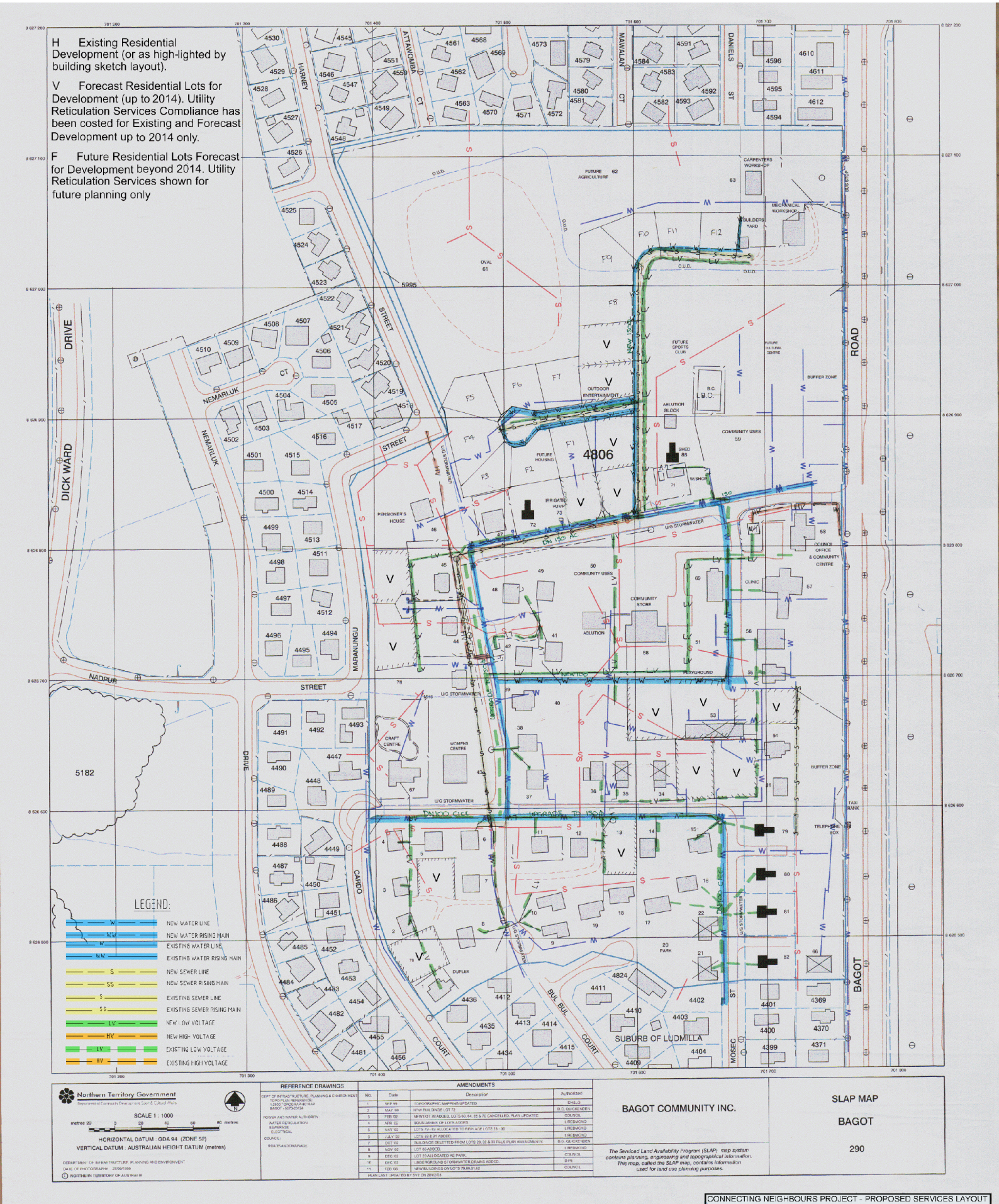
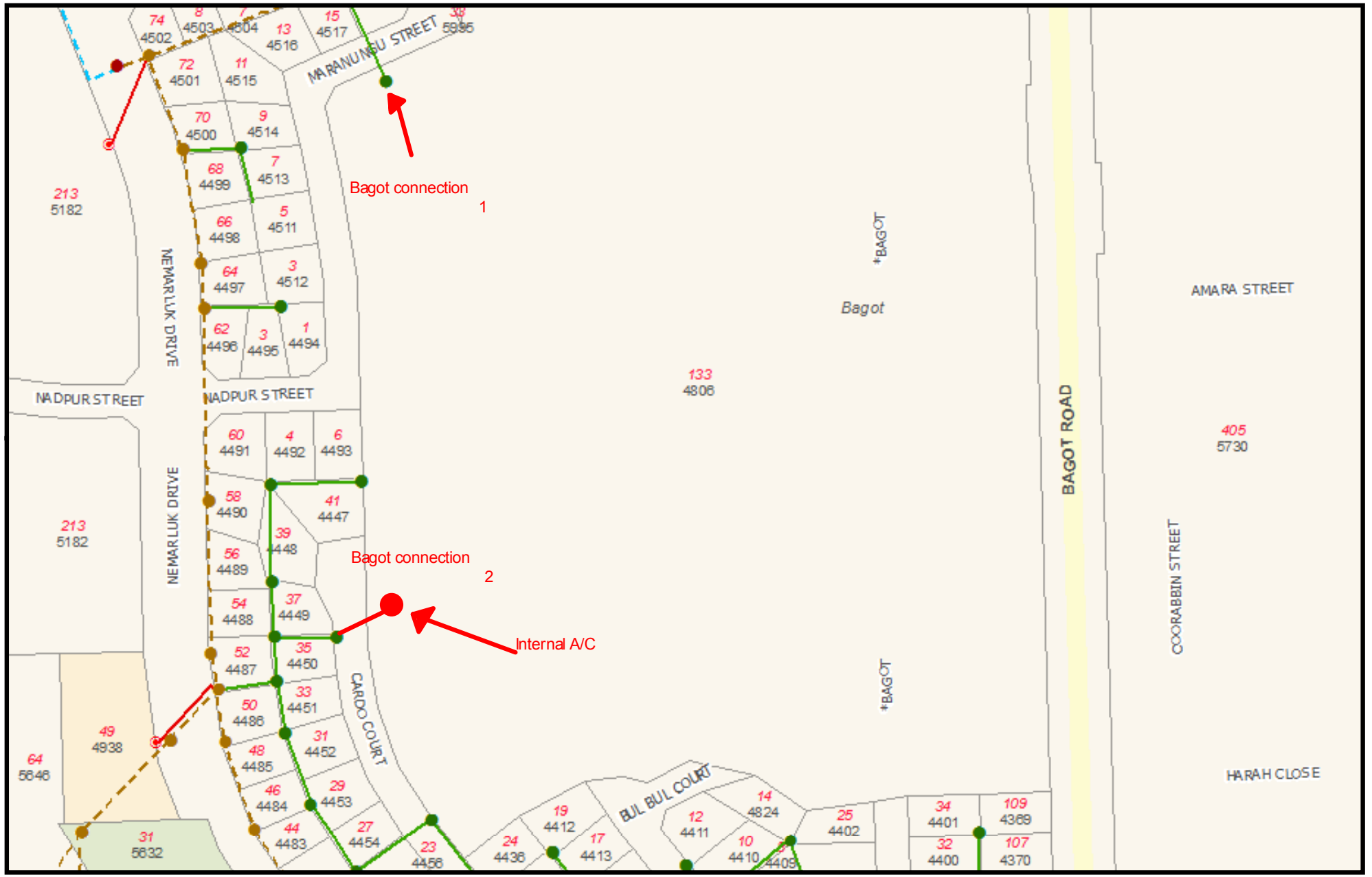

H Existing Residential Development (or as high-lighted by building sketch layout).
V Forecast Residential Lots for Development (up to 2014). Utility Reticulation Services Compliance has been costed for Existing and Forecast Development up to 2014 only.
F Future Residential Lots Forecast for Development beyond 2014. Utility Reticulation Services shown for future planning only
LEGEND:
NEW WATER LINE
NEW WATER RISING MAIN
EXISTING WATER LINE
EXISTING WATER RISING MAIN
NEW SEWER LINE
NEW SEWER RISING MAIN
EXISTING SEWER LINE
EXISTING SEWER RISING MAIN
NEW LOW VOLTAGE
NEW HIGH VOLTAGE
EXISTING LOW VOLTAGE
EXISTING HIGH VOLTAGE
DRIVE
DICK WARD
NEMARLUK
STREET
HARNEY
ATTAWOMBA
CT
MAWALAN
DANIELS
ST
ROAD
BAGOT
NADDUR
MARANUNGU
CARDO
COURT
BUL BUL
MOSEC
SUBURB OF LUDMILLA
4806
5182
5995
OVAL 61
FUTURE AGRICULTURE 62
OUTDOOR ENTERTAINMENT
FUTURE SPORTS CLUB
FUTURE CULTURAL CENTRE
BUFFER ZONE
COMMUNITY USES 59
FUTURE HOUSING
PENSIONER'S HOUSE
IRRIGATION PUMP
U/G STORMWATER
COUNCIL OFFICE & COMMUNITY CENTRE
CLINIC
COMMUNITY STORE
ABLUTION
PLAYGROUND
CRAFT CENTRE
WOMENS CENTRE
DUPLEX
PARK 20
TAXI RANK
TELEPHONE BOX
CARPENTERS WORKSHOP
MECHANICAL WORKSHOP
BUILDERS YARD
BUSSTOP
SHED
W/SHOP
ABLUTION BLOCK
B.C. L.B.C.
UPGRADE TO 150 dia
NEW DN100 dia
UPGRADE TO 150 dia
NEW 150 dia
Northern Territory Government
SCALE 1 : 1000
HORIZONTAL DATUM : GDA 94 (ZONE 52)
VERTICAL DATUM : AUSTRALIAN HEIGHT DATUM (metres)
REFERENCE DRAWINGS
AMENDMENTS
BAGOT COMMUNITY INC.
SLAP MAP
BAGOT
290
The Services Land Availability Program (SLAP) map system contains planning, engineering and topographical information. This map, called the SLAP map, contains information used for land use planning purposes.
CONNECTING NEIGHBOURS PROJECT - PROPOSED SERVICES LAYOUT
FIGURE F4 - BAGOT



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17/02/2017

6914

Transformer data

Group	Com Id	Location	Community Name	Dwellings No. (Funded Dwellings)	Dwellings No. (Bennett Design)	New Houses ** (Future Demand)	Primary Volatge Level (KV)	PWC Substation ID	PWC Test Number	Transformer size (KVA)	KVA Total dwellings @ 4.5KVA	KVA Total dwellings @ 7KVA	Comments
1	290	Darwin	Bagot	55	55		11	1924	1735	300	247.5	385	
	344	Darwin	Knuckey Lagoons	18	19	2	11	1771	2163	100	85.5	133	
	347	Darwin	Kulaluk	19	19		11	1092	10607	50	85.5	133	
	403	Darwin	Palmerston Town Camp	20	16		22	10196	10245	100	90	140	Two transformers for this Town Camp. Transformers are not in boundary of Town Camp [The nearest transformers data to Town Camp are highlighted in yellow].
							22	265	11645	25			
	412	Darwin	Railway Dam (One Mile Dam)	5	6	2	11	1041	4378	200	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	427	Adelaide River	Amangal	9	9		22	216	12187	100	40.5	63	Two transformers for this Town Camp.
							22	184	5646	63			
	687	Jabiru	Manabadurma	10	12		11	5050	11107	200	54	84	
	825	Darwin	Minmarama Park	24	24		11	2147	11372	100	108	168	
2	606	Katherine	Warlpiri Transient Camp	9	9		22	6416	4886	100	40.5	63	Two transformers for this Town Camp.
							22	6074	4695	25			
	621	Katherine	Miali Brumby (Kalano)	47	31		22	6133	12247	315	211.5	329	
	640	Pine Creek	Pine Creek Compound	4	4		22	6666	3147	25	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	971	Mataranka	Mulggan	12	9	4	22	6819	5296	16	54	84	
							22	6818	5297	16			
							22	6384	11028	25			
3	215	Tennant Creek	Blueberry Hill (Munji-Marla)	2	2		22	7079	1868	200	9	14	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	223	Tennant Creek	Dump Camp (Marla-Marla)	7	7		22	7181	11088	200	31.5	49	
	224	Elliott	Elliott South Camp	12	12		11	7504	4718	200	54	84	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	225	Elliott	Elliott North Camp	36	25		11	7505	4715	100	162	252	
	238	Tennant Creek	Kargaru (East Side Camp)	12	12	1	22	7572		200	54	84	
	246	Tennant Creek	Ngalpa Ngalpa	18	21		22	7179		200	94.5	147	Two transformers for this Town Camp.
							22	7033	10904	315			
	271	Tennant Creek	Village Camp	12	12	1	22	7183	11107	200	54	84	
	681	Tennant Creek	Tingkarli	12	12		22	7180		200	54	84	
	684	Tennant Creek	Wuppa	15	15	1	22	7141	11092	100	67.5	105	Two transformers for this Town Camp.
							22	7182	11095	200			
4	3	Alice Springs	Akngwertnarre (Morris Soak)	11	15		11	8596	11336	300	67.5	105	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	16	Alice Springs	Anthelk Ewlpaye (Charles Creek)	17	10		11	8569		315	76.5	119	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	17	Alice Springs	Anthepe	15	15		22	8598	5874	200	67.5	105	Data extracted from PWC asset information. There was not access to this Town Camp due to ceremony on inspection day.
							22	8597	11244	315			
	19	Alice Springs	Aper Alwerrknge (Palmers)	7	6		11	8405	2939	200	31.5	49	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	35	Alice Springs	Ewyenper Atwatye (Hidden Valley)	47	47		11	8622	11202	100	211.5	329	
							11	8623	11203	100			
							22	8625	11205	63			
							11	8626	11204	100			
	47	Alice Springs	Ilparpa	13	13		22	8611	11702	200	58.5	91	
	48	Alice Springs	Ilperle Tyathe (Walpiri)	10	9		11	8001	11209	315	45	70	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	50	Alice Springs	Ilyperenye (Old Timers)	10	10		22	8145	3323	100	45	70	
	64	Alice Springs	Bassos	2	2		11	8002	10946	50	9	14	
	69	Alice Springs	Karnte	19	19		22	8282	2345	100	85.5	133	
	87	Alice Springs	Yarrenty Altere (Larapinta Valley)	34	34		11	8617	11334	100	153	238	
							11	8618	11200	63			
							11	8619	11335	100			
							11	8620	11201	100			
	90	Alice Springs	Inarlenge (Little Sisters)	16	22		22	8137	2925	100	99	154	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	108	Alice Springs	Mpwetyerre (Abbotts)	6	6		11	8093	11703	315	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	113	Alice Springs	Mount Nancy (Nyewente)	11	12		11	8405	2939	200	54	84	
	129	Alice Springs	Nyewente (Trucking Yards)	26	26		11	8629	11312	300	117	182	
	675	Alice Springs	Hoppys	15	19						85.5	133	There is not any Transformer in boundary of Town Camp. Also it's not shown in PWC asset information.
	676	Alice Springs	Ilpiye Ilpiye (Golders Camp)	15	14		11	8314	369	50	67.5	105	
	1029	Alice Springs	Kunoth	4	4		11	8569		315	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
5	222	Borroloola	Mara	28	29	2	11	6187	12610	100	130.5	203	Two transformers for this Town Camp.
							11	6545	10203				
	229	Borroloola	Garawa 1	16	14		11	6546	10166	100	72	112	Two transformers for this Town Camp.
							11	6332	4890	100			
	278	Borroloola	Yanyula	29	29		11	6162	10496	200	130.5	203	Data extracted from PWC asset information. It's outside of Twon Camp, shown only Transformer to this Town Camp.
							11		10167				This transformer is not shown in PWC asset information. It's installed in Boat Ramp Road near to Town Camp and connected to Electrical reticulation of Town Camp.
	992	Borroloola	Garawa 2	11	11		11	6189	2669	25	49.5	77	

** For New house's demand calculation see section 13.4 "Future Demand".

Kulaluk

Kulaluk

1 Design

The infrastructure reviews have been undertaken against current relevant standards for typical sub-divisions. The following standards have been used in undertaking the reviews.

Sewerage and water supply

- Water Services Association of Australia – Sewerage Code – WSA 02 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 02
- Water Services Association of Australia – Sewerage Pumping Station Code – WSA 04 -2005 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 04
- Water Services Association of Australia – Water Supply Code – WSA 03 2002 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 03
- Power and Water Corporation Indigenous Community Engineering Guidelines (2008)
- Department of Housing and Community Development Indigenous Community Engineering Guidelines (ICEG 2014, updated September 2016)
- Power and Water Corporation Essential Services Infrastructure Assessment and Upgrade Guidelines (for Town Camps in Urban Communities, 2009)
- Power and Water Corporation Standard Drawings
- Australian Standards

Electrical services

Electrical infrastructure has been assessed against AS/NZS3000 Wiring Rules and against PWC Service, Installation and Metering Rules and Urban Residential Development (URD) Design Standards where possible.

With one exception, town camps are each a single lot and compliance with AS/NZS3000 is sufficient to address potential safety concerns.

As such application of PWC URD Design Standards will mainly apply to the incoming supply and bulk or initial multi-metering panels if provided.

URD Design Standards for internal reticulation and street lighting appear to have been applied in many cases for convenience rather than compliance.

For the purposes of this report, the demand per dwelling allowances of URD Design Standards have been used to estimate incoming supply and overall distribution capacity requirements.

The following standards apply:

- Australian Standards
- Power Networks Design and Construction Guidelines, Power and Water Corporation
  - NP001.1_Design and Construction of Network Assets – General Requirements
  - NP001.3_General Specification for Overhead Electrical Reticulation
  - NP001.6_General Specification for URD Subdivisions
  - NP003_Installation Rules_V3
  - NP007_Service Rules
  - NP027_Capture of Newly Installed Street Lighting Information

- NP041_Guidelines for Electrical Design Consultants

Further referral to the guidelines in this report will be designated by the guidelines number, NP001.1.

Communications

- National Broadband Network Website viewed 21 January 2017 (http://www.nbnco.com.au/) – NBN rollout maps

Council Guidelines

In addition to the above standards, the following Council guidelines will be used where applicable.

- Darwin City Council – Subdivision and Development Guidelines, September 2005

General

It should be noted that if the town camps are proposed to be subdivided and services assets gifted to Power and Water Corporation (PWC) for operation and maintenance, all of these services will need to fully meet PWC standards. With the exception of a few town camps that have recently been upgraded, this will require the full replacement and/or realignment of most services.

2 Condition assessment

2.1 Rating assessment matrix

A condition rating matrix was developed and used to assess all municipal infrastructure. The same rating was used for all services to maintain consistency in assessments. Table 1 below shows the condition rating and operability.

Table 1 Condition rating

Condition rating		Operability
1	Very Poor	Not operational
2	Poor	Not fully operational or requires immediate maintenance to keep operational
3	Good	Fully operational, may require routine maintenance
4	Very Good	Fully operational, may require maintenance in the next six months
5	Excellent	New, fully operational

2.2 Civil assessment limitations

The civil infrastructure condition investigations were subject to a number of limitations. These include:

- Only accessible services have been investigated. This includes inspecting the top of sewer manholes, side entry pits, etc., however, does not include opening pits to inspect infrastructure below ground.
- No physical testing of the sewer, water or stormwater network was undertaken.
- No survey or service locating was undertaken.

As there was no survey, potholing or CCTV undertaken on the underground infrastructure there is insufficient information to make determinations on the asset condition. The condition assessments discussed in this report are only for the accessible services and do not necessarily represent the condition of the underground infrastructure. For the majority of the town camps, other than a few that have recently been upgraded it was found that the underground services are generally undersized and it is likely, due to their age, that the these services are in poor condition. Either factor would trigger the need for a complete replacement to meet current relevant standards.

2.3 Electrical assessment limitations

The electrical infrastructure condition investigations were subject to a number of limitations. These include:

- Inspections were carried out without the assistance of an electrical tradesman.
- Only accessible services were investigated. Assessments were of a visual nature and no pit covers were removed.
- Overhead equipment was assessed from ground level.
- Switchboards were not opened and no assessment of the internal connections or bus ratings was made.

