

## Appendix 1.B / Appendix 2.A – Priority Information Products and Monitoring Requirements

### Appendix 2.A – Water Information Generators

#### Appendix 2.A.1 – Assessment Programs in the Daly Roper Region

Program / Project	Agency	Program Value Score	Description	Monitoring Requirements
Baseline GW Monitoring Northern Region	NRETAS	6557	This project is mandated under the Water Act (1992) in providing the Controller of Water with assessment and monitoring information for water resources in the NT. The focus is currently on the regional resources, and with some key sites reflecting climate change	<ul style="list-style-type: none"> <li>• Surface water variables - baseflows and associated stage, water quality required from a number of areas including McMinns/Howard East Area and Lambells Lagoon (Howard Spring, Howard River (3 locations) and Hollands, Blacks, Bakers, Litchfield, Sunday and Melacca Creeks)</li> </ul>
Baseline SW Monitoring SWMA 814 Daly River Region	NRETAS	4119		
Baseline SW Monitoring SWMA 903 Roper River Catchment	NRETAS	2680		
Katherine Tindal Limestone Assessment	NRETAS	2060	This project aims to provide annually updated monitoring data for model input. The model output is required to advise planners and provide basis for announcement of seasonal allocations from this aquifer system. The 5 year review/assessment of the water	<ul style="list-style-type: none"> <li>• Surface water variables: stage and flow – Katherine River between Knotts Crossing and Galloping Jacks, Katherine Hot Springs, Stein Eric Spring, Springvale Spring, Sculpture Cave system, King River at Stuart Highway, Lake Hickey and Tindall Creek.</li> <li>• Groundwater variables</li> </ul>
Flood Forecasting Daly River	NRETAS	1715	In the Territory, most of the towns and communities are located on the banks of major rivers and are flood prone. One of non structural mitigation measures undertaken to reduce the flood impacts is flood forecasting and warning. This service is provided	Direct measurements Primary - Stage, cross sections, gaugings, rainfall, groundwater, water velocity Secondary – Gas pressure, battery voltage, telemetry signal strength Derived measurements – ratings, flow, rainfall from BoM Other (contextual)
Flood Forecasting Katherine River	NRETAS	1715		
Flood Forecasting Upper Roper River	NRETAS	1715		

<b>Program / Project</b>	<b>Agency</b>	<b>Program Value Score</b>	<b>Description</b>	<b>Monitoring Requirements</b>
Sustainable Development and Management of Water Resources in Northern Australia: A Model Approach (NWC)	NRETAS	1398	This project assisted in the delivery of water management initiatives such as water use monitoring, resource monitoring infrastructure and integrated model development in both the Darwin Rural Area (Koolpinyah Dolomite Aquifer) and the Daly Catchment.	<ul style="list-style-type: none"> <li>• Surface water variables - baseflows and associated stage, water quality required from the McMinns/Howard East Area and Lambells Lagoon (Howard Spring, Howard River (3 locations) and Hollands, Blacks, Bakers, Litchfield, Sunday and Melacca Creeks)</li> </ul>
Major spring systems of the Ooloo Dolostone Daly River project (NWC)	NRETAS	1159	Study to fill knowledge gaps concerning various aspects of the water balance of the Ooloo aquifer. Provide monitoring infrastructure. Identify management practices compatible with maintenance of spring dependant ecosystems so as to inform planners, resource managers	<ul style="list-style-type: none"> <li>• Surface water variables - baseflows and associated stage, water quality required from a number of stations including Katherine River, Flora River and Daly River at Dorisvale, Theyona, Ooloo Crossing (G8140038 - only necessary for the life of this project)</li> </ul>
Ooloo Assessment	NRETAS	1159	This assessment represents the ongoing study of the Ooloo aquifer and aims to fill knowledge gaps concerning various aspects of the water balance and provide monitoring infrastructure. In conjunction with the NWC project, this work will identify management priorities	<ul style="list-style-type: none"> <li>• Surface water variables - baseflows and associated stage, water quality required from a number of stations including Katherine River, Flora River and Daly River at Dorisvale, Theyona, Ooloo Crossing (G8140038 - only necessary for the life of the NWC project)</li> </ul>
Mataranka Tindal Limestone Assessment	NRETAS	819	At the most fundamental level, this project investigates the hydrogeology and wet-dry season hydrology in the Mataranka region. Information gained through the available data furthers the understanding of the natural processes and hydrogeological conceptual modelling	<ul style="list-style-type: none"> <li>• Surface water data – flows at Elsey Creek, Salt Creek, Roper Creek, Waterhouse River and Roper River (springflow from Mataranka to Red Lily Lagoon), Rainbow and Bitter Springs. Key variables are stage and dry season flow.</li> <li>• Groundwater data for all extraction licences</li> </ul>
Floodplain Mgt Assessments Beswick Community	NRETAS	805	Floodplain mapping are developed for emergency flood response purposes and land use planning. These maps have been developed for few flood prone towns and communities.	Direct measurements Primary - Stage, cross sections, gaugings, rainfall, groundwater, water velocity Secondary – Gas pressure, battery voltage, telemetry signal strength Derived measurements – ratings, flow, rainfall from BoM Other (contextual)
Floodplain Mgt Assessments Naiyu	NRETAS	805		

