



# ICRC

independent competition and regulatory commission

## Compliance and performance survey 2012-13

### Water supply and sewerage

#### Part 3: Technical (dam safety)

##### Introduction

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**(Refer to Part 1: Non-technical survey for section 2 and Part 2: Technical (general) for section 2)**

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## Instructions for completing the annual report

**Note :** This report should be completed after reading the separate explanatory notes and data dictionary for water supply and sewerage (dam safety).

Completing the templates:

- 1 For instructions on completing Part 3 of the report, please refer to the explanatory notes provided on the first page of the '2012 Water and Sewerage - Pt3 Technical (dam safety) Dictionary'.
- 2 Please indicate where material provided is confidential and not for general public release.



**Tip :** Press **Alt-Enter** to start a new line in a cell.

Legend and data validation

### Legend

- Blue cells with white text indicate column headings
- Blank white cells beneath column headings can be used for additional comments
- Orange cells indicate qualitative inputs.
- Yellow cells indicate quantitative inputs
- Grey cells indicate information to note when completing the form
- Diagonal stripes indicate a value is not required
- Blue text indicates a link to another page

Column heading

Enter comments in these cells

Enter qualitative data in these cells

Enter quantitative data in these cells

Notes for completing questions

These cells are locked

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## About the survey

Under section 25(2)(d) of the *Utilities Act 2000* (Utilities Act), utilities are required to report to the Independent Competition and Regulatory Commission (Commission) each financial year on the performance of their functions under the statute and their compliance with licence conditions. Reports must be submitted to the Commission within three months of the end of the financial year (i.e. by 1 October). The reported information forms the basis for the Commission's compliance reports and performance reports for licensed utility service providers. Parts 1 (Non-technical), 2 (Technical) and 3 (Technical - dam safety) of this template sets out the reporting requirements for 2012-13.

Part 3 (Technical - dam safety) is made up of general dam questions, and specific questions for the:


- Corin Dam
- Bendora Dam
- Cotter Dam
- LMWQCC Dam
- Googong Dam



## 3.1 General responses

**Note:** Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

The authorising officer may use an electronic signature.

Number	Part	Question (short form)	Utility 2013 response
<b>General</b>			
DS1	a	Corporate Approval (Y/N?)	Yes
DS1	b	Authorising officer name	Ian Carmody
DS1	c	Authorising officer title / position	Deputy CEO
DS1	d	Authorising officer signature	
<b>Management of DSMSs</b>			
DS2	a	Responsible officer title	Principal Engineer - Dam Safety Management
DS2	b	Office for reporting title	Branch Manager - Infrastructure Development and Asset Management
DS2	c	Qualifications and experience required	Degree in relevant field backed by experience in Dam Safety Management
DS2	d	Qualifications and experience actual	Ph.D in civil engineering, more than 30 years in Dam construction industry and safety management
DS2	e	Documentation of responsibilities (Y/N?)	Yes
<b>Quality management of Dam Safety Management Systems (DSMSs)</b>			
DS3	a	Function level audit(Y/N?)	Yes
DS3	b	Process and Validation level audits (Y/N?)	No
<b>Training for dam safety</b>			
DS4	a	Training of personnel (Y/N?)	Yes
DS4	b	Positions trained (list)	Dam Safety Manager, Dam Safety Engineer, Dam Surveillance Officer, Dam Safety Inspectors, Maintenance Personnel

Number	Part	Question (short form)	Utility 2013 response
DS4	c	Training dates (list)	Dam Safety Engineers - ANCOLD Conference on 25 Oct 2012 and Advanced Dam Safety training on 19/20 April 2010. Dam Surveillance Officer - Advanced Dam Safety training on 19/20 April 2010. Field Inspectors & maintenance personnel - Advanced Dam safety Training on 19/20 April 2010.
DS4	d	Positions not trained (list)	None
<b>DSMS Documents</b>			
DS5		Archiving of documents (Y/N?)	Yes
<b>Unscheduled at Unscheduled and New Dams</b>			
DS6	a	Unscheduled dams current (Y/N?)	Yes
DS6	b	Unscheduled dams future (Y/N?)	No

Note for DS3b - A Utilities ACT Audit of the Dam Surveillance Program was conducted by the Technical Regulator on 19 April 2012. ACTEW Water does not hold a copy of this report and has sought a copy from the Regulator. Moreover, a section of a current consultancy for the Type 1 (Comprehensive) Dam Surveillance Report for Googong Dam includes an assessment of the Operation and Maintenance manuals, procedures and programs; measured against ANCOLD Guidelines and other relevant industry standards.



