CHAPTER 1

METHODOLOGY

Nullinga Dam and Other Options Preliminary Business Case

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1 METHODOLOGY

CHAPTER SUMMARY AND CONCLUSIONS

- This chapter outlines the approach to preliminary business case (PBC) development for risk, stakeholder engagement and options selection.
- The risk assessment was based on the Department of Energy and Water Supply (DEWS) risk matrix, in accordance with the department as the Project Owner. Risks were identified and qualified through a series of agency and internal advisor workshops to develop the risk register.
- The stakeholder engagement approach and stakeholder engagement plan was developed with assistance from DEWS, SunWater, Leisa Prowse Consulting, Marsden Jacobs Associates (MJA) and Jacobs.
- Stakeholder engagement was undertaken via a series of channels:
  - formation and meetings of a Stakeholder Reference Group, comprised of regional representatives from a wide variety of stakeholder organisations, including government, industry and economic development groups. The Stakeholder Reference Group process was managed by Leisa Prowse Consulting.
  - interviews between MJA and stakeholders as part of MJA's demand assessment
  - interviews between Jacobs and stakeholders as part of Jacobs peer review of MJA's demand assessment and Jacobs testing of the proposed long list and shortlisted options.
- Options selection considered the State Infrastructure Plan (SIP) categories for options assessment (reform, better use, improve existing and new build) and the approach that a range of solutions have the potential to achieve a desired outcome.
- The service need, long list of options, options filtering and shortlisted options process included workshops with key agency stakeholders and Jacobs; Stakeholder Reference Group feedback; and Project Steering Committee consideration.

1.1 Purpose

This chapter outlines the approach to PBC development for risk, stakeholder engagement and options selection.

1.2 Background

Nullinga Dam has a long history, first being proposed in the 1950s as part of the development of the Mareeba-Dimbulah Irrigation Area (MDIA) for tobacco production. Since that time, Nullinga Dam has been proposed to provide a bulk water supply for a variety of uses, most recently Cairns urban water supply.

Given the history of proposed uses for Nullinga Dam, the following initial objectives were developed for the PBC:

- identify and clearly describe the water supply problems/opportunities within the region
- present the Nullinga Dam option along with other options as potential solutions to the identified problems/opportunities
- undertake a preliminary analysis of the shortlisted options

- provide recommendations for a stage 2 Detailed Business Case.

1.3 Risk Approach

This section describes the risk-management approach used to identify options and refine the shortlisted options. It also describes the risk management approach used to select (and design/refine and describe) the preferred options.

Risk-management activities during PBC development have included:

- identifying development risks to ensure those risks are effectively addressed where possible
- identifying proposal risks including risks associated with changes in:
  - proposal background
  - service need
  - options generation and shortlisting
  - strategic and political context
- identifying method risks including:
  - key assumptions (e.g. demand and costs)
  - data availability, accuracy and state of current relevance
  - an approach to delivering the social, environmental, economic, financial assessment[1]
- identifying process risks including:
  - stakeholder engagement activities and timing to help ensure the process maximises potential outcomes
- identifying options/project risks including:
  - governance arrangements
  - funding
  - delivery
  - timing.

These risks have been given due consideration and managed during PBC development to ensure the preferred options account for key risks and risk considerations have been incorporated into cost estimates.

1.3.1 Risk Framework

The DEWS risk matrix was utilised in accordance with the department being the Project Owner for the PBC stage.

The risk management process and risk matrix outlined in the following figures reflect a risk management policy and procedure that aligns with AS/NZS ISO 31000:2009 Risk management—Principles and guidelines (DEWS 2015).

[1] Addressed in method, assumptions and limitations sections of each chapter respectively.

