Department of **ENVIRONMENT, PARKS AND WATER SECURITY**

BRRG Meeting

August 2022

NORTHERN TERRITORY GOVERNMENT

Agenda

1. Introductions, notes from previous meeting
2. Whole of project update
3. Environmental health studies
4. Update from Water, GHG, and Terrestrial
5. SCE: Indicator validation and data collection
6. Reporting and communication
7. Water Allocation Planning

Previous meeting notes

Presentations and discussion

- The BRRG membership were consulted by the Social, Cultural and Economic team from the University of Queensland (UQ) to assist identify relevant regional indicators for the Beetaloo.
- The UQ team presented the methodology for identifying key indicators, and planning for focus group discussions and conducting surveys in the coming months.
- Members discussed a range of socio-economic themes and how they may be affected under development conditions. Key topics discussed were: waste management, road safety and infrastructure, accessibility of healthcare services, telecommunications, workforce availability and capacity, residential land availability, and industry engagement.

Progress and updates

- The biophysical teams recommenced field surveys in February and are aiming to conclude in July 2022.
- The Environmental Health study will have 4 components: population health, air quality, soils and water quality.

Whole of project update

- Teams now in data cleaning and analysis phase, some teams on last rounds of fieldwork
- All study domains are on track
- Focus on data management and building data management platform
- Final report and domain reports to be delivered by Dec 2022

Environmental Health Studies

Air Quality (GHD)

Population Health (Jacobs)

Soil Quality (Tetra Tech Coffey)

Water Quality (Tetra Tech Coffey)

NORTHERN TERRITORY GOVERNMENT

TETRA TECH
ECO LOGICAL AUSTRALIA

SREBA Water Studies

August 2022 BRRG Update on Progress

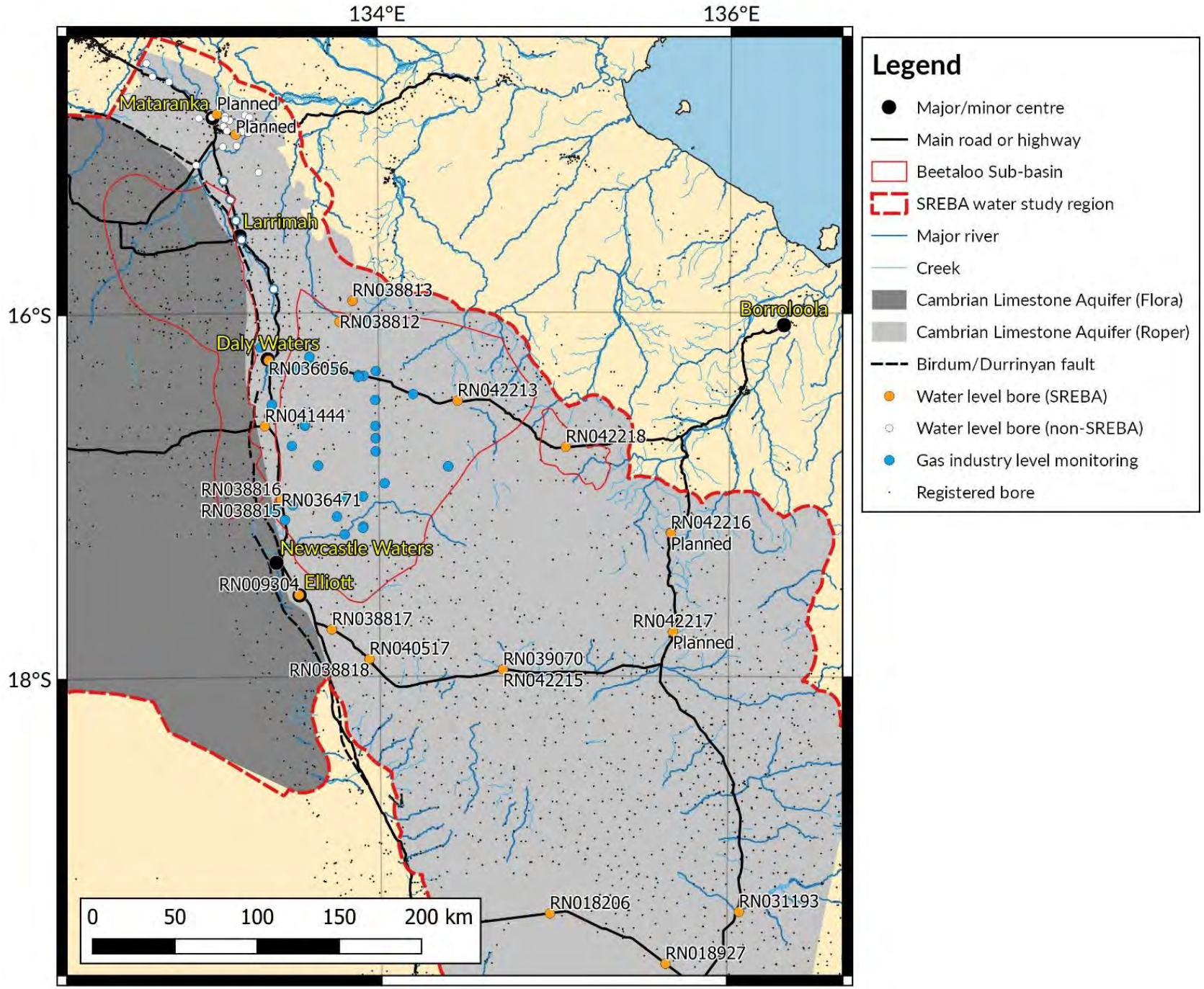
Image: large pseudo-karst sinkhole in the middle of a portion of the old Buchanan Hwy (Buchanan Downs Station). Thanks to A.Henwood for providing directions and land access.

Water Studies progress

TETRA TECH
ECO LOGICAL AUSTRALIA

- Sub-project 1 (knowledge gaps)
  - Identified key regional knowledge gaps and priority assessments based on the Bioregional Assessment outputs and Water Allocation Plan (WAP) requirements.
  - Final report available on SREBA website.

- Sub-project 2 (water quality and levels)
  - Installation of over ten new monitoring bores spanning Western Creek Rd to Barkly Stock Route.
  - Establishment of monitoring at over ten existing bores from Flora River to Barkly Hwy.
  - Implementation of regional water level monitoring to support Flora, Wiso and Georgina WAPs.
  - Implementation of station bore water quality sampling (two sampling round to-date) to supplement CSIRO, Geoscience Australia and industry sampling.
  - National Centre for Groundwater Research and Training reviewing previous water quality assessments and data.
  - Outputs to be published through WAP reporting. Ongoing monitoring to be recommended by WAPs.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Planned
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Daly Waters
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Borroloola
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Newcastle Waters
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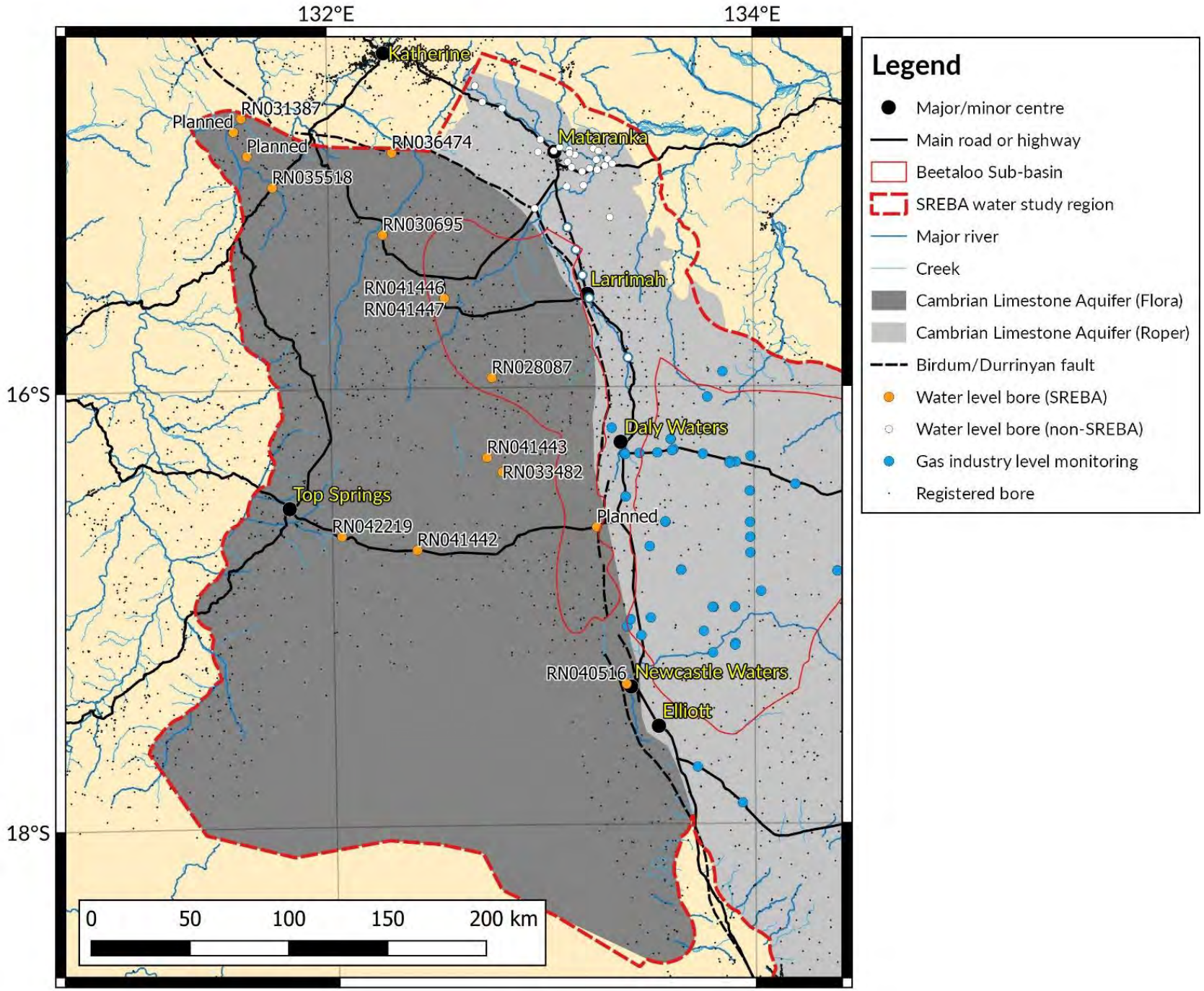
200 km
Legend
Major/minor centre
Main road or highway
Beetaloo Sub-basin
SREBA water study region
Major river
Creek
Cambrian Limestone Aquifer (Flora)
Cambrian Limestone Aquifer (Roper)
Birdum/Durrinyan fault
Water level bore (SREBA)
Water level bore (non-SREBA)
Gas industry level monitoring
Registered bore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Larrimah
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RN041447
RN028087
Daly Waters
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RN033482
Top Springs
RN042219
RN041442
Planned
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Newcastle Waters
Elliott
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Water level bore (non-SREBA)
Gas industry level monitoring
Registered bore

Water Studies progress

TETRA TECH
ECO LOGICAL AUSTRALIA

- Sub-project 3 (aquifer properties and inter-aquifer connectivity)
  - Review and compilation of all historic pumping tests.
  - Installation of multi-level test sites on Barkly Stock Route (tests to occur in late-2022).
  - Review of downhole geophysics data to refine stratigraphic conceptualisation.
  - Age-dating of Bukalara Sandstone core samples to assist with refining the Neoproterozoic (hydro)stratigraphy.
  - Updating the NT Aquifers spatial product for the Beetaloo area.
  - Summary report to be published in late-2022 (aiming for mid-Sep completion).