- Electrical infrastructure was assessed down to the meter for multi-meter panels and down to the termination, overhead pole or distribution pillar, of the supply cable to a meter located at a dwelling.

3 Current infrastructure issues

Power and Water Corporation (PWC) have advised of the following concerns and issues in regard to the sewerage, water and electrical infrastructure at all town camps.

3.1 Ownership and maintenance

PWC stated there has always been confusion regarding the ownership and responsibilities of the internal sewer, water and electrical infrastructure. PWC have advised that they have no legal tenure on the majority of assets in any town camps and that the owner is essentially that of the land owner or leaseholder. This is further discussed for each type of infrastructure for each town camp.

The ownership and who is responsible for the maintenance of the sewage pump stations and street lighting is a major concern. In most town camps it was found that PWC have been maintaining the assets on an in-kind basis, although there are no maintenance or access agreements in place and the infrastructure is generally not compliant to PWC standards.

3.2 Access to infrastructure

PWC advised that due to the uncertainty surrounding ownership and responsibility of the sewerage, water and electrical infrastructure, each town camp is seen as a single lot with multiple houses on it. There are no formal road reserves or easements where the municipal infrastructure should be located. PWC therefore have no legal right to enter the town camps to work on the infrastructure, nor can PWC stop others from working on the infrastructure. There is a risk that the maintenance undertaken by others may be to a lower standard than PWC.

It should be noted that there are currently no legal services easements within the town camps, except for a few cases where a town service passes through the town camp. Therefore it is recommended that easements are created over any infrastructure owned by PWC and any future assets to be gifted to PWC, to allow the service providers access to the infrastructure.

3.3 Existing infrastructure

PWC have stated that although the existing sewerage and water infrastructure appears to comply with relevant standards in some locations, the capacity cannot be assumed to meet PWC requirements due to the potential for underground substandard condition and/or grading of pipework. It is likely that these assets will need to be fully replaced to PWC standards to ensure sufficient capacity.

The planning process currently allows construction within the town camps on Commonwealth land without requiring service authority (PWC) approvals. This means that there has been no opportunity for PWC to recover contributions towards required upgrades to headworks servicing the developments and these upgrades have been paid for by PWC in the past. This inconsistency needs to be addressed for future developments within the town camps to ensure PWC are able to continue to provide adequate services.

3.4 Safety concerns

PWC have expressed concerns with safety of PWC staff and contractors working within the camps. PWC have employed procedures such as multiple people / vehicles to attend the site, with police or housing safety officers as required. This

generally leads to a delayed response time and increased cost to respond to and remediate emergency situations.

PWC have also raised the concern that if others work on water infrastructure within the town camps and do not apply the correct sanitation procedures they not only risk contaminating the entire water supply network within the town camp, at some town camps with direct connections to the town supply, they risk contaminating the entire town's water supply.

4 Available information

As the site investigations were limited to accessible / visible services, information on below ground services (such as electrical cables, sewer pipes, water supply pipes, etc.) were determined from available information. This information included:

- Serviced Land Availability Program (SLAP) maps,
- Department of Family & Community Services - Connecting Neighbours Program – Essential Services Scoping Study Report Volume 1 April 2005,
- Connecting Neighbours Project – Infrastructure Assessment and Recommendation Report - Arup Pty Ltd, April 2005,
- Drawings supplied by NT Department of Infrastructure - Technical Records,
- Drawings supplied by Power and Water Corporation,
- Bennett Design inspection reports and population data.

Aurecon undertook a site investigation of the Kulaluk community to inspect roads, stormwater drainage, electrical services, sewerage and water supply, and community structures. The following sections detail the outcomes of this investigation and the assessments of the infrastructure.

The civil and electrical inspection reports can be found in the Appendices.

5 Sewerage

5.1 Ownership and boundaries

The DN100 PVC internal sewer network within Kulaluk is believed to be owned by Gwalwa Daraniki Association Incorporated, but the responsibility of Yilli Rreung Housing Aboriginal Corporation to maintain. The DN150 PVC connection and DN450 RC/PVC trunk main are owned and maintained by Power and Water Corporation.

Kulaluk community is serviced by a DN150 PVC pipe that comes off a DN450 RC/PVC trunk sewer main that runs to the west of the community in an easement. Drawings of the internal sewer network were not available, but it appears that the community has a reticulated sewer that services all lots within Kulaluk. Previous reports have detailed that the reticulated sewer is a DN100 PVC pipe, which would have been constructed in accordance with AS3500, however DN100 pipes are not permitted by PWC standards.

5.1.1 Connection methods and billing

PWC advised that they currently charge a single sewerage bill based on a total number of houses or sanitary fixtures, which for Kulaluk is 20. The sewerage bill is charged to Gwalwa Daraniki Association Inc.

It is not known what contribution the residents make towards the sewerage bills.

5.2 Existing infrastructure condition assessment

The sewer infrastructure inspection was limited to inspecting the condition of manholes covers, as all other sewerage infrastructure is below ground. A total of three manholes were inspected, with condition ratings as follows:

Table 2 Sewer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Manholes				3		3

Figure 1 Sewer manhole, condition: *very good*

The manholes were rated as very good and do not require any maintenance works at this stage.

As there are no drawings available depicting the internal sewer network, it is not known whether the sewer lines are within road reserves, or if they require realigning. For the purpose of cost estimates, it is assumed that realigning the sewer main is not required.

The current sewer pipe size is undersized, according to PWC standards, as they recommended a minimum pipe size of DN150 PVC. The cost estimates for upgrade works required include upgrading the sewer network to DN150 PVC pipework.

5.3 Current performance and risks

The current capacity of the sewer network was calculated based on the following design assumptions:

- The adopted minimum grade for the pipework is 1.0%, as advised by Power and Water Corporation.
- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.
- The capacity has been assessed by calculating the current flow rate, and the maximum flow rate when the sewer pipe flows full. The result is then a percentage of how much of the pipe is currently being used.
- Manning's roughness coefficient of the pipework is 0.012, as recommended by PWC for PVC pipes.
- Where the sewer pipe grade, size or material is not known, it is assumed to be non-compliant to PWC standards.

The current number of houses in Kulaluk is 19, this multiplied by 9 EP per house gives a total current EP of 171. The capacity of the existing sewer was then calculated. The percentage shows how much of the pipe capacity is currently being used by Kulaluk community.

Table 3 Existing sewer capacity

Catchment	Current total EP	Diameter of connection (mm)	Adopted PWC minimum slope (%)	Q_{full} (L/s)	Current Q (L/s)	Current capacity (%)
Catchment 1	171	150	1.0	16.50	2.05	12%

Table 3 above shows that the capacity of the existing sewer network is adequate for the current peak population. As the DN150 PVC pipe discharges directly into the trunk main, the downstream or surrounding catchments do not need to be included in this analysis.

5.4 Future demands

As no new developments are currently planned for the Kulaluk community, there are no additional upgrades required to cater for future demand.

5.5 Recommended works

To upgrade the current network to meet PWC standards, the current pipe size needs to be confirmed and upgraded to DN150 PVC if found to be a DN100 pipe. Cost estimates for a new DN150 PVC pipe have been included.

6 Water supply

6.1 Ownership and boundaries

The existing water main servicing the community is believed to be a DN50 main with a single supply point.

The water supply assets within Kulaluk are believed to be owned by Gwalwa Daraniki Association Incorporated, but are the responsibility of Yilli Rreung Housing Aboriginal Corporation to maintain. The water meter and upstream water network is owned and maintained by PWC.

Figure 2 below shows the water services surrounding Kulaluk.

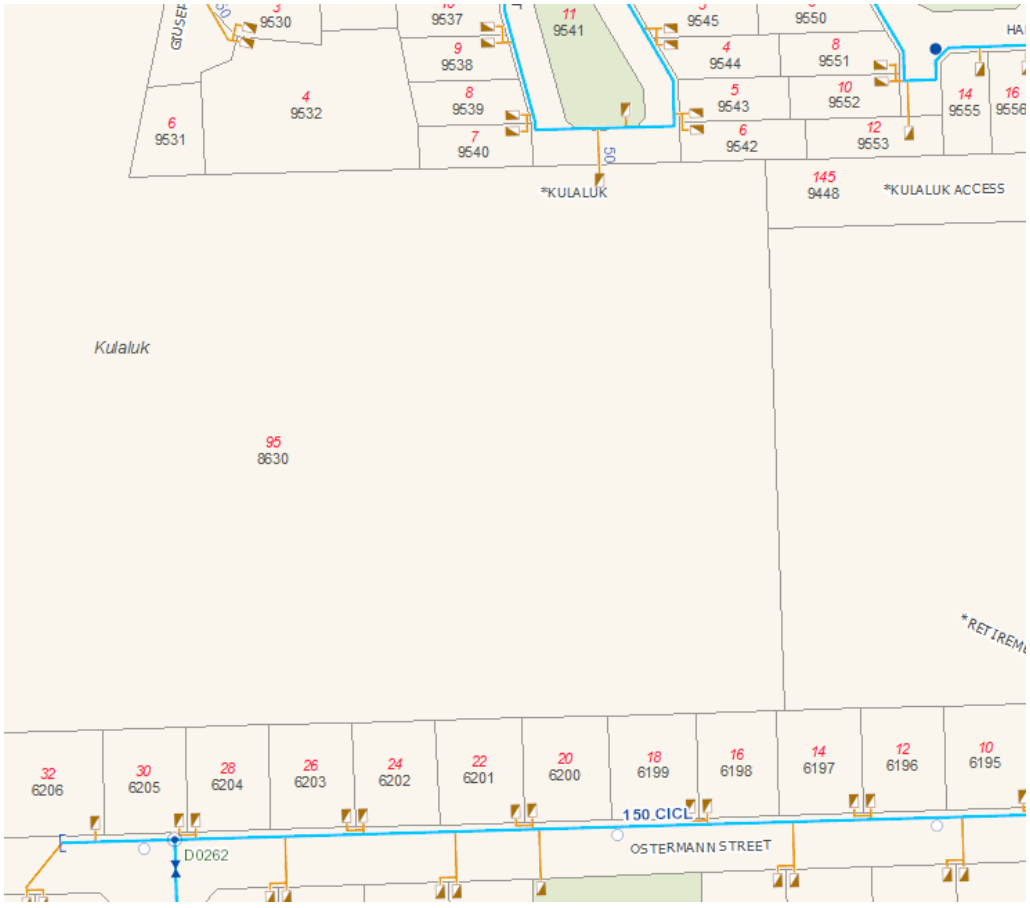


Figure 2 Water services surrounding Kulaluk

6.1.1 Connection methods and billing

PWC advised that they currently charge a single water bill to the Gwalwa Daraniki Association Inc. It is not known what contribution the residents make towards the water bills. It is understood that the water usage is measured at the bulk water meter located on the community boundary.

Current PWC guidelines recommended that shared meters are removed and individual water meters are installed for each lot. Under these guidelines, up to 19 new residential lot water meters are required to ensure each lot has its own meter.

It is proposed that PWC continues to measure the water supply to the entire community, as opposed to individual lots within the community. Under this scheme, the water bill for the entire community is the responsibility of the governing body,

being Gwalwa Daraniki Association Incorporated for Kulaluk. It will be up to governing body to assign bills to residents accordingly.

It is also recommended that the installation of individual lot meters is included. This will assist with the governing body distributing bills to residents, the identification of any leaks in the network, and meeting PWC standards should the community wish to become a formal subdivision in the future.

6.2 Existing infrastructure condition assessment

The site investigation for the water infrastructure included assessing the condition of any air valves, fire hydrants, tanks, taps, and water meters within the town camp.

Table 4 below summaries the water supply condition ratings.

Table 4 Water supply condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Water meter (bulk)			1			1

Figure 3 Water meter (bulk), condition: *good*

The only water supply asset located within Kulaluk is a bulk water meter and no immediate maintenance is required.

6.3 Current performance and risks

The current capacity of the water supply was calculated based on the following design assumptions:

- The nominal peak day flow is 1100 L/capita/day, based on PWC's supplement to WSA 03 2002. This value is for the northern region of NT. It was assumed that the nominal peak day flow of 1100 L/capita/day also applies to water usage within the community, although it is possible that this value could be higher in real life due to a lack of controls to reduce water usage.
- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.

- The peak hour factors are listed in PWC's supplement to WSA 03-2002, and they depend on the population range of the community. The peak hour factor of 3.0 has been adopted, for populations less than 500.
- The water meter has PWC's minimum pressure guaranteed value of 15 m.
- The maximum flow velocity used for calculating the incoming flow capacity is 1.4 m/s. PWC supplement to WSA 03-2002 states that flow velocities should generally not exceed 1.4 m/s during peak hour demand.

Table 5 shows the calculated peak hour water demand.

Table 5 Current water demand

Total dwellings	EP	Demand (l/s)	Peak hour demand (l/s)	Pipe size	Total length (m)
19	171	2.18	6.53	DN50	300

Table 6 Current peak hour water demand analysis

Demand	Velocity (m/s)	Headloss (m)	Pressure (m)
Peak hour demand	3.33	73.30	-58.3

The layout and pipe sizes are not compliant with PWC standards, although no engineering drawings were available to confirm the layout and size. It is recommended that a DN150 PVC looped main replaced the existing reticulation.

The existing network exceeds the maximum velocity and does not have the capacity to supply adequate pressure for peak hour demand. This supports the recommendation for a new DN150 PVC looped water main.

No firefighting services were found in the community, and the existing network does not have capacity for fire flow demands. New fire hydrants are required and should be connected to the proposed DN150 water main.

6.4 Future demands

As no new developments are currently planned for the Kulaluk community, there are no additional upgrades required to cater for future demand.

6.5 Recommended works

It is proposed that the network is upgraded to a DN150 PVC looped water main. The community is viewed overall as a large single lot and as previously detailed proposed have the water usage measured accordingly. In order to measure the water usages as a single lot, a bulk water meter should be installed. Cost estimated for the upgrade at Kulaluk include;

- DN150 PVC pipe for water main, approximately 1100 m.
- New DN150 bulk meter at community boundary.
- Installation of 19 residential lot meters.
- Install new fire hydrants, approximately three.

7 Roadworks

7.1 Ownership and boundaries

It is the current understanding that the road assets within Kulaluk are owned by Gwalwa Daraniki Association Incorporated, but are the responsibility of Yilli Rreung Housing Aboriginal Corporation to maintain.

7.2 Existing infrastructure condition assessment

The road network within Kulaluk community consists of sealed and unsealed roads. There are also numerous tracks which appear to be used frequently which are not included in the inspection and report. Table 7 and Table 8 below summarise the condition of the road furniture and the roads as assessed during the site inspection.

Table 7 Roadworks condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Sign		1	1	1	1	4
Carpark			1			1

The four signs in Kulaluk all vary in condition from poor to excellent, it is recommended that remedial works are done to the sign in poor condition.

The carpark within Kulaluk is in good condition and only requires some general maintenance to clean some of the dirt and vegetation away.

Figure 4 Carpark, condition: *good*

Figure 5 Sign, condition: *poor*

Figure 6 Pavement, condition: good

There was no road furniture, such as footpaths or speed humps at Kulaluk. As there are no kerbs along the road, there are no formal driveways or layover kerbs.

Table 8 below and Figure 7 show the condition of the roads within Kulaluk community for specific segments. The roads in poor condition are recommended to have maintenance work undertaken.

Figure 7 Road condition assessment

The following table shows the road condition and particular defects that were observed during the site inspection. Note that the defects given as a percentage refer to percentage of road for that particular segment.

Table 8 Road network condition assessment

Road Name	Chainage Start (km)	Chainage end (km)	Road segment condition (1-5)	Defects and associated condition (1-5)
Kulaluk Access	0	0.4	3	- 90% of road has edge (3) breaks - 5% of the road has longitudinal cracks (4) - 3 significant potholes (3)
347_1	0	0.15	2	-80% of the road has broken edges (2) -5% of the road has potholes (2) -70% of the road has stone loss and therefore looks unsealed (2)
	0.15	0.3	2	-10% of the road has ponding in road sumps (2)
347_2	0	0.05	2	-80% of the roads surface is failing (2)
347_3	0	0.06	2	-90% of the roads surface is failing (2) -90% of the road has a generally very poor appearance to the point that it appears unsealed (2)
347_4	0	0.03	3	-The entirety of the road is slightly deformed (3)

7.3 Current performance and risks

The main road into Kulaluk was rated as having good condition, although there were significant edge breaks and some potholes. The road network within Kulaluk is in poor condition and requires significant maintenance and/or upgrades. As the roads have undulation and pavement failure, it is likely that there are more significant issues to do with the subgrade or drainage that will require remediation before the road can be resealed.

The layout of the road network is sufficient for the current number of houses, although the condition of the road is poor.

It was noted during the site inspections that a number of unsealed 'short-cuts' had been created and were regularly used. It is not recommended that these paths are formalised.

7.4 Future demands

As no new developments are currently planned for the Kulaluk community, there are no additional upgrades required to cater for future demand.

7.5 Recommended works

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following works are recommended to upgrade the current infrastructure;

- Replace one 40 km/hr sign and post
- Clean one sign
- Repair edge break and shoulder
- Reseal three roads - approximately 1920 m2
- Fill and reseal – three potholes
- Repair cracks

- General tidy up of roads – approximately 560

In order to allow for a longer term sustainable road network a significant upgrade would be required. It is recommended that a long term design which incorporates a full two lane road network, with all appropriate road furniture, line-marking, kerbs and gutters is constructed. A cost estimate to reinstate the base and subbase material, reseal with a two coat spray seal surface, construct subsoil drainage, line marking and signage has been included. Note that these works will need to be fully designed, the cost estimate is for budgetary purposes only and only indicates the construction phase. A footpath next to the road is also recommended to provide a safe trail for pedestrians.

As the maximum road width within the Kulaluk community is 4.5 m, this means that all 840 m of the road network will need to be upgraded to a 7.2 m wide road. The stormwater drainage infrastructure upgrades that are closely associated with the road upgrade i.e. kerb and gutters, side entry pits and underground drainage pipes are included in the stormwater section of this report.

8 Stormwater drainage

8.1 Ownership and boundaries

The stormwater drainage assets within Kulaluk are believed to be owned by Gwalwa Daraniki Association Incorporated, but are the responsibility of Yilli Rreung Housing Aboriginal Corporation to maintain. Beyond the boundaries of the community the stormwater assets are the responsibility of the City of Darwin.

The majority of the drainage infrastructure assessed at Kulaluk was along the Kulaluk access road where a large open drain runs adjacent the road. This drain is expected to be upgraded in the near future by the (former) Department of Lands, Planning and the Environment, so no works are proposed to remediate this drain.

8.2 Existing infrastructure condition assessment

The site investigation for the stormwater infrastructure included assessing the condition of swales, culverts and side entry pits (SEP). Only the above ground infrastructure was assessed. Consequently, the underground stormwater pipes were not investigated. As the inspection was undertaken outside of a storm event, flooding due to blockages or damages to the underground infrastructure could not be assessed. Table 9 below summarises the condition of the stormwater assets as assessed during the inspection.

Table 9 Stormwater drainage condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Culverts		3	2			5
Letter box pit			1			1
Swale		1	2			3

Figure 8 Culvert, condition: *poor*

Figure 9 Letterbox pit, condition: g*ood*

Figure 10 Swale, condition: *poor*

8.3 Current performance and risks

The current performance of the stormwater network cannot be fully analysed without significant hydraulic and hydrodynamic modelling, which is outside the scope of this project. It is understood that hydraulic modelling is currently being undertaken for upgrades to the drain adjacent Kulaluk access road.

The City of Darwin's general design philosophy for stormwater drainage is that the design is to be based on a system of sealed roads, kerb and gutter, side entry pits and underground drainage. This infrastructure currently does not exist, or is in poor condition, at Kulaluk and there would be major headworks required if stormwater drainage is to be incorporated. It is recommended that a stormwater drainage network is constructed at Kulaluk to reduce the impact of flooding within the community.

8.4 Future demands

As no new developments are currently planned for the Bagot community, there are no additional upgrades required to cater for future demand.

8.5 Recommended works

The following works are recommended to upgrade or improve the current infrastructure:

- Remove debris from swale
- Remove debris from culverts and headwalls
- Install guard rails above the culverts for road safety
- Install stormwater drainage network, including kerbs and gutters, side entry pits, underground pipework and other works as required.