Figure 1 Risk Management Process

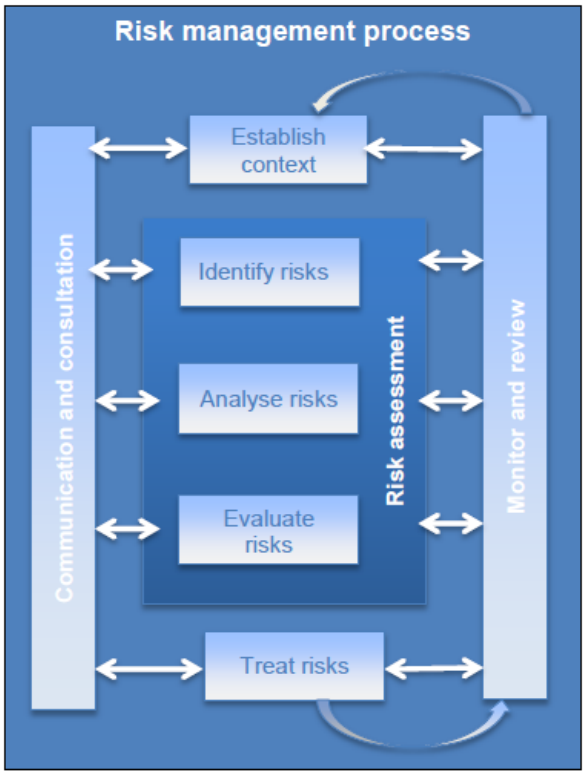

Figure 2 Risk Matrix

RISK ANALYSIS MATRIX					
CONSEQUENCES					
LIKELIHOOD	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Medium (11)	Medium (16)	High (20)	Extreme (23)	Extreme (25)
Likely	Low (7)	Medium (12)	High (17)	High (21)	Extreme (24)
Possible	Low (4)	Medium (8)	Medium (13)	High (18)	High (22)
Unlikely	Low (2)	Low (5)	Medium (9)	Medium (14)	High (19)
Rare	Low (1)	Low (3)	Low (6)	Medium (10)	Medium (15)

The DEWS guidance was initially used to interpret the likelihood of risks and consequences as follows.

Table 1 DEWS Risk Likelihood Table

LIKELIHOOD	QUALITATIVE DESCRIPTION	EXAMPLE OF QUANTITATIVE DESCRIPTION
Almost Certain	The event is expected to occur in most circumstances	May occur once a year or more
Likely	The event will probably occur in many circumstances	May occur once every 3 years
Possible	Identified factors indicate the event could occur at some time	May occur once every 10 years
Unlikely	The event could occur at some time but is not expected	May occur once every 30 years
Rare	The event may occur only in exceptional circumstances	May occur once every 100 years

Table 2 DEWS Risk Consequence Table

IMPACT AREA	CONSEQUENCE				
	INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC
Business delivery	Negligible impact on the effectiveness of the department	Minimal impact on delivery of strategic or business outcomes	Moderate impact on delivery of strategic or business outcomes	Severe impact on delivery of strategic or business outcomes	Strategic or business outcomes unable to delivered
	Minimal impact on the delivery of core services	Minor delays in the delivery of core services	Core services have to be prioritised and or delayed	Delays in providing or prioritisation of critical services required	Failure to provide critical services

The DEWS guidance was then adjusted to include quantitative guidelines to assess the consequence for economic and financial inputs as part of risk adjustments for each option.

1.3.2 Identification and Quantification/Qualification of Risks

The process used to identify and quantify/quality risks for the risk register included:

- Two agency risk workshops were held in February 2017. The risk workshops were facilitated by Jacobs and included representatives from Building Queensland, DEWS, SunWater, Treasury and Corrs Chambers Westgarth.
- Three internal risk workshops, facilitated by Jacobs, were subsequently held in February 2017 to refine the results of the agency risk workshops, and included practice leaders and economic and financial modelling leads. Review of the initial findings and the draft PBC by Building Queensland and relevant government agencies, including the Business Case Review Committee.
- Final agency risk workshop in April 2017 following assurance reviews.

1.4 Stakeholder Engagement Approach

This section documents the stakeholder engagement approach and activities. Stakeholder engagement was a key and valuable input during PBC development to assist with understanding of the service need and the analysis and options assessment.

Stakeholder engagement for the PBC has occurred through the following channels:

- Identification of stakeholders, development of a Stakeholder Engagement Plan and consideration of key risks associated with stakeholder engagement with the assistance of Leisa Prowse Consulting. Key inputs to the Stakeholder Engagement Plan were developed in a workshop between Leisa Prowse Consulting, Building Queensland, DEWS and SunWater.
- Formation and meetings of the Stakeholder Reference Group, comprised of regional representatives from a wide variety of stakeholder organisations. The Stakeholder Reference Group process was managed by Leisa Prowse Consulting.
- Interviews between MJA and stakeholders as part of its demand assessment.

- Interviews between Jacobs and stakeholders as part of Jacobs peer review of MJA's demand assessment and Jacobs testing of the proposed long list and shortlisted options.

The stakeholder engagement process supported the demand assessment and identification of the shortlisted options and assisted in refining the components involved in the shortlisted options.

1.4.1 Stakeholder Engagement Activities

1.4.1.1 Stakeholder Reference Group

The Stakeholder Reference Group met three times during the PBC.

The first Stakeholder Reference Group meeting was held on 26 October 2016 in Mareeba. The purpose of this meeting was to enable key stakeholders to understand the purpose of the PBC and to discuss the water supply problem and opportunities in the region, and regional needs and benefits. Presentations were given by Building Queensland about the PBC and MJA about the demand assessment. Each table was then asked to discuss a series of questions. Notes of the discussion were taken at each table by a nominated scribe, and each table reported-back to the larger group at the end of each discussion.