## 3.2 Corin Dam responses

Section 3: Technical regulation of water and sewerage

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**Note:** Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Utility 2013 response
<b>Data file</b>			
DS7		Data file (Y/N)?	Yes
<b>Sunny Day Classification</b>			
DS8	a	Sunny Day Consequence category	Extreme
DS8	b	Sunny Day Consequence basis ("PAR", "PLL" or "other")	PLL
DS8	c	Sunny Day Consequence value (value or consideration)	127
DS8	d	Sunny Day Consequence review date (date)	SKM report on Flood study -30-08-2012
DS8	e	Sunny Day Consequence next review (date/"Not Planned")	Not planned
DS8	f	Sunny Day Consequence change (Y/N?)	Yes
<b>Flood Consequence Classification</b>			
DS9	a	Flood Consequence category	High A
DS9	b	Flood Consequence category basis ("PAR", "PLL" or "other")	PLL
DS9	c	Flood Consequence category (value or consideration)	48
DS9	d	Flood Consequence category review date (date)	SKM report on Flood study dated 30-08-2012
DS9	e	Flood Consequence category next review (date/"Not Planned")	Not planned
DS9	f	Flood Consequence category change (Y/N?)	Yes
<b>Operation and maintenance manuals</b>			
DS10	a	O&M manual exists(Y/N?)	Yes
DS10	b	O&M manual update (Y/N?)	Yes
DS10	c	O&M manual is a controlled document (Y/N?)	Yes
DS10	d	O&M log (Y/N?)	Yes
<b>Operations issues - Flood</b>			
DS11	a	DCF – headwater level (m)	961.61m
DS11	b	DCF –discharge	1400 m <sup>3</sup> /sec (wave wall top)
DS11	c	DCF – AEP	1: 1000,000
DS11	d	Safe Flood Capacity – level (m)	962.58 (wave wall top)
DS11	e	Safe Flood Capacity - discharge	1,400 cu.m
DS11	f	Safe Flood Capacity ("AEP"/"PMPDF"/"PMF")	AEP
DS11	g	Safe Flood Capacity (value of AEP/PMPDF/PMF)	1:1000,000

Number	Part	Question (short form)	Utility 2013 response
DS11	h	Flood capacity (citation)	SKM report on Flood study - 30/08/2012
DS11	i	Flood events (#)	None
DS11	j	Worst Flood – date	25/08/2012
DS11	k	Worst Flood – peak inflow	412.552 ML/day
DS11	l	Worst Flood – peak outflow	844.893 ML/day
DS11	m	Worst Flood – peak headwater	955.636 m AHD (RL)
<b>Operations issues - Earthquake</b>			
DS12	a	Safe earthquake - PGA	0.38g
DS12	b	Safe earthquake - AEP	1:50000
DS12	c	Earthquake capacity (citation)	Comprehensive Surveillance Report - Corin Dam May 2012
DS12	d	Earthquake (#)	None
DS12	e	Earthquake – date/"No Event"	No event
DS12	f	Earthquake – intensity/"No Event"	No event
DS12	g	Earthquake – shaking measured (state/"No Event")	No event
<b>Operations issues - General</b>			
DS13		Operating problems (Y/N?)	No
<b>Maintenance performance</b>			
DS14	a	Maintenance record (Y/N?)	Yes
DS14	b	Deferred Maintenance (Y/N?)	Yes
<b>Inspection of dams</b>			
DS15	a	Inspection regime (Y/N?)	Yes
DS15	b	Inspection frequency (Y/N?)	Yes
DS15	c	Inspection reports to suit dam (Y/N?)	Yes
DS15	d	Inspection reports minimum content (Y/N?)	Yes
DS15	e	Special/Emergency inspections (Y/N?)	No
DS15	f	Completion of inspections (Y/N?)	Yes
DS15	g	Inspection reports signed (Y/N?)	Yes
<b>Surveillance reports</b>			
DS16	a	Dam surveillance program submission (date)	Yes
DS16	b	Latest Surveillance Report (citation)	Yes
DS16	c	Content of Surveillance Reports (Y/N?)	Yes
<b>Instrumentation</b>			

Number	Part	Question (short form)	Utility 2013 response
DS17	a	Available instrumentation (list)	Ground water bore holes Water level Leakage weirs Piezometers Formation survey Seismometer Rain gauges Stream gauges Yes
DS17	b	Calibration of instrumentation (Y/N?)	Yes
<b>Monitoring of dams</b>			
DS18	a	Monitoring undertaken (describe)	Main Dam, Abutments, Toe area, Tunnel, Tower
DS18	b	Frequency of monitoring (Y/N?)	No
DS18	c	Monitoring of anchors (Y/N/"No Anchors"?)	No
DS18	d	Mechanical/electrical monitoring (Y/N?)	Yes
DS18	e	Monitoring records archived (Y/N?)	Yes
<b>Surveillance evaluation</b>			
DS19		Surveillance evaluation – personnel	Yes
DS19		Surveillance evaluation – frequency	Yes
DS19		Surveillance evaluation (Y/N?)	Yes
<b>Safety review</b>			
DS20	a	Latest safety review - date	Jun-13
DS20	b	Peer reviewed comprehensive safety review (Y/N?)	Yes
DS20	c	Safety Review Report (citation)	Annual Surveillance Report - Corin Dam 2013
DS20	d	Corresponding Separate Peer review Report (citation)	Comprehensive Surveillance Report - Corin Dam May 2012
DS20	e	Peer reviewed comprehensive safety review – availability	Jun-18
<b>Dam safety emergency plans</b>			
DS21	a	DSEP exists (Y/N?)	Yes
DS21	b	Date of latest DSEP update (citation)	Dam Safety Emergency Plans - Cotter River Dams (Corin, Bendora and Cotter Dams)
DS21	c	Latest DSEP test (citation)	Cotter River dams desktop flood exercise conducted on 22/02/11. Agencies John Holland, GHD, ACTEW, ActewAGL, ACTPLA
DS21	d	Draft DSEP submission (date)	10/05/2013
DS21	e	Inundation mapping data submission (date)	10/05/2013
DS21	f	Inundation mapping data start (co-ordinates)	184223.75 E - 575,658.70 N
DS21	g	Inundation mapping data end (co-ordinates)	161096 E - 634676 N
DS21	h	Inundation mapping data submission sheets (#)	8
DS21	i	DSEP contact list submission (date)	23/04/2013
DS21	j	Dam emergency event report submission (Y/N?)	No
<b>Security of dams</b>			
DS22	a	Security plan (Y/N?)	Yes



