APPENDIX B9 NATHAN DAM AND PIPELINES SEIS WETLAND SURVEY

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SKM

Nathan Dam Wetland Survey

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Contents

List of Figures

List of Tables

1. Introduction

This report addresses submissions from the review of the Nathan Dam Environmental Impact Statement (EIS) by The Department of Environment and Heritage Protection (DEHP), formerly the Department of Environment and Resource Management (DERM). These comments were in regard to the existence of wetlands within the Nathan Dam Project Area (issue numbers 41.68 and 41.69). DEHP advised that Queensland Wetland Mapping shows the presence of ten wetlands (eight palustrine and two lacustrine) that will be inundated or partially inundated by the proposed Nathan Dam (the project) (**Table 1**).

A review of the Queensland Wetland Mapping database identified six palustrine wetlands within the water storage area of Nathan Dam (DERM 2012); five of those identified by DEHP (**Table 1**), and another identified by SKM (SKM ID: C, Wetland ID: 46400). These wetlands were located on five properties: two on "Bentley", one on "Bookabie", one on "The Bend", one near Taroom, and one near the proposed dam wall (**Figure 1**). This report describes the condition of these six wetlands.

The remaining five wetlands identified by DEHP will not be affected by the project as they do not fall within the water storage area (**Table 1**, **Figure 1**).

Table 1 Wetlands identified in the area of the Nathan Dam inundation zone by DEHP

Wetland ID	SKM ID	Typology	Impact from dam
46392	D	Palustrine	Inundated
46386	A	Palustrine	Inundated
46397	B	Palustrine	Inundated
46393	F	Palustrine	Inundated
7334	E	Palustrine	Inundated
46390	N/A	Lacustrine	Nil
46389	N/A	Palustrine	Nil
46391	N/A	Palustrine	Nil
46395	N/A	Lacustrine	Nil
46394	N/A	Palustrine	Nil

The objectives of this survey were:

1. To determine the existence of palustrine wetlands (other than springs) that have been previously mapped within the Project area by Queensland Wetland Mapping (DERM, 2012);
2. To determine the overall health (rating) for aquatic life within these wetlands; and
3. To describe the likely impact of the proposed dam on the mapped wetlands.