9 Community structures

9.1 Ownership and boundaries

It is the current understanding that the community structure assets within Kulaluk are owned by Gwalwa Daraniki Association Incorporated, but are the responsibility of Yilli Rreung Housing Aboriginal Corporation to maintain.

9.2 Existing infrastructure condition assessment

The site investigation for the community structures included assessing the condition and features of a playground and basketball court. Table 10 shows the condition rating given to the community structures.

Table 10 Community structures condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Playground			1			1
Basketball court			1			1

Figure 11 Basketball court, condition: *Good*

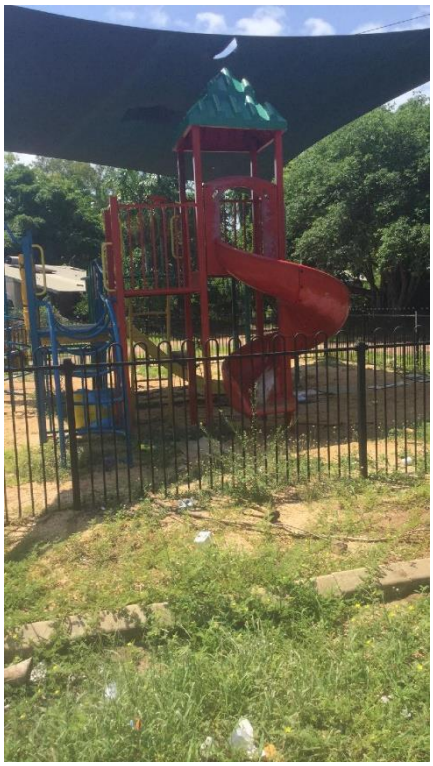


Figure 12 Playground, condition: *Good*

9.3 Current performance and risks

The playground was rated to have poor appearance, due to the paint peeling, debris, weeds, and tears in the shade cloth, however the condition of the playground was rated as good since the structure had minimal defects.

The basketball court was rated in good appearance. A general tidy up is required to remove debris, overgrown flora, etc. from around the playground and basketball court.

9.4 Future demands

As no new developments are currently planned for the Kulaluk community, there are no additional upgrades required to cater for future demand.

9.5 Recommended works

The following works are recommended to upgrade the current infrastructure;

- Repaint areas of faded paint and graffiti on playground
- Repair tears in shade structure
- General tidy up of both playground and basketball court
- Landscape maintenance

10 Electrical services

10.1 Ownership and boundaries

The following points, from Network Policy NP003 Installation Rules Section3, define the typical shared ownership of electrical infrastructure by Power and Water Corporation (PWC) and customers.

- The point of supply is defined as the point where PWC makes the electrical supply available. For domestic supply, this is normally one of the following:
- A point of attachment of an overhead service on to a building or pole on which a metering panel is fitted.
- A point of attachment of an overhead service on to a pole forming part of unmetered aerial consumer's mains.
- A nominated point on a distribution substation located on the customer's lot.
- A point of connection of an underground service in a metering panel, including underground services originating at an overhead line.
- A point of connection of an underground service in a pillar or junction box forming part of unmetered consumer's mains, located on the customer's lot.
- A point on a Power and Water pillar located on the customer's lot.

Typically, distribution infrastructure upstream of the point of supply is owned and maintained by PWC and infrastructure below the point of supply is owned and maintained by the customer.

In many cases PWC have defined a Point Of Supply to ensure that they retain responsibility for aerial high voltage infrastructure to minimise the possibility of the community or it's contractors coming into contact, either deliberately or inadvertently, with aerial high voltage infrastructure.

In other cases isolation facilities are present or desired by PWC to define the Point of Supply at or near the boundary of the town camp.

The Kulaluk community electrical reticulation systems is supplied from the PWC network by a pole transformer and unmetered consumer's mains run to a main switchboard. The main board distributes the individual houses through underground reticulation to prepaid meters on dwellings.

Some dwellings have multiple prepaid meters, presumably because they supply other dwellings or are multiple dwellings.

PWC advise that the Point Of Supply is the LV terminals of the transformer and that they own and are responsible for the pole mount transformer and upstream infrastructure.

PWC advise that street lighting is supplied from unmetered LV infrastructure and is the responsibility of the lot holder and not PWC.

All meters, whether pre- or post-paid are the property of PWC.

Kulaluk community are responsible for maintaining all unmetered and metered LV infrastructure including the main switchboard, metering panel (excluding meter), underground distribution feeders, distribution pillars, consumers mains and consumer switchboards and street lighting.

10.2 Existing infrastructure condition assessment

Table 11 shows the condition rating given to the distribution switchboards and distribution pillars. The distribution pillars have 100% operational rating and 100%

of the pillars had minor maintenance issues to address, including bolt replacement and labelling. Refer to Appendices.

Table 11 Distribution panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Distribution panels			1			1

Table 12 shows the condition rating given to the street lights. The majority of street lights are supplied via overhead LV reticulation and are generally eight (8) metres high with mercury vapour lamp M80D and with lamp covers protected by cages.

Some general street lights are solar powered with batteries.

The street lights have 67% operational rating, from daytime visual inspection.

The very poor lights were the solar powered lights which were totally inoperable.

Table 12 Street light condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Street light	3		5	1		9

Table 13 shows the condition rating given to the Street Light on O/H Pole. The street lights on overhead poles were of overhead feed and unknown lamp wattage and design.

Table 13 Street light on O/H pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Street light on O/H pole		1				1

Table 14 shows the condition rating given to the transformer. The transformer was of pole mount substation design and supplied to a switchboard. The transformer was visually accessed to be in good condition.

Table 14 Transformer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Transformer			1			1

Table 15 shows the condition rating given to power poles. The overhead poles are of Weld Construction (Universal Pole construction) and steel overhead LV distribution. The overhead poles have 100% operational rating from the visual inspection.

Table 15 Overhead pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Overhead pole			7			7

Table 16 shows the condition rating given to the Metering panels. All assessed meters in this community are prepaid digital meters.

Table 16 Meter panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Pre-paid Meter			14			14
Switchboard		2	7			9

Table 17 shows the condition rating given to the switchboards associated to dwellings.

Table 17 Switchboard condition assessment (housing footprint)

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Switchboard			3			3
Pump station			1			1

The details of the individual inspections and photographs of each infrastructure item are included in Appendices.

10.3 Current performance and risks

The electrical infrastructure evaluation was conducted against the following criteria

- Number of dwellings on tenure, the higher value of the funded dwelling and as quoted in the population report was utilised.
- Urban area, NP001.1, 4. Definitions.
- General Specification for URD Subdivisions, NP001.6, 4.3 Substation Size.
- Normal ADMD (After Diversity Maximum Demand) of 4.5 kVA and high cost subdivisions at 7 kVA.
- Transformer ratings were assumed to be correct in Dekho (PWC asset information system) and compared against photographs of test or transformer numbers collected.
- Substation loads were compared against transformer sizes only. No load flow analysis was conducted.
- No load calculations were performed or assessment conducted on overhead or underground cable, visual inspection from the ground only.
- Streetlighting loads were ignored as they are not significant.

The calculated maximum demand of the Kulaluk community transformer is 171% of rated capacity based on 4.5kVA/dwelling.

PWC advise that no damage has occurred to this infrastructure.

Table 18 Kulaluk Current Demand Load vs Transformer ratings

Com Id	Community name	Dwellings	Transformer (kVA)	kVA total @ 4.5kVA	kVA total @ 7kVA
347	Kulaluk	19	50	85.5	133

A tabulated summary of all community transformers is included in Appendices.

There is a risk of equipment not being maintained associated with the non-standard division of responsibilities between the customer and PWC.

The following points from the PWC Metering Rules should be noted:

- The routine maintenance of metering installations and the replacement of any faulty meters is the responsibility of PWC.
- The property owners are responsible for the maintenance and upkeep of meter rooms, boxes and panels (including lids, doors and locking mechanisms).
- The installation of pre-paid metering is a cost to the customer, refer NP010 Meter Manual-Maintenance of Metering Installations, Power and Water Corporation.

10.4 Future demands

As no new developments are currently planned for the Kulaluk community, there are no additional upgrades required to cater for future demand.

10.5 Recommended works

The Kulaluk community transformer is owned by PWC who are aware of the loading of this transformer and have assessed the load does not require that this transformer be upgraded or replaced.

The following maintenance works and upgrades are recommended:

- Replace four 80W street lights
- Replace two switchboards inside the metering panel
- Install new street lighting - approximately 42 poles

11 Communications

11.1 Ownership and boundaries

Details of Telstra pit and conduit infrastructure within the town camp boundaries were sought but were not forthcoming.

11.2 Existing infrastructure condition assessment

The telecommunications infrastructure assessed included pits and telephone booths.

The Appendices contain the individual reports.

Table 19 Telecommunication pit condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Telecommunication pit			1			1

11.3 Current performance and risks

No details of the performance of communications infrastructure were obtained.

11.4 Future demands

The current availability of broadband services at Kulaluk is displayed in the Figure 14 below. NBN is available to residents via a fixed telecommunication line on application to an appropriate NBN access provider.

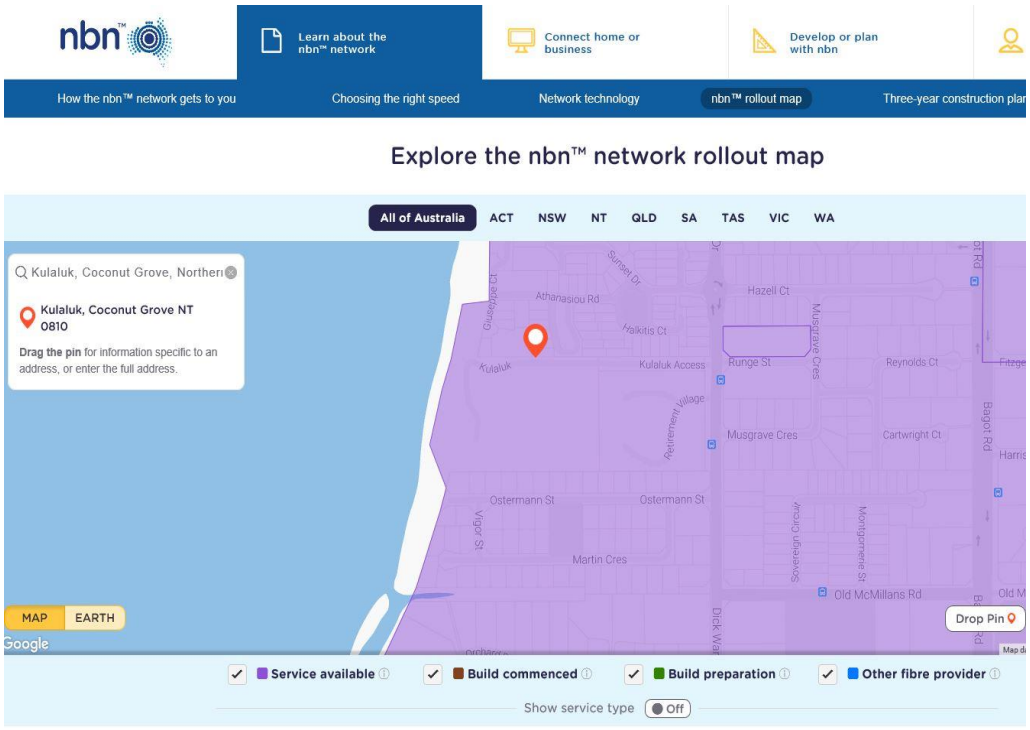


Figure 13 NBN network availability map

Purple indicates the area that NBN is currently available via fixed telecommunications line on application.

11.5 Recommended works

Representatives from NBN's Land Access and Stake Holder management teams are currently engaged with Yilli Housing and NT Housing to look at how camps will be serviced. It is expected that any existing premises in these camps will have some type of NBN service via the NBN brownfields rollout in the future.

No works are required at Kulaluk because NBN is available to residents via fixed telecommunications line on application to an appropriate NBN access provider.

12 Cost estimates

Table 20 below shows a summary of the cost estimates to undertake the maintenance required to fix the existing infrastructure, and to upgrade the existing network to meet current design standards. No upgrades are required for future demand. The estimates take into account a 30% contingency, and are inclusive of GST.

Table 20 Cost estimates

Infrastructure	Maintenance of existing infrastructure	Upgrades to meet current design
Sewerage	$ 0	$ 277,000
Water supply	$ 0	$ 825,000
Roadworks	$ 353,000	$ 1,019,000
Stormwater drainage	$ 16,000	$ 388,000
Community structures	$ 13,000	$ 0
Electrical	$ 37,000	$ 129,000
Communications	$ 0	$ 0
Miscellaneous provisions	$ 60,000	$ 326,000
Total (including GST)	**$ 479,000**	**$ 2,964,000**
Grand total	**$ 3,443,000**	

The cost estimates are a preliminary estimate only. Since Aurecon has no control over the cost of labour, materials, equipment or services furnished by others, or over contractors' methods of determining prices, or over competitive bidding or market conditions, Aurecon cannot guarantee actual costs will not vary from these estimates.

13 Summary

A summary of the works required at Kulaluk community is as follows;

Sewerage

- Replace sewer network with DN150 PVC reticulation main, including house connections, manholes and connection to existing town sewer

Water supply

- DN150 PVC pipe for water main, approximately 1100 m
- New DN150 bulk meter at community boundary
- Installation of 19 residential lot meters
- Install new fire hydrants, approximately three

Roadworks

- Replace one 40 km/hr sign and post
- Clean one sign
- Repair edge break and shoulder
- Reseal three roads - approximately 1920 m2
- Fill and reseal – 3 potholes
- Repair cracks
- General tidy up of roads – approximately 560 m
- It is recommended that the road is upgraded to a two lane network with all appropriate road furniture, line marking, kerbs, footpaths, etc.

Stormwater drainage

- Remove debris from swale
- Remove debris from culverts and headwalls
- Install guard rails above the culverts for road safety
- It is recommended that underground stormwater drainage, including kerbs and gutters, and side entry pits are constructed to reduce flooding and ponding issues within the community.

Community structures

- Repaint areas of faded paint and graffiti on playground
- Repair tears in shade structure
- Remove rubbish and weeds around playground and basketball court
- Landscape maintenance

Electrical services

- Replace four 80W street lights
- Replace two switchboards inside the metering panel
- Install new street lighting - approximately 42 poles
- Since the load on the transformer exceeds 85% it is recommended that power monitoring be undertaken to allow PWC to determine, by assessment, whether the transformer needs to be upgraded or not.

Communications

- No works are required because NBN is available to residents via fixed telecommunications line on application to an appropriate NBN access provider.

Civil inspection reports

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 08:41 Imagery: Nearmap 11/06/2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 1

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Sewerage

347 - Kulaluk (Darwin)

6948

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 08:41 Imagery: Nearmap 11/06/2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 1

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Water

347 - Kulaluk (Darwin)

6949

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 08:41 Imagery: Nearmap 11/06/2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 1
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments
Road furniture, stormwater drainage & community structures
347 - Kulaluk (Darwin)

6950

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:48:25 AM

Insp ID: 130 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Road Name:	Kulaluk Access
What are you inspecting:	Car Parks
Carpark Width (m):	5
Carpark Length (m):	20
Carpark Type:	Sealed - asphalt
Carpark Condition:	3 - Good
Line marking:	No
Kerbs:	No
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 9:41:19 AM

Insp ID: 116 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Stormwater Infrastructure:	Culverts
Culvert Type:	RCBC
Diameter (mm):	
Width (mm):	1200
Culvert Depth (mm):	
Culvert Length (m):	
Culvert Condition:	2 - Poor
Culvert Blockage (%):	80
Culvert Comments:	Can't tell depth or length. Helen advised drains will be removed after dl
Culvert Head Wall:	No Access
Safety Grate:	No Access
Headwall Blockage:	
Headwall Condition:	
Headwall Comment:	
End Wall:	Yes
End Wall condition:	3 - Good
EW Comment:	Blocked

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 9:57:11 AM

Insp ID: 118 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Stormwater Infrastructure:	Culverts
Culvert Type:	RCP
Diameter (mm):	450
Width (mm):	
Culvert Depth (mm):	
Culvert Length (m):	11
Culvert Condition:	3 - Good
Culvert Blockage (%):	10
Culvert Comments:	
Culvert Head Wall:	NA
Safety Grate:	NA
Headwall Blockage:	
Headwall Condition:	
Headwall Comment:	Letterbox pit
End Wall:	Yes
End Wall condition:	3 - Good
EW Comment:	Scour around sides of end wall

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:16:46 AM

Insp ID: 123 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Stormwater Infrastructure:	Culverts
Culvert Type:	RCBC
Diameter (mm):	
Width (mm):	1200
Culvert Depth (mm):	900
Culvert Length (m):	10
Culvert Condition:	3 - Good
Culvert Blockage (%):	
Culvert Comments:	
Culvert Head Wall:	No Access
Safety Grate:	No
Headwall Blockage:	
Headwall Condition:	
Headwall Comment:	In locked easement
End Wall:	Yes
End Wall condition:	3 - Good
EW Comment:	Some cracking and scour around endwall

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:36:56 AM

Insp ID: 128 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Stormwater Infrastructure:	Culverts
Culvert Type:	RCP
Diameter (mm):	270
Width (mm):	
Culvert Depth (mm):	
Culvert Length (m):	11
Culvert Condition:	2 - Poor
Culvert Blockage (%):	50
Culvert Comments:	
Culvert Head Wall:	Yes
Safety Grate:	
Headwall Blockage:	10
Headwall Condition:	3 - Good
Headwall Comment:	Overgrown around headwall
End Wall:	Yes
End Wall condition:	3 - Good
EW Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:36:56 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 9:54:31 AM

Insp ID: 117	Group 1 - Darwin, Jabiru, Adelaide River	Kulaluk

Stormwater Infrastructure:	Letter Box Pit
Length (mm):	600
Height (mm):	380
Blockage Percentage (%):	0
LB Condition:	3 - Good
LB Comments:	Some concrete damage on lid

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 9:54:31 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:22:02 AM

Insp ID: 137 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Round
Manhole Cover Diam (mm):	650
Manhole Length (mm):	
Manhole Width (mm):	
Manhole Condition:	4 - Very Good
Notes on Lid:	Class B
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:23:37 AM

Insp ID: 138 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Square
Manhole Cover Diam (mm):	
Manhole Length (mm):	700
Manhole Width (mm):	700
Manhole Condition:	4 - Very Good
Notes on Lid:	Gatic
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:25:35 AM

Insp ID: 139 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Round
Manhole Cover Diam (mm):	650
Manhole Length (mm):	
Manhole Width (mm):	
Manhole Condition:	4 - Very Good
Notes on Lid:	Class B
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 9:44:30 AM

Insp ID: 121 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Road Name:	Kulaluk Access
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.4
Road Type:	Sealed - spray seal
Section Width (m):	4.5
Road Condition:	3 - Good
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks	90	3 - Good	90% of road length has edge breaks
Longitudinal Cracks	5	4 - Very Good	5%
Potholes		3 - Good	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed	0.5	50		3	50

Linemarking Section

Obstruction Section

Road Obstruction	Other Road Obstruction
Trees	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 9:44:30 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 9:44:30 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 9:44:30 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:48:41 AM

Insp ID: 131 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Road Name:	347_1
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.15
Road Type:	Sealed - spray seal
Section Width (m):	4.5
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks	80	2 - Poor	80% of road has broken edges
Potholes	5	2 - Poor	
Stone Loss	70	2 - Poor	70 % of road has stone loss / looks unsealed

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		Few short sections of kerb

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed				2	Some pounding, overgrowth

Linemarking Section

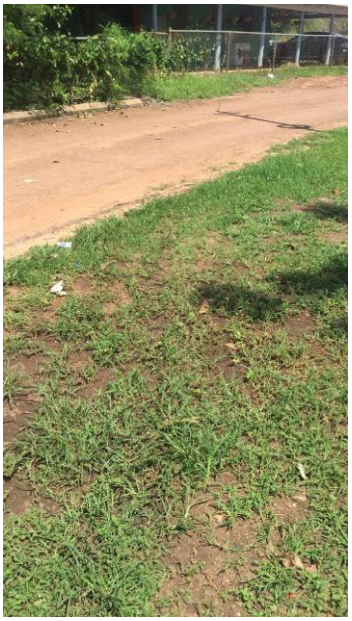
Obstruction Section

Road Obstruction	Other Road Obstruction
Trees	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:48:41 AM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:48:41 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:03:08 AM

