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Water resource assessment for the Victoria catchment

A report from the CSIRO Victoria River Water Resource
Assessment for the National Water Grid

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The Assessment was guided by two committees:

- i. The Assessment's Governance Committee: CRC for Northern Australia/James Cook University; CSIRO; National Water Grid (Department of Climate Change, Energy, the Environment and Water); Northern Land Council; NT Department of Environment, Parks and Water Security; NT Department of Industry, Tourism and Trade; Office of Northern Australia; Queensland Department of Agriculture and Fisheries; Queensland Department of Regional Development, Manufacturing and Water
- ii. The Assessment's joint Roper and Victoria River catchments Steering Committee: Amateur Fishermen's Association of the NT; Austrade; Centrefarm; CSIRO; National Water Grid (Department of Climate Change, Energy, the Environment and Water); Northern Land Council; NT Cattlemen's Association; NT Department of Environment, Parks and Water Security; NT Department of Industry, Tourism and Trade; NT Farmers; NT Seafood Council; Office of Northern Australia; Parks Australia; Regional Development Australia; Roper Gulf Regional Council Shire; Watertrust

Responsibility for the Assessment's content lies with CSIRO. The Assessment's committees did not have an opportunity to review the Assessment results or outputs prior to their release.

This report was reviewed by Dr Brian Keating (Independent consultant). Individual chapters were reviewed by Dr Rebecca Doble, CSIRO (Chapter 2); Dr Chris Pavey, CSIRO (Chapter 3); Dr Heather Pasley, CSIRO (Chapter 4); Mr Chris Turnadge, CSIRO (Chapter 5); Dr Nikki Dumbrell, CSIRO (Chapter 6); Dr Adam Liedloff, CSIRO (Chapter 7). The material in this report draws largely from the companion technical reports, which were themselves internally and externally reviewed.

For further acknowledgements, see page xxv.

Acknowledgement of Country

CSIRO acknowledges the Traditional Owners of the lands, seas and waters of the area that we live and work on across Australia. We acknowledge their continuing connection to their culture and pay our respects to their Elders past and present.

Photo

The Victoria River is the longest singularly named river in the NT with permanent water. Photo: CSIRO – Nathan Dyer

Appendices



Skull Creek formation - part of the outcropping
Proterozoic dolostone aquifer in the central
part of the Victoria catchment

Photo: CSIRO - Nathan Dyer

Appendix A

Assessment products

More information about the Victoria River Water Resource Assessment can be found at <https://www.csiro.au/victoriariver>. The website provides readers with a communications suite including factsheets, multimedia content, FAQs, reports and links to other related sites, particularly about other research in northern Australia.

In order to meet the requirements specified in the contracted 'Timetable for the Services', the Assessment provided the following key deliverables:

- Technical reports present scientific work at a level of detail sufficient for technical and scientific experts to reproduce the work. Each of the activities of the Assessment has at least one corresponding technical report.
- The catchment report (this report) synthesises key material from the technical reports, providing well-informed but non-scientific readers with the information required to make decisions about the opportunities, costs and benefits associated with water resource development.
- A summary report is provided for a general public audience.
- A factsheet provides key findings for a general public audience.

This appendix lists all such deliverables, plus those jointly delivered for the concurrent Southern Gulf Water Resource Assessment.

Please cite as they appear.

Methods report

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Technical reports

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Devlin K (2023) Pump stations for flood harvesting or irrigation downstream of a storage dam. A technical report from the CSIRO Victoria and Southern Gulf Water Resource Assessments for the National Water Grid. CSIRO, Australia.

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Catchment report

Petheram C, Philip S, Watson I, Bruce C and Chilcott C (eds) (2024) Water resource assessment for the Victoria catchment. A report from the CSIRO Victoria River Water Resource Assessment for the National Water Grid. CSIRO, Australia.

Summary report

CSIRO (2024) The Victoria River Water Resource Assessment. A summary report from the CSIRO Victoria River Water Resource Assessment for the National Water Grid. CSIRO, Australia.

Factsheet on key findings

CSIRO (2024) The Victoria River Water Resource Assessment. Key messages of reports to the CSIRO Victoria River Water Resource Assessment for the National Water Grid. CSIRO, Australia.