- Sub-project 4 (recharge and surface water-groundwater interactions)
  - Review of modelling predictions of recharge and discharge.
  - Environmental tracer sampling of the Flora River groundwater discharge flow system (CDU).
  - Review of satellite-derived actual evapotranspiration estimates at key discharge areas (CDU).
  - Plans to visit 'Hot Springs Valley' on Tanumbirini Station in mid-Sep to undertake baseline survey of potential deep-sourced springs. Cindy Ong accompanying for CH_4 monitoring.
  - CDU reports to be published in late-2022, other outputs to be reported through WAP processes.

Water Studies progress

TETRA TECH
ECO LOGICAL AUSTRALIA

- Sub-project 5 (Daly-Roper numerical model upgrade)
  - Sections of the model have already been upgraded through National Water Grid Authority work programs.
  - Scope of works in-development for upgrading the Beetaloo regions of the model.
  - Upgrade to commence in late-2022, with NTG and independent review to occur in 2023.
  - Model upgrade scope of work to be published in late-2022. Model report and peer review to be published in 2023.

- Sub-project 6 (surface water characterisation)
  - Mapping and data review of surface water catchments overlying the Beetaloo region.
  - Rainfall-runoff model development for Roper, Daly and Barkly Lakes catchments.
  - Review of historic monitoring and recommendations for priority WAP monitoring.
  - Outputs to be published through WAP reporting. Ongoing monitoring to be recommended by WAPs.

Water Studies progress

- Sub-project 7 (cultural water values)
  - Undertaken and reported as part of socio-economic study domain. Work also undertaken through WAPs.

- Sub-project 8 (summary report)
  - To commence in early-October when outputs of other sub-projects are finalised.
  - Report to be published in late-2022.

Methane & Greenhouse Gas Studies for the Beetaloo Sub-basin

Cindy Ong, Charles Heath, Dave Down, Bruce Maney, Mederic Mainson | 03 August 2022

Australia's National Science Agency

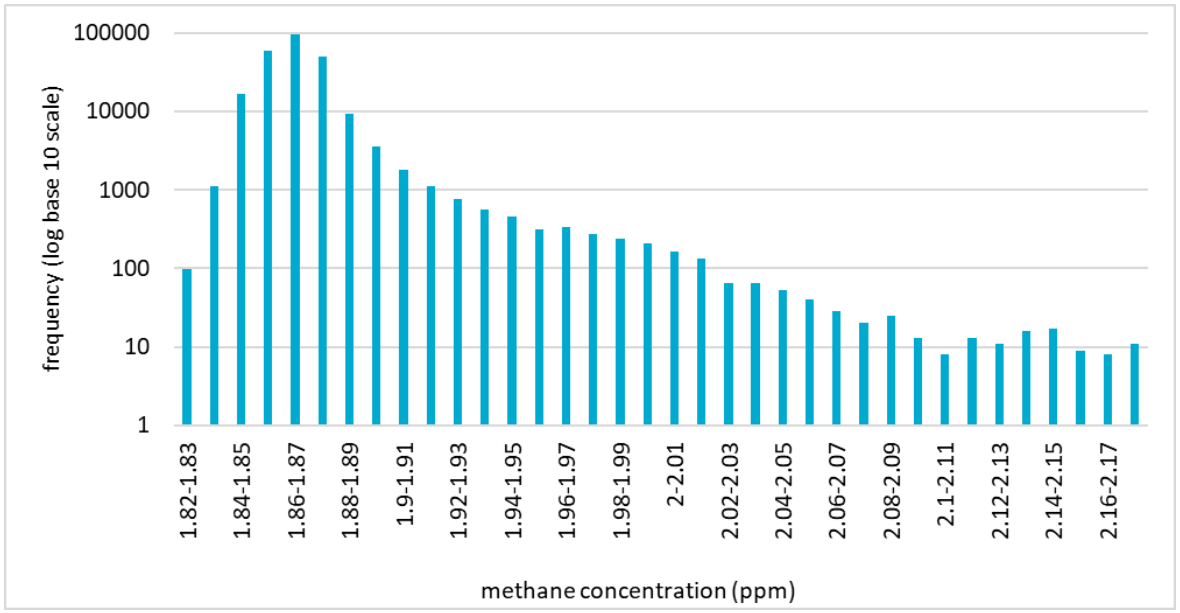
I would like to begin by acknowledging the Wadjuk people of the Noongar nation as the Traditional Owners of the land that I’m speaking from today, and pay my respect to their Elders past and present.

Mobile Survey Data Acquisition

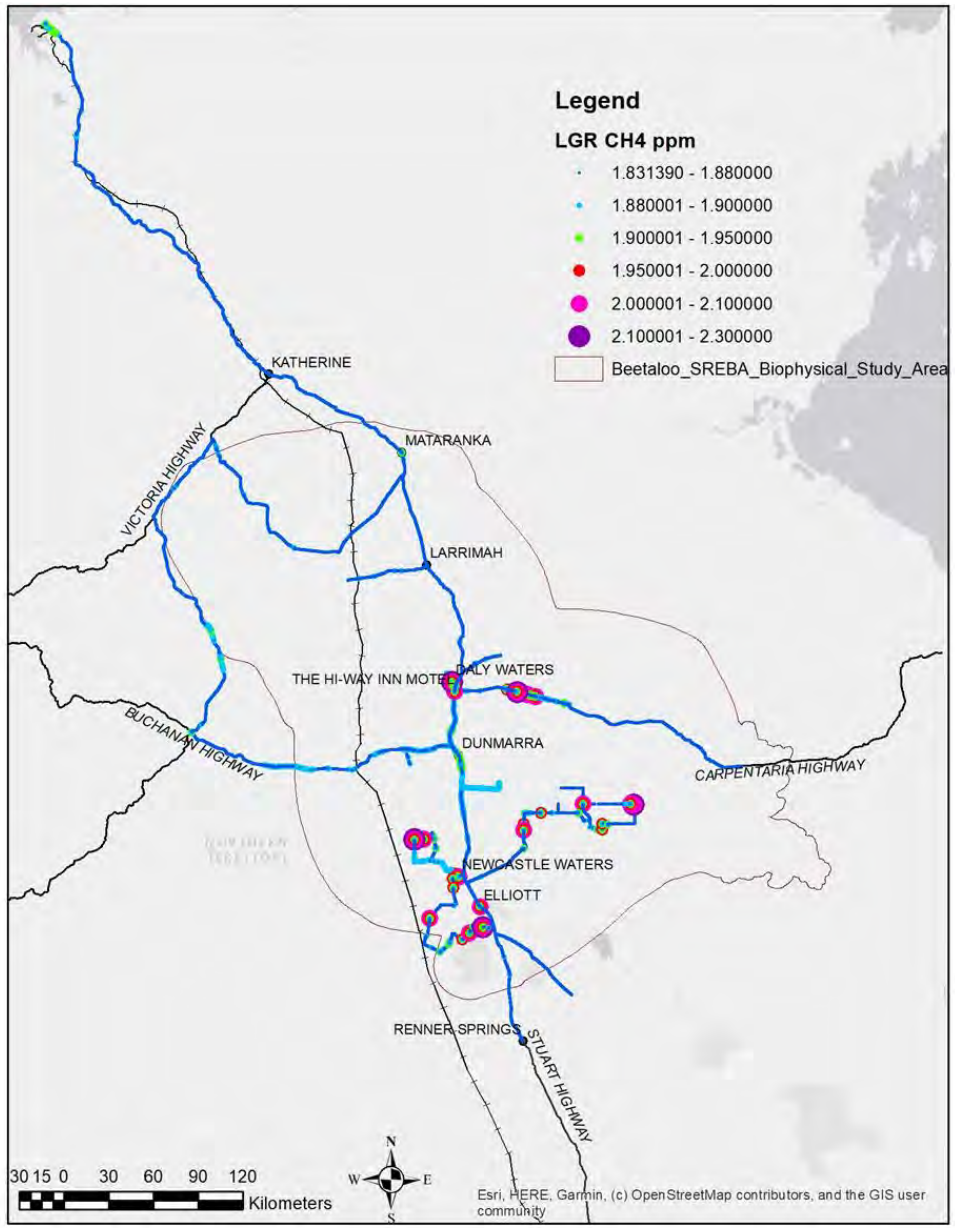
Baseline mobile surveys to understand ambient methane concentration for the study area across the different seasons.

- October 2021 – Fire Season;
  - 19-26 Oct 2021, 5700 km;
  - Data processing completed;
  - Report draft completed;
- February 2022 – Wet Season;
  - 23-24 Feb 2022, reduced survey - severe weather warning;
  - Survey completed;
  - Data processing underway;
- July 2022 – Dry Season;
  - 11-21 July 2022, ~ 5700 km replicating Oct 2021 survey;
  - Survey completed;