Insp ID: 134 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Road Name:	347_2
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.05
Road Type:	Sealed - spray seal
Section Width (m):	3.6
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Surfacing Failure	80	2 - Poor	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed				2	

Linemarking Section

Obstruction Section

Road Obstruction	Other Road Obstruction
Debris	
other	Broken down car on road

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:03:08 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:03:08 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:13:50 AM

Insp ID: 136 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Road Name:	347_3
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.06
Road Type:	Sealed - spray seal
Section Width (m):	3.5
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Surfacing Failure	90	2 - Poor	
General Appearance	90	2 - Poor	Covered in dirt, looks unsealed

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Special	3 - Good	

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:13:50 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:13:50 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:21:57 AM

Insp ID: 140 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Road Name:	347_1
What are you inspecting:	Pavements
Ch From (km):	0.15
Ch To (km):	0.3
Road Type:	Unsealed
Section Width (m):	4.5
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Undulation/Settlement	10	2 - Poor	Ponding in road sumps

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed					

Linemarking Section

Obstruction Section

Road Obstruction	Other Road Obstruction
other	Wheel chair
Trees	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:21:57 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:21:57 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:33:23 AM

Insp ID: 141 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Road Name:	347_4
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.03
Road Type:	Sealed - spray seal
Section Width (m):	3.5
Road Condition:	3 - Good
General Comment:	

Road Defects Section

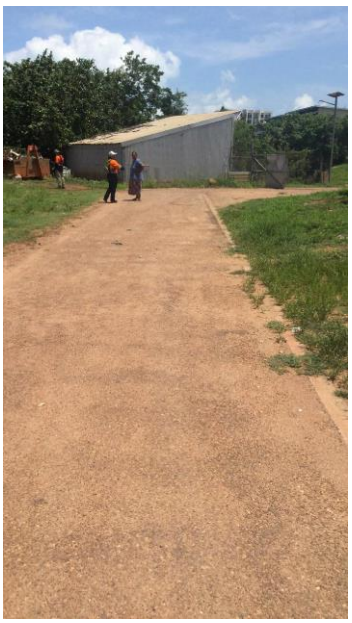
Defect Type	Defect QTY	Defect Condition	Defect Comments
Undulation/Settlement	100	3 - Good	100% of road slightly deformed

Kerbs Section

Shoulders Section

Linemarking Section

Obstruction Section



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:33:23 AM

Northern Territory Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:44:12 AM

Insp ID: 129 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Inspection Type:	Shade Structure
Shade Structure Type:	Basket Ball Court
Shade Floor Type:	Spray seal
Roof Type:	Not Covered
Width (mm):	
Length (mm):	
Appearance:	3
Appearance Comment:	New linemarking
Condition:	3 - Good
Comment:	

Northern Territory Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:44:12 AM

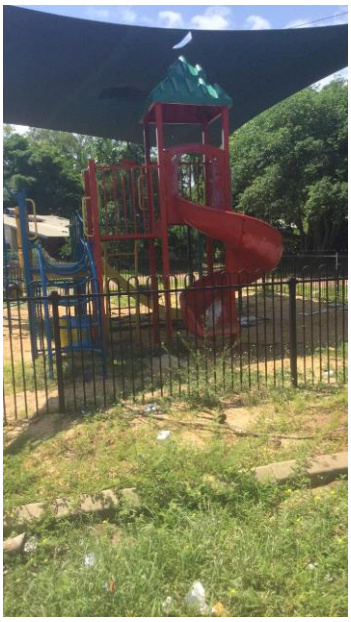
Northern Territory Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:53:31 AM

Insp ID: 132 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Inspection Type:	Shade Structure
Shade Structure Type:	Play ground
Shade Floor Type:	Sand
Roof Type:	Shadecloth
Width (mm):	10
Length (mm):	13
Appearance:	2
Appearance Comment:	Paint fading, cuts in shade cloth, overgrown grass, rubbish
Condition:	3 - Good
Comment:	Fenced



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:26:25 AM

Insp ID: 124	Group 1 - Darwin, Jabiru, Adelaide River	Kulaluk

Road Name:	Kulaluk Access
What are you inspecting:	Signs
Type of Sign:	Welcome to Kulaluk
Sign Condition:	5 - Excellent
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:32:22 AM

Insp ID: 126 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Road Name:	Kulaluk Access
What are you inspecting:	Signs
Type of Sign:	Bikes
Sign Condition:	3 - Good
Sign Comment:	Starting to fade
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:39:11 AM

Insp ID: 127 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Road Name:	Kulaluk Access
What are you inspecting:	Signs
Type of Sign:	20 kph
Sign Condition:	4 - Very Good
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:59:44 AM

Insp ID: 135 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Road Name:	347_2
What are you inspecting:	Signs
Type of Sign:	40 kph
Sign Condition:	2 - Poor
Sign Comment:	Post in private porperty
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:01:44 AM

Insp ID: 119 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Stormwater Infrastructure:	Swales
Type of lining:	No Lining
Are dimensions uniform along drain:	No
Base Width (m):	2
Overall Width (m):	6.6
Swale Depth (m):	0.7
Length of Batter 1 (m):	2.3
Length of Batter 2 (m):	2.3
Swale Condition:	2 - Poor
Swale Ponding:	No
Drain flooded at time of inspection:	No
Swale Comments:	Full of debris

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:01:44 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:14:14 AM

Insp ID: 122 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Stormwater Infrastructure:	Swales
Type of lining:	Concrete
Are dimensions uniform along drain:	No
Base Width (m):	
Overall Width (m):	
Swale Depth (m):	
Length of Batter 1 (m):	
Length of Batter 2 (m):	
Swale Condition:	3 - Good
Swale Ponding:	Yes
Drain flooded at time of inspection:	No Access
Swale Comments:	Swale is locked, could not access

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:27:20 AM

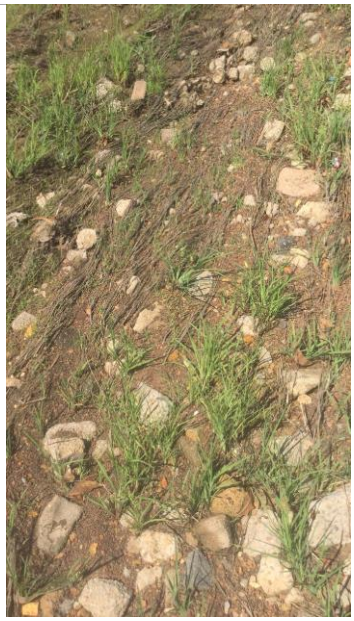
Insp ID: 125 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

Stormwater Infrastructure:	Swales
Type of lining:	Loose rocks and grass
Are dimensions uniform along drain:	Yes
Base Width (m):	4.6
Overall Width (m):	8.1
Swale Depth (m):	0.5
Length of Batter 1 (m):	1.8
Length of Batter 2 (m):	1.7
Swale Condition:	3 - Good
Swale Ponding:	Yes
Drain flooded at time of inspection:	No
Swale Comments:	Need guard rails at culvert outlet

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:27:20 AM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:07:58 AM

Insp ID: 120	Group 1 - Darwin, Jabiru, Adelaide River	Kulaluk

What Water Asset Are you Capturing: Water Meter

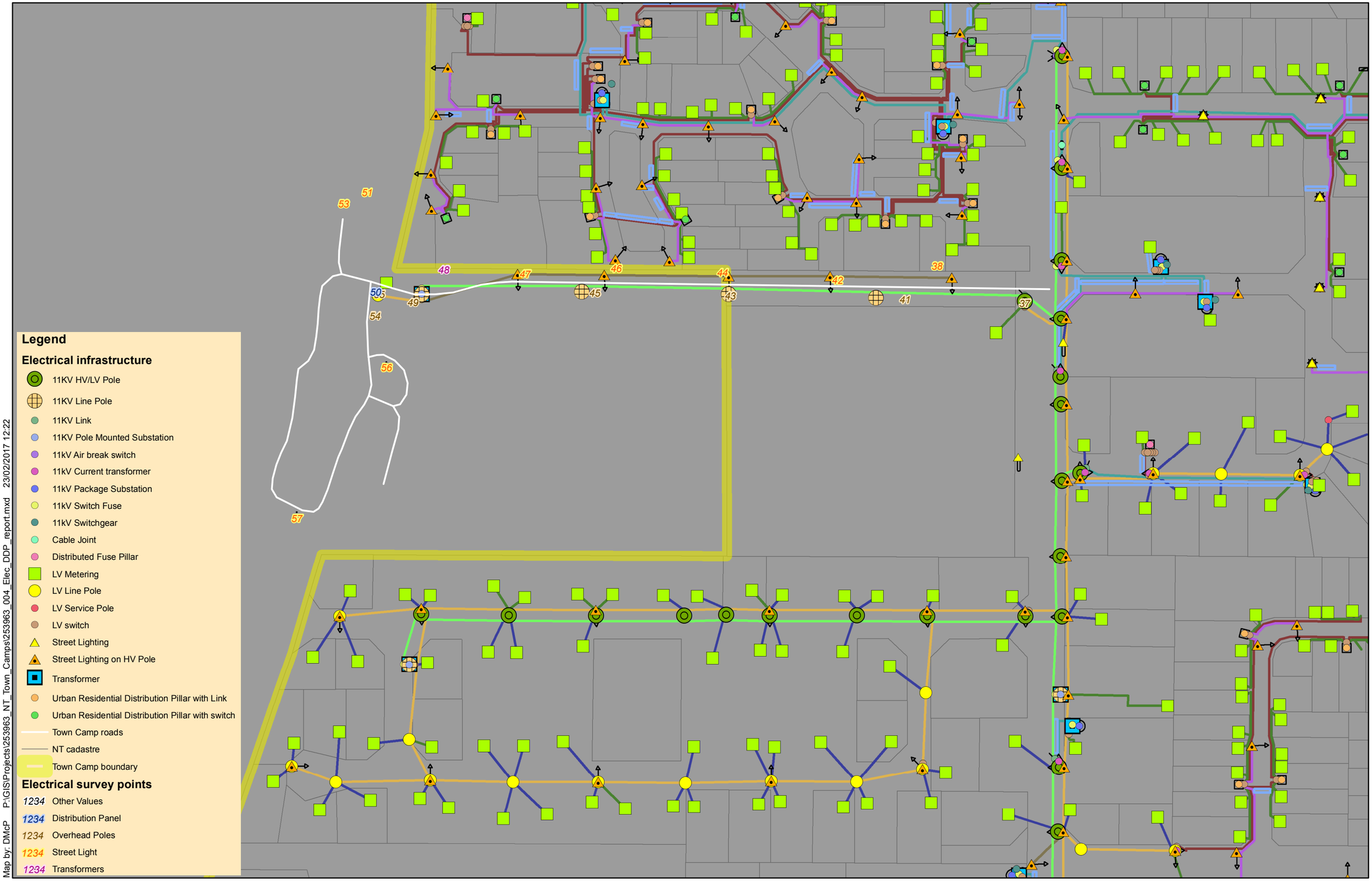
Water Meter Type:	Bulk
Bulk Water Meter Size (mm):	100
Bulk Water Meter Condition:	3 - Good
Bulk Water Meter Comment:	100 dia in, 50 dia to kulaluk
Lot Number:	
Lot Water Meter Size:	
Lot Water Meter Condition:	
Lot Water Meter Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 10:07:58 AM

Electrical inspection report



A3 scale: 1:2,000

0 20 40 60 80 100 m

Date: 23/02/2017 Version: 3

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Electrical

347 - Kulaluk (Darwin)

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:44:50 AM

Insp ID: 50 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Distribution Panel
What is Main Distribution Panel installation method:	Outdoor
Is the distribution panel labelled:	No
What is Distribution Panel main CB Rating:	Unknown
What is the main incoming cable type/Size to Distribution Panel:	Unknown
What is the condition of switchboard:	3
Condition Comments:	
What is the condition of cables/glands into switchboard:	
Cable/Gland Condition Comments:	Unknown
Distribution Panels name plate access:	No

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:44:50 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 12:36:16 PM

Insp ID: 58	Group 1 - Darwin, Jabiru, Adelaide River	Kulaluk

What Comms Category are you capturing:	Distribution
What is distribution method to households:	Underground
Is it Shared with PWC:	
Is there Anti-climb barrier provided for this pole:	
What is Pole construction type:	
Is street light fitted:	
Is there concrete collar around the base of pole:	
What is the condition of tap off to house:	
What is the condition of pole:	
How many Lots are connected to this pole:	
Is there access to Pits to take a photo:	Yes
What is Pit Condition:	3
Underground Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 9:37:00 AM

Insp ID: 3332 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid
Meter Switchboard Cond:	2
Meter Condition:	3
Meter Comment:	Blank plates are missing on CB slot.
Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 10:00:03 AM

Insp ID: 3333 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment:

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 10:19:48 AM

Insp ID: 3334 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

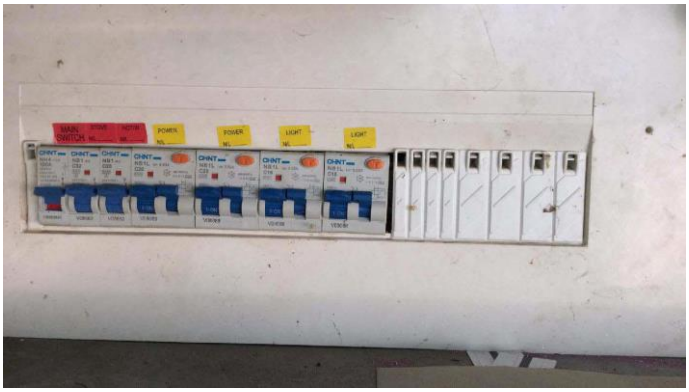
Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment:

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 10:00:50 AM

Insp ID: 3335 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

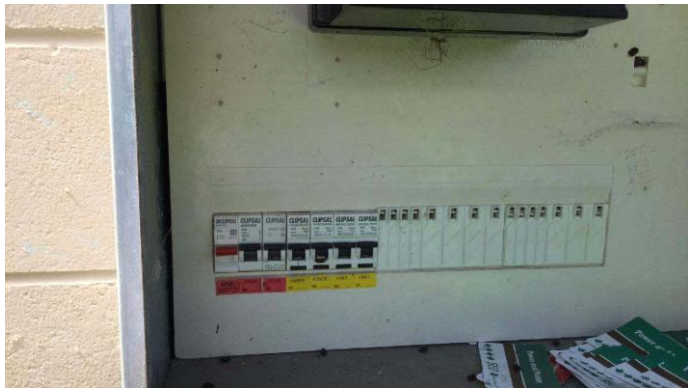
Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment:

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 9:34:41 AM

Insp ID: 3336 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid
Meter Switchboard Cond:	2
Meter Condition:	3
Meter Comment:	Blank plates are missing on CB slot.
Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 10:38:43 AM

Insp ID: 3337 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment:

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 9:31:45 AM

Insp ID: 3338 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: 3 Digital Meters

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 9:51:34 AM

Insp ID: 3339 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: 6 Digital Meters. Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 10:10:00 AM

Insp ID: 3340 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: 6 Digital Meters. Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 10:00:05 AM

Insp ID: 3341 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: 6 Digital Meters.

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 9:43:01 AM

Insp ID: 3342 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: 3 Digital Meters

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 9:40:37 AM

Insp ID: 3370 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed.

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 9:56:46 AM

Insp ID: 3371 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed.

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 7/11/2016 5:23:59 PM

Insp ID: 3372 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed.

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 10:44:47 AM

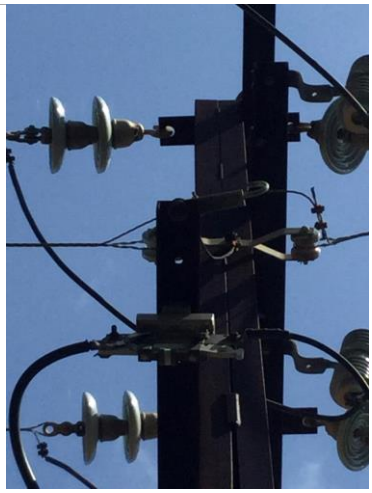
Insp ID: 37 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	Surface rust

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 10:44:47 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 10:53:01 AM

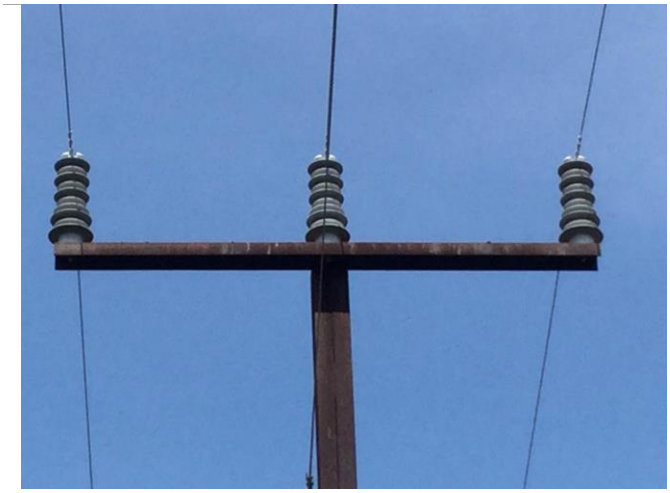
Insp ID: 41 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	Surface rust ,minor pitting on isolator

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 10:53:01 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:00:38 AM

Insp ID: 43 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:00:38 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:06:56 AM

Insp ID: 45 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:06:56 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:38:17 AM

Insp ID: 49 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel and twisted
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	11/.415kV

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:38:17 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 12:15:37 PM

Insp ID: 54 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 12:15:37 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 12:20:55 PM

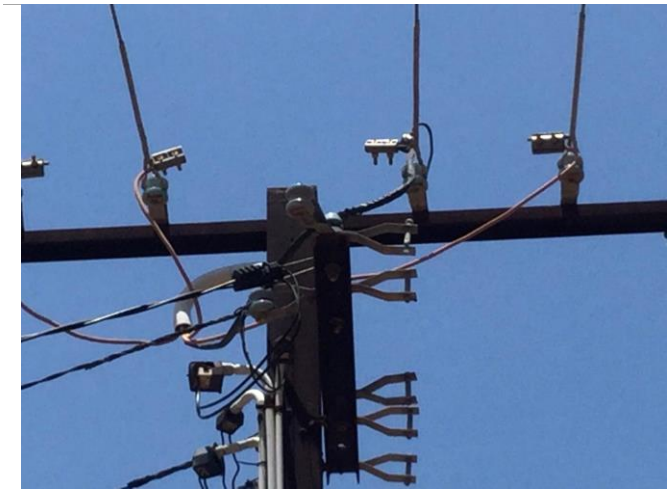
Insp ID: 55 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Unknown no access
What is the Condition of plant:	
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 12:20:55 PM



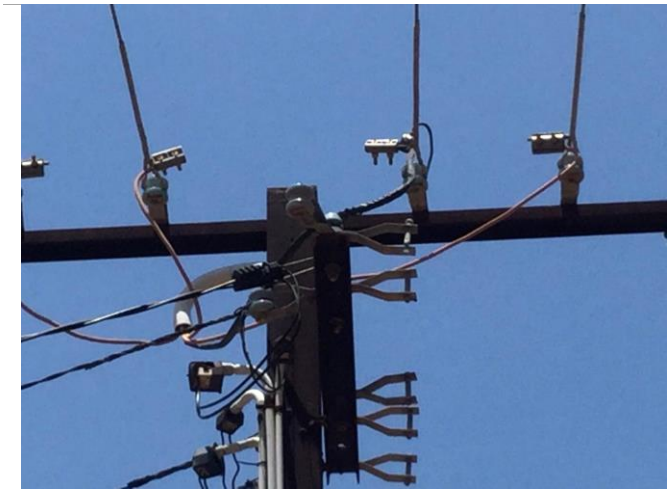
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 12:20:55 PM