Appendix B

Shortened forms

SHORT FORM	FULL FORM
4WD	four-wheel drive
AAPA	Aboriginal Areas Protection Authority
ABS	Australian Bureau of Statistics
ACARA	Australian Curriculum, Assessment and Reporting Authority
AE	adult equivalent
AEP	annual exceedance probability
AHD	Australian Height Datum
ALRA	<i>Aboriginal Land Rights (Northern Territory) Act 1976</i> (Cth)
AMTD	adopted middle thread distance
APSIM	Agricultural Production Systems SIMulator
APVMA	Australian Pesticides and Veterinary Medicines Authority
ASC	Australian Soil Classification
AWC	available water capacity
BCR	benefit-to-cost ratio
BOM	Bureau of Meteorology
CAMBA	China–Australia Migratory Bird Agreement
CBA	cost–benefit analysis
CBR	cost-to-benefit ratio
CLA	Cambrian Limestone Aquifer
CLC	Central Land Council
CMB	chloride mass balance
CMIP	Coupled Model Intercomparison Project
CSIPN	Center for Support of Indigenous Peoples of the North
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Cth	Commonwealth
CV	coefficient of variation
DCFR	diversion commencement flow requirement
DEPWS	Department of Environment, Parks and Water Security
DIDO	drive-in drive-out
DIWA	Directory of Important Wetlands in Australia
DKIS	Darwin–Katherine Interconnected System
DOI	digital object identifier

SHORT FORM	FULL FORM
EB	embankment dams
EBITDA	earnings before interest, taxes, depreciation and amortisation
EC	electrical conductivity
EIS	Environmental Impact Statement
ENSO	El Niño–Southern Oscillation
EOS	end of system
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPPRD	Emergency Plant Pest Response Deed
ET	evapotranspiration
FIFO	fly-in fly-out
FSL	full supply level
FTE	full-time equivalent
GCM	global climate model
GCM-PS	global climate model – pattern scaled
GDE	groundwater-dependent ecosystem
GM	gross margin
GVAP	gross value of agricultural production
GVIAP	gross value of irrigated agricultural production
HSD	health service district
IBA	Important Bird and Biodiversity Area
IEO	Index of Education and Occupation
IER	Index of Economic Resources
ILUA	Indigenous Land Use Agreement
IPA	Indigenous Protected Area
IPCC	Intergovernmental Panel on Climate Change
IRR	internal rate of return
IRSAD	Index of Relative Socio-Economic Advantage and Disadvantage
IRSD	Index of Relative Socio-Economic Disadvantage
IUCN	International Union for Conservation of Nature
JAMBA	Japan–Australia Migratory Bird Agreement
KIP	Kalkarindji Igneous Province
MAR	managed aquifer recharge
MODIS	Moderate Resolution Imaging Spectroradiometer
NAISMA	Northern Indigenous Land and Sea Management Alliance
NAWRA	Northern Australia Water Resource Assessment
n.d.	not dated
NLC	Northern Land Council
NPF	Northern Prawn Fishery

SHORT FORM	FULL FORM
NPV	net present value
NT	Northern Territory
O&M	annual operation and maintenance
ORIA	Ord River Irrigation Area
PAW	plant available water
PAWC	plant available water capacity
PBC	Prescribed Body Corporate
PDA	Proterozoic dolostone aquifer
PE	potential evaporation
PET	potential evapotranspiration
PHN	primary health network
PMST	Protected Matters Search Tool
Qld	Queensland
RCC	roller compacted concrete
RNTBC	Registered Native Title Body Corporate
ROKAMBA	Republic of Korea–Australia Migratory Bird Agreement
RoNA	rest of northern Australia
SA2	Statistical Area Level 2
SAWR	Strategic Aboriginal Water Reserve
SEIFA	socio-economic indexes for areas
SGG	soil generic group
SILO	Scientific Information for Land Owners
SOI	Southern Oscillation Index
SSP	Shared Socio-economic Pathway
SWL	standing water level
TDS	total dissolved solids
TO	Traditional Owner
TraNSIT	Transport Network Strategic Investment Tool
VRD	Victoria River district
WA	Western Australia
WAP	water allocation plan
WoNS	Weed of National Significance

Units

SHORT FORM	FULL FORM
\$	dollars
%	per_cent
c	cents
cm	centimetre
d	day
dS	decisiemens
DS	dry season
g	gram
GL	gigalitre (1,000,000,000 litres)
GWh	gigawatt hour
ha	hectare
kg	kilogram (1000 grams)
km	kilometre (1000 metres)
km ²	square kilometre
kPa	kilopascal
kV	kilovolt
kW	kilowatt
kWh	kilowatt hour
L	litre
m	metre
m ³	cubic metre
mBGL	metres below ground level
mEGM96	metres (Earth Gravity Model of 1996)
mg	milligram
ML	megalitre (1,000,000 litres)
mm	millimetre
MW	megawatt
MWh	megawatt hour
s	second
t	metric tonne
y	year
°C	degrees Celsius

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