Number	Part	Question (short form)	Utility 2013 response
DS22	b	Security plan test/review (date)	4/04/2013
DS22	c	Security assessment (date)	2010
<b>Dam safety incidents</b>			
DS23		Dam safety incidents (Y/N?)	No
<b>Dam safety developments</b>			
DS24	a	Developments affecting dam safety (Y/N?)	No
DS24	b	Affect of any other dam (Y/N?)	Yes
<b>Modification of dams</b>			
DS25	a	Dam modifications (Y/N?)	No
DS25	b	Improvement due to modifications (Y/N/"No Modification"?)	No Modification
<b>Key documents</b>			
DS26	a	Design reports or safety reviews (Y/N?)	Yes
DS26	b	Design reports or safety reviews (citation)	Number of comprehensive surveillance reports
DS26	c	Construction reports (Y/N?)	No
DS26	d	WAE drawings (Y/N?)	Yes
<b>Safety status of dams</b>			
DS27	a	Safety status ("A", "B" or "C")	A
DS27	b	Safety status document (citation)	Cotter River Dams Flood Risk Studies - Ver 2 of 30-08-2012



### 3.3 Corin Dam responses - Supplementary information

**Note:** Please reference each item with the relevant question.

Number	Part	Utility 2013 response
DS8	f	With the completion of Enlarged Cotter Dam, this may change.
DS9	f	With the new study planned the PAR and PLL may be changed.
DS18	b	Rainfall storage level are monitored continuously. Leakage monitoring is done monthly. Project to undertake the upgrade of the instruments and telemetering is planned.
DS18	c	Anchors are below water level most of the time and well protected.
DS21	c	NSW- SES, Police. ACT- ACTEWAGL, SES, Police, Ambulance, ESDD, Community Services, RFS, Fire Brigade. Other/ Federal - EMA, Red Cross, National Capital Authority.
DS24	b	Construction of Enlarged Cotter Dam may change the consequence category of Corin Dam.
DS26	c	Construction reports for 1991 upgrade and the spillway upgrade available.





### 3.4 Bendora Dam responses

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**Note:** Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Utility 2013 response
<b>Data file</b>			
DS7		Data file (Y/N)?	Yes
<b>Sunny Day Classification</b>			
DS8	a	Sunny Day Consequence category	High A
DS8	b	Sunny Day Consequence basis ("PAR", "PLL" or "other")	PLL
DS8	c	Sunny Day Consequence value (value or consideration)	16
DS8	d	Sunny Day Consequence review date (date)	30/08/2012
DS8	e	Sunny Day Consequence next review (date/"Not Planned")	Not planned
DS8	f	Sunny Day Consequence change (Y/N)?	Yes
<b>Flood Consequence Classification</b>			
DS9	a	Flood Consequence category	High A
DS9	b	Flood Consequence category basis ("PAR", "PLL" or "other")	PLL
DS9	c	Flood Consequence category (value or consideration)	16
DS9	d	Flood Consequence category review date (date)	30/08/2012
DS9	e	Flood Consequence category next review (date/"Not Planned")	Not Planned
DS9	f	Flood Consequence category change (Y/N)?	Yes
<b>Operation and maintenance manuals</b>			
DS10	a	O&M manual exists(Y/N)?	Yes
DS10	b	O&M manual update (Y/N)?	Yes
DS10	c	O&M manual is a controlled document (Y/N)?	Yes
DS10	d	O&M log (Y/N)?	Yes
<b>Operations issues - Flood</b>			
DS11	a	DCF – headwater level (m)	783.53 m RL
DS11	b	DCF –discharge	1,540 m <sup>3</sup> /s
DS11	c	DCF – AEP	1:10,000
DS11	d	Safe Flood Capacity – level (m)	784.4
DS11	e	Safe Flood Capacity - discharge	2,599 m <sup>3</sup> /s
DS11	f	Safe Flood Capacity ("AEP"/"PMPDF"/"PMF")	AEP
DS11	g	Safe Flood Capacity (value of AEP/PMPDF/PMF)	N/A