Insp ID: 55	Group 1 - Darwin, Jabiru, Adelaide River	Kulaluk

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	2
Street Light Height	



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 12:20:55 PM

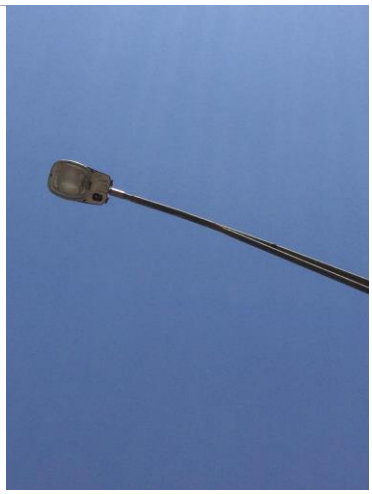
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 10:51:10 AM

Insp ID: 38 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	M80D 14
What Wattage is the lamp:	80
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	10



Northern Territory Town Camps

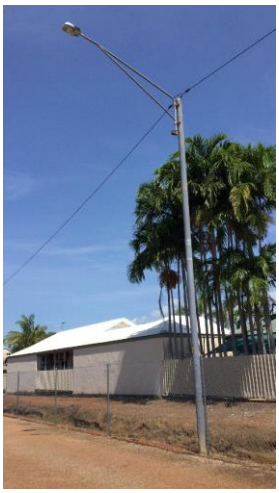
Electrical Infrastructure

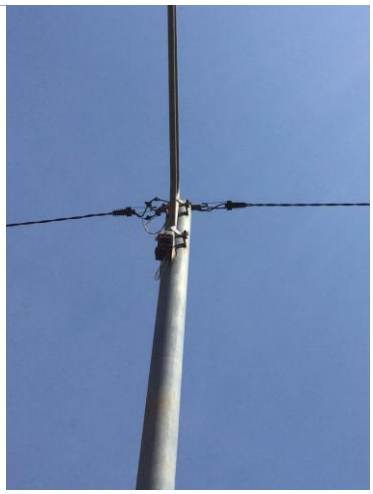
Inspection Date 8/11/2016 10:57:40 AM

Insp ID: 42 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Street Light

What is power supply method:	Overhead
What is the lamp type:	M80D 14
What Wattage is the lamp:	80
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	

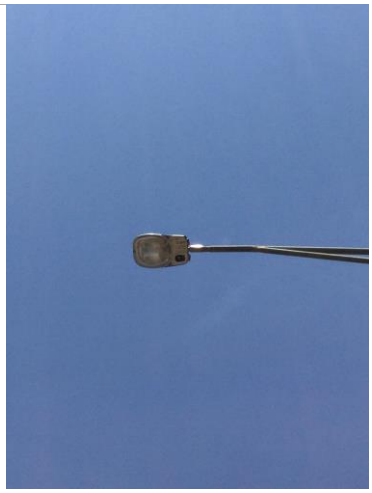




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 10:57:40 AM



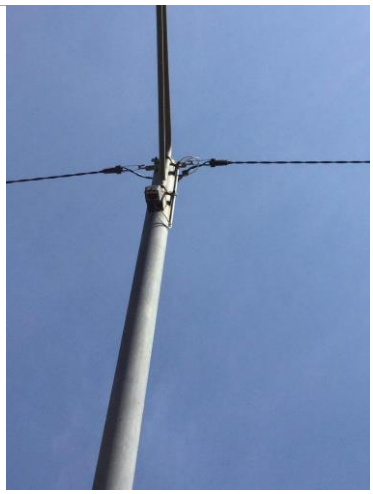
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:02:03 AM

Insp ID: 44 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

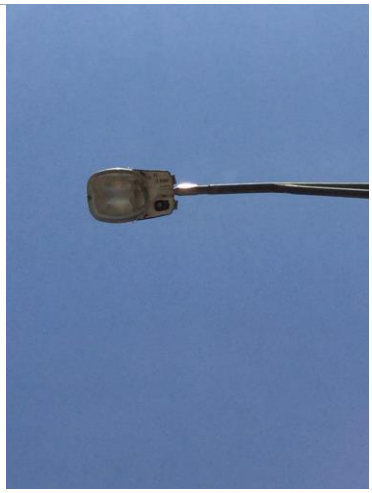
What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	M80D 14
What Wattage is the lamp:	80
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	10



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:02:03 AM



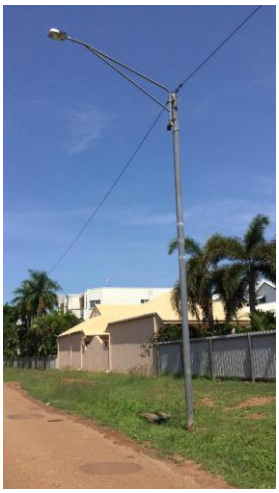
Northern Territory Town Camps

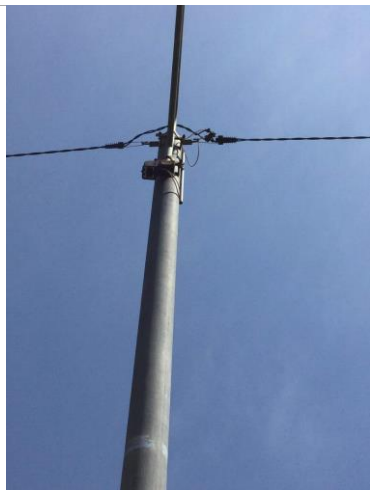
Electrical Infrastructure

Inspection Date 8/11/2016 11:07:35 AM

Insp ID: 46 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	M80D 14
What Wattage is the lamp:	80
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	10





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:07:35 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:10:28 AM

Insp ID: 47 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Street Light

What is power supply method:	Overhead
What is the lamp type:	M80D 14
What Wattage is the lamp:	80
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:58:59 AM

Insp ID: 51 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Street Light
What is power supply method:	Solar
What is the lamp type:	None
What Wattage is the lamp:	
What is the condition of street lights:	1
What is Street Lighting pole installation height (approximate):	6

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 12:11:05 PM

Insp ID: 53 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Street Light
What is power supply method:	Solar
What is the lamp type:	Unknown
What Wattage is the lamp:	
What is the condition of street lights:	1
What is Street Lighting pole installation height (approximate):	6

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 12:11:05 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 12:24:58 PM

Insp ID: 56 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Street Light
What is power supply method:	Solar
What is the lamp type:	Unknown
What Wattage is the lamp:	0
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	6

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 12:31:14 PM

Insp ID: 57 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing:	Street Light
What is power supply method:	Solar
What is the lamp type:	Unknown
What Wattage is the lamp:	0
What is the condition of street lights:	1
What is Street Lighting pole installation height (approximate):	6

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:30:23 AM

Insp ID: 48 Group 1 - Darwin, Jabiru, Adelaide River Kulaluk

What Category are you capturing: Transformers

What is Transformer installation method:	Pole
If method know:	11SS1P
What is the condition of the mounting:	3
What is Transformer Rating:	Estimate 200kva
Is there access to transformers name plate to take a photo:	No
What is the condition of transformer:	3
What is cable type to transformer:	insulated black flex
What is cable size to transformer:	0
Is there switch gear or fusing associated with the transformer:	Drop out fuse
Transformer Comment:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 11:30:23 AM

Road map

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Roads_DDP2.mxd 20/02/2017 16:41 Imagery: Nearmap 11/06/2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Date: 20/02/2017 Version: 1

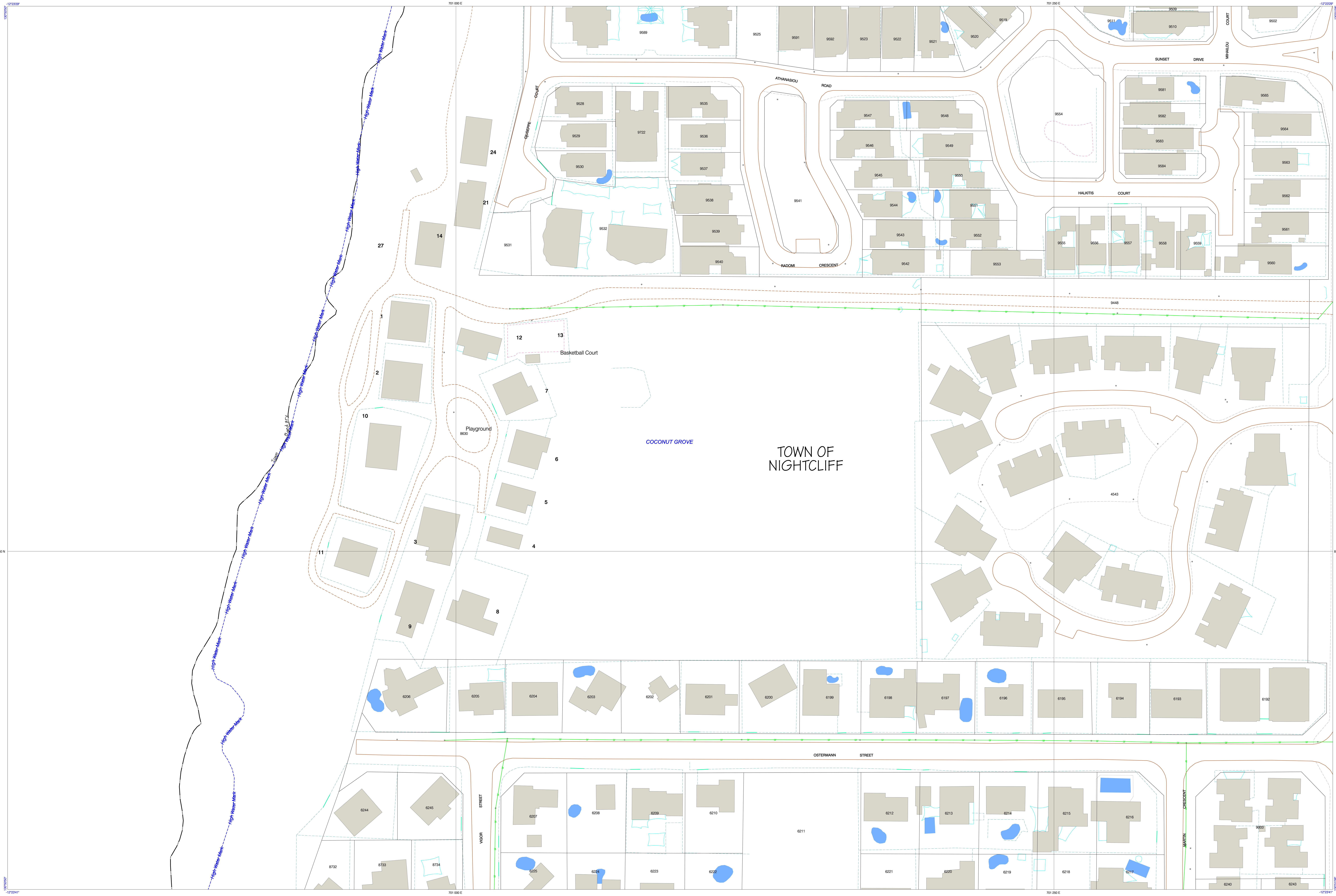
Coordinate system:MGA52

NT Town Camp Road Assessments

347 - Kulaluk (Darwin)

7045

Existing drawings



LEGEND

LAND USE PLANNING:

APPROX. POSITION OF BUILDING constructed since date of photography

LAND EXCLUDED FROM DEVELOPMENT

GENERAL EXCLUSION/BUFFERS

CULTURAL EXCLUSION AREAS:

Unauthorised entry, works on or use of land where there is a sacred site is an offence under the Northern Territory Aboriginal Sacred Sites Act. For conditions relating to works on or use of land within a Cultural Exclusion Area contact the Aboriginal Areas Protection Authority (AAPA): email enquiries.aapa@nt.gov.au or phone 8999 4332.

This advice does not negate the need for consent for entry, works, or use which may be required under the Aboriginal Land Rights(NT) Act (in the case of Aboriginal land), or another statute.

CADASTRE

Current 123

Proposed 123

Locality LOCALITY

UTILITY SERVICES

ELECTRICITY

LOW VOLTAGE LV

HIGH VOLTAGE HV

WATER RETICULATION

WATER MAIN W

WATER RISING MAIN W W

SEWER

SEWER MAIN S

SEWER RISING MAIN S S

DIAL BEFORE YOU DIG www.1100.com.au

TOPOGRAPHY

Road Sealed, Bridge

Road Unsealed, Track

Footpath, Drain, Culvert

Wall, Gate, Fence, Cattle Grid

Railway, Disused Railway

Aerodrome Tarmac, Landing Strip

Taxiway, Apron

Pipeline: Oil, Water, Undetermined Gas, Sewage

Building, Building-Shape unconfirmed

Shade Structure, Incomplete Building

Sewage Ponds, Tailings Pond

Oval, Arena, Swimming Pool

High Water Mark, Low Water Mark

Mine; Quarry, Surface Excavation

Contour; Index, Intermediate 75

Contour; Depression

Top of Bank, Bottom of Bank, Cliff

Watercourse; Perennial, Intermittent, Channel or Canal

WaterBodies; Perennial, Intermittent

WaterBodies; Reservoir, Water Hole

Swamp; Swamp Perennial, Swamp Intermittent

Flat; Mud Flat, Clay/Saltpan, STI

Pole; Power, General, Light

Tank; Water, Elevated, Non-Water, Silo

Manhole, Pylon, Communication Tower, Bore.

AVAILABLE FROM AND PRODUCED BY:

Northern Territory Government

NOTES:
POWER POLES, MANHOLES, SEPTIC TANKS, TOWERS/POSTS and other similar shaped objects are captured from Aerial Photography and have their locations confirmed from aerial survey techniques.
These features are suitable as LOCAL SURVEY CONTROL. Their ground location is expected to be within +/-0.3m of their mapped location.

DIAL BEFORE YOU DIG phone 1100 (freecall) or visit www.1100.com.au
For water, sewer, and power information and connection requirements for developments contact Power and Water Corporation, Indigenous Community Development on 1800 245 092, and visit http://www.powerwater.com.au/business

General enquiries, corrections, updates, errors and omissions:
Indigenous Community Land Use Planning, NT Dept of Lands and Planning
TEL: (08) 8999 1300, FAX: (08) 8999 7189, Email: planning@nt.gov.au

This product is a compilation of data holdings from (but not restricted to) NT Dept of Lands and Planning, NT Dept of Housing, Local Government and Regional Services, Power and Water Corporation and Aboriginal Areas Protection Authority.
Whilst every effort has been made to ensure the accuracy of this map, errors and omissions may occur.
No Warranty is given concerning the accuracy of the information herein. Users should refer to the originating bodies or departments regarding the accuracy and currency of the data.

Topographic information:
Land Information Division
Dept of Lands and Planning
TEL: (08) 8995 5331, FAX: (08) 8995 5366
Email: landinfo.dpi@nt.gov.au

Cadastral information:
Office of the Surveyor-General
Dept of Lands and Planning
TEL: (08) 8995 5353, FAX: (08) 8995 5365
Email: landinfo.dpi@nt.gov.au

Power, Water or Sewer information:
Remote Operations Planning Branch
Power and Water Corporation
TEL: (08) 8924 5094, FAX: (08) 8924 5360

Aboriginal Areas Protection Authority:
The Registrar
Aboriginal Areas Protection Authority
TEL: (08) 8999 4332
Email: enquiries.aapa@nt.gov.au

Planning information:
Indigenous Community Land Use Planning
Dept of Lands and Planning
TEL: (08) 8999 1300, FAX: (08) 8999 7189
Email: planning@nt.gov.au

Housing Infrastructure Information:
Infrastructure Delivery Branch
Dept of Housing, Local Government, and Regional Services
TEL: (08) 8995 5013, FAX: (08) 8995 5110
Email: ies.dhlgrs@nt.gov.au

SOURCE INFORMATION

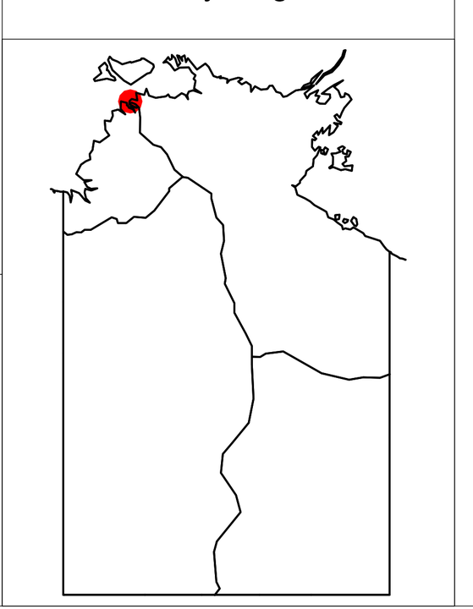
CONTOUR INTERVAL :		CURRENCY OF TOPOGRAPHY :	3 June 2011
HORIZONTAL DATUM :		SOURCE MAP SCALE :	2500
VERTICAL DATUM :		ZONE UTM :	52
PROJECTION :	Transverse Mercator	DATE GENERATED :	20 June 2012

N

GDA

0 10 20 30 40 50

Locality Diagram



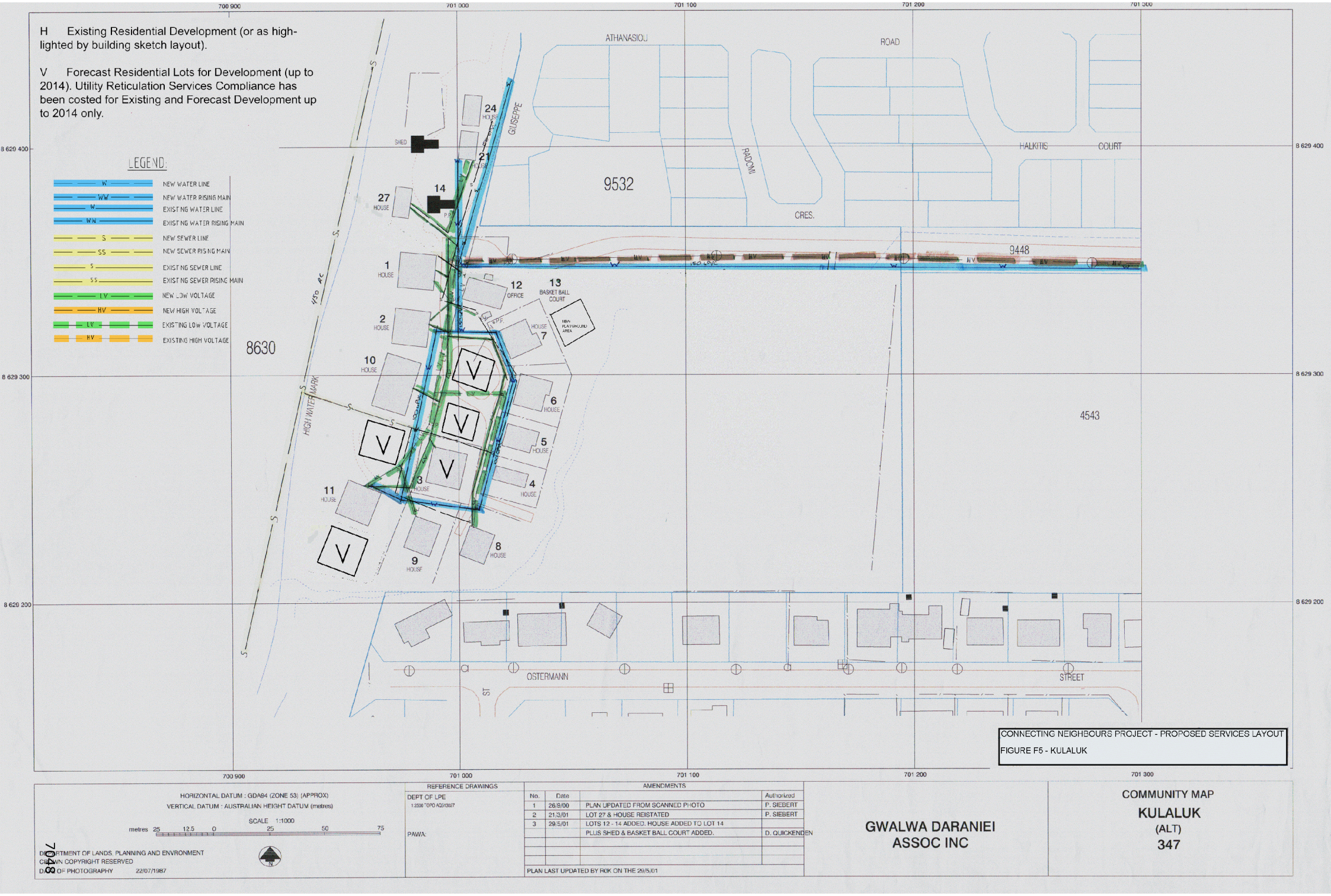
SERVICED LAND AVAILABILITY PROGRAM
SLAP Map
Kulaluk (Darwin Town Camp)