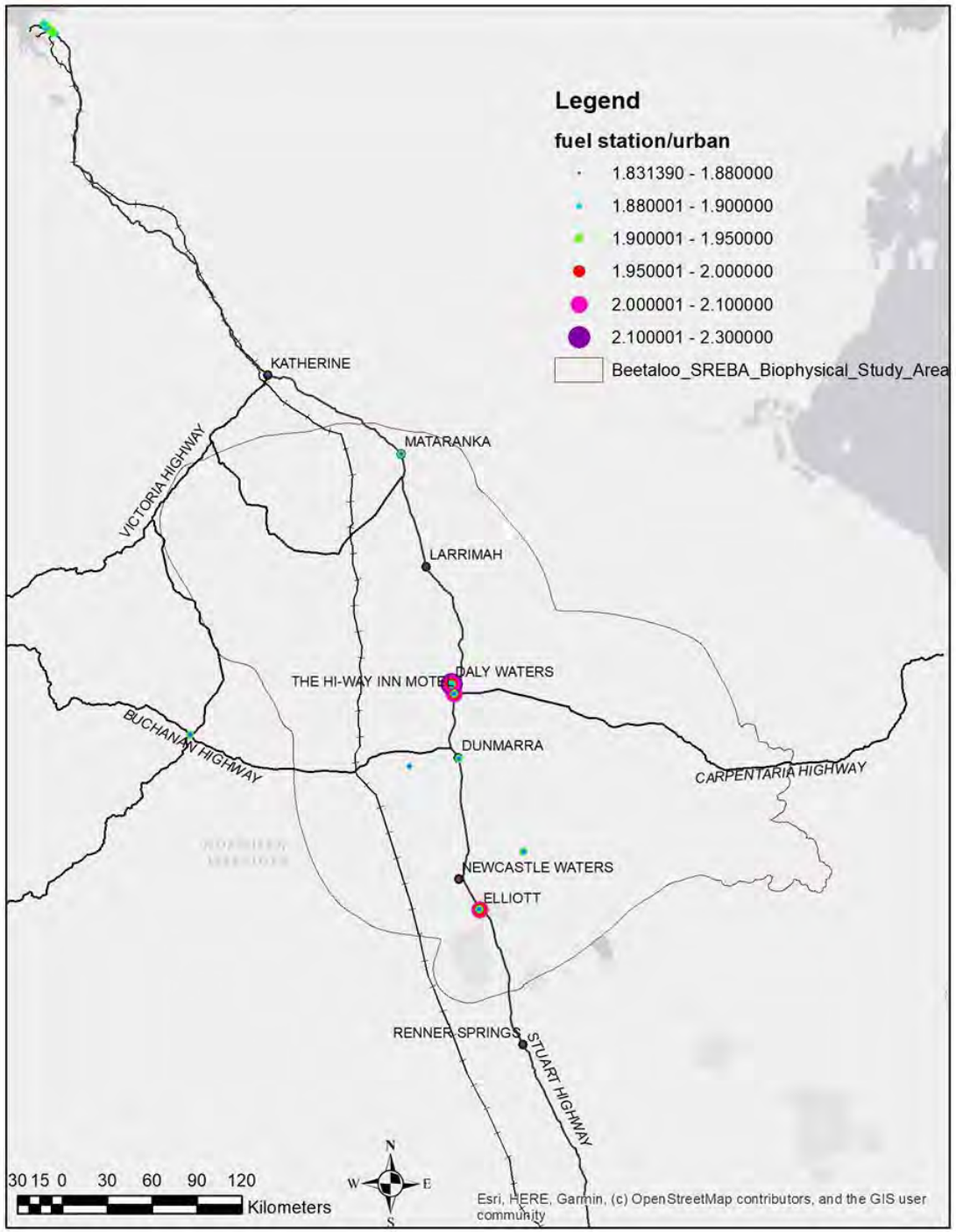
Mobile Survey Fire Season Results



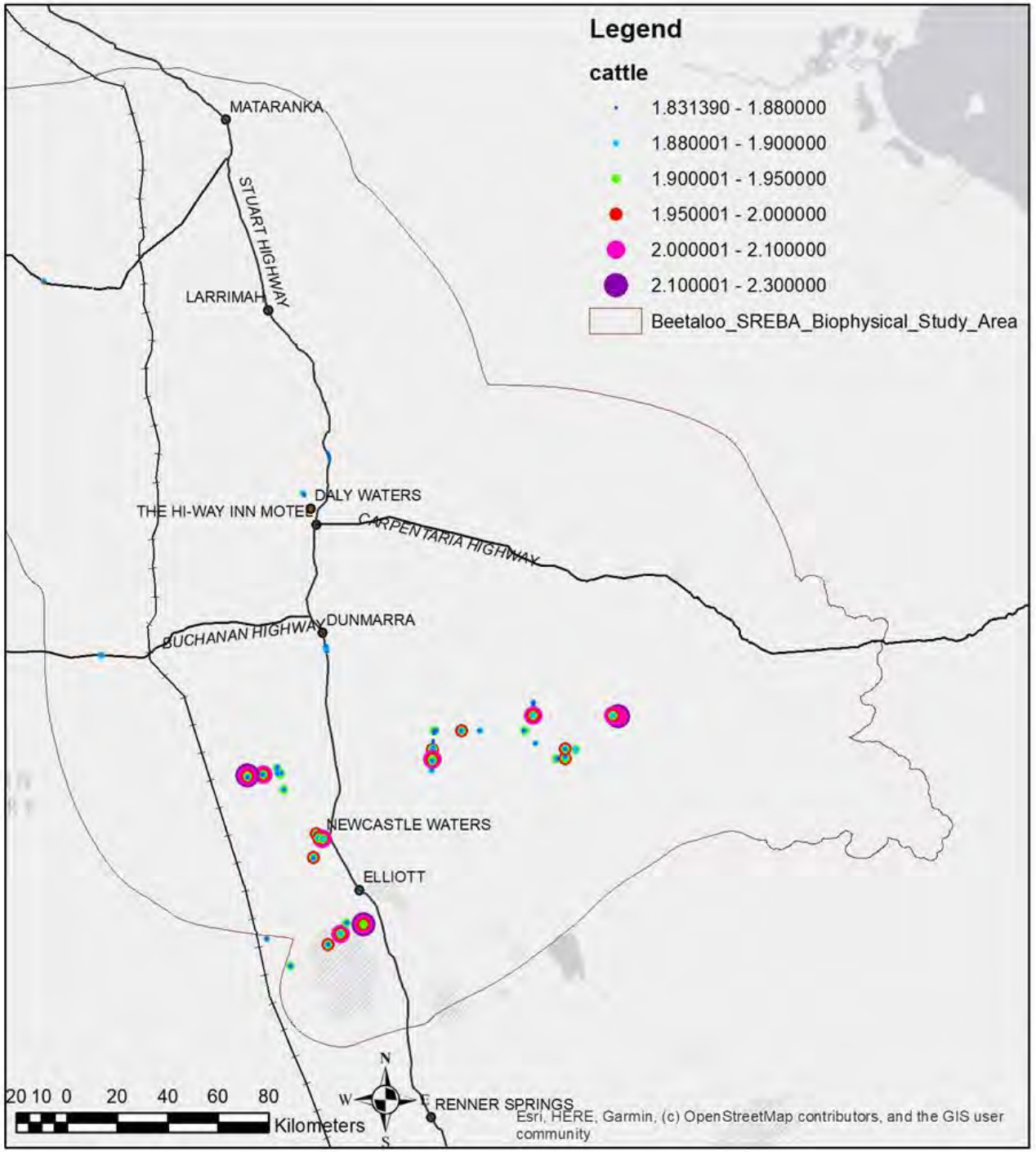
- Median & Mode: 1.86 ppm
- Cape Grim: 1.86 ppm
- Urban/city ~ 1.9 ppm (CSIRO Kensington, WA)
- 92% 1.80 – 1.88 ppm
- Maximum – 2.28 ppm (at fuel station)



Town Infrastructure & Fuel Station



Cattle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MATARANKA
STUART HIGHWAY
LARRIMAH
DALY WATERS
THE HI-WAY INN MOTEL
CARPENTARIA HIGHWAY
BUCHANAN HIGHWAY
DUNMARRA
NEWCASTLE WATERS
ELLIOTT
RENNER SPRINGS
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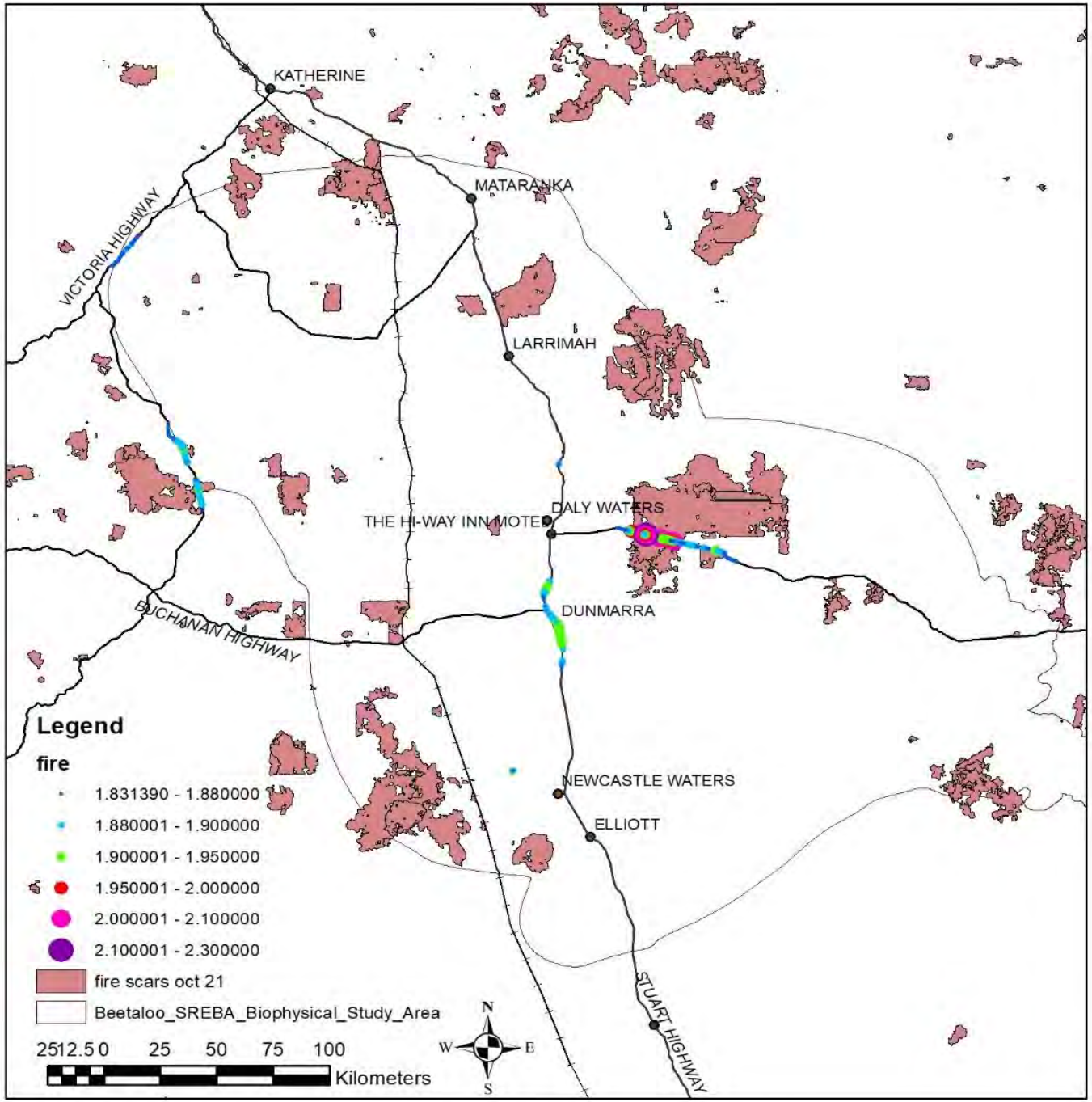
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Fire


KATHERINE
MATARANKA
VICTORIA HIGHWAY
LARRIMAH
THE HI-WAY INN MOTEL
DALY WATERS
DUNMARRA
BUCHANAN HIGHWAY
NEWCASTLE WATERS
ELLIOTT
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Beetaloo_SREBA_Biophysical_Study_Area
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Continuous Methane Concentration Measurement

Measurements of Methane Concentration at a reference site & geological seep to understand temporal variation

- Reference site deployed since November 2021;
  - Data collected since November 2021, some intermittent gaps due to shading & insufficient solar;
  - Upgrade of system in Jun/Jul 2022;

Continuous Methane Concentration Measurement

- Data is streaming in real time in Mataranka
- Additional units installed where necessary

Thank you

CSIRO Energy
Cindy Ong

Cindy Ong

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cindy.ong@csiro.au

TEAM: Cindy Ong, Charles Heath, Mederic Mainson, Dave Down, Ema Frery, Jelena Markov, Bruce Maney

Department of **Environment, Parks and Water Security**

SREBA – Terrestrial Ecosystems

Dr. Lauren Young and Dr. John Patykowski
Flora and Fauna Division

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Terrestrial Biodiversity Surveys

- Vegetation and flora
    - 659 full floristic sites
    - ~7000 rapid assessment sites
- Fauna
    - 97 fauna inventory sites
    - Threatened species
        - 51 Crested Shrike-tit sites
        - 17 Gouldian Finch sites plus opportunistic records
        - Ghost Bat surveys
        - 750 km Greater Bilby aerial transects
        - 38 km Plains Death Adder transects
        - Records of additional non-target threatened species


Photo: NT Government


Photo: B. Ross, NT Government

NORTHERN TERRITORY GOVERNMENT

Key Results to Date - Flora

- Flora and vegetation
  - > 1000 species recorded
  - No threatened species
  - 2 near threatened, 2 data deficient species recorded
  - Potential undescribed species
  - Vegetation map currently being refined

NORTHERN TERRITORY GOVERNMENT

Key Results to Date - Fauna

- Fauna
  - 48 mammal, 202 bird, 102 reptile, 14 amphibian and ~700 invertebrate species recorded to date
  - New records of
    - 4 out of 5 target threatened species
    - 6 non-target threatened species
  - Range extensions for multiple species
  - Undescribed invertebrates:
    - >600 ant species
    - 14/17 weevil species
    - >30 mutilid wasps

Acknowledgements

- Traditional Owners
- Owners and managers of 38 properties
- Field survey teams – 20 fauna ecologists, 15 botanists
- Charles Darwin University – invertebrate identification
- Support teams – engagement, logistics


Photo: A. Miller, NT Government


Photo: NT Government


Photo: M. Clonan, NT Government

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SCE: Indicator validation and data collection

- Regular visits to communities and stakeholders through to the end of September.
- Will commence validation of data with face-to-face engagement.