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<b>Program / Project</b>	<b>Agency</b>	<b>Program Value Score</b>	<b>Description</b>	<b>Monitoring Requirements</b>
Hydrographic Contract Services: - DCI - KTC	NRETAS	127	Automated alerts generated by Hydrotel data ingestion database provide text messages to Dept of Construction and Infrastructure staff responsible for closing roads/bridges affected by river flows that may impact on access or community safety. Additional	Direct measurements - Stage Other (contextual) – Bridge deck levels, causeway levels, approach road levels, alarm levels and resets. Resolution: Temporal: real-time (event based), Shape of Hydrograph dependant. Seasonal Wet Season operations,

## Appendix 2.A.2 – Assessment Programs in the Daly Roper Region

Program / Project	Agency	Program Value Score	Description	Monitoring Requirements
Baseline GW Monitoring Northern Region	NRETAS	6557	This project is mandated under the Water Act (1992) in providing the Controller of Water with assessment and monitoring information for water resources in the NT. The focus is currently on the regional resources, and with some key sites reflecting climate change	<ul style="list-style-type: none"> <li>• Surface water variables - baseflows and associated stage, water quality required from a number of areas including McMinns/Howard East Area and Lambells Lagoon (Howard Spring, Howard River (3 locations) and Hollands, Blacks, Bakers, Litchfield, Sunday and Melacca Creeks)</li> </ul>
Baseline SW Monitoring SWMA 815 Darwin Region Catc	NRETAS	1693		<ul style="list-style-type: none"> <li>• Surface water variables - significant flows (esp. flood) and associated stage required from a number of areas including Ti Tree (Woodforde River, Trephina and Allungra Creek, Hanson River), Western Davenport (Wycliffe Creek, Murray Creek, Hanson River),</li> </ul>
Baseline SW Monitoring SWMA 817 Adelaide River Cat	NRETAS	465		
Sustainable Development and Management of Water Resources in Northern Australia: A Model Approach (NWC)	NRETAS	1398	This project assisted in the delivery of water management initiatives such as water use monitoring, resource monitoring infrastructure and integrated model development in both the Darwin Rural Area (Koolpinyah Dolomite Aquifer) and the Daly Catchment.	<ul style="list-style-type: none"> <li>• Surface water variables - baseflows and associated stage, water quality required from the McMinns/Howard East Area and Lambells Lagoon (Howard Spring, Howard River (3 locations) and Hollands, Blacks, Bakers, Litchfield, Sunday and Melacca Creeks)</li> </ul>
Flood Forecasting Adelaide River	NRETAS	1363	In the Territory, most of the towns and communities are located on the banks of major rivers and are flood prone. One of non structural mitigation measures undertaken to reduce the flood impacts is flood forecasting and warning. This service is provided	<p>Direct measurements</p> <p>Primary - Stage, cross sections, gaugings, rainfall, groundwater, water velocity</p> <p>Secondary – Gas pressure, battery voltage, telemetry signal strength</p> <p>Derived measurements – ratings, flow, rainfall from BoM</p> <p>Other (contextual)</p>