Number	Part	Question (short form)	Utility 2013 response
DS11	h	Flood capacity (citation)	SKM report on Cotter river dams Flood Risk studies of 30-08-12
DS11	i	Flood events (#)	None
DS11	j	Worst Flood – date	27/08/2012
DS11	k	Worst Flood – peak inflow	617.435 ML/day
DS11	l	Worst Flood – peak outflow	0 ML/day
DS11	m	Worst Flood – peak headwater	778.566 m/ AHD (RL)
<b>Operations issues - Earthquake</b>			
DS12	a	Safe earthquake - PGA	0.28g
DS12	b	Safe earthquake - AEP	1:10,000
DS12	c	Earthquake capacity (citation)	5.0-7.5 ML
DS12	d	Earthquake (#)	None
DS12	e	Earthquake – date/"No Event"	No event
DS12	f	Earthquake – intensity/"No Event"	No event
DS12	g	Earthquake – shaking measured (state/"No Event")	No event
<b>Operations issues - General</b>			
DS13		Operating problems (Y/N?)	No
<b>Maintenance performance</b>			
DS14	a	Maintenance record (Y/N?)	Yes
DS14	b	Deferred Maintenance (Y/N?)	Yes
<b>Inspection of dams</b>			
DS15	a	Inspection regime (Y/N?)	Yes
DS15	b	Inspection frequency (Y/N?)	Yes
DS15	c	Inspection reports to suit dam (Y/N?)	Yes
DS15	d	Inspection reports minimum content (Y/N?)	Yes
DS15	e	Special/Emergency inspections (Y/N?)	No
DS15	f	Completion of inspections (Y/N?)	Yes
DS15	g	Inspection reports signed (Y/N?)	Yes
<b>Surveillance reports</b>			
DS16	a	Dam surveillance program submission (date)	Yes
DS16	b	Latest Surveillance Report (citation)	Yes
DS16	c	Content of Surveillance Reports (Y/N?)	Yes
<b>Instrumentation</b>			
DS17	a	Available instrumentation (list)	Ground water bore holes Joint meters Water level measurements Deformation Survey River Gauge Rainfall gauge
DS17	b	Calibration of instrumentation (Y/N?)	Yes

Number	Part	Question (short form)	Utility 2013 response
<b>Monitoring of dams</b>			
DS18	a	Monitoring undertaken (describe)	Main Dam, Abutments, Right abutment rock movement, Gallery, Tower, Cone Valve, Right bank cut, Mini Hydro, Downstream bridge, Gravity Main, Diesel generator
DS18	b	Frequency of monitoring (Y/N?)	No
DS18	c	Monitoring of anchors (Y/N/"No Anchors"?)	No Anchors
DS18	d	Mechanical/electrical monitoring (Y/N?)	Yes
DS18	e	Monitoring records archived (Y/N?)	Yes
<b>Surveillance evaluation</b>			
DS19		Surveillance evaluation – personnel	Yes
DS19		Surveillance evaluation – frequency	Yes
DS19		Surveillance evaluation (Y/N?)	Yes
<b>Safety review</b>			
DS20	a	Latest safety review - date	Jun-13
DS20	b	Peer reviewed comprehensive safety review (Y/N?)	Yes
DS20	c	Safety Review Report (citation)	Annual Surveillance Report - Bendora Dam 2013
DS20	d	Corresponding Separate Peer review Report (citation)	Comprehensive Surveillance Report - Bendora Dam May 2012
DS20	e	Peer reviewed comprehensive safety review – availability	Jun-18
<b>Dam safety emergency plans</b>			
DS21	a	DSEP exists (Y/N?)	Yes
DS21	b	Date of latest DSEP update (citation)	Dam Safety Emergency Plans - Cotter River Dams (Corin, Bendora and Cotter Dams)
DS21	c	Latest DSEP test (citation)	Cotter River dams desktop flood exercise conducted on 22/02/11. Agencies John Holland, GHD, ACTEW, ActewAGL,ACTPLA
DS21	d	Draft DSEP submission (date)	10/05/2013
DS21	e	Inundation mapping data submission (date)	10/05/2013
DS21	f	Inundation mapping data start (co-ordinates)	184223.75 E - 575,658.70 N
DS21	g	Inundation mapping data end (co-ordinates)	161096 E- 634676 N
DS21	h	Inundation mapping data submission sheets (#)	8
DS21	i	DSEP contact list submission (date)	23/04/2013
DS21	j	Dam emergency event report submission (Y/N?)	No
<b>Security of dams</b>			
DS22	a	Security plan (Y/N?)	Yes
DS22	b	Security plan test/review (date)	6/03/2013
DS22	c	Security assessment (date)	2010
<b>Dam safety incidents</b>			
DS23		Dam safety incidents (Y/N?)	No
<b>Dam safety developments</b>			
DS24	a	Developments affecting dam safety (Y/N?)	No

Number	Part	Question (short form)	Utility 2013 response
DS24	b	Affect of any other dam (Y/N?)	Yes
<b>Modification of dams</b>			
DS25	a	Dam modifications (Y/N?)	No
DS25	b	Improvement due to modifications (Y/N/"No Modification"?)	No Modification
<b>Key documents</b>			
DS26	a	Design reports or safety reviews (Y/N?)	Yes
DS26	b	Design reports or safety reviews (citation)	Review of Stability, Bendora Dam by NSW Dept. of Commerce April 2008 Review of Stability of Right Abutment by NSW Dept. of Commerce April 2008
DS26	c	Construction reports (Y/N?)	No
DS26	d	WAE drawings (Y/N?)	Yes
<b>Safety status of dams</b>			
DS27	a	Safety status ("A", "B" or "C")	A
DS27	b	Safety status document (citation)	SKM report on Cotter River Dams Flood Risk studies of 30/08/12