Reporting and communication

- Draft SREBA findings presented in November (Katherine and online).
- Reports to land holders will be provided as soon as possible.
- Roadshow of presentations throughout the region planned for early 2023.
- Videos, summaries and other products will be published on the web.
- New DEPWS webpage
- Questions re the use of point webpage

Department of **Environment, Parks and Water Security**

Beetaloo Sub-basin Water Allocation Plans

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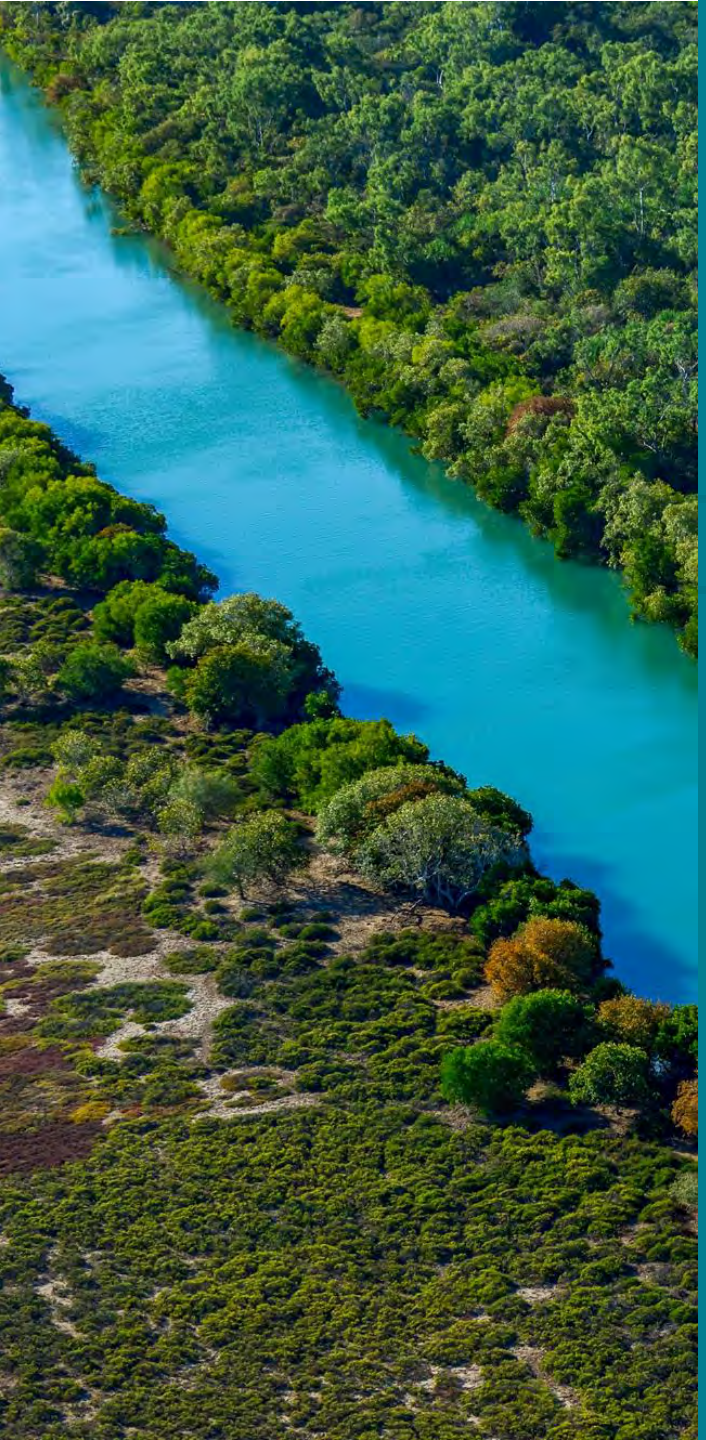


Beetaloo Sub-basin water allocation planning

Timelines

- Draft plans released for public comment – August/September
    - Extended consultation period
- Consideration of comments and plan finalisation
- Plans declared December 2022

Proposed BRRG Contribution

Provide feedback on key elements of plans:

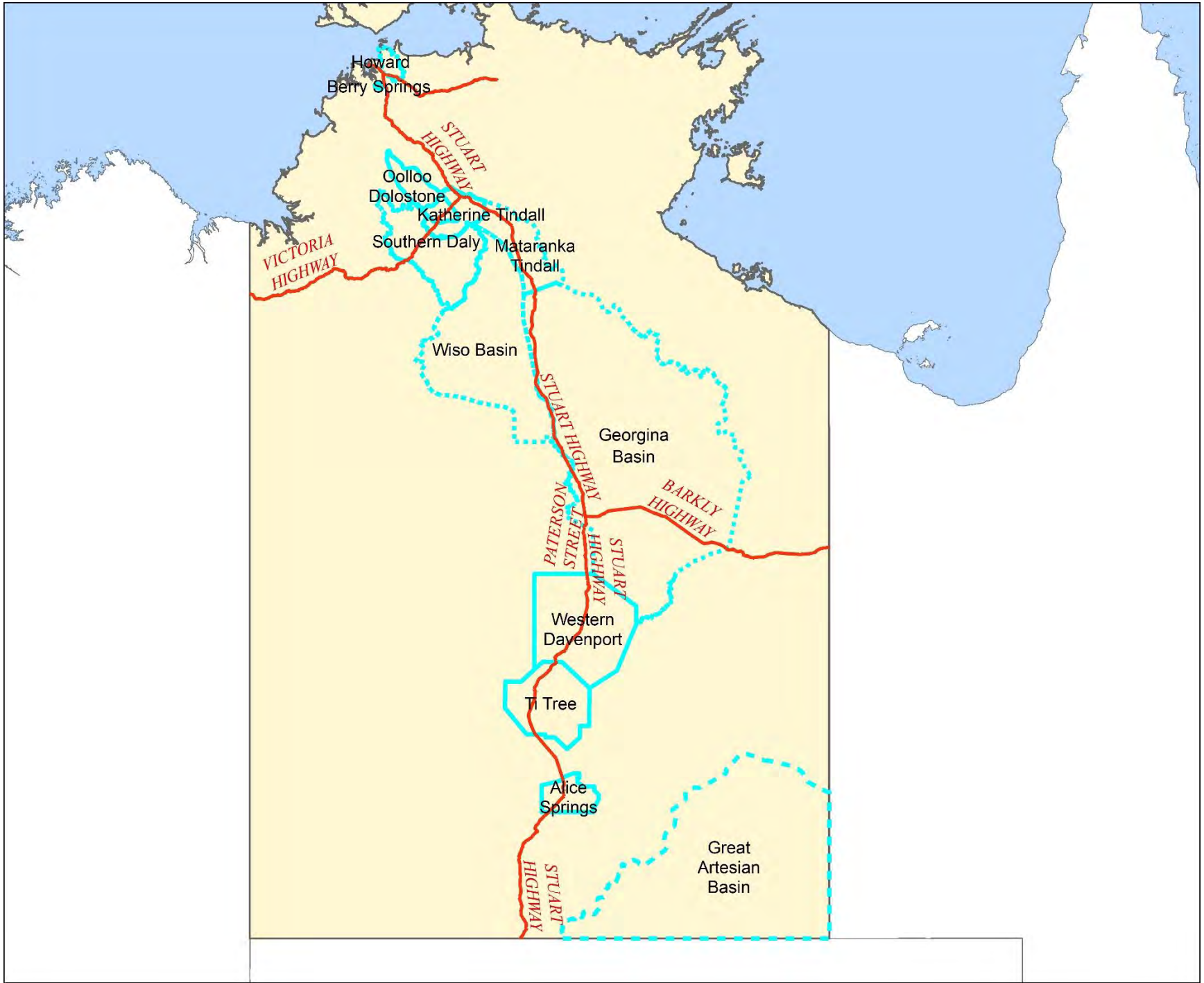
- Potential objectives and values
- strategies to protect environmental cultural and public benefits;
- sustainable yield;
- risk and uncertainty
- guidelines for managing resource including adaptive management and trading water

Proposed Process

Water Resources to

- Present plan content to BRRG for feedback
- Provide updates on key plan elements to BRRG
- Preferred method of engagement ?
- Opportunities/availability of members ?
- Other suggestions ?

Overview of Water Allocation Planning


Howard
Berry Springs
STUART HIGHWAY
Oolloo
Dolostone
Katherine Tindall
Southern Daly
Mataranka
Tindall
VICTORIA HIGHWAY
Wiso Basin
STUART HIGHWAY
Georgina
Basin
BARKLY HIGHWAY
PATERSON STREET
STUART HIGHWAY
Western
Davenport
Ti Tree
Alice
Springs
STUART HIGHWAY
Great
Artesian
Basin

Water Control Districts

- Water control districts are declared in the NT to allow enhanced management of water resources:
- Declared in areas with competing demands and/or recognised environmental value.

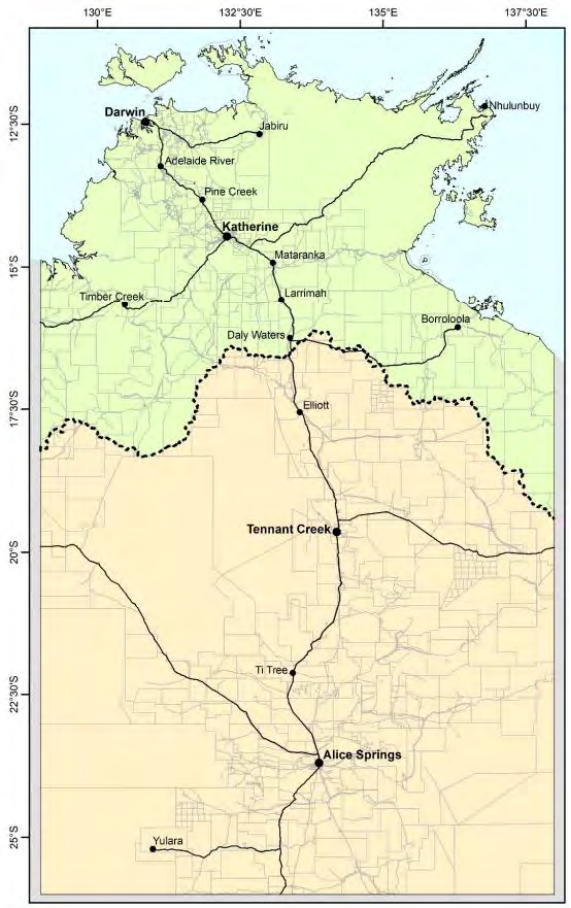
NT Allocation Framework (Policy)

1. Scientific research

   Environmental and cultural water requirements to define use

2. Contingent allocation

	Aquifer	River
Top End	Maintain >80% discharge Use <20% recharge	Maintain >80% flow Use <20% flow **Use <5% wet season flow**
Arid Zone	Maintain GDE Use <80% storage/100yr (0.8% per year)	Maintain 95% flow Use 5% flow



