rivers.

53. Local impacts from the operation of the subsidiary dam spillway would be irreversible and highly unsightly and result in erosion impact of an additional 3 million cubic metres relative to other options.

54. These and other impacts to ecology and heritage could be avoided through the selection of an alternative option if desired but at a price premium.

55. These additional impacts downstream of a spillway at the subsidiary dam wall and in the lower Peel River would only occur at a very low flood frequency (less than 1:10,000 AEP).

56. More work is required to better detail the likely terrestrial, aquatic and heritage particularly Aboriginal impacts, from the operation of Option B1 in the lower Peel River.