### 3.5 Bendora Dam responses - Supplementary information

**Note:** Please reference each item with the relevant question.

Number	Part	Utility 2013 response
DS18	b	Rainfall storage level are monitored continuously. Leakage monitoring is done monthly. Project to undertake the upgrade of the instruments and telemetering is planned.
DS8	f	The inflow and outflow are also monitored continuously.
DS9	f	With the completion of Enlarged Cotter dam this may change.
DS24	b	With the new study planned the PAR & PLL may change.
DS26	d	Construction of Enlarged Cotter dam may change the consequence category of Bendora Dam
		There are Work As Executed drawings available for key components and may not be complete.

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### 3.6 Cotter Dam responses

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**Note:** Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Utility 2013 response
Data file			
DS7		Data file (Y/N?)	
<b>Sunny Day Classification</b>			
DS8	a	Sunny Day Consequence category	
DS8	b	Sunny Day Consequence basis ("PAR", "PLL" or "other")	
DS8	c	Sunny Day Consequence value (value or consideration)	
DS8	d	Sunny Day Consequence review date (date)	
DS8	e	Sunny Day Consequence next review (date/"Not Planned")	
DS8	f	Sunny Day Consequence change (Y/N?)	
<b>Flood Consequence Classification</b>			
DS9	a	Flood Consequence category	
DS9	b	Flood Consequence category basis ("PAR", "PLL" or "other")	
DS9	c	Flood Consequence category (value or consideration)	
DS9	d	Flood Consequence category review date (date)	
DS9	e	Flood Consequence category next review (date/"Not Planned")	
DS9	f	Flood Consequence category change (Y/N?)	
<b>Operation and maintenance manuals</b>			
DS10	a	O&M manual exists(Y/N?)	
DS10	b	O&M manual update (Y/N?)	
DS10	c	O&M manual is a controlled document (Y/N?)	
DS10	d	O&M log (Y/N?)	
<b>Operations issues - Flood</b>			
DS11	a	DCF – headwater level (m)	
DS11	b	DCF –discharge	
DS11	c	DCF – AEP	
DS11	d	Safe Flood Capacity – level (m)	
DS11	e	Safe Flood Capacity - discharge	
DS11	f	Safe Flood Capacity ("AEP"/"PMPDF"/"PMF")	

Number	Part	Question (short form)	Utility 2013 response
DS11	g	Safe Flood Capacity (value of AEP/PMPDF/PMF)	
DS11	h	Flood capacity (citation)	
DS11	i	Flood events (#)	
DS11	j	Worst Flood – date	
DS11	k	Worst Flood – peak inflow	
DS11	l	Worst Flood – peak outflow	
DS11	m	Worst Flood – peak headwater	
<b>Operations issues - Earthquake</b>			
DS12	a	Safe earthquake - PGA	
DS12	b	Safe earthquake - AEP	
DS12	c	Earthquake capacity (citation)	
DS12	d	Earthquake (#)	
DS12	e	Earthquake – date/"No Event"	
DS12	f	Earthquake – intensity/"No Event"	
DS12	g	Earthquake – shaking measured (state/"No Event")	
<b>Operations issues - General</b>			
DS13		Operating problems (Y/N?)	
<b>Maintenance performance</b>			
DS14	a	Maintenance record (Y/N?)	
DS14	b	Deferred Maintenance (Y/N?)	
<b>Inspection of dams</b>			
DS15	a	Inspection regime (Y/N?)	
DS15	b	Inspection frequency (Y/N?)	
DS15	c	Inspection reports to suit dam (Y/N?)	
DS15	d	Inspection reports minimum content (Y/N?)	
DS15	e	Special/Emergency inspections (Y/N?)	
DS15	f	Completion of inspections (Y/N?)	
DS15	g	Inspection reports signed (Y/N?)	
<b>Surveillance reports</b>			
DS16	a	Dam surveillance program submission (date)	
DS16	b	Latest Surveillance Report (citation)	
DS16	c	Content of Surveillance Reports (Y/N?)	
<b>Instrumentation</b>			
DS17	a	Available instrumentation (list)	
DS17	b	Calibration of instrumentation (Y/N?)	
<b>Monitoring of dams</b>			
DS18	a	Monitoring undertaken (describe)	
DS18	b	Frequency of monitoring (Y/N?)	