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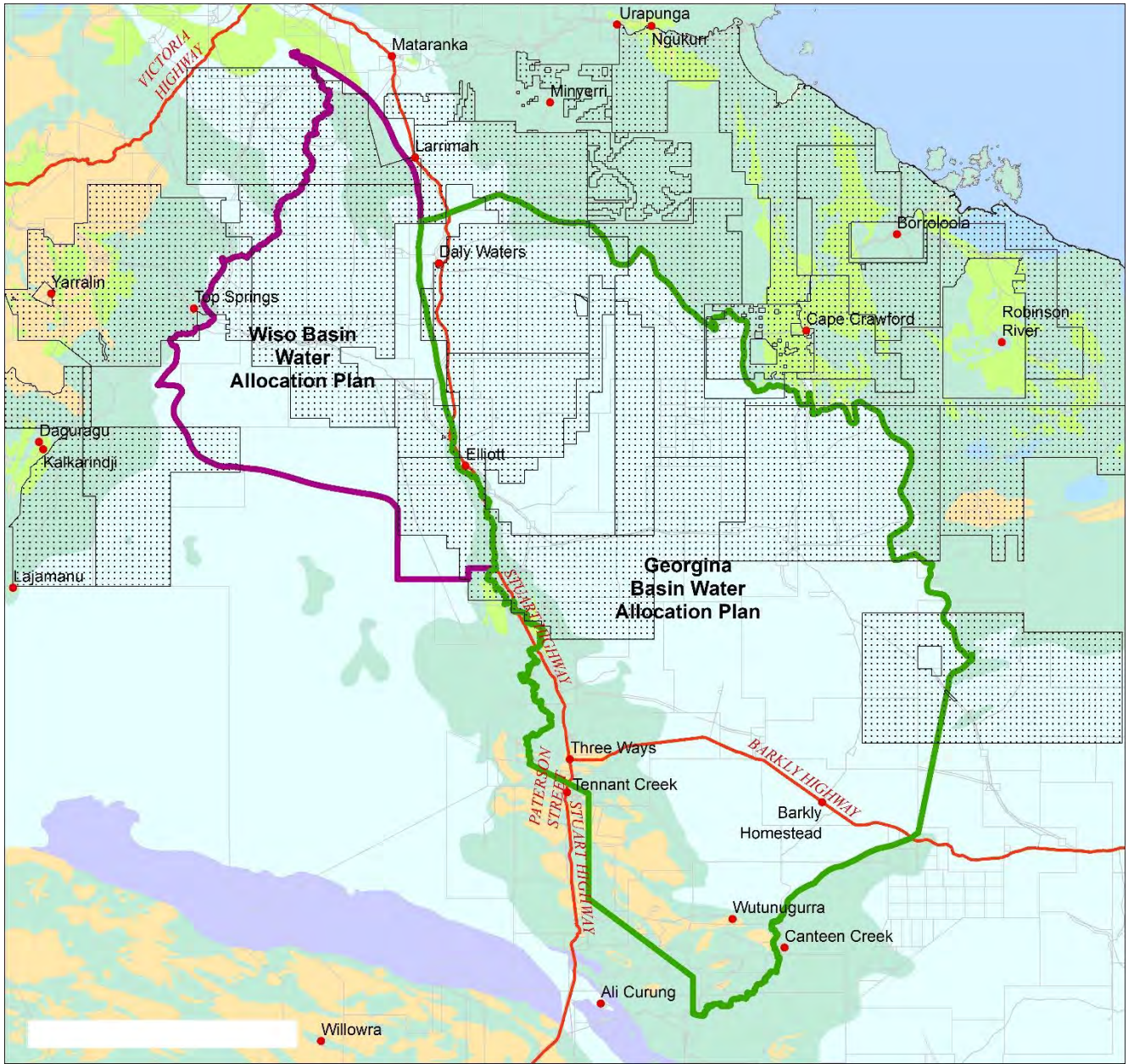
Water Allocation Plans

- blueprint for future sustainability
- limits the amount of water assigned to each beneficial use
- scientific assessment
- community consultation
- one or multiple water sources, surface or groundwater.
- monitoring is critical

Petroleum Titles

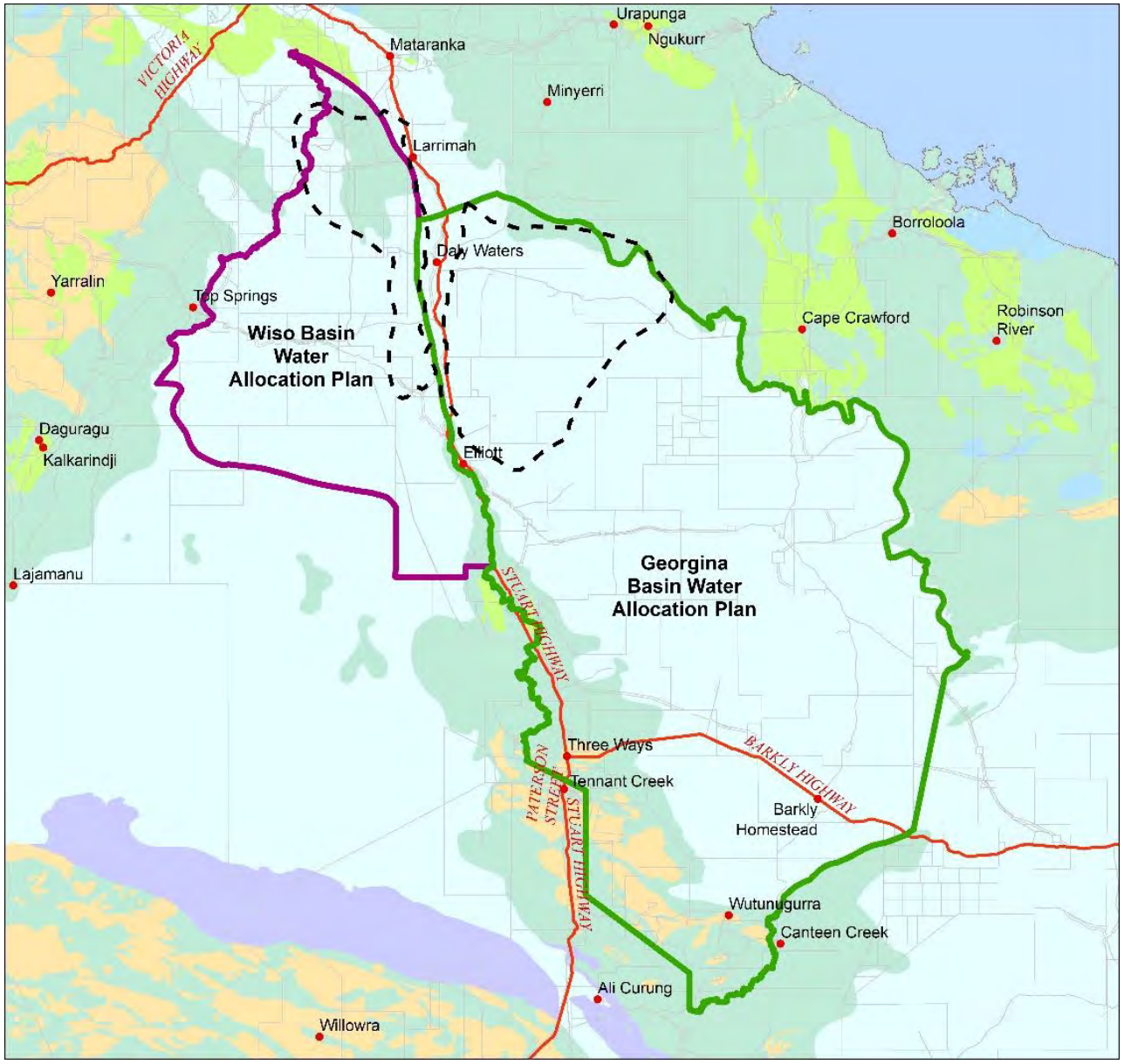


The Planning Process

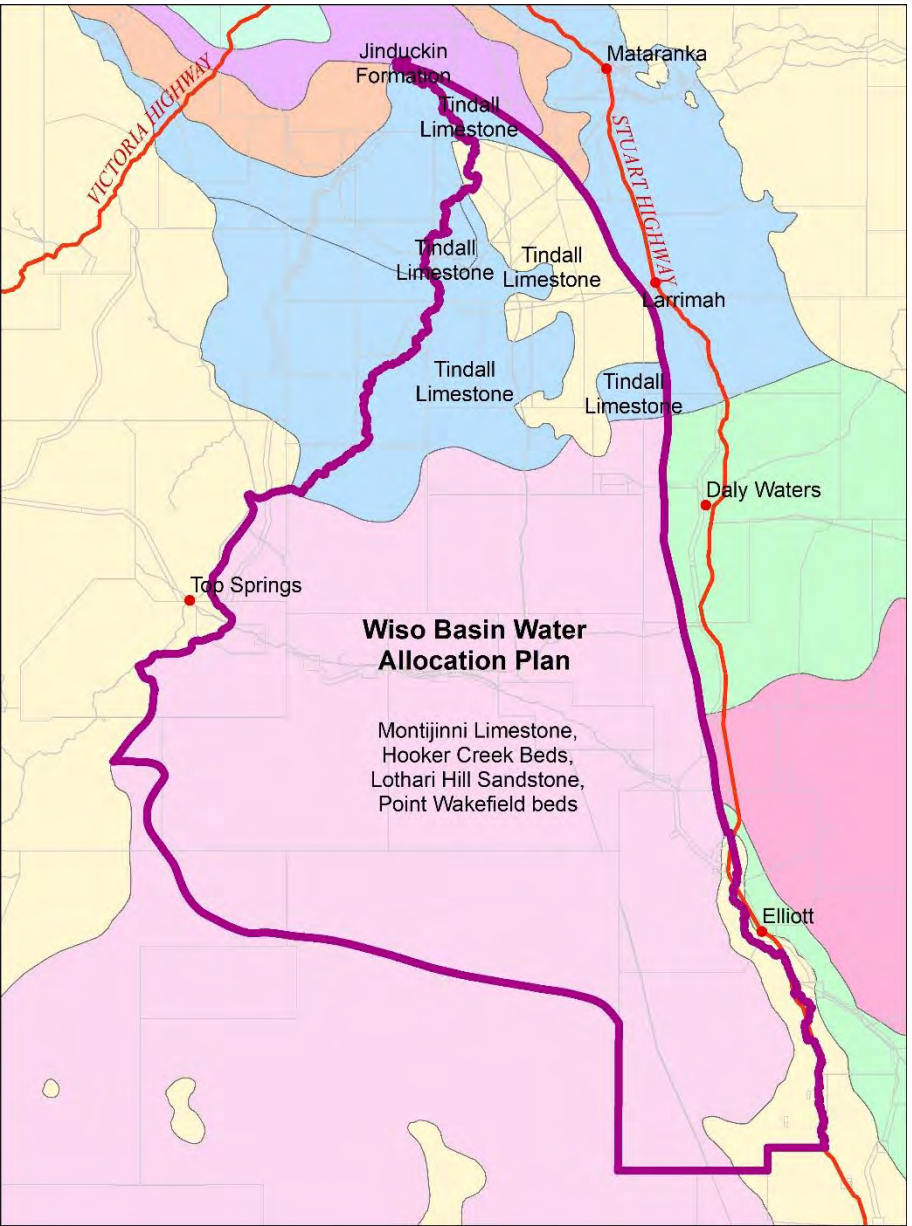
- Characterise the Water Resource
- Water Advisory Committee
- Matters that are considered
- Develop Water Allocation Plan
- Implementation
- Review