Gwalwa Daraniei Assoc

Darwin City Council

Community ID: 347

7047



CONNECTING NEIGHBOURS PROJECT - PROPOSED SERVICES LAYOUT

FIGURE F5 - KULALUK

HORIZONTAL DATUM : GDA84 (ZONE 53) (APPROX)

VERTICAL DATUM : AUSTRALIAN HEIGHT DATUM (metres)

SCALE 1:1000

metres 25 12.5 0 25 50 75

DEPARTMENT OF LANDS, PLANNING AND ENVIRONMENT

CROWN COPYRIGHT RESERVED

DATE OF PHOTOGRAPHY 22/07/1987

REFERENCE DRAWINGS

DEPT OF LPE

1:2500 "OPO AQ13027

PAWA:

AMENDMENTS

No.	Date		Authorized
1	26/9/00	PLAN UPDATED FROM SCANNED PHOTO	P. SIEBERT
2	21/3/01	LOT 27 & HOUSE REISTATED	P. SIEBERT
3	29/5/01	LOTS 12 - 14 ADDED. HOUSE ADDED TO LOT 14	
		PLUS SHED & BASKET BALL COURT ADDED.	D. QUICKENDEN

PLAN LAST UPDATED BY ROK ON THE 29/5/01

GWALWA DARANIEI ASSOC INC

COMMUNITY MAP

KULALUK

(ALT)

347

768.499 E
1009.729 N
PLAIN ENDWALL TO PIPE OUTLET
WITH MANPROOF GRATE .
GRATE - RF92 MESH WITH 4-12 PLATE
WELDED TAGS AND 4/M12 SS CHEMSET ANCHORS
TO ENDWALL, HOT DIP GALVANISE FRAME
AFTER FABRICATION
12m2 RENO MATTRESS OUTLET PROTECTION

802.384 E
1009.849 N
900x600 GRATED INLET PIT
TOP RL 3.95
TRIM AND RESHAPED SURROUNDING
AREA TO DRAIN TO PIT
TOPSOIL AND REGRASS

827.553 E
1009.938 N
900x600 GRATED INLET PIT
TOP RL 3.95
TRIM AND RESHAPED SURROUNDING
AREA TO DRAIN TO PIT
TOPSOIL AND REGRASS

861.096 E
1008.559 N
900x600 GRATED INLET PIT
TOP RL 3.95
TRIM AND RESHAPED SURROUNDING
AREA TO DRAIN TO PIT
TOPSOIL AND REGRASS

DEMOLISH AND REMOVE EXISTING LETTER BOX PITS
AND DN300 RCP DRAIN. CONSTRUCT TABLE DRAIN
AND GRADE TO NEW GIP

4m WIDE ACCESS GATE IN SECURITY FENCE
CONTRACTOR SHALL SUPPLY PADLOCK AND 2 KEYS
TO DARWIN CITY COUNCIL

RADOMI CRESCENT

9531 9532 9540 9542 9543 9448

IL 2.60 IL 2.78 IL 2.80 IL 2.93 IL 2.95 IL 3.00 IL 4.30

DN375 RCP CLASS 2
DN375 RCP CLASS 2
EXISTING DN450 SEWER
APPROXIMATE IL 0.0
DRAINAGE EASEMENT
EXISTING DN300 RCP
EXISTING DN450 RCP

89°47'50"
185.15

3/1800x900 RCBC

DEMOLISH AND REMOVE EXISTING
CONCRETE PIPE CULVERT AND HEADWALLS
BACKFILL AND REINSTATE ROAD TO MATCH
EXISTING FINISHED LEVELS

DRAIN IL 3.79

REFER DRAWING NUMBER R04-1567
FOR CULVERT GENERAL ARRANGEMENT

10.0
19.5
4m WIDE ACCESS FOR MAINTENANCE
160.97
179°47'30"
PROPERTY BOUNDARY
4543
LOT 4543

8630
LOT 8630

EASEMENT
SEWERAGE
EXISTING DN375 SEWER MAIN

EXISTING OPEN UNLINED DRAIN
SHALL BE BACKFILLED IN THE FUTURE
BY OTHERS

BUILDING
POLE
EXISTING OUD

839.397 E
886.977 N
842.786 E
885.704 N
843.740 E
876.809 N
850.456 E
870.533 N

BACKFILL EXISTING OUD
MATCH EXISTING SURFACE LEVEL
AT TOP OF EXISTING BATTER

CONSTRUCT TEMPORARY CONNECTION OF EXISTING
OUD TO NEW - 2m BASE 1 IN 4 BATTERS.
6.1m LONG 1200x900 RCBC (REUSE LENGTH OF DEMOLISHED CULVERT)
UNDER FENCE WITH MANPROOF GRATE OVER INLET. REFER DETAIL
DRAWING NUMBER R04-1566

CONSTRUCT NEW 1800 HIGH CHAINWIRE MESH
SECURITY FENCE. REFER STD DRG C(S)1303

985.785 E
879.025 N
977.814 E
870.996 N

4m WIDE ACCESS GATE IN SECURITY FENCE
CONTRACTOR SHALL SUPPLY PADLOCK AND 2 KEYS
TO DARWIN CITY COUNCIL

3/1800x900 RCBC

4m WIDE ACCESS FOR MAINTENANCE

DRAIN IL 3.38

BREAK OUT AND REMOVE EXISTING CONCRETE HEADWALL
CONNECT NEW DN525 RCP CLASS 2 TO EXISTING WITH COLLAR JOINT
NEW PIPE 7.32m LONG U/S IL 3.85 D/S IL 3.45
CONSTRUCT STANDARD ENDWALL REFER STD DRAWING C(S)1102
8m2 RENO MATTRESS OUTLET PROTECTION

224.685
269°47'30"
PROPERTY BOUNDARY

CONCRETE LINED DRAIN

DRAIN IL 2.9

6206 6205 6204 6203 6202 6201 6200 6199 6198 6197

REFER DRAWING NUMBER R04-1568
FOR CULVERT GENERAL ARRANGEMENT

BACKFILL EXISTING OUD
MATCH EXISTING SURFACE LEVEL
AT TOP OF EXISTING BATTER

SITE PLAN

Scale 0 5 10 15 20 25 Metres

TENDER ISSUE

No	DATE	INITIAL	AMENDMENT
B	3/8/2005	RP	FENCE AND MAINTENANCE ACCESS AMENDED
A	18/6/04	RP	ISSUED FOR TENDER
-	7/6/04	SB	DRAWING UNDER REVISION

Northern Territory Government
Department of Infrastructure, Planning and Environment

SINCLAIR KNIGHT MERZ
A.C.N. 001 024 095
GPO Box 1252 Darwin, Northern Territory 0801
Telephone (08) 8982 4800 Facsimile (08) 8982 4840

PROJECT: DARWIN - COCONUT GROVE
KULALUK COMMUNITY TRUNK DRAINAGE

DRAWN	CHECKED	PROJECT MANAGER	PROJECT DIRECTOR
RP			
DESIGNED	CHECKED		
PS			

TITLE: GENERAL ARRANGEMENT PLAN

SCALE	SKM PROJECT No	DRAWING No	AMDT
AS SHOWN	DI04962	R04-1565	B

Transformer data

Group	Com Id	Location	Community Name	Dwellings No. (Funded Dwellings)	Dwellings No. (Bennett Design)	New Houses ** (Future Demand)	Primary Volatge Level (KV)	PWC Substation ID	PWC Test Number	Transformer size (KVA)	KVA Total dwellings @ 4.5KVA	KVA Total dwellings @ 7KVA	Comments
1	290	Darwin	Bagot	55	55		11	1924	1735	300	247.5	385	
	344	Darwin	Knuckey Lagoons	18	19	2	11	1771	2163	100	85.5	133	
	347	Darwin	Kulaluk	19	19		11	1092	10607	50	85.5	133	
	403	Darwin	Palmerston Town Camp	20	16		22	10196	10245	100	90	140	Two transformers for this Town Camp. Transformers are not in boundary of Town Camp [The nearest transformers data to Town Camp are highlighted in yellow].
							22	265	11645	25			
	412	Darwin	Railway Dam (One Mile Dam)	5	6	2	11	1041	4378	200	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	427	Adelaide River	Amangal	9	9		22	216	12187	100	40.5	63	Two transformers for this Town Camp.
							22	184	5646	63			
	687	Jabiru	Manabadurma	10	12		11	5050	11107	200	54	84	
	825	Darwin	Minmarama Park	24	24		11	2147	11372	100	108	168	
2	606	Katherine	Warlpiri Transient Camp	9	9		22	6416	4886	100	40.5	63	Two transformers for this Town Camp.
							22	6074	4695	25			
	621	Katherine	Miali Brumby (Kalano)	47	31		22	6133	12247	315	211.5	329	
	640	Pine Creek	Pine Creek Compound	4	4		22	6666	3147	25	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	971	Mataranka	Mulggan	12	9	4	22	6819	5296	16	54	84	
							22	6818	5297	16			
							22	6384	11028	25			
3	215	Tennant Creek	Blueberry Hill (Munji-Marla)	2	2		22	7079	1868	200	9	14	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	223	Tennant Creek	Dump Camp (Marla-Marla)	7	7		22	7181	11088	200	31.5	49	
	224	Elliott	Elliott South Camp	12	12		11	7504	4718	200	54	84	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	225	Elliott	Elliott North Camp	36	25		11	7505	4715	100	162	252	
	238	Tennant Creek	Kargaru (East Side Camp)	12	12	1	22	7572		200	54	84	
	246	Tennant Creek	Ngalpa Ngalpa	18	21		22	7179		200	94.5	147	Two transformers for this Town Camp.
							22	7033	10904	315			
	271	Tennant Creek	Village Camp	12	12	1	22	7183	11107	200	54	84	
	681	Tennant Creek	Tingkarli	12	12		22	7180		200	54	84	
	684	Tennant Creek	Wuppa	15	15	1	22	7141	11092	100	67.5	105	Two transformers for this Town Camp.
							22	7182	11095	200			
4	3	Alice Springs	Akngwertnarre (Morris Soak)	11	15		11	8596	11336	300	67.5	105	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	16	Alice Springs	Anthelk Ewlpaye (Charles Creek)	17	10		11	8569		315	76.5	119	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	17	Alice Springs	Anthepe	15	15		22	8598	5874	200	67.5	105	Data extracted from PWC asset information. There was not access to this Town Camp due to ceremony on inspection day.
							22	8597	11244	315			
	19	Alice Springs	Aper Alwerrknge (Palmers)	7	6		11	8405	2939	200	31.5	49	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	35	Alice Springs	Ewyenper Atwatye (Hidden Valley)	47	47		11	8622	11202	100	211.5	329	
							11	8623	11203	100			
							22	8625	11205	63			
							11	8626	11204	100			
	47	Alice Springs	Ilparpa	13	13		22	8611	11702	200	58.5	91	
	48	Alice Springs	Ilperle Tyathe (Walpiri)	10	9		11	8001	11209	315	45	70	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	50	Alice Springs	Ilyperenye (Old Timers)	10	10		22	8145	3323	100	45	70	
	64	Alice Springs	Bassos	2	2		11	8002	10946	50	9	14	
	69	Alice Springs	Karnte	19	19		22	8282	2345	100	85.5	133	
	87	Alice Springs	Yarrenty Altere (Larapinta Valley)	34	34		11	8617	11334	100	153	238	
							11	8618	11200	63			
							11	8619	11335	100			
							11	8620	11201	100			
	90	Alice Springs	Inarlenge (Little Sisters)	16	22		22	8137	2925	100	99	154	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	108	Alice Springs	Mpwetyerre (Abbotts)	6	6		11	8093	11703	315	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	113	Alice Springs	Mount Nancy (Nyewente)	11	12		11	8405	2939	200	54	84	
	129	Alice Springs	Nyewente (Trucking Yards)	26	26		11	8629	11312	300	117	182	
	675	Alice Springs	Hoppys	15	19						85.5	133	There is not any Transformer in boundary of Town Camp. Also it's not shown in PWC asset information.
	676	Alice Springs	Ilpiye Ilpiye (Golders Camp)	15	14		11	8314	369	50	67.5	105	
	1029	Alice Springs	Kunoth	4	4		11	8569		315	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
5	222	Borroloola	Mara	28	29	2	11	6187	12610	100	130.5	203	Two transformers for this Town Camp.
							11	6545	10203				
	229	Borroloola	Garawa 1	16	14		11	6546	10166	100	72	112	Two transformers for this Town Camp.
							11	6332	4890	100			
	278	Borroloola	Yanyula	29	29		11	6162	10496	200	130.5	203	Data extracted from PWC asset information. It's outside of Twon Camp, shown only Transformer to this Town Camp.
							11		10167				This transformer is not shown in PWC asset information. It's installed in Boat Ramp Road near to Town Camp and connected to Electrical reticulation of Town Camp.
	992	Borroloola	Garawa 2	11	11		11	6189	2669	25	49.5	77	

** For New house's demand calculation see section 13.4 "Future Demand".

Minmarama Park

Minmarama Park

1 Design

The infrastructure reviews have been undertaken against current relevant standards for typical sub-divisions. The following standards have been used in undertaking the reviews.

Sewerage and water supply

- Water Services Association of Australia – Sewerage Code – WSA 02 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 02
- Water Services Association of Australia – Sewerage Pumping Station Code – WSA 04 -2005 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 04
- Water Services Association of Australia – Water Supply Code – WSA 03 2002 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 03
- Power and Water Corporation Indigenous Community Engineering Guidelines (2008)
- Department of Housing and Community Development Indigenous Community Engineering Guidelines (ICEG 2014, updated September 2016)
- Power and Water Corporation Essential Services Infrastructure Assessment and Upgrade Guidelines (for Town Camps in Urban Communities, 2009)
- Power and Water Corporation Standard Drawings
- Australian Standards

Electrical services

Electrical infrastructure has been assessed against AS/NZS3000 Wiring Rules and against PWC Service, Installation and Metering Rules and Urban Residential Development (URD) Design Standards where possible.

With one exception, town camps are each a single lot and compliance with AS/NZS3000 is sufficient to address potential safety concerns.

As such application of PWC URD Design Standards will mainly apply to the incoming supply and bulk or initial multi-metering panels if provided.

URD Design Standards for internal reticulation and street lighting appear to have been applied in many cases for convenience rather than compliance.

For the purposes of this report, the demand per dwelling allowances of URD Design Standards have been used to estimate incoming supply and overall distribution capacity requirements.

The following standards apply:

- Australian Standards
- Power Networks Design and Construction Guidelines, Power and Water Corporation
    - NP001.1_Design and Construction of Network Assets – General Requirements
- NP001.3_General Specification for Overhead Electrical Reticulation
    - NP001.6_General Specification for URD Subdivisions
    - NP003_Installation Rules_V3

- NP007_Service Rules
- NP027_Capture of Newly Installed Street Lighting Information
- NP041_Guidelines for Electrical Design Consultants

Further referral to the guidelines in this report will be designated by the guidelines number, NP001.1.

Communications

- National Broadband Network Website viewed 21 January 2017 (http://www.nbnco.com.au/)– NBN rollout maps

Council guidelines

In addition to the above standards, the following Council guidelines will be used where applicable.

- Darwin City Council – Subdivision and Development Guidelines, September 2005

General

It should be noted that if the town camps are proposed to be subdivided and services assets gifted to Power and Water Corporation (PWC) for operation and maintenance, all of these services will need to fully meet PWC standards. With the exception of a few town camps that have recently been upgraded, this will require the full replacement and/or realignment of most services.

2 Condition assessment

2.1 Rating assessment matrix

A condition rating matrix was developed and used to assess all municipal infrastructure. The same rating was used for all services to maintain consistency in assessments. Table 1 below shows the condition rating and operability.

Table 1 Condition rating

Condition rating		Operability
1	Very Poor	Not operational
2	Poor	Not fully operational or requires immediate maintenance to keep operational
3	Good	Fully operational, may require routine maintenance
4	Very Good	Fully operational, may require maintenance in the next six months
5	Excellent	New, fully operational

2.2 Civil assessment limitations

The civil infrastructure condition investigations were subject to a number of limitations. These include:

- Only accessible services have been investigated. This includes inspecting the top of sewer manholes, side entry pits, etc., however, does not include opening pits to inspect infrastructure below ground.
- No physical testing of the sewer, water or stormwater network was undertaken.
- No survey or service locating was undertaken.

As there was no survey, potholing or CCTV undertaken on the underground infrastructure there is insufficient information to make determinations on the asset condition. The condition assessments discussed in this report are only for the accessible services and do not necessarily represent the condition of the underground infrastructure. For the majority of the town camps, other than a few that have recently been upgraded it was found that the underground services are generally undersized and it is likely, due to their age, that the these services are in poor condition. Either factor would trigger the need for a complete replacement to meet current relevant standards.

2.3 Electrical assessment limitations

The electrical infrastructure condition investigations were subject to a number of limitations. These include:

- Inspections were carried out without the assistance of an electrical tradesman.
- Only accessible services were investigated. Assessments were of a visual nature and no pit covers were removed.
- Overhead equipment was assessed from ground level.
- Switchboards were not opened and no assessment of the internal connections or bus ratings was made.

- Electrical infrastructure was assessed down to the meter for multi-meter panels and down to the termination, overhead pole or distribution pillar, of the supply cable to a meter located at a dwelling.

3 Current infrastructure issues

Power and Water Corporation (PWC) have advised of the following concerns and issues in regard to the sewerage, water and electrical infrastructure at all town camps.

1.1 Ownership and maintenance

PWC stated there has always been confusion regarding the ownership and responsibilities of the internal sewer, water and electrical infrastructure. PWC have advised that they have no legal tenure on the majority of assets in any town camps and that the owner is essentially that of the land owner or leaseholder. This is further discussed for each type of infrastructure for each town camp.

The ownership and who is responsible for the maintenance of the sewage pump stations and street lighting is a major concern. In most town camps it was found that PWC have been maintaining the assets on an in-kind basis, although there are no maintenance or access agreements in place and the infrastructure is generally not compliant to PWC standards.

1.2 Access to infrastructure

PWC advised that due to the uncertainty surrounding ownership and responsibility of the sewerage, water and electrical infrastructure, each town camp is seen as a single lot with multiple houses on it. There are no formal road reserves or easements where the municipal infrastructure should be located. PWC therefore have no legal right to enter the town camps to work on the infrastructure, nor can PWC stop others from working on the infrastructure. There is a risk that the maintenance undertaken by others may be to a lower standard than PWC.

1.3 Existing infrastructure

PWC have stated that although the existing sewerage and water infrastructure appears to comply with relevant standards in some locations, the capacity cannot be assumed to meet PWC requirements due to the potential for underground substandard condition and/or grading of pipework. It is likely that these assets will need to be fully replaced to PWC standards to ensure sufficient capacity.

The planning process currently allows construction within the town camps on Commonwealth land without requiring service authority (PWC) approvals. This means that there has been no opportunity for PWC to recover contributions towards required upgrades to headworks servicing the developments and these upgrades have been paid for by PWC in the past. This inconsistency needs to be addressed for future developments within the town camps to ensure PWC are able to continue to provide adequate services.

1.4 Safety concerns

PWC have expressed concerns with safety of PWC staff and contractors working within the camps. PWC have employed procedures such as multiple people / vehicles to attend the site, with police or housing safety officers as required. This generally leads to a delayed response time and increased cost to respond to and remediate emergency situations.

PWC have also raised the concern that if others work on water infrastructure within the town camps and do not apply the correct sanitation procedures they not only risk contaminating the entire water supply network within the town camp, at some

town camps with direct connections to the town supply, they risk contaminating the entire town’s water supply.