Number	Part	Question (short form)	Utility 2013 response
DS18	c	Monitoring of anchors (Y/N/"No Anchors"?)	
DS18	d	Mechanical/electrical monitoring (Y/N?)	
DS18	e	Monitoring records archived (Y/N?)	
<b>Surveillance evaluation</b>			
DS19		Surveillance evaluation – personnel	
DS19		Surveillance evaluation – frequency	
DS19		Surveillance evaluation (Y/N?)	
<b>Safety review</b>			
DS20	a	Latest safety review - date	
DS20	b	Peer reviewed comprehensive safety review (Y/N?)	
DS20	c	Safety Review Report (citation)	
DS20	d	Corresponding Separate Peer review Report (citation)	
DS20	e	Peer reviewed comprehensive safety review – availability	
<b>Dam safety emergency plans</b>			
DS21	a	DSEP exists (Y/N?)	
DS21	b	Date of latest DSEP update (citation)	
DS21	c	Latest DSEP test (citation)	
DS21	d	Draft DSEP submission (date)	
DS21	e	Inundation mapping data submission (date)	
DS21	f	Inundation mapping data start (co-ordinates)	
DS21	g	Inundation mapping data end (co-ordinates)	
DS21	h	Inundation mapping data submission sheets (#)	
DS21	i	DSEP contact list submission (date)	
DS21	j	Dam emergency event report submission (Y/N?)	
<b>Security of dams</b>			
DS22	a	Security plan (Y/N?)	
DS22	b	Security plan test/review (date)	
DS22	c	Security assessment (date)	
<b>Dam safety incidents</b>			
DS23		Dam safety incidents (Y/N?)	
<b>Dam safety developments</b>			
DS24	a	Developments affecting dam safety (Y/N?)	
DS24	b	Affect of any other dam (Y/N?)	
<b>Modification of dams</b>			
DS25	a	Dam modifications (Y/N?)	
DS25	b	Improvement due to modifications (Y/N/"No Modification"?)	
<b>Key documents</b>			
DS26	a	Design reports or safety reviews (Y/N?)	

Number	Part	Question (short form)	Utility 2013 response
DS26	b	Design reports or safety reviews (citation)	
DS26	c	Construction reports (Y/N?)	
DS26	d	WAE drawings (Y/N?)	
<b>Safety status of dams</b>			
DS27	a	Safety status ("A", "B" or "C")	
DS27	b	Safety status document (citation)	







### 3.8 LMWQCC Dam responses

**Note:** Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Utility 2013 response
<b>Data file</b>			
DS7		Data file (Y/N)?	Yes
<b>Sunny Day Classification</b>			
DS8	a	Sunny Day Consequence category	Low
DS8	b	Sunny Day Consequence basis ("PAR", "PLL" or "other")	PAR
DS8	c	Sunny Day Consequence value (value or consideration)	0
DS8	d	Sunny Day Consequence review date (date)	1994
DS8	e	Sunny Day Consequence next review (date/"Not Planned")	Not Planned
DS8	f	Sunny Day Consequence change (Y/N)?	No
<b>Flood Consequence Classification</b>			
DS9	a	Flood Consequence category	Low
DS9	b	Flood Consequence category basis ("PAR", "PLL" or "other")	PAR
DS9	c	Flood Consequence category (value or consideration)	0
DS9	d	Flood Consequence category review date (date)	1994
DS9	e	Flood Consequence category next review (date/"Not Planned")	Not Planned
DS9	f	Flood Consequence category change (Y/N)?	No
<b>Operation and maintenance manuals</b>			
DS10	a	O&M manual exists(Y/N)?	Yes
DS10	b	O&M manual update (Y/N)?	Yes
DS10	c	O&M manual is a controlled document (Y/N)?	Yes
DS10	d	O&M log (Y/N)?	Yes
<b>Operations issues - Flood</b>			
DS11	a	DCF – headwater level (m)	482.5
DS11	b	DCF –discharge	No procedures
DS11	c	DCF – AEP	No procedures
DS11	d	Safe Flood Capacity – level (m)	482.1
DS11	e	Safe Flood Capacity - discharge	50 m <sup>3</sup> /s
DS11	f	Safe Flood Capacity ("AEP"/"PMPDF"/"PMF")	AEP



Number	Part	Question (short form)	Utility 2013 response
DS11	g	Safe Flood Capacity (value of AEP/PMPDF/PMF)	1: 10,000
DS11	h	Flood capacity (citation)	Design Review Documents
DS11	i	Flood events (#)	None
DS11	j	Worst Flood – date	N/A
DS11	k	Worst Flood – peak inflow	N/A
DS11	l	Worst Flood – peak outflow	N/A
DS11	m	Worst Flood – peak headwater	N/A
<b>Operations issues - Earthquake</b>			
DS12	a	Safe earthquake - PGA	0.257g
DS12	b	Safe earthquake - AEP	See Note
DS12	c	Earthquake capacity (citation)	Dam safety Emergency Plan for the Lower Molonglo water Quality Control Centre Bypass Storage Dam - July 2012
DS12	d	Earthquake (#)	None
DS12	e	Earthquake – date/“No Event”	No event
DS12	f	Earthquake – intensity/“No Event”	No event
DS12	g	Earthquake – shaking measured (state/“No Event”)	No event
<b>Operations issues - General</b>			
DS13		Operating problems (Y/N?)	No
<b>Maintenance performance</b>			
DS14	a	Maintenance record (Y/N?)	Yes
DS14	b	Deferred Maintenance (Y/N?)	Yes
<b>Inspection of dams</b>			
DS15	a	Inspection regime (Y/N?)	Yes
DS15	b	Inspection frequency (Y/N?)	Yes
DS15	c	Inspection reports to suit dam (Y/N?)	Yes
DS15	d	Inspection reports minimum content (Y/N?)	Yes
DS15	e	Special/Emergency inspections (Y/N?)	No
DS15	f	Completion of inspections (Y/N?)	Yes
DS15	g	Inspection reports signed (Y/N?)	Yes
<b>Surveillance reports</b>			
DS16	a	Dam surveillance program submission (date)	Yes
DS16	b	Latest Surveillance Report (citation)	Yes
DS16	c	Content of Surveillance Reports (Y/N?)	Yes
<b>Instrumentation</b>			