The second Stakeholder Reference Group meeting was held on 13 December 2016 in Mareeba. This meeting provided an update on the study and sought feedback on the preliminary findings on water demand and a range of potential water supply options. Building Queensland gave a presentation about the initial findings on the demand profile for Cairns and agriculture in the region and the proposed options to be progressed to the next stage of analysis. Each table was then asked to discuss a series of questions relating to the service need in the region and potential options. Notes of the discussion were taken at each table by a nominated scribe, and each table reported back to the larger group at the end of each discussion.

The third Stakeholder Reference Group meeting was held on 21 March 2017 in Mareeba. The purpose of this meeting was to provide an update on the PBC, outline the defined water supply problems and opportunities for the PBC, the options not being progressed and the four shortlisted options. Building Queensland gave a presentation on each of these matters. Each table was then asked to discuss a series of questions relating to the four shortlisted options. Notes of the discussion were taken at each table by a nominated scribe, and each table reported-back to the larger group at the end of each discussion.

1.4.1.2 Marsden Jacob Associates

MJA conducted a two-stage consultation process with stakeholders as part of its demand assessment.

The purpose of the Stage 1 consultation was to gain an understanding of the underlying demand drivers for water in the region and the supply options to address identified future demand. Stage 1 involved discussions with a range of stakeholders from Cairns and the MDWSS including state government departments, local government, water service providers, industry bodies and commercial entities.

The purpose of Stage 2 was to gain an understanding of key stakeholder's views of the proposed four shortlisted supply options agreed with Building Queensland, and focused on the likely cost of the options and stakeholders' willingness to pay the potential water price for each option. The four shortlisted supply options in Stage 2 were: water trading; on-farm water efficiency; conversion of MDWSS losses and Nullinga Dam. Key stakeholders involved in the Stage 2 consultations included local government, water service providers and commercial entities.

1.4.1.3 Jacobs

Jacobs consulted with state government departments, water service providers, commercial entities and irrigator representatives as part of its stakeholder engagement.

These discussions were held during January and February 2017. Stakeholder expectations about the potential outcomes of the PBC were carefully managed by a transparent and complete discussion of the staged business case process.

Interviewees provided insightful and diverse perspectives on the long and short-listed options and assisted with further testing of demand.

1.5 Options Selection Approach

This section summarises the approach to options generation, options filtering, shortlisted options and the identification of the preferred option/s.

1.5.1 Service Need

The service need was developed as follows:

- Review background documents to determine previous assessments of the service need. These documents included the Far North Queensland Regional Water Supply Strategy, DEWS Regional Water Supply Security Assessments, Cairns Water Security Strategy and SunWater reports.
- Review the MJA demand assessment and Jacobs's peer review of the MJA demand assessment.
- Present the proposed water demand profile for Cairns and agriculture on the Tablelands to the Stakeholder Reference Group and receive feedback.
- Develop potential definition of the service need via discussion of past problem/opportunity definitions and emerging problem/opportunity definition.
- Conduct a workshop with key agencies to establish and agree on the service need the PBC will address.
- Present the proposed service need to the Project Steering Committee for consideration and endorsement.

Following this process, the service need to be addressed in the PBC was considered to be an opportunity to expand agricultural production on the Atherton Tableland by increasing the availability of supplemented medium priority water allocations.

It was considered there was no Cairns urban water supply service need to be addressed in the PBC. Cairns Regional Council has a portfolio of council owned and operated supply measures that could be implemented to meet future water demand and it was unlikely that Cairns would require an external water source (such as Nullinga Dam) until the very long term.

1.5.2 Long List of Options, Options Filtering and Shortlisted Options

Following clarification of the service need, the long list of options, options filtering process and shortlisted options were developed as follows:

- List all previously considered options. List variations of previous options (e.g. variations of the Nullinga Dam option) supported by analysis and available data. List any new options generated by work on the PBC.
- In consideration of the State Infrastructure Plan policy approach and categories for options assessment develop a proposed long list of options to meet the identified service need.
- In consideration of the Building Queensland Business Case Development Framework develop selection criteria to filter options to a shortlist.

- Present proposed options to be taken forward in the PBC to the Stakeholder Reference Group and seek feedback.
- Conduct a workshop with key government agencies, refine the long list of options and selection criteria, deliberate on options, and agree on a shortlist of options.
- Present the proposed shortlisted options to the Project Steering Committee for consideration and endorsement.

Following this process, the following shortlisted options were identified for further consideration in the PBC:

- Option 1: Do minimum (base case)
- Option 1: Improve MDWSS rules and operation
- Option 2: Modernise MDWSS and convert losses
- Option 4: Nullinga Dam for agricultural use.