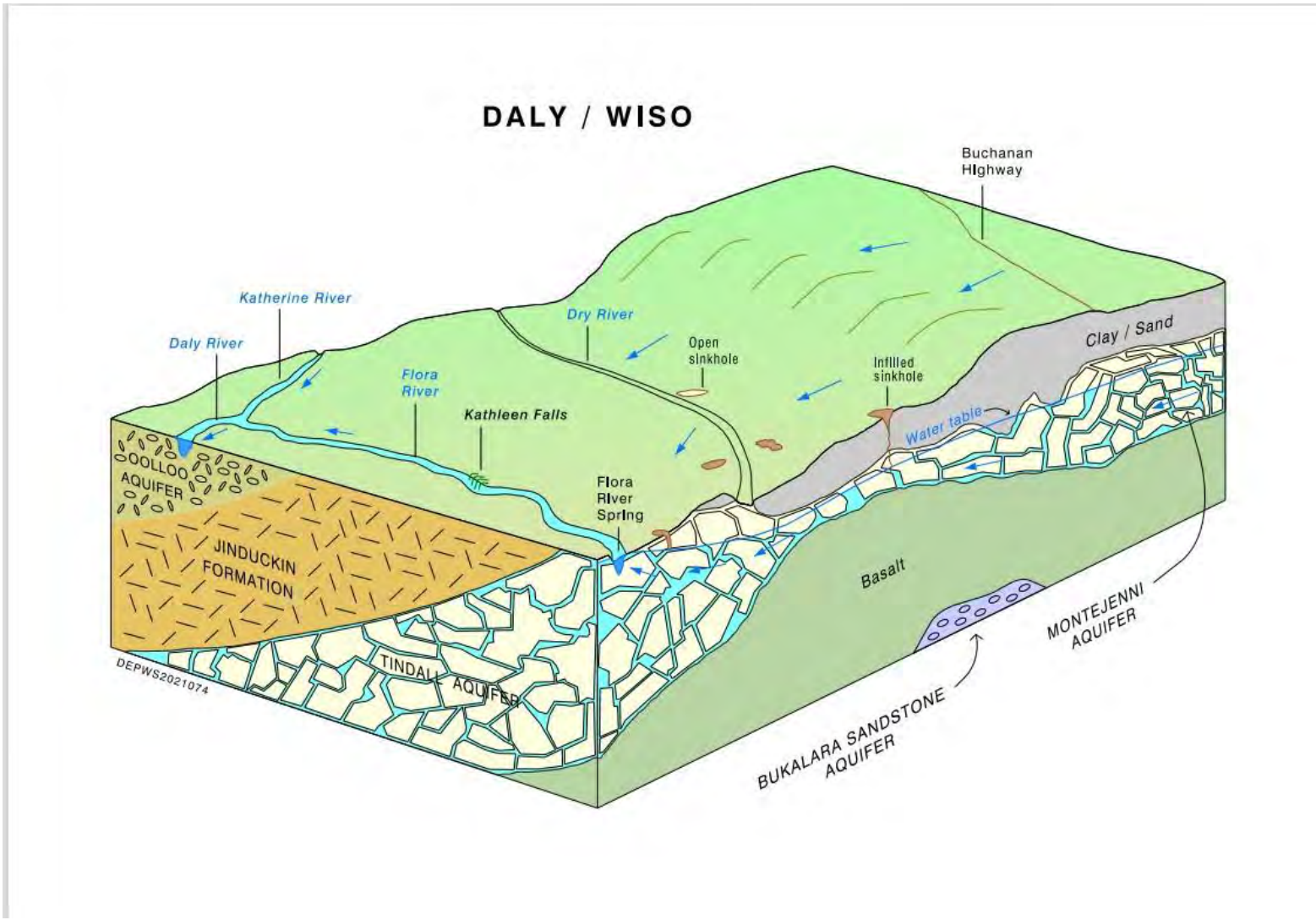
Georgina and Wiso Basins Water Allocation Plans