Number	Part	Question (short form)	Utility 2013 response
DS17	a	Available instrumentation (list)	Ground water bore holes Leakage weirs piezometers Deformation survey network Rainfall gauge Inflow flow meters Yes
DS17	b	Calibration of instrumentation (Y/N?)	Yes
<b>Monitoring of dams</b>			
DS18	a	Monitoring undertaken (describe)	Leakage, Piezometers, Deformation Survey, Rainfall Ground water levels, Dam water level,
DS18	b	Frequency of monitoring (Y/N?)	Yes
DS18	c	Monitoring of anchors (Y/N/ No Anchors?)	No Anchors
DS18	d	Mechanical/electrical monitoring (Y/N?)	Yes
DS18	e	Monitoring records archived (Y/N?)	Yes
<b>Surveillance evaluation</b>			
DS19		Surveillance evaluation – personnel	Yes
DS19		Surveillance evaluation – frequency	Yes
DS19		Surveillance evaluation (Y/N?)	Yes
<b>Safety review</b>			
DS20	a	Latest safety review - date	Apr-13
DS20	b	Peer reviewed comprehensive safety review (Y/N?)	Yes
DS20	c	Safety Review Report (citation)	Annual Dam Surveillance Report - LMWQCC By Pass Dam , June 2013
DS20	d	Corresponding Separate Peer review Report (citation)	Comprehensive Surveillance Report LMWQCC By Pass dam, June 2012
DS20	e	Peer reviewed comprehensive safety review – availability	Planned in 2017
<b>Dam safety emergency plans</b>			
DS21	a	DSEP exists (Y/N?)	Yes
DS21	b	Date of latest DSEP update (citation)	Dam safety Emergency Plan for the Lower Molonglo Water Quality Control Centre Bypass Storage Dam
DS21	c	Latest DSEP test (citation)	N/A
DS21	d	Draft DSEP submission (date)	10/05/2013
DS21	e	Inundation mapping data submission (date)	N/A
DS21	f	Inundation mapping data start (co-ordinates)	N/A
DS21	g	Inundation mapping data end (co-ordinates)	N/A
DS21	h	Inundation mapping data submission sheets (#)	N/A
DS21	i	DSEP contact list submission (date)	23/04/2013
DS21	j	Dam emergency event report submission (Y/N?)	No
<b>Security of dams</b>			
DS22	a	Security plan (Y/N?)	Yes
DS22	b	Security plan test/review (date)	Mar-13

Number	Part	Question (short form)	Utility 2013 response
DS22	c	Security assessment (date)	2010
<b>Dam safety incidents</b>			
DS23		Dam safety incidents (Y/N?)	No
<b>Dam safety developments</b>			
DS24	a	Developments affecting dam safety (Y/N?)	No
DS24	b	Affect of any other dam (Y/N?)	No
<b>Modification of dams</b>			
DS25	a	Dam modifications (Y/N?)	No
DS25	b	Improvement due to modifications (Y/N/"No Modification"?)	No Modification
<b>Key documents</b>			
DS26	a	Design reports or safety reviews (Y/N?)	Yes
DS26	b	Design reports or safety reviews (citation)	Design Report - DSU 94/02 - 1994, Spillway & Stilling basin Design- 1993, Flood frequency curve for the proposed LMWQCC By pass dam, comprehensive surveillance report 2003-2004
DS26	c	Construction reports (Y/N?)	No
DS26	d	WAE drawings (Y/N?)	Yes
<b>Safety status of dams</b>			
DS27	a	Safety status ("A", "B" or "C")	A
DS27	b	Safety status document (citation)	Reviewed at Comprehensive Surveillance safety reviews







### 3.10 Googong Dam responses

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 Section 3: Technical regulation of water and sewerage