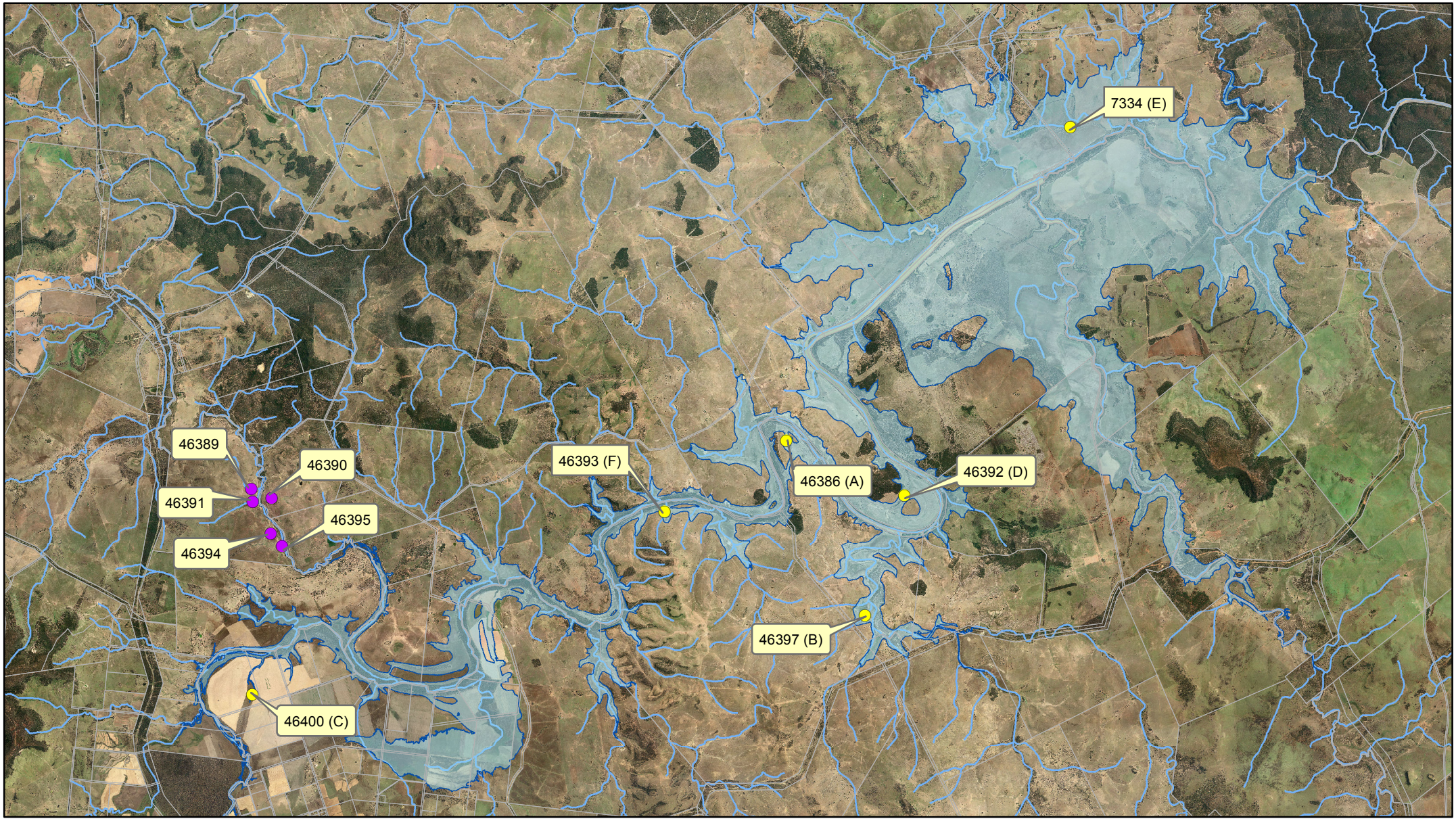
This report presents the survey objectives, methods, results and a brief description of the potential impact that the project will have on these wetlands.

2. Wetland survey methods

Five wetlands within the project area were surveyed from 19th – 25th October 2012 (**Figure 1**). The team attempted to visit a sixth wetland, situated on the property "Bentley", but was unsuccessful due to access difficulties. However inferences of its quality were made through examination of aerial imagery and the investigation of neighbouring wetlands. Relevant data was recorded using a revised form the 'State of the Rivers' data sheets as developed by Anderson (1993). Observations of fauna were not made.

Survey data was then assessed against the Queensland Wetland Definition and Delineation Guideline (DERM, 2011) to help determine wetland status. To be considered a wetland, the area must show evidence of one or more of the following attributes (DERM 2011):

1. The land supports, at least periodically, plants or animals that are adapted to and dependant on living in wet conditions for at least part of their life cycle;
2. The substratum is predominately undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers; and/or
3. The substratum is not soil and is saturated with water, or covered by water, at some time.



LEGEND

- Towns
- Wetlands Within Full Supply Level (Wetland Id (SKM Id))
- Wetlands Not Within Supply Level (Wetland Id)
- Watercourse
- Cadastre
- Full Supply Level (183.5m AHD)

Projection: GDA94 Zone 56

Figure 1

0 0.5 1 2 3
Kilometres

N

Scale 1:150,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM EIS SUPPLEMENTARY REPORT

Wetlands

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3. Wetland survey observations

Five wetlands (A-E) were assessed during the field survey. Four were confirmed as valid wetlands (Wetlands A-D) and Wetland E was confirmed as a spring. Attributes of each wetland are described in **Table 2** to **Table 6**.

Wetland C was a dam and classified as riverine (channel environments), while the remaining wetlands were classified as naturally occurring palustrine wetlands (non-channel environments).