Beetaloo Sub-basin

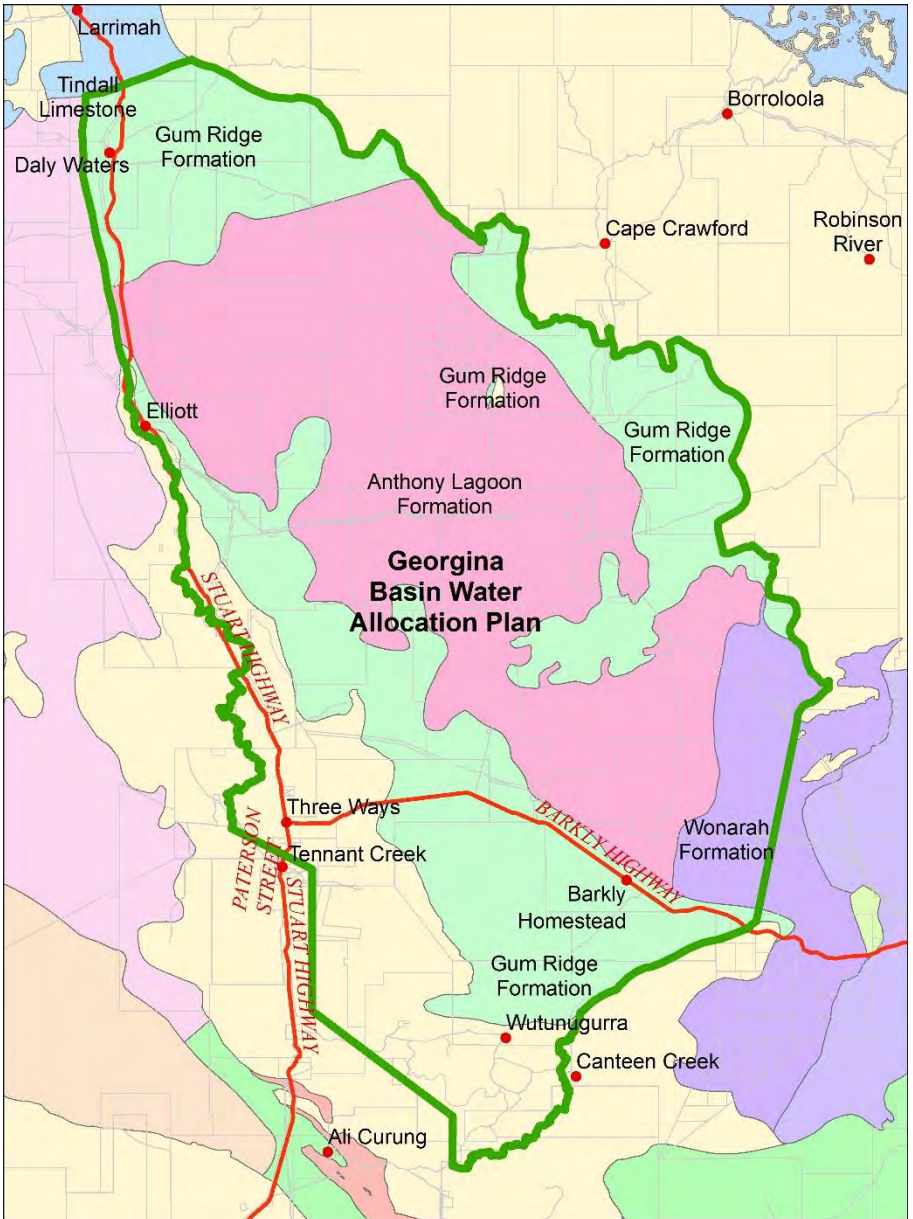


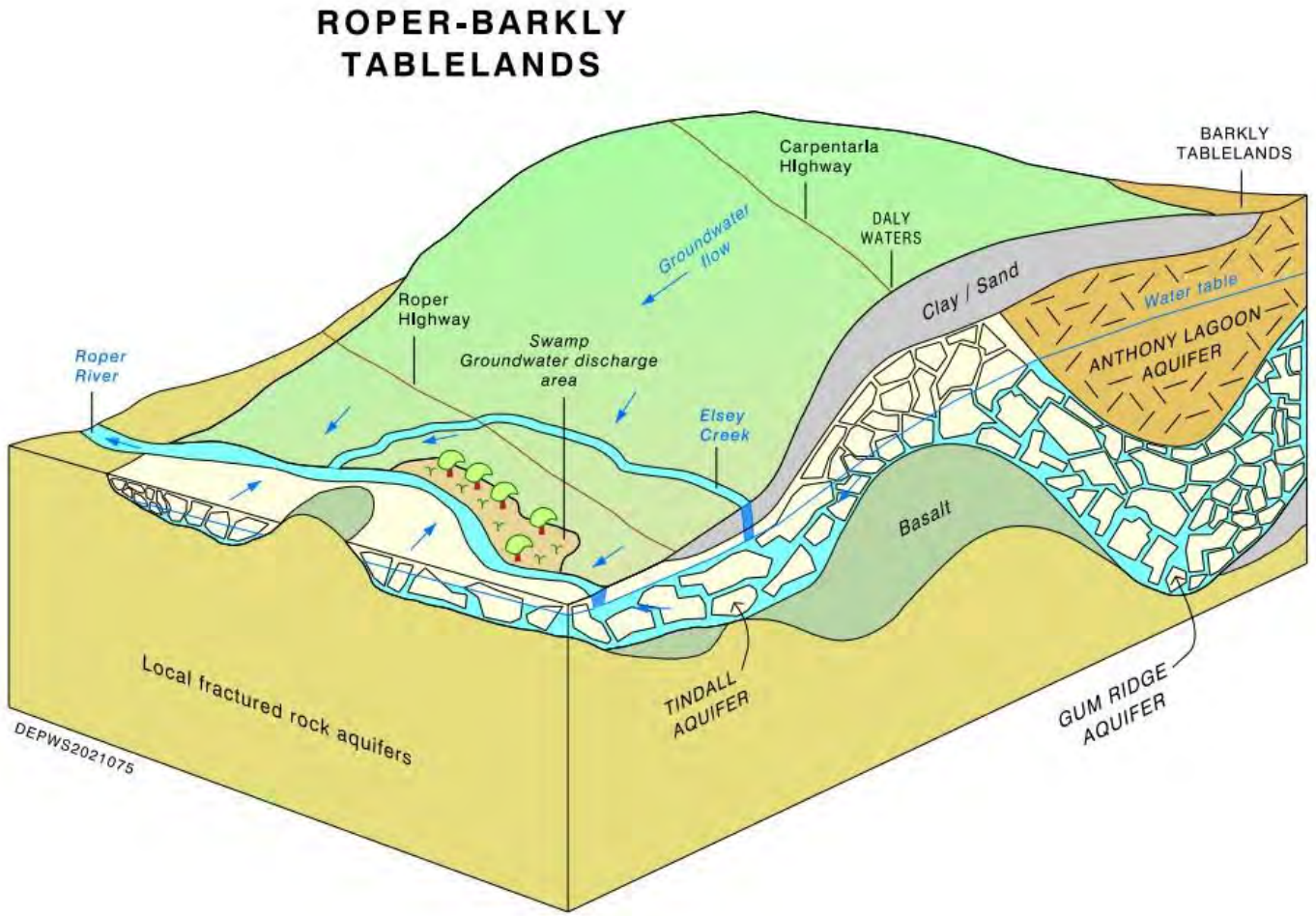
Wiso Basin WAP



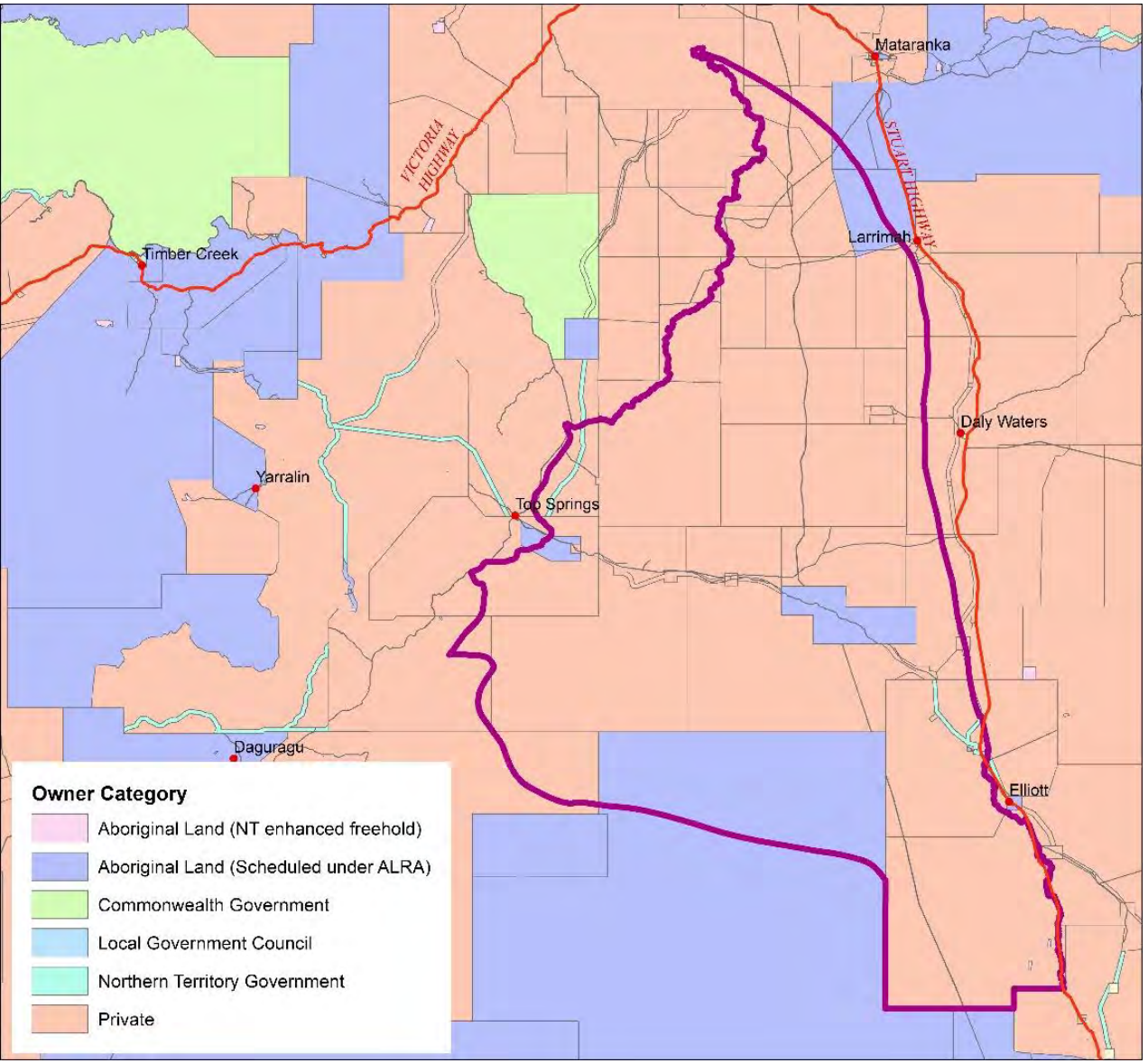


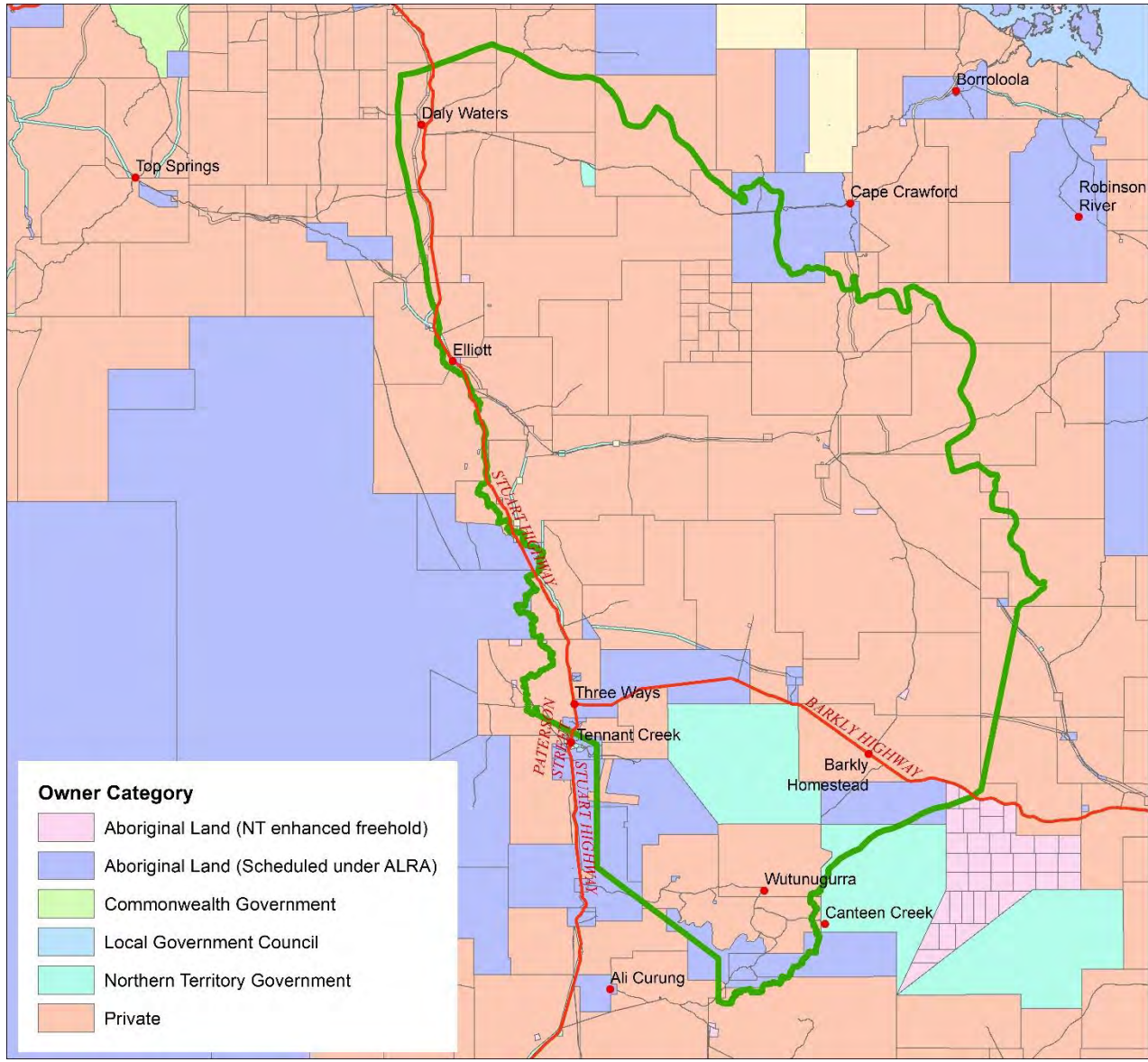
Georgina Basin WAP





Land Tenure


Mataranka
VICTORIA HIGHWAY
STUART HIGHWAY
Timber Creek
Larrimah
Daly Waters
Yarralin
Top Springs
Daguragu
Elliott
Owner Category
Aboriginal Land (NT enhanced freehold)
Aboriginal Land (Scheduled under ALRA)
Commonwealth Government
Local Government Council
Northern Territory Government
Private