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<b>Program / Project</b>	<b>Agency</b>	<b>Program Value Score</b>	<b>Description</b>	<b>Monitoring Requirements</b>
Floodplain Mgt Assessments Alice Springs Rural	NRETAS	833	Floodplain mapping are developed for emergency flood response purposes and land use planning. These maps have been developed for few flood prone towns and communities.	Direct measurements Primary - Stage, cross sections, gaugings, rainfall, groundwater, water velocity Secondary – Gas pressure, battery voltage, telemetry signal strength  Derived measurements – ratings, flow, rainfall from BoM  Other (contextual)
Floodplain Mgt Assessments Alice Springs Town	NRETAS	833		
Floodplain Mgt Assessments Finke River Region	NRETAS	833		
Floodplain Mgt Assessments Adelaide River Township	NRETAS	805		
Catchment Event Monitoring	NRETAS	830	Loads at Gauge Stations: Water quality monitoring at gauge stations for load estimation  Collection of pollutant concentrations and stream flow data at hydrographic gauge stations to estimate pollutant loads from a variety of land uses and across years.	Hydrographic and pollutant concentration data at gauge stations for flow regimes over several years or different land uses, climate and other environmental data, GIS data, and potentially modelling data, point source pollution load data. Main data collect
McMinns\Howard East Assessment	NRETAS	778	This assessment represents an ongoing study of the McMinns/Howard East aquifer system and identify additional monitoring infrastructure as required. This project will provide monitoring data for ongoing model development. The model is required to as a d	<ul style="list-style-type: none"> <li>• Surface water variables - baseflows and associated stage, water quality required from a number of areas including McMinns/Howard East Area and Lambells Lagoon (Howard Spring, Howard River (3 locations) and Hollands, Blacks, Bakers, Litchfield, Sunday and Melacca Creeks)</li> </ul>
Berry Springs Assessment	NRETAS	706	This project will provide an initial assessment of the aquifer system and evaluate the groundwater resources in terms of an annual sustainable yield. This project incorporates the development of a numerical model of the Berry Springs aquifer. The ongoing	<ul style="list-style-type: none"> <li>• Surface water variables: Flow from Berry Spring, Parson Spring and others yet to be identified.</li> <li>• Groundwater variables: Water level from all existing monitoring bores and water quality from selected bores.</li> <li>• Meteorological variables: rainfall and evaporation</li> </ul>

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<b>Program / Project</b>	<b>Agency</b>	<b>Program Value Score</b>	<b>Description</b>	<b>Monitoring Requirements</b>
Koolpinyah Dolomite Aquifer Characteristics Project (NWC)	NRETAS	679	This project is a collaboration between NRETAS and the National Water Commission to investigate the geology of the Proterozoic basement and overlying formations and determine the hydrogeological characteristics of these formations with particular referenc	<ul style="list-style-type: none"> <li>• Surface water variables - baseflows and water quality required from a number of areas including McMinns/Howard East Area and Lambells Lagoon (Howard Spring, Howard River (3 locations) and Hollands, Blacks, Bakers, Litchfield, Sunday and Melacca Creeks)</li> </ul>
Biophysical Modelling of Water Quality in a Darwin Rural Area Groundwater Dependent Ecosystem (NHT)	NRETAS	184	The water resources aspect of this project is concerned with the establishment of monsoon vine forests in the Darwin Rural Area as GDEs and the determination of their water usage quantities and patterns, and hence their environmental requirement. The imp	<ul style="list-style-type: none"> <li>• Surface water variables - baseflows and water quality required from a number of streams fed by springs in the Koolpinyah Dolomite (Hollands, Blacks, Bakers, Litchfield and Sunday Creeks) and which flow into the various MVF's.</li> <li>• Groundwater variables: w</li> </ul>
Salt Water Intrusion NT Coastal Plain (GA)	NRETAS	99	Examine salt water intrusion potential on the north coastal plains using AEM and drilling	<ul style="list-style-type: none"> <li>• Groundwater variables: water level and water quality at selected sites</li> <li>• Data continuity: One off measurements required</li> </ul>