4 Available information

As the site investigations were limited to accessible / visible services, information on below ground services (such as electrical cables, sewer pipes, water supply pipes, etc.) were determined from available information. This information included:

- Serviced Land Availability Program (SLAP) maps,
- Department of Family & Community Services - Connecting Neighbours Program – Essential Services Scoping Study Report Volume 1 April 2005,
- Connecting Neighbours Project – Infrastructure Assessment and Recommendation Report - Arup Pty Ltd, April 2005,
- Drawings supplied by NT Department of Infrastructure - Technical Records,
- Drawings supplied by Power Water Corporation,
- Bennett Design inspection reports and population data.

Aurecon undertook a site investigation of the Minmarama Park community to inspect roads, stormwater drainage, electrical services, sewerage and water supply, and community structures. The following sections detail the outcomes of this investigation and the assessments of the infrastructure.

The civil and electrical inspection reports can be found in the Appendices, respectively.

5 Sewerage

5.1 Ownership and boundaries

Minmarama Park community is serviced by a DN100 PVC reticulation main that disposes to a dedicated pump station in the north-west of the community. Previous design drawings from 1997 show that the sewer main is DN100; it is not known whether any changes have been made to the sewer network since this time. The pipework is undersized according to PWC standards.

The pump station consists of two submersible sewage pumps and a 250 m long DN100 rising main to PWC sewer network. Approximately two years ago, PWC formally agreed to take over the ownership and responsibility of the sewage pump station at Minmarama Park however the administrative side has not been finalised and PWC do not yet own the pump station, and there are no easements to provide formal access.

The internal sewer network is owned by Gwalwa Daraniki Association Incorporated, but is the responsibility of Yili Rreung Housing Aboriginal Corporation to maintain.

5.1.1 Connection methods and billing

PWC advised that they currently charge a single sewerage bill based on a total number of houses or sanitary fixtures, which for Minmarama Park is 25. The sewerage bill is charged to the Gwalwa Daraniki Association Inc.

It is not known what contribution the residents make towards the sewerage bills.

5.2 Existing infrastructure condition assessment

The sewer infrastructure inspection was limited to inspecting the condition of manholes covers, as all other sewerage infrastructure is below ground. A total of two manholes and one pump station were inspected, with condition ratings as follows:

Table 2 Sewer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Manholes				2		2
Pump station			1			1

Figure 1 Pump station, condition: *good*

Figure 2 Sewer manhole, condition: *very good*

Figure 3 Sewer manhole, condition: *very good*

The manholes were rated as very good and do not require any maintenance works at this stage.

The available drawings of the sewer network show that the sewer pipes do not follow the road alignment. It is recommended that if the sewer network is upgraded, the new alignment is within the road reserve. It should be noted that there are currently no legal road reserves since the town camp is perceived as a single lot, therefore it is recommended that the new pipework generally follows the road alignment in case a road reserve is created in the future. In addition to this, an easement should be created over the sewerage infrastructure to allow service providers access to the infrastructure, in particular for the sections where the pipework does not follow the road alignment. There are currently no easements over the sewerage infrastructure.

The current sewer pipe size is undersized, according to PWC standards, as they recommended a minimum pipe size of DN150 PVC. The cost estimates for upgrade works required include upgrading the sewer network to DN150 PVC pipework.

5.3 Current performance and risks

The current capacity of the sewer network was calculated based on the following design assumptions:

- The adopted minimum grade for the pipework is 1.0%, as advised by Power and Water Corporation.

- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.
- The capacity has been assessed by calculating the current flow rate, and the maximum flow rate when the sewer pipe flows full. The result is then a percentage of how much of the pipe is currently being used.
- Manning's roughness coefficient of the pipework is 0.012, as recommended by PWC for PVC pipes.
- Where the sewer pipe grade, size or material is not known, it is assumed to be non-compliant to PWC standards.

The current number of houses in Minmarama Park is 24, this multiplied by 9 EP per house gives a total current EP of 216. The capacity of the existing sewer was then calculated. The percentage shows how much of the pipe capacity is currently being used.

Table 3 Existing sewer capacity

Catchment	Current total EP	Diameter of connection (mm)	Adopted minimum slope (%)	Q_{full} (L/s)	Current Q (L/s)	Current capacity (%)
Catchment 1	216	100	1.0%	5.60	2.24	40%

Table 3 above shows that the capacity of the existing sewer network is adequate for the current peak population.

Drawings of the pump station could not be obtained, therefore an analysis of the capacity of the pump station could not be undertaken.

5.4 Future demands

As no new developments are currently planned for Minmarama Park, there are no additional upgrades required to cater for future demand.

5.5 Recommended works

To upgrade the current network to PWC standards, the current pipe size needs to be confirmed and upgraded to DN150 PVC if found to be a DN100 pipe. The new pipe also needs to be within the road alignment. Cost estimates have been made based on these works, and including new manholes, house connections and connection to the pump station.

6 Water supply

6.1 Ownership and boundaries

The water main servicing Minmarama Park is a looped network with a combination of DN100 and DN150 pipes. The as-constructed drawing, (refer Appendices) show the water main is located outside of the road reserve.

The water supply assets within Minmarama community are owned by Gwalwa Daraniki Association Incorporated, but are the responsibility of Yili Rreung Housing Aboriginal Corporation to maintain. Figure 4 below shows the water services surrounding Minmarama community.

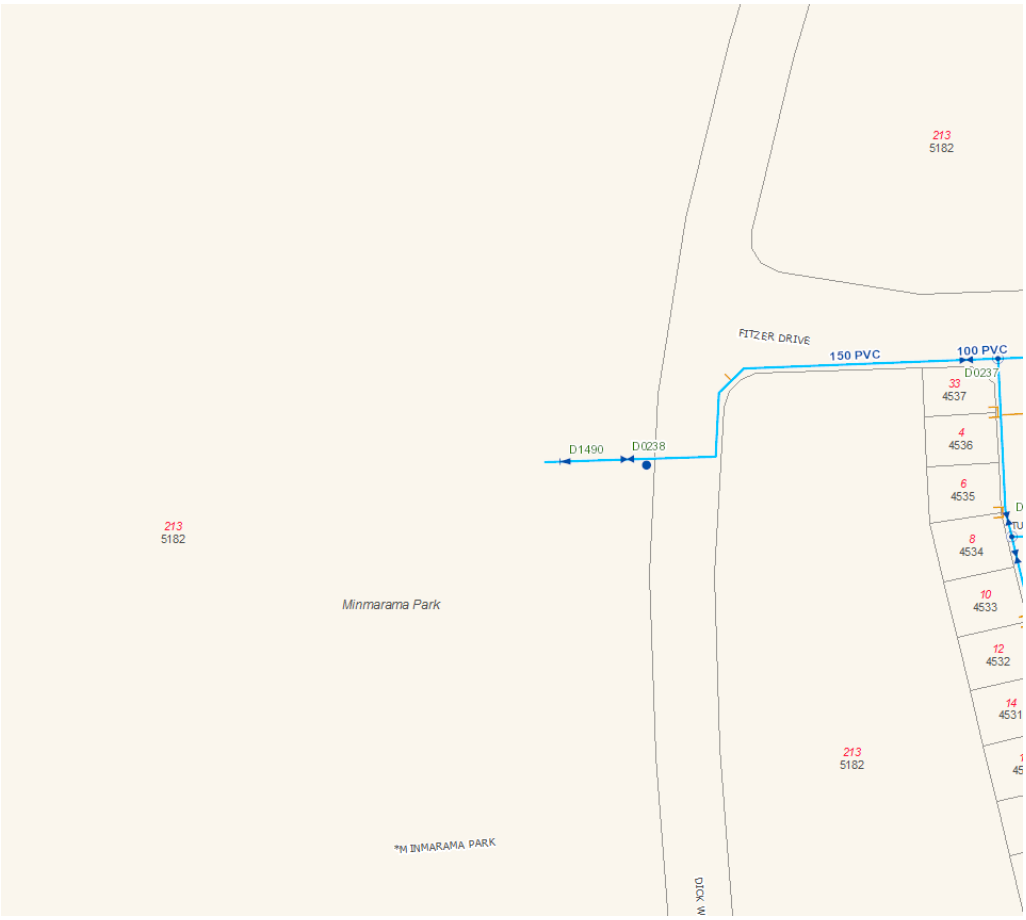


Figure 4 PWC water supply to Minmarama Park community

6.1.1 Connection methods and billing

PWC advised that they currently charge a single water bill to the Gwalwa Daraniki Association Inc. It is not known what contribution the residents make towards the water bills. It is understood that the water usage is measured at the bulk water meter located on the community boundary.

Only two residential lot water meters were assessed during the inspection, however other meters may not have been found due to location of water meter, restricted property access or overgrown flora. Consequently water meters may have not been discovered during the inspection. Therefore, up to 22 residential lot water meters are required to be installed to ensure each property has its own water meter.

It is proposed that PWC continues to measures the water supply to the entire community with a bulk meter, as opposed to individual lots within the community. Under this scheme, the water bill for the entire community is the responsibility of the governing body, being Gwalwa Daraniki Association Incorporated for Minmarama Park. It will be up to governing body to assign bills to residents accordingly.

It is recommended that the installation of individual lot meters is maintained in addition to the proposed continuation of using bulk water meters. This will assist with the governing body distributing bills to residents, the identification of any leaks in the network, and meeting PWC standards should the town camp be subdivided in the future.

6.2 Existing infrastructure assessment

The site investigation for the water infrastructure included assessing the condition of any air valves, fire hydrants, tanks, taps, and water meters. The assessment was limited to services that could be accessed above ground; no excavation of below ground services was undertaken.

The condition of each asset is as follows:

Table 4 Water supply condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Taps	1					1
Water meter (bulk)				1		1
Water meter (residential lots)			2			2

Figure 5 Water meter (bulk), condition: *very good*

Figure 6 Tap, condition: *very poor*

Figure 7 Water meter (lot), condition: *good*

A single tap was found to be in very poor condition. The tap handle was missing at the time of inspection and is recommended to be replaced.

6.3 Current performance and risks

The demand of the water supply was calculated based on the following design assumptions:

- The nominal peak day flow is 1100 L/capita/day, based on PWC's supplement to WSA 03 2002. This value is for the northern region of NT. It was assumed that

the nominal peak day flow of 1100 L/capita/day also applies to water usage within the community, although it is possible that this value could be higher in real life due to a lack of controls to reduce water usage.
- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.
- The peak hour factors are listed in PWC's Supplement to WSA 03-2002, and they depend on the population range of the community. The peak hour factor of 3.0 has been adopted, for populations less than 500.

Table 5 shows the water demand for Minmarama Park.

Table 5 Current water demand

Total dwellings	EP	Demand (l/s)	Peak hour demand (l/s)
24	216	2.75	8.25

It expected that the current network has sufficient capacity to supply adequate pressure for peak hour demands.

The assessment of water supply for firefighting has been based on the size of the water mains and the condition of the accessible fire hydrants. Additional hydrants have been recommended where it appears the existing number of hydrants are insufficient. In the case of Minmarama Park no fire hydrants were found. The installation of six fire hydrants has been incorporated into the cost estimates.

The currently water main is non-compliant with PWC standards due to the undersized pipes.

6.4 Future demands

As no new developments are currently planned for Minmarama Park, there are no additional upgrades required to cater for future demand.

6.5 Recommended works

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following maintenance works are recommended;

- Replace broken tap

It is recommended that the existing water main is replaced with a DN150 PVC looped main. Water usage is proposed to be measured with a bulk water meter located at the community boundary. Additionally, residential lot water meters should be installed on the connection to each dwelling which will assist with bill distribution to residents and identifying any leaks in the internal network. Fire hydrants should also be installed on the upgraded water main. The cost estimates for upgrades at Minmarama Park include;

- Install new DN150 PVC looped main, approximately 1200 m
- Install new DN150 bulk water meter on looped main.
- Install six new fire hydrants
- Install 22 residential lot water meters

7 Roadworks

7.1 Ownership and boundaries

It is the current understanding that roads within Minmarama Park community are owned by Gwalwa Daraniki Association Incorporated, but are the responsibility of Yili Rreung Housing Aboriginal Corporation to maintain.

7.2 Existing infrastructure condition assessment

The road network within the Minmarama community consists of primarily unsealed roads. There was minimal road furniture found at Minmarama Park, with only one sign being assessed. Table 6 below summarise the condition of the road furniture as assessed during the site inspection.

Table 6 Roadworks condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Sign		1				1

Figure 8 Minmarama Park welcoming sign, condition: *poor*

The only road furniture in Minmarama Park was a sign rated poor due to the graffiti, (refer Figure 8).

Figure 9 shows a map of Minmarama Park's road network.

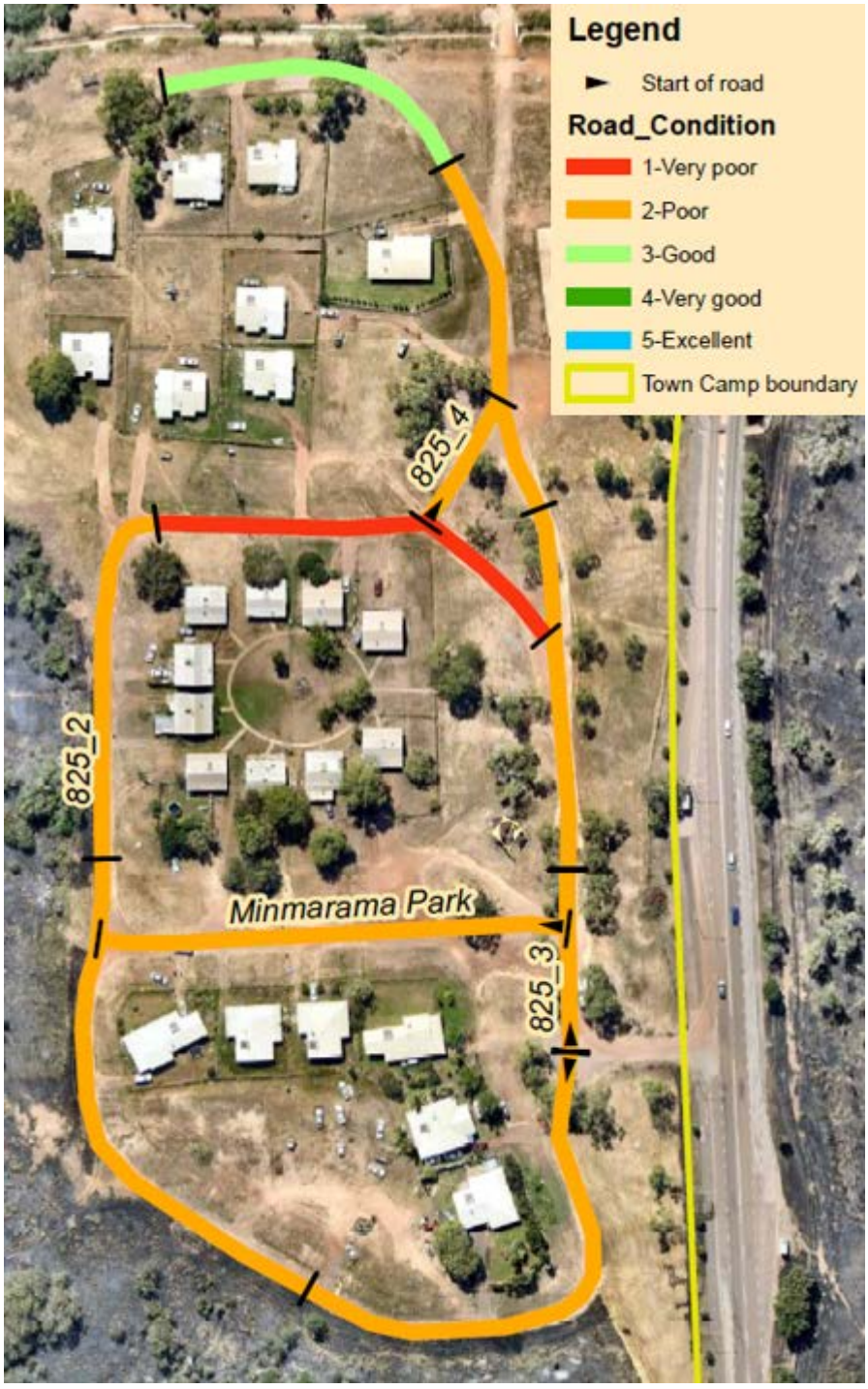


Figure 9 Minmarama Park road network condition

The following table details the condition of the roads within Minmarama Park community for specific segments.

The driveways were rated in the same condition as the road in that section. Generally, the driveways were in poor condition and none were defined formally.

Table 7 Road network condition assessment

Road name	Chainage start(km)	Chainage end (km)	Road segment condition (1-5)	Defects and associated condition (1-5)
825_2	0	0.15	2	-5% of road has potholes, varying size (3)
	0.15	0.3	2	-50% of the road has undulations -10% of road has potholes (2)
	0.3	0.4	2	-Surface failures (2) -6 x Potholes (2) -Undulations (2) -Edge breaks (2)
	0.4	0.52	1	-Edge breaks (1) -10 x Potholes
825_3	0	0.05	2	-5% of sealed section has crocodile cracks (4) -Edge breaks (3)
	0.05	0.15	2	-12 x Potholes (2) -10 x Undulation
	0.15	0.25	2	-Potholes (2) -Edge Breaks (3) -Undulations (3)
	0.25	0.34	3	-Edge Breaks (3) -Undulations (3)
825_4	0	0.04	2	-5 x Surface cracks (3) -30 x Undulation (2)
Minmarama Park	0	0.13	2	-Edge breaks (1) -3 x potholes (3)

Figure 10 and Figure 11 below show typical sections of road within the Minmarama Park community.

Figure 10 Typical sealed road, condition: *poor*

Figure 11 Typical unsealed road, condition: *poor*

7.3 Current performance and risks

The road network within Minmarama Park was rated as poor or very poor with the exception of one 90 m stretch in good condition. As the roads have edge breaks, undulations and pavement failure, there may be more significant issues to do with the subgrade or drainage that will require remediation before the road can be resealed. It is recommended that the road is reconstructed as a two lane network with all appropriate stormwater drainage.

The layout of the road network is sufficient for the current number of houses, although the condition of the road is poor.

It was noted during the site inspections that a number of unsealed 'short-cuts' had been created and were regularly used. It is not recommended that these paths are formalised.

It is also recommended that a road safety audit is undertaken to determine where signage, line marking, etc. are required.

7.4 Future demands

As no new developments are currently planned for the Bagot community, there are no additional upgrades required to cater for future demand.

7.5 Recommended works

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following works are recommended to upgrade the current infrastructure;

- Clean existing sign entrance sign of graffiti (or replacement)
- Total reseal of approximately 120 m of road ≈ 480 m2
- Repair approximately 50 potholes throughout community
- General tidy up of approximately 940 m of road
- Repair 590 m of edge breaks
- Repair approximately 30 m^2 of surface cracking

In order to allow for a longer term sustainable road network a significant upgrade would be required. It is recommended that a long term design which incorporates a full two lane road network, with all appropriate road furniture, line-marking, kerbs and gutters is constructed. A cost estimate to reinstate the base and subbase material, reseal with a two coat spray seal surface, construct subsoil drainage, line marking and signage has been included. Note that these works will need to be fully designed, the cost estimate is for budgetary purposes only and only indicates the construction phase. A footpath next to the road is also recommended to provide a safe trail for pedestrians.

As the maximum road width within the Minmarama Park community is 4 m, this means that all 1000 m of the road network will need to be upgraded to a 7.2 m wide road. The stormwater drainage infrastructure upgrades that are closely associated with the road upgrade i.e. kerb and gutters, side entry pits and underground drainage pipes are included in the stormwater section of this report.

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8 Stormwater drainage

8.1 Ownership and boundaries

There are currently no stormwater drainage assets within the Minmarama Park community, however there are two major drains on the northern and southern sides of the community which were investigated during the site inspection.

The stormwater assets that were investigated are property of City of Darwin.

8.2 Existing infrastructure condition assessment

The site investigation for the stormwater infrastructure included assessing the condition of swales, culverts, headwalls and side entry pits (SEP), where applicable. Table 8 below summarises the condition of the stormwater assets as assessed during the inspection.