Borroloola
Daly Waters
Top Springs
Cape Crawford
Robinson River
Elliott
STUART HIGHWAY
Three Ways
BARKLY HIGHWAY
Tennant Creek
Barkly Homestead
Wutunugurra
Canteen Creek
Ali Curung
Owner Category
Aboriginal Land (NT enhanced freehold)
Aboriginal Land (Scheduled under ALRA)
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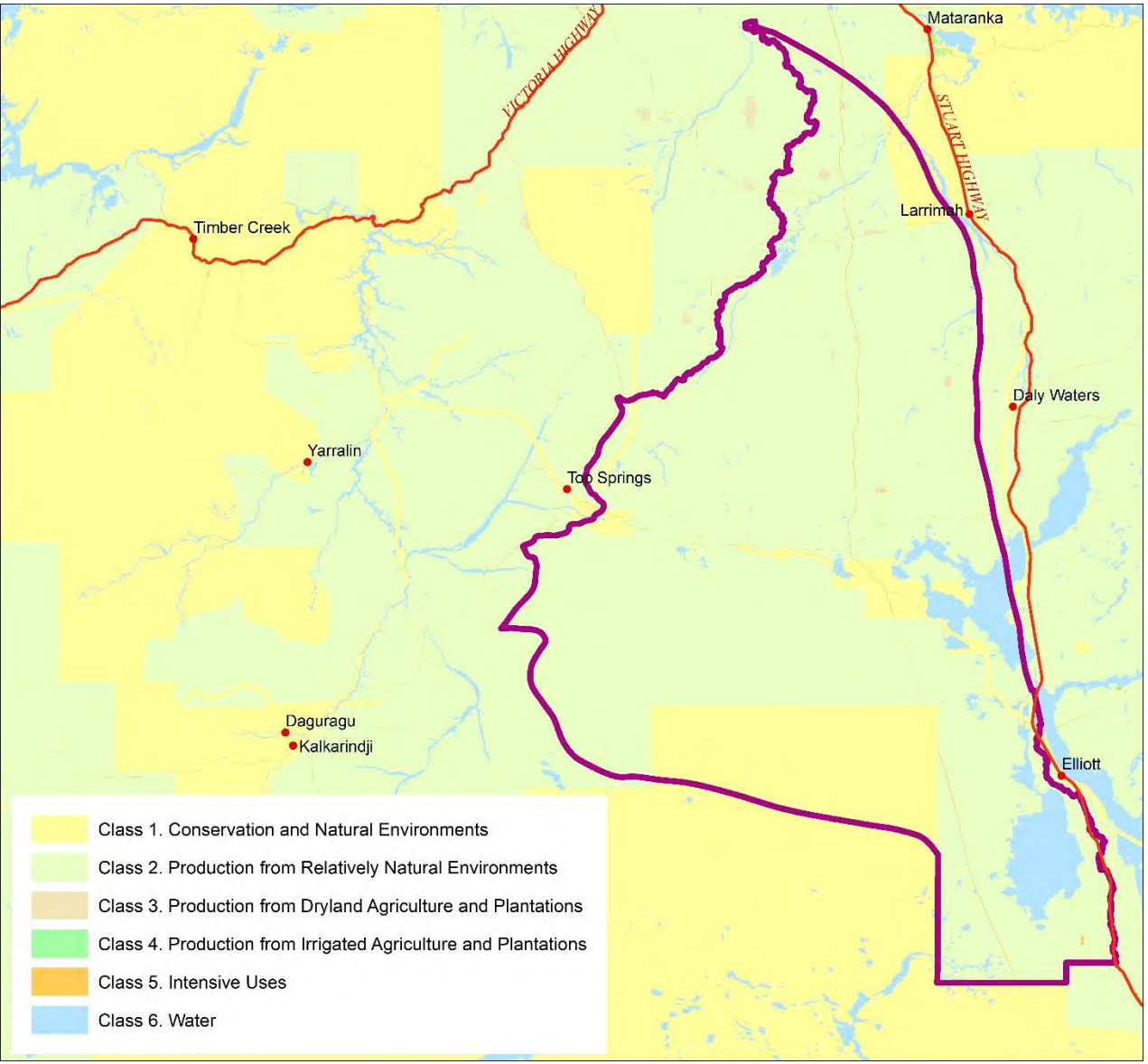
Land Use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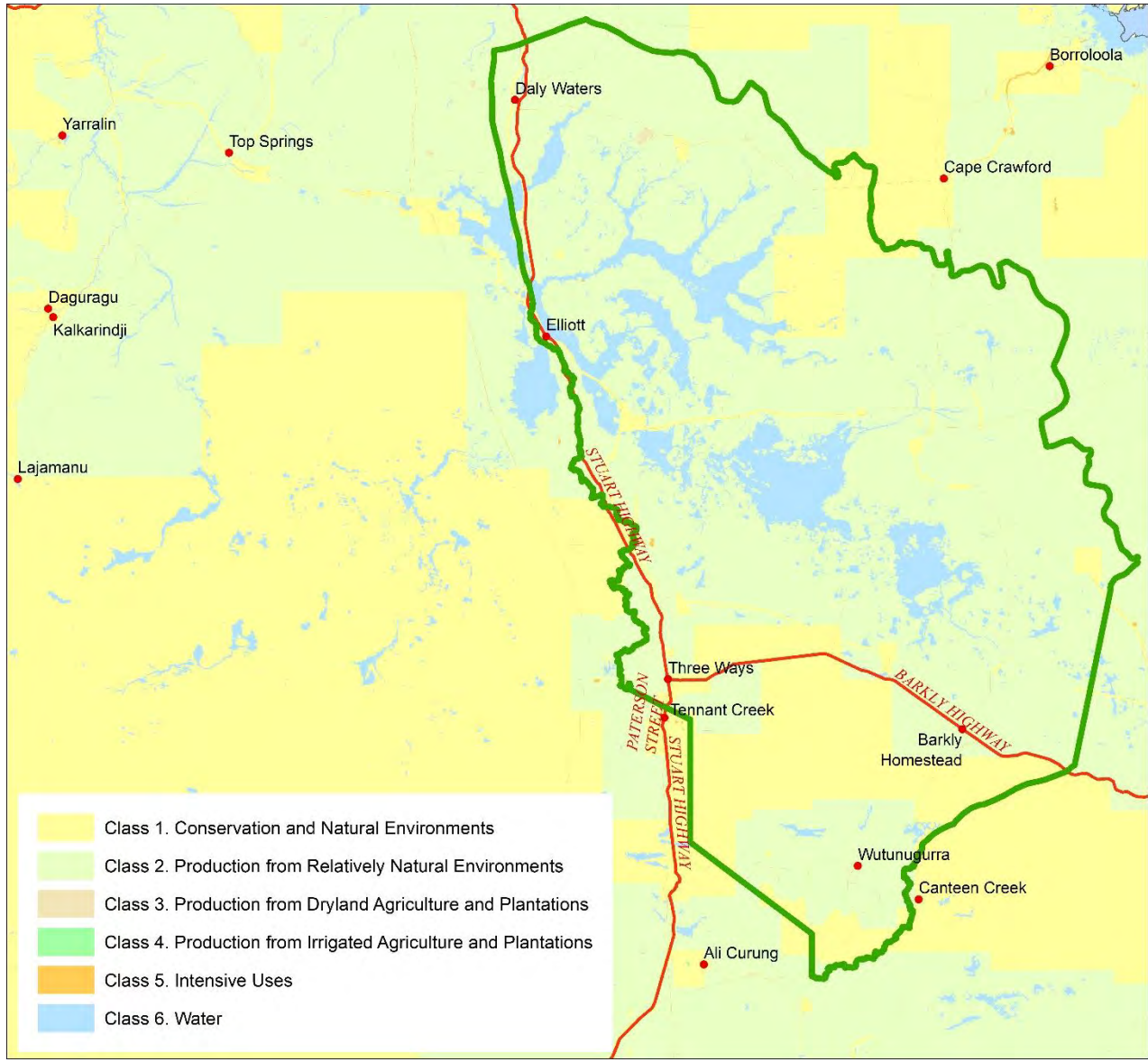
VICTORIA HIGHWAY
STUART HIGHWAY
Timber Creek
Larrimah
Daly Waters
Yarralin
Top Springs
Daguragu
Kalkarindji
Elliott
Class 1. Conservation and Natural Environments
Class 2. Production from Relatively Natural Environments
Class 3. Production from Dryland Agriculture and Plantations
Class 4. Production from Irrigated Agriculture and Plantations
Class 5. Intensive Uses
Class 6. Water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Kalkarindji
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Lajamanu
STUART HIGHWAY
Three Ways
BARKLY HIGHWAY
Tennant Creek
Barkly
Homestead
Wutunugurra
Canteen Creek
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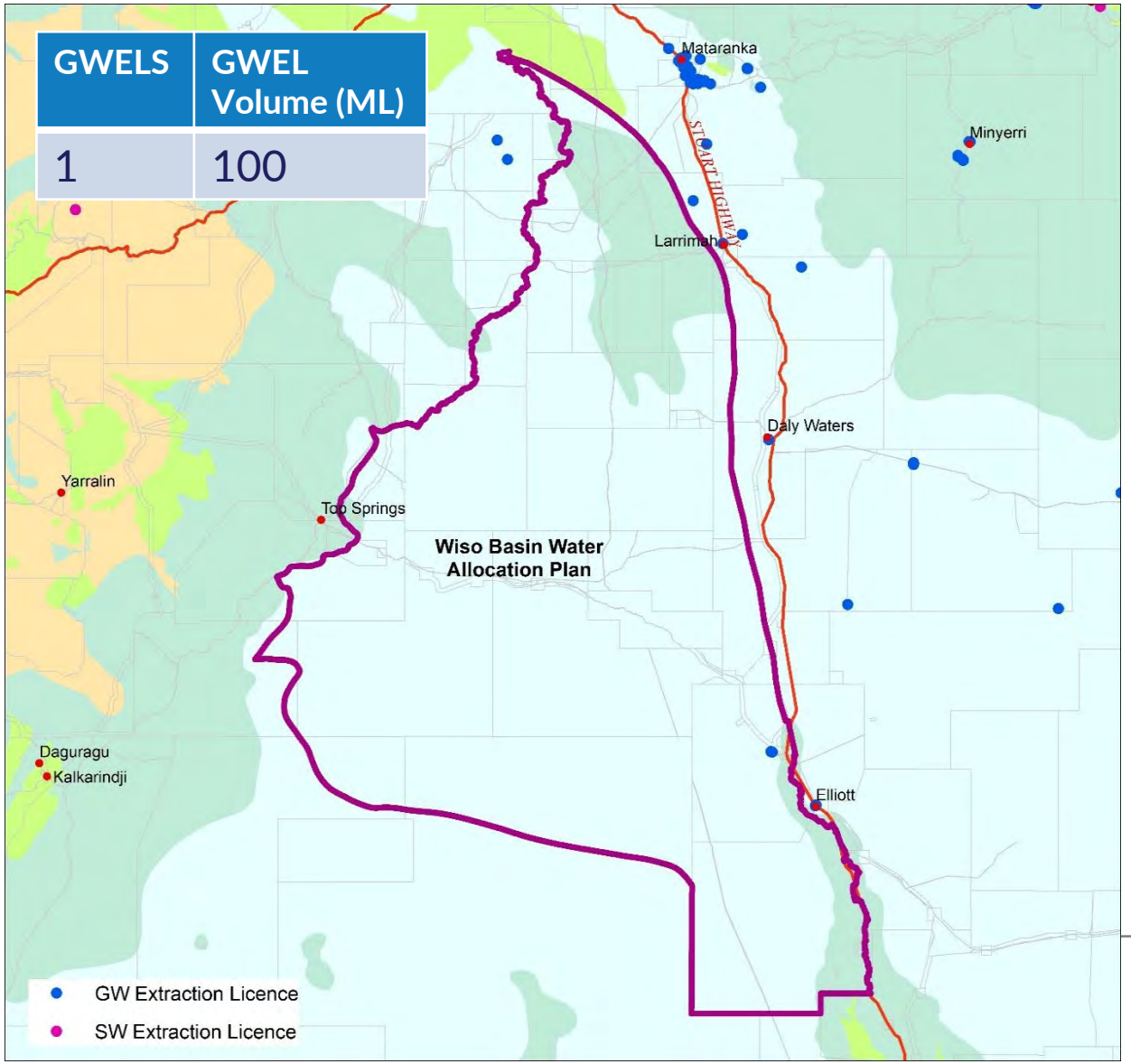
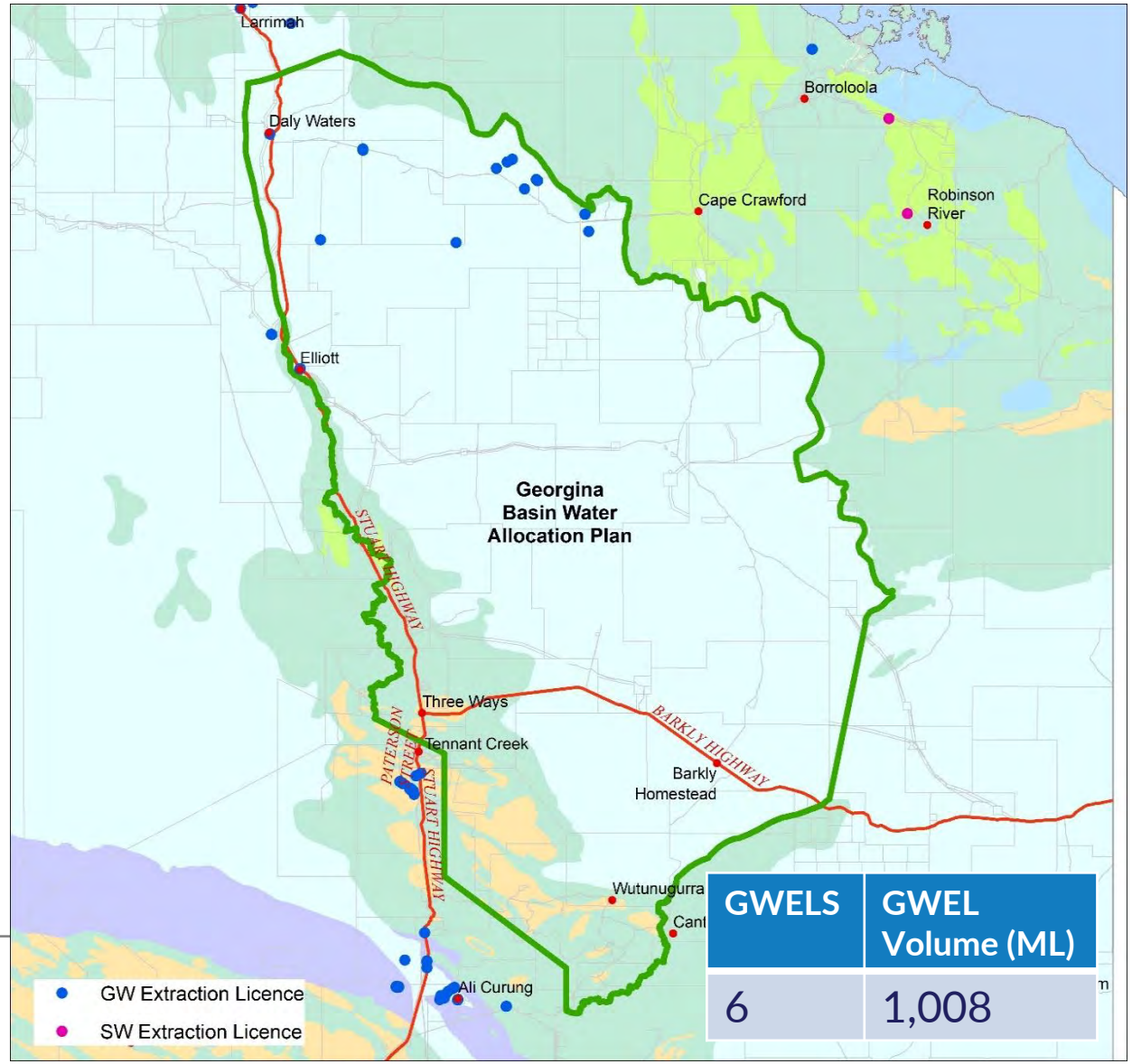
Class 2. Production from Relatively Natural Environments
Class 3. Production from Dryland Agriculture and Plantations
Class 4. Production from Irrigated Agriculture and Plantations
Class 5. Intensive Uses
Class 6. Water

Bore Development

Licensed Use



GWELS	GWEL Volume (ML)
1	100



GWELS	GWEL Volume (ML)
6	1,008

Wiso Basin Plan Objectives

(Potential) objectives :

- Protect the environmental and cultural water requirements of the Wiso Basin;
- Protect the quality and volume of groundwater discharge to the Flora River coming from the Wiso Basin;
- Protect significant drainage systems and lakes including Western Creek and Lake Woods;
- Allocate water to beneficial uses within the estimated yield for water surface water and groundwater; and
- Manage water use in the Plan area.

Georgina Basin Plan Objectives

(Potential) objectives are:

- Protect the environmental and cultural water requirements of the Georgina Basin;
- Protect the quality and volume of groundwater discharge to the Roper River coming from the Georgina Basin;
- Protect the quality and volume of surface water flow to significant drainage systems and lakes including Newcastle Creek and flows into Lake Woods;
- Allocate water to beneficial uses within the estimated yield for water surface water and groundwater; and
- Manage water use in the Plan area.

Thank you

NORTHERN TERRITORY GOVERNMENT