### Appendix 2.A.3 – Assessment Programs in Central NT

<b>Program / Project</b>	<b>Agency</b>	<b>Program Value Score</b>	<b>Description</b>	<b>Monitoring Requirements</b>
Baseline GW Monitoring Southern Region	NRETAS	4395	This project is mandated under the Water Act (1992) in providing the Controller of Water with assessment and monitoring information for water resources in the NT. The focus is currently on the regional resources, and with some key sites reflecting climate change	<ul style="list-style-type: none"> <li>• Surface water variables - significant flows (esp. flood) and associated stage required from a number of areas including Ti Tree (Woodforde River, Trephina and Allungra Creek, Hanson River), Western Davenport (Wycliffe Creek, Murray Creek, Hanson River),</li> </ul>
Western Davenport Assessment	NRETAS	753	This project aims to deliver the 5 year review/assessment of the water resources particular to the Water Allocation Plan for the Western Davenport Water Control District 2010 - 2020. The review will be based on the data and information acquired in the in	<ul style="list-style-type: none"> <li>• Surface water variables - significant flows (esp. flood) and associated stage required from Wycliffe Creek, Murray Creek, Hanson River to assess flow frequency, environmental water use and local and floodout recharge to underlying aquifers.</li> <li>• Groundwater variables</li> </ul>
Ti Tree Assessment	NRETAS	682	This project aims to deliver the 5 year review/assessment of the water resources particular to the Ti Tree Region Water Allocation Plan 2009. The review will be based on the data and information acquired in the intervening 5 year period.	<ul style="list-style-type: none"> <li>• Surface water variables - significant flows (esp. flood) and associated stage required from Woodforde River, Trephina and Allungra Creek, Hanson River to assess flow frequency, and local and floodout recharge to the underlying aquifers.</li> <li>• Groundwater variables</li> </ul>

## Appendix 2.A.4 – Assessment Programs in the Alice Springs Region

<b>Program / Project</b>	<b>Agency</b>	<b>Program Value Score</b>	<b>Description</b>	<b>Monitoring Requirements</b>
Baseline GW Monitoring Southern Region	NRETAS	4395	This project is mandated under the Water Act (1992) in providing the Controller of Water with assessment and monitoring information for water resources in the NT. The focus is currently on the regional resources, and with some key sites reflecting climate change	<ul style="list-style-type: none"> <li>• Surface water variables - significant flows (esp. flood) and associated stage required from a number of areas including Ti Tree (Woodforde River, Trepina and Allungra Creek, Hanson River), Western Davenport (Wycliffe Creek, Murray Creek, Hanson River),</li> </ul>
Baseline SW Monitoring SWMA 006 Todd River Catchment	NRETAS	2267		
Baseline SW Monitoring SWMA 005 Finke River Catchment	NRETAS	365		
Alice Springs Regional Assessment	NRETAS	2269	This project aims to deliver the 5 year review/assessment of the water resources particular to the Alice Springs Water Resource Strategy. The review will be based on the data and information acquired in the intervening 5 year period.	<ul style="list-style-type: none"> <li>• Groundwater variables – water levels and water quality sampling (from selected bores) required in bores monitoring the nominated alluvial aquifers (Town Basin, Inner Farm Basin, Outer Farm Basin and Wannardi Basin) and Amadeus Basin Rock aquifers (Shannons and Pacoota)</li> </ul>
Flood Forecasting Todd River	NRETAS	1363	In the Territory, most of the towns and communities are located on the banks of major rivers and are flood prone. One of non structural mitigation measures undertaken to reduce the flood impacts is flood forecasting and warning.	<p>Direct measurements:</p> <p>Primary - Stage, cross sections, gaugings, rainfall, groundwater, water velocity;</p> <p>Secondary – Gas pressure, battery voltage, telemetry signal strength;</p> <p>Derived measurements – ratings, flow, rainfall from BoM;</p> <p>Other (contextual)</p>