Table 8 Stormwater drainage condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Culverts			1	1		2
Swales		2		1		3

Figure 12 Headwall

Figure 13 Swale

8.3 Current performance and risks

The current performance of the stormwater network cannot be fully analysed without significant hydraulic and hydrodynamic modelling, which is outside the scope of this project.

The City of Darwin's general design philosophy for stormwater drainage is that the design is to be based on a system of sealed roads, kerb and gutter, entry pits and underground drainage. This infrastructure currently does not exist and there would be major headworks required if stormwater drainage is to be incorporated. It is recommended that a stormwater drainage network, including side entry pits, kerbs and gutters, underground pipework, etc is constructed.

8.4 Future demands

As no new developments are currently planned for Minmarama Park, there are no additional upgrades required to cater for future demand.

8.5 Recommended works

There are no works required to upgrade the current stormwater drains on the northern and southern side of the community.

It is recommended that underground stormwater drainage, including kerb and gutter and side entry pits are constructed to reduce flooding and ponding issues within Minmarama Park.

9 Community structures

9.1 Ownership and boundaries

The community structures within Minmarama community are owned by Gwalwa Daraniki Association Incorporated, but are the responsibility of Yili Rreung Housing Aboriginal Corporation to maintain.

9.2 Existing infrastructure condition assessment

The site investigation for the community structures included assessing the condition and features of the playground and basketball court. Table 9 shows the condition rating given to the community structures.

Table 9 Community structures condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Basketball court			1			1
Playground			1			1

Figure 14 Playground, condition: *good*

Figure 15 Basketball court, condition: *good*

9.3 Current performance and risks

The playground was rated to have good appearance, due to the paint quality and general appearance, the condition was rated similarly as good.

The basketball court was also rated in good condition.

9.4 Future demands

As no new developments are currently planned for the Bagot community, there are no additional upgrades required to cater for future demand.

9.5 Recommended works

The following works are recommended to upgrade the current infrastructure;

- Replace entire shade cloth on playground
- Install nets on basketball rims
- Landscape maintenance around both the basketball court and the playground.

10 Electrical services

10.1 Ownership and boundaries

The following points, from Network Policy NP003 Installation Rules Section3, define the typical shared ownership of electrical infrastructure by Power and Water Corporation (PWC) and customers.

- The point of supply is defined as the point where PWC makes the electrical supply available. For domestic supply, this is normally one of the following:
- A point of attachment of an overhead service on to a building or pole on which a metering panel is fitted.
- A point of attachment of an overhead service on to a pole forming part of unmetered aerial consumer's mains.
- A nominated point on a distribution substation located on the customer's lot.
- A point of connection of an underground service in a metering panel, including underground services originating at an overhead line.
- A point of connection of an underground service in a pillar or junction box forming part of unmetered consumer's mains, located on the customer's lot.
- A point on a Power and Water pillar located on the customer's lot.

Typically, distribution infrastructure upstream of the Point Of Supply is owned and maintained by PWC and infrastructure below the point of supply is owned and maintained by the customer.

In many cases PWC have defined a Point Of Supply to ensure that they retain responsibility for aerial high voltage infrastructure to minimise the possibility of the community or its contractors coming into contact, either deliberately or inadvertently, with aerial high voltage infrastructure.

In other cases isolation facilities are present or desired by PWC to define the Point of Supply at or near the boundary of the town camp.

The Minmarama Park community electrical reticulation system is supplied from the PWC network via a pole mounted transformer. Unmetered consumer's mains run to a main switchboard with outgoing LV feeders to LV distribution pillars and underground reticulation to prepaid meters on dwellings or in the field.

All meters in this site are pre-paid digital meters.

PWC advise that the Point Of Supply is the LV terminals of the substation and that they own and are responsible for the pole mount substation and upstream infrastructure.

PWC advise that street lighting is supplied from unmetered LV infrastructure and is the responsibility of the lot holder and not PWC.

All meters, whether pre- or post-paid are the property of PWC.

Minmarama Park community are responsible for maintain all unmetered and metered LV infrastructure including the main switchboard, metering panel (excluding meter), underground distribution feeders, distribution pillars, consumers mains and consumer switchboards and street lights.

10.2 Existing infrastructure condition assessment

Table 10 shows the condition rating given to the distribution switchboards and distribution pillars. The distribution pillars have 100% operational rating and 17%

of the pillars required immediate maintenance to maintain capability. Refer to Appendices.

Table 10 Distribution panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Distribution panels		1	5			6

Table 11 shows the condition rating given to the street lights. The street lights are supplied via underground LV reticulation and are eight (8) metres and (6) meters high with mercury vapour lamp M80D and with lamp covers protected by cages.

The street lights have 43% operational rating and 57% non-operational based on daytime visual inspection.

Table 11 Street light condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Street light	3	5	6			14

Table 12 shows condition ratings given to transformers. The transformer is a pole mount type with a main switchboard.

The transformer was visually accessed to be in good condition.

Table 12 Transformer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Transformer			1			1

Table 13 shows the condition rating given to the Overhead pole. The overhead poles are of Weld Construction (Universal Pole construction) and steel overhead LV distribution.

The overhead poles have 100% operational rating based on the visual inspection.

Table 13 Overhead pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Overhead pole			3			3

Table 14 shows the condition ratings given to pumps. Access not available to pump station.

Table 14 Pump/motor condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Pump/motor						1 (status unknown)

Table 15 shows the condition rating given to the Metering panels. All assessed meters in this community are prepaid digital meters.

Table 15 Meter panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Pre-paid meter			17			17
Switchboard		4	11			15

Table 16 shows the condition rating given to the switchboards associated to dwellings.

Table 16 Switchboard condition assessment (Housing footprint)

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Switchboard		2	12			14

The details of the individual inspections and photographs of each infrastructure item are included in Appendices.

10.3 Current demands

The electrical infrastructure evaluation was conducted against the following criteria

- Number of dwellings on tenure, the higher value of the funded dwelling and as quoted in the population report was utilised.
- Urban area, NP001.1, 4. Definitions.
- General Specification for URD Subdivisions, NP001.6, 4.3 Substation Size.
- Normal ADMD (After Diversity Maximum Demand) of 4.5 kVA and high cost subdivisions at 7 kVA.
- Transformer ratings were assumed to be correct in Dekho (PWC asset information system) and compared against photographs of test or transformer numbers collected.
- Substation loads were compared against transformer sizes only. No load flow analysis was conducted.
- No load calculations were performed or assessment conducted on overhead or underground cable, visual inspection from the ground only.
- Streetlighting loads were ignored as they are not significant.

The calculated maximum demand of the Minmarama Park community transformer is 108% of rated capacity based on 4.5kVA/dwelling.

PWC advise that no damage has occurred to this infrastructure.

Table 17 Minmarama Park current demand load vs transformer ratings

Com Id	Community name	Dwellings	Transformer (kVA)	kVA total @ 4.5kVA	kVA total @ 7kVA
825	Minmarama Park	24	100	108	168

A tabulated summary of all community transformers is included in Appendices.

There is a risk of equipment not being maintained associated with the non-standard division of responsibilities between the customer and PWC.

The following points from the PWC Metering Rules should be noted:

- The routine maintenance of metering installations and the replacement of any faulty meters is the responsibility of PWC.
- The property owners are responsible for the maintenance and upkeep of meter rooms, boxes and panels (including lids, doors and locking mechanisms).
- The installation of pre-paid metering is a cost to the customer, refer NP010 Meter Manual-Maintenance of Metering Installations, Power and Water Corporation.

10.4 Future demands

As no new developments are currently planned for Minmarama Park, there are no additional upgrades required to cater for future demand.

10.5 Recommended works

The Minmarama community transformer is owned by PWC who are aware of the loading of this transformer and have assessed the load does not require that this transformer be upgraded or replaced.

The following maintenance works and upgrades are required:

- Replace eight street lights 80W.
- Replace metering switchboard (multiple)
- Replace four switchboards inside the metering panel
- Replace two switchboards associated to dwellings
- Install new street lighting - approximately 52 poles

11 Communications

11.1 Ownership and boundaries

Details of Telstra pit and conduit infrastructure within the town camp boundaries were sought but were not forthcoming.

11.2 Existing infrastructure condition assessment

The telecommunications infrastructure assessed included pits and telephone booths. There were no telephone booths found at Minmarama Park.

Appendices contains the individual reports.

Table 18 Telecommunication pit condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Telecommunication pit			1			1

11.3 Current performance and risks

No details of the performance of communications infrastructure were obtained.

11.4 Future demands

The current availability of broadband services at Minmarama Park is displayed in the Figure 16 below. NBN is available to residents via a fixed telecommunication line on application to an appropriate NBN access provider.

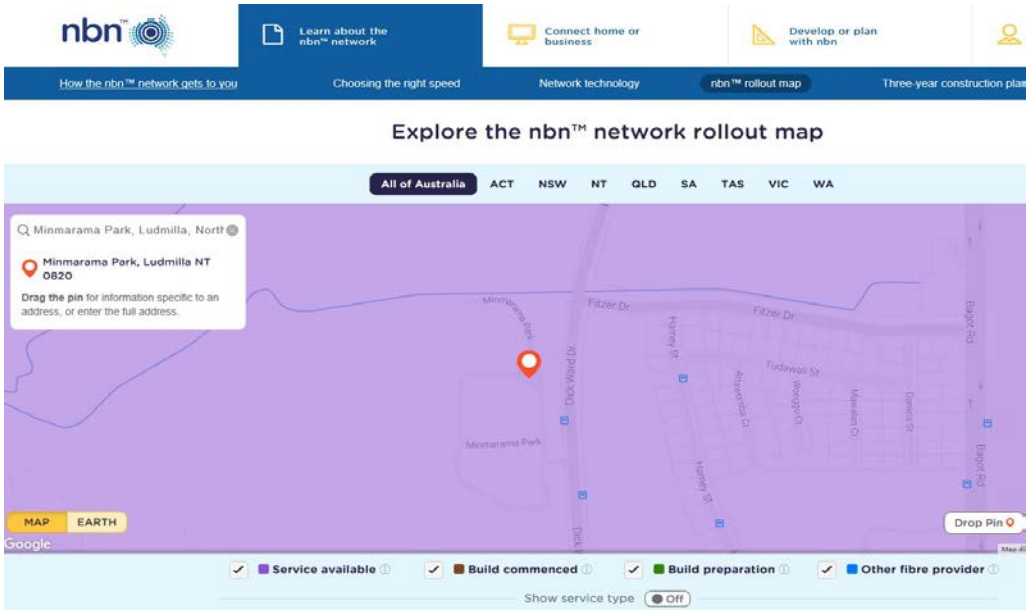


Figure 16 NBN network availability map

The NBN rollout map confirms that NBN is planned to be made available to residents via fixed telecommunications line on application to an appropriate NBN access provider.

11.5 Recommended works

Representatives from NBN's Land Access and Stake Holder management teams are currently engaged with Yilli Housing and NT Housing to look at how camps will be serviced. It is expected that any existing premises in these camps will have some type of NBN service via the NBN brownfields rollout in the future.

No works are required at Minmarama Park because NBN is available to residents via fixed telecommunications line on application to an appropriate NBN access provider.

12 Cost estimates

Table 19 below shows a summary of the cost estimates to undertake the maintenance required to fix the existing infrastructure and to upgrade the existing network to meet current design standards. There are no upgrades required for the future design as no new houses are recommended to be built. The estimates take into account a 30% contingency and are inclusive of GST.

Table 19 Cost estimates

Infrastructure	Maintenance of existing infrastructure	Upgrades to meet current design
Sewerage	$ 0	$ 552,000
Water supply	$ 1,000	$ 958,000
Roadworks	$ 173,000	$ 1,252,000
Stormwater drainage	$ 0	$ 1,173,000
Community structures	$ 14,000	$ 0
Electrical	$ 60,000	$ 889,000
Communications	$ 0	$ 0
Miscellaneous provisions	$ 39,000	$ 588,000
Total (including GST)	$ 287,000	$ 5,412,000
Grand total	**$ 5,699,000**	

The cost estimates are a preliminary estimate only. Actual prices may be different to those used to prepare the estimates. Aurecon does not guarantee that the works can or will be undertaken at the estimated price. A breakdown of the cost estimates can be supplied. Note also that a location factor has been applied to town camps outside of Darwin.

13 Summary

The following works are recommend for Minmarama Park community:

Sewerage

- Install new reticulation main DN150 PVC, including new house connections, manholes and connection to sewage pump station

Water supply

- Replace broken tap
- Install new DN150 PVC looped mains, approximately 1200 m
- Install new DN150 bulk water meters on each looped main
- Install new fire hydrants (cost estimates based on six fire hydrants)
- Install up to 20 residential lot water meters

Roadworks

- Clean existing sign entrance sign of graffiti
- Total reseal of approximately 120 m of road ≈ 480 m2
- Repair approximately 50 potholes throughout community
- General tidy up of approximately 940 m of road
- Repair 590 m of edge breaks
- Repair approximately 30 m2 of surface cracking including crocodile cracks
- It is recommended that the road is upgraded to a two lane network with all appropriate road furniture, line marking, kerbs, footpaths, etc.

Stormwater drainage

- It is recommended that underground stormwater drainage, including kerb and gutter and side entry pits are constructed to reduce flooding and ponding issues within Minmarama Park.

Community structures

- Replace entire shade cloth on playground
- Install nets on basketball rims
- Landscape maintenance around both the basketball court and the playground.

Electrical services

- Replace eight street lights 80W
- Replace metering switchboard (multiple)
- Replace four switchboards inside the metering panel
- Replace two switchboards associated to dwellings
- Install new street lighting - approximately 52 poles
- Since the load on the transformer exceeds 85% it is recommended that power monitoring be undertaken to allow PWC to determine, by assessment, whether the transformer needs to be upgraded or not.

Communications

- No works are required because NBN is available to residents via fixed telecommunications line on application to an appropriate NBN access provider.

Civil inspection reports

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 08:41 Imagery: Nearmap 11/06/2016

A3 scale: 1:2,500

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 1
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Sewerage

825 - Minmarama Park (Darwin)

7086

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 08:41 Imagery: Nearmap 11/06/2016

A3 scale: 1:2,500

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 1
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Water

825 - Minmarama Park (Darwin)

7087

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 08:41 Imagery: Nearmap 11/06/2016

A3 scale: 1:2,500

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 1
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments
Road furniture, stormwater drainage & community structures
825 - Minmarama Park (Darwin)

7088

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 1:52:34 PM

Insp ID: 147 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Stormwater Infrastructure:	Culverts
Culvert Type:	RCBC
Diameter (mm):	
Width (mm):	1550
Culvert Depth (mm):	800
Culvert Length (m):	7
Culvert Condition:	4 - Very Good
Culvert Blockage (%):	0
Culvert Comments:	
Culvert Head Wall:	Yes
Safety Grate:	No
Headwall Blockage:	0
Headwall Condition:	4 - Very Good
Headwall Comment:	
End Wall:	Yes
End Wall condition:	4 - Very Good
EW Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 9/11/2016 11:15:43 AM

Insp ID: 185 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Stormwater Infrastructure:	Culverts
Culvert Type:	RCP
Diameter (mm):	1200
Width (mm):	
Culvert Depth (mm):	
Culvert Length (m):	
Culvert Condition:	3 - Good
Culvert Blockage (%):	10
Culvert Comments:	
Culvert Head Wall:	No Access
Safety Grate:	No Access
Headwall Blockage:	
Headwall Condition:	
Headwall Comment:	
End Wall:	Yes
End Wall condition:	3 - Good
EW Comment:	Some scour around end wall, Ponding in culvert

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:08:40 PM

Insp ID: 150	Group 1 - Darwin, Jabiru, Adelaide River	Minmarama Park

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	4 - Very Good
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:51:05 PM

Insp ID: 155	Group 1 - Darwin, Jabiru, Adelaide River	Minmarama Park

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	4 - Very Good
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:34:25 AM

Insp ID: 142 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Road Name:	825_4
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.04
Road Type:	Sealed - spray seal
Section Width (m):	4
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Surfacing Cracks	5	3 - Good	5
Undulation/Settlement	30	2 - Poor	Soil build up in undulations, 30 % of road

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed					

Linemarking Section

Obstruction Section

Road Obstruction	Other Road Obstruction
Trees	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:34:25 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 11:34:25 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 1:57:24 PM

Insp ID: 148 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Road Name:	825_3
What are you inspecting:	Pavements
Ch From (km):	0.25
Ch To (km):	0.34
Road Type:	Sealed - spray seal
Section Width (m):	4
Road Condition:	3 - Good
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks		3 - Good	
Undulation/Settlement		3 - Good	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed					

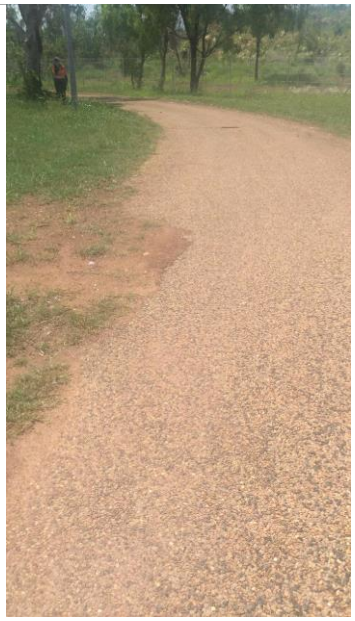
Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 1:57:24 PM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 1:57:24 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:10:21 PM

Insp ID: 152 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Road Name:	825_3
What are you inspecting:	Pavements
Ch From (km):	0.15
Ch To (km):	0.25
Road Type:	Unsealed
Section Width (m):	4
Road Condition:	2 - Poor
General Comment:	Gravel turn around area at ch100

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Potholes	1	2 - Poor	
Edge Breaks		3 - Good	
Undulation/Settlement		3 - Good	

Kerbs Section

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed					

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:10:21 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:10:21 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:39:00 PM

Insp ID: 153 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Road Name:	825_2
What are you inspecting:	Pavements
Ch From (km):	0.4
Ch To (km):	0.52
Road Type:	Sealed - spray seal
Section Width (m):	4
Road Condition:	1 - Very Poor
General Comment:	Last 50 m is unsealed

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks		1 - Very Poor	
Potholes	10		

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed					

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:39:00 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:39:00 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:38:20 PM

Insp ID: 154 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Road Name:	825_2
What are you inspecting:	Pavements
Ch From (km):	0.3
Ch To (km):	0.4
Road Type:	Sealed - spray seal
Section Width (m):	4
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Surfacing Failure		2 - Poor	
Potholes	6	2 - Poor	
Undulation/Settlement		2 - Poor	
Edge Breaks		2 - Poor	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed					

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:38:20 PM

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Civil Infrastructure

Inspection Date 8/11/2016 2:38:20 PM

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Civil Infrastructure

Inspection Date 8/11/2016 3:13:42 PM

Insp ID: 159 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Road Name:	825_3
What are you inspecting:	Pavements
Ch From (km):	0.05
Ch To (km):	0.15
Road Type:	Unsealed
Section Width (m):	
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Potholes	12	2 - Poor	
Undulation/Settlement	10		

Kerbs Section

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed				3	

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 3:13:42 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 3:13:42 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 3:08:46 PM

Insp ID: 160 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Road Name:	825_3
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.05
Road Type:	Sealed - spray seal
Section Width (m):	8
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Crocodile Cracks	5	4 - Very Good	5 % of sealed section
Edge Breaks		3 - Good	

Kerbs Section

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 3:08:46 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 3:08:46 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 3:08:46 PM

Insp ID: 161 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Road Name:	825_3
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.05
Road Type:	Sealed - spray seal
Section Width (m):	8
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Crocodile Cracks	5	4 - Very Good	5 % of sealed section
Edge Breaks		3 - Good	

Kerbs Section

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 3:08:46 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 3:08:46 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:58:59 PM

Insp ID: 162 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Road Name:	Minmarama Park
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.13
Road Type:	Sealed - spray seal
Section Width (m):	4
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks		1 - Very Poor	
Potholes	3	3 - Good	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed					

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:58:59 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:58:59 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 9/11/2016 10:57:51 AM

Insp ID: 183 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Road Name:	825_2
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.15
Road Type:	Sealed - spray seal
Section Width (m):	4
Road Condition:	2 - Poor
General Comment