**Note:** Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Utility 2013 response
<b>Data file</b>			
DS7		Data file (Y/N?)	Yes
<b>Sunny Day Classification</b>			
DS8	a	Sunny Day Consequence categories	Extreme
<b>Flood Consequence Classification</b>			
DS9	a	Flood Consequence categories	Extreme
<b>Operation and maintenance manuals</b>			
DS10	a	O&M manual exists(Y/N?)	Yes
DS10	c	O&M manual is a controlled document (Y/N?)	Yes
DS10	d	O&M log (Y/N?)	Yes
<b>Operations issues</b>			
DS11	a	DCF – headwater level (m)	674.5 RL
DS11	b	DCF –discharge	more than 10,500 m <sup>3</sup> /s
DS11	c	DCF – AEP	N/A See Note
DS11	d	Safe Flood Capacity – level (m)	See Note
DS11	e	Safe Flood Capacity - discharge	10,500 m <sup>3</sup> /s
DS11	f	Safe Flood Capacity (“AEP”/“PMPDF”/“PMF”)	PMF
DS11	g	Safe Flood Capacity (value of AEP/PMPDF/PMF)	1,100,000
DS11	h	Flood capacity (citation)	SKM report on flood study for Googong dam - 2007
DS11	i	Flood events (#)	2
DS11	j	Worst Flood – date	12/10/2012
DS11	k	Worst Flood – peak inflow	5896.541 ML/day
DS11	l	Worst Flood – peak outflow	5257.409 ML/day
DS11	m	Worst Flood – peak headwater	663.401 m
<b>Operations issues - Earthquake</b>			
DS12	a	Safe earthquake - PGA	0.08-0.09 g
DS12	b	Safe earthquake - AEP	N/A See Note
DS12	c	Earthquake capacity (citation)	Googong Dam - Comprehensive Surveillance Report Dec 2005
DS12	d	Earthquake (#)	None

Number	Part	Question (short form)	Utility 2013 response
DS12	e	Earthquake – date/"No Event"	No event
DS12	f	Earthquake – intensity/"No Event"	No event
DS12	g	Earthquake – shaking measured (state/"No Event")	No event
<b>Operations issues - General</b>			
DS13		Operating problems (Y/N?)	No
<b>Inspection of dams</b>			
DS15	e	Special/Emergency inspections (Y/N?)	No
<b>Surveillance reports</b>			
DS16	a	Dam surveillance program submission (date)	Jul-12
DS16	b	Latest Surveillance Report (citation)	Googong dam Annual Surveillance Report - June 2013
DS16	d	Regulators requirements (list)	To rectify the d/s surface of Saddle dam
DS16	e	Regulators requirements implemented (Y/N?)	Yes
<b>Surveillance evaluation</b>			
DS19	a	Surveillance evaluation – personnel	Yes
DS19	b	Surveillance evaluation – frequency	Yes
DS19	c	Surveillance evaluation (Y/N?)	Yes
<b>Safety review</b>			
DS20	a	Latest safety review - date	25/02/2009
DS20	b	Peer reviewed comprehensive safety review (Y/N?)	Yes
DS20	c	Safety Review Report (citation)	Googong Dam Spillway Upgrade - Flood Hydrology Report by SKM
DS20	d	Corresponding Separate Peer review Report (citation)	Reviewed by SKM
DS20	e	Peer reviewed comprehensive safety review – availability	Jan-14
DS20	f	DSC review of peer reviewed comprehensive safety review (Y/N?)	Yes
DS20	g	Utility response to DSC requirements (state)	Issues closed after carrying out maintenance works.
<b>Dam safety emergency plans</b>			
DS21	a	DSEP exists (Y/N?)	Yes
DS21	b	Date of latest DSEP update (citation)	Dam Safety Emergency Plan for Googong Dam
DS21	c	Latest DSEP test (citation)	27/03/2012
DS21	d	Draft DSEP submission (date)	10/05/2013
DS21	e	Inundation mapping data submission (date)	10/05/2013
DS21	f	Inundation mapping data start (co-ordinates)	223033E - 588668 N
DS21	g	Inundation mapping data end (co-ordinates)	202638E - 603310 N
DS21	h	Inundation mapping data submission sheets (#)	2
DS21	i	DSEP contact list submission (date)	23/04/2013
DS21	j	Dam emergency event report submission (Y/N?)	No
<b>Dam safety incidents</b>			
DS23		Dam safety incidents (Y/N?)	No
<b>Dam safety developments</b>			

Number	Part	Question (short form)	Utility 2013 response
DS24	a	Developments affecting dam safety (Y/N?)	No
DS24	b	Affect of any other dam (Y/N?)	No
<b>Modification of dams</b>			
DS25	a	Dam modifications (Y/N?)	No
DS25	b	Improvement due to modifications (Y/N/"No Modification"?)	No Modification
<b>Key documents</b>			
DS26	a	Design reports or safety reviews (Y/N?)	Yes
DS26	b	Design reports or safety reviews (citation)	Googong Dam Spillway Upgrade - Flood Hydrology Report by SKM 25/02/09
DS26	c	Construction reports (Y/N?)	Yes
DS26	d	WAE drawings (Y/N?)	Yes
<b>Safety status of dams</b>			
DS27	a	Safety status ("A", "B" or "C")	A
DS27	b	Safety status document (citation)	Googong Dam Spillway Upgrade - Flood Hydrology Report by SKM - 25/02/09





### 3.11 Googong Dam responses - Supplementary information

**Note:** Please reference each item with the relevant question.

**Number**   **Part**   **Utility 2013 response**

DS11	c	The Googong spillway is designed to pass the PMF of 10,500 m <sup>3</sup> /s without flood level reaching the crest of the dam. It would contain within the walls of the spillway.
DS11	d	As above
DS12	c	A study carried out for Tuggeranong Dam was used as it is 20 km from Googong dam site. Maximum Credible Earthquake of 7.5 ML was used in the investigation.

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