Floodplain Mgt Assessments - Alice Springs Rural - Alice Springs Town - Finke River Region	NRETAS	833	Floodplain mapping are developed for emergency flood response purposes and land use planning. These maps have been developed for few flood prone towns and communities.	Direct measurements: Primary - Stage, cross sections, gaugings, rainfall, groundwater, water velocity Secondary – Gas pressure, battery voltage, telemetry signal strength; Derived measurements – ratings, flow, rainfall from BoM; Other (contextual)
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### Appendix 2.A.5 – Assessment Programs in other areas of the NT

Other areas include:

1. Victoria River
2. McArthur River
3. Gove
4. Groote Eylandt
5. Tiwi Islands

Region	Program / Project	Agency	Program Value Score	Description	Monitoring Requirements
GAB	GAB Mound Springs project	NRETAS	367	This is a collaborative project undertaken with SA Government, Flinders and Adelaide Universities. The project is investigating the hydrogeology, ecology and nature of mound springs along the southwest margin of the great artesian basin. NRETAS involvement	<ul style="list-style-type: none"> <li>• Surface water data for all rivers draining to the Lake Eyre Basin within the NT (Finke, Todd, Hale, Hay, Plenty Rivers as well as Illogwa and Goyder Creeks). Key variables are stage height and flow.</li> <li>• Groundwater data for all existing monitoring bores</li> </ul>
GAB	Great Artesian Basin Monitoring Network Implementation (Stage 2) through funding under the Great Artesian Basin Sustainability Initiative (GABSI)	NRETAS	240	Funding has been provided under the Great Artesian Basin Sustainability Initiative (GABSI) to obtain survey heights for six GAB monitoring bores and to install loggers in 12 GAB monitoring Bores. A number of these are yet to be drilled and will be installed	<ul style="list-style-type: none"> <li>• Groundwater data for all existing monitoring bores in the GAB (currently only six), key variables include level, pressure and temperature (for artesian bores) and water quality (for selected bores). Additional bores are and will be constructed for monitoring</li> </ul>

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<b>Region</b>	<b>Program / Project</b>	<b>Agency</b>	<b>Program Value Score</b>	<b>Description</b>	<b>Monitoring Requirements</b>
Gulf Region	Floodplain Mgt Assessments Borroloola	NRETAS	819	Floodplain mapping are developed for emergency flood response purposes and land use planning. These maps have been developed for few flood prone towns and communities.	<p>Direct measurements                      Primary - Stage, cross sections, gaugings, rainfall, groundwater, water velocity                      Secondary – Gas pressure, battery voltage, telemetry signal strength</p> <p>Derived measurements – ratings, flow, rainfall from BoM</p> <p>Other (contextual)</p>
McArthur River	Flood Forecasting McArthur River	NRETAS	1209	In the Territory, most of the towns and communities are located on the banks of major rivers and are flood prone. One of non structural mitigation measures undertaken to reduce the flood impacts is flood forecasting and warning. This service is provided	<p>Direct measurements                      Primary - Stage, cross sections, gaugings, rainfall, groundwater, water velocity                      Secondary – Gas pressure, battery voltage, telemetry signal strength</p> <p>Derived measurements – ratings, flow, rainfall from BoM</p> <p>Other (contextual)</p>
NT Wide	Baseline GW Monitoring Northern Region	NRETAS	6557	This project is mandated under the Water Act (1992) in providing the Controller of Water with assessment and monitoring information for water resources in the NT. The focus is currently on the regional resources, and with some key sites reflecting climat	<ul style="list-style-type: none"> <li>• Surface water variables - baseflows and associated stage, water quality required from a number of areas including McMinns/Howard East Area and Lambells Lagoon (Howard Spring, Howard River (3 locations) and Hollands, Blacks, Bakers, Litchfield, Sunday and Melacca Creeks)</li> </ul>
NT Wide	Hydrographic Contract Services: ERISS	NRETAS	127	Hydrographic Contract Services;ERISS	