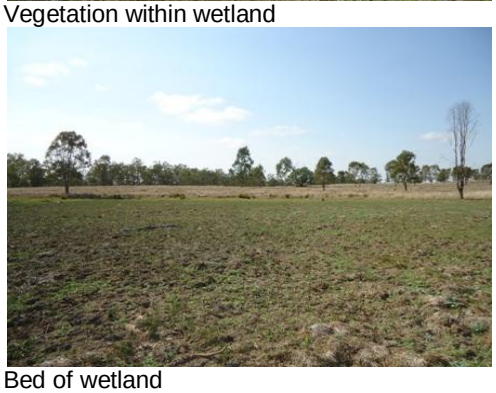
Wetland D was found to be in good overall health for aquatic life due to favourable attributes such as a permanent water source, moderate canopy cover, diverse depth levels, low disturbance and moderate habitat availability. The other four wetlands were found to be in poor overall health for aquatic life. Grounds for this assessment included variable water source consistency, poor vegetation cover and elevated levels of disturbance.

Wetland F could not be surveyed due to access difficulties. However from the examination of aerial imagery it is considered a naturally occurring wetland. Evidence supporting this conclusion is that there is a lack of obvious tributaries, no evidence of land-works indicating a dam wall and mature *Eucalyptus* sp. surrounding the wetland.

Table 2 Detailed assessment of Wetland A

Wetland attributes	Data	Wetland photographs
Wetland ID	46386	
Northing Easting	7172602.1947 194337.0991	
Wetland type	Palustrine (non – channel environment)	
Wetland description	Dry ephemeral billabong. Floodplain runner.	
Main water source	Floodplain	
Length Width Average depth	120 m 80 m Dry at time of survey	
Aquatic habitat Dominant substrate Instream - % of total	 Silt/clay Absent	
Debris present -% of total Riparian Wetted zone	 Woody – 2 Woody – 1	
Vegetation present Riparian Aquatic	 *Eucalyptus tereticornis* *Juncus* spp.	
Erosion levels	low	
Major disturbance (local and catchment)	Extensive grazing/feral pigs, minor pugging.	
Water quality (visual)	N/A	
Wetland – yes/no? Evidence	Yes - Aquatic vegetation - Riparian vegetation	
Overall rating for aquatic life? ▪ Very high/pristine ▪ High ▪ Good ▪ Poor ▪ Very poor	Poor - Low diversity of instream cover - Poor canopy and other vegetation cover - Moderate disturbance	


Vegetation within wetland


Bed of wetland


Riparian vegetation adjacent to wetland

Table 2 Detailed assessment of Wetland B

Wetland attributes	Data	Wetland photographs
Wetland ID	46397	 Riparian vegetation adjacent to wetland  Bed of wetland  Floodplain adjacent to wetland
Northing Easting	7167473.5099 196644.6593	
Wetland type	Palustrine (non – channel environment)	
Wetland description	Dry ephemeral billabong. Floodplain runner.	
Main water source	Floodplain	
Length Width Average depth	100 m 60 m Dry at time of survey	
Aquatic habitat Dominant substrate Instream - % of total	 Silt/clay absent	
Debris present -% of total Riparian Wetted zone	 Woody – 5 Woody – 2	
Vegetation present Riparian Aquatic	 *Eucalyptus tereticornis* *Juncus* spp. *Juncus* spp.	
Erosion levels	Low	
Major disturbance (local and catchment)	Extensive grazing/feral pigs, moderate pugging.	
Water quality (visual)	N/A	
Wetland – yes/no? Evidence	<u>Yes</u> - Aquatic vegetation - Riparian vegetation	
Overall rating for aquatic life? ▪ Very high/pristine ▪ High ▪ Good ▪ Poor ▪ Very poor	<u>Poor</u> - Low diversity of cover - Poor canopy and other vegetation cover - Moderate disturbance	

Table 3 Detailed assessment of Wetland C

Wetland attributes	Data	Wetland photographs
Wetland ID	46400	 Dam impoundment area  Riparian and aquatic vegetation  Downstream of dam
Northing Easting	7165146.5677 178686.3101	
Wetland type	Riverine (connected to creek – flows into Dawson River 1 km Downstream)	
Wetland description	Lagoon with semi-permanent water (artificially dammed).	
Main water source	Floodplain	
Length Width Average depth	100 m 60 m 0.2 m	
Aquatic habitat Dominant substrate Instream - % of total	 Silt/clay Snags - 1	
Debris present -% of total Riparian Wetted zone	 Woody – 10 Leaf litter - 5 Woody – 8 Leaf litter - 5	
Vegetation present Riparian Aquatic	 *Eucalyptus tereticornis* *Cyperus* spp.	
Erosion levels	low	
Major disturbance (local and catchment)	Grazing and crops	
Water quality (visual)	Poor (high turbidity)	
Wetland – yes/no? Evidence	<u>Yes</u> - Semi-permanent water (dam) - Aquatic vegetation - Riparian vegetation	
Overall rating for aquatic life? ▪ Very high/pristine ▪ High ▪ Good ▪ Poor ▪ Very poor	 <u>Poor</u> - Semi-permanent water source - poor canopy and other vegetation cover - low disturbance - low habitat availability	

Table 4 Detailed assessment of Wetland D

Wetland attributes	Data	Wetland photographs
Wetland ID	46392	
Northing Easting	7170994.3740 197802.0394	
Wetland type	Palustrine (non – channel environment)	
Wetland description	Billabong with permanent water.	
Main water source	Floodplain, possible groundwater connectivity.	
Length Width Average depth	180 m 15 m 2.5 m	
Aquatic habitat Dominant substrate Instream - % of total	 Silt/clay Snags – 5	
Debris present -% of total Riparian Wetted zone	 Woody – 15 Leaf litter - 2 Woody – 5 Leaf litter - 1	
Vegetation present Riparian Aquatic	 *Eucalyptus tereticornis* Absent	
Erosion levels	low	
Major disturbance (local and catchment)	Moderate grazing/feral pigs.	
Water quality (visual)	Good (slight turbidity)	
Wetland – yes/no? Evidence	<u>Yes</u> - Permanent water - Riparian vegetation and distinct riparian zone	
Overall rating for aquatic life? ▪ Very high/pristine ▪ High ▪ Good ▪ Poor ▪ Very poor	<u>Good</u> - permanent water source - moderate canopy cover - moderate diversity of depths - low disturbance - moderate habitat availability	

Billabong looking upstream

Billabong looking downstream

Left bank showing riparian zone

Table 6 Detailed assessment of Wetland E

Wetland attributes	Data	Wetland photographs
Wetland ID	7334	 Riparian vegetation adjacent to wetland  Bed of wetland  Floodplain adjacent to wetland
Northing Easting	7181773.2752 202664.4722	
Wetland type	Spring	
Wetland description	Ephemeral wetland. Also mapped as a spring in the Queensland Wetland Mapping database	
Main water source	Unknown	
Length Width Average depth	80 m 50 m Dry at time of survey	
Aquatic habitat Dominant substrate Instream - % of total	 Silt/clay absent	
Debris present -% of total Riparian Wetted zone	 Woody – 10 Leaf litter – 2 Woody – 5	
Vegetation present Riparian Aquatic	 *Eucalyptus tereticornis* *Juncus* spp. Absent	
Erosion levels	Low	
Major disturbance (local and catchment)	Moderate grazing	
Water quality (visual)	N/A	
Wetland – yes/no? Evidence	<u>Yes</u> - Aquatic vegetation - Riparian vegetation	
Overall rating for aquatic life? ▪ Very high/pristine ▪ High ▪ Good ▪ Poor ▪ Very poor	<u>Poor</u> - Semi-permanent water source - Moderate canopy and dense vegetation cover - Low disturbance	

4. Conclusion

One wetland (Wetland D) was found to be in good condition. Three wetlands were found to be in poor overall condition for their ability to support aquatic life. Although Wetland F was not inspected, it is considered to be a naturally occurring wetland. Wetland E was confirmed as a spring and is assessed in Chapters 1 and 28 of the EIS (SunWater 2012).

5. References

Anderson, J.R. (1993) State of the Rivers Project. Report 1. *Development and Validation of the Methodology.* Department of Primary Industries, Queensland Government, Brisbane.

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