Region	Program / Project	Agency	Program Value Score	Description	Monitoring Requirements
Semi Arid Zone	Catchment Event Monitoring	NRETAS	830	<p>Loads at Gauge Stations: Water quality monitoring at gauge stations for load estimation</p> <p>Collection of pollutant concentrations and stream flow data at hydrographic gauge stations to estimate pollutant loads from a variety of land uses and across years.</p>	Hydrographic and pollutant concentration data at gauge stations for flow regimes over several years or different land uses, climate and other environmental data, GIS data, and potentially modelling data, point source pollution load data. Main data collect
Semi Arid Zone	Baseline SW Monitoring SWMA 815 Darwin Region Catchment	NRETAS	1693	This project is mandated under the Water Act (1992) in providing the Controller of Water with assessment and monitoring information for water resources in the NT. The focus is currently on the regional resources, and with some key sites reflecting climate change	<ul style="list-style-type: none"> <li>• Surface water variables - significant flows (esp. flood) and associated stage required from a number of areas including Ti Tree (Woodforde River, Trepina and Allungra Creek, Hanson River), Western Davenport (Wycliffe Creek, Murray Creek, Hanson River),</li> </ul>
Semi Arid Zone	Baseline SW Monitoring SWMA 817 Adelaide River Catchment	NRETAS	465	This project is mandated under the Water Act (1992) in providing the Controller of Water with assessment and monitoring information for water resources in the NT. The focus is currently on the regional resources, and with some key sites reflecting climate change	<ul style="list-style-type: none"> <li>• Surface water variables - significant flows (esp. flood) and associated stage required from a number of areas including Ti Tree (Woodforde River, Trepina and Allungra Creek, Hanson River), Western Davenport (Wycliffe Creek, Murray Creek, Hanson River),</li> </ul>
Semi Arid Zone	Baseline SW Monitoring SWMA 907 McArthur River Catchment	NRETAS	465	This project is mandated under the Water Act (1992) in providing the Controller of Water with assessment and monitoring information for water resources in the NT. The focus is currently on the regional resources, and with some key sites reflecting climate change	<ul style="list-style-type: none"> <li>• Surface water variables - significant flows (esp. flood) and associated stage required from a number of areas including Ti Tree (Woodforde River, Trepina and Allungra Creek, Hanson River), Western Davenport (Wycliffe Creek, Murray Creek, Hanson River),</li> </ul>

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Region	Program / Project	Agency	Program Value Score	Description	Monitoring Requirements
Tiwi Islands	Tiwi Islands Assessment	NRETAS	1132	This project provides a broad assessment of the water resources to support the Water Allocation Plan currently being developed for the Tiwi Islands. Initially, the monitoring data will be required for baseline assessment of natural system behaviour and s	<ul style="list-style-type: none"> <li>• Surface water variables: flow and stage data required for rivers (the sites nominated are the historic gauging sites which are required to be re-opened)</li> <li>• Groundwater variables: water levels from existing network of monitoring bores; water quality from</li> </ul>
Victoria River District	Flood Forecasting Victoria River	NRETAS	1320	In the Territory, most of the towns and communities are located on the banks of major rivers and are flood prone. One of non structural mitigation measures undertaken to reduce the flood impacts is flood forecasting and warning.	Direct measurements Primary - Stage, cross sections, gaugings, rainfall, groundwater, water velocity Secondary – Gas pressure, battery voltage, telemetry signal strength Derived measurements – ratings, flow, rainfall from BoM Other (contextual)
Victoria River District	Floodplain Mgt Assessments Timber Creek	NRETAS	733	Floodplain mapping are developed for emergency flood response purposes and land use planning. These maps have been developed for few flood prone towns and communities.	Direct measurements Primary - Stage, cross sections, gaugings, rainfall, groundwater, water velocity Secondary – Gas pressure, battery voltage, telemetry signal strength Derived measurements – ratings, flow, rainfall from BoM Other (contextual)
Victoria River District	Baseline SW Monitoring SWMA 811 Victoria River Catchment	NRETAS	745	This project is mandated under the Water Act (1992) in providing the Controller of Water with assessment and monitoring information for water resources in the NT. The focus is currently on the regional resources, and with some key sites reflecting climate change	<ul style="list-style-type: none"> <li>• Surface water variables - significant flows (esp. flood) and associated stage required from a number of areas including Ti Tree (Woodforde River, Trepkina and Allungra Creek, Hanson River), Western Davenport (Wycliffe Creek, Murray Creek, Hanson River),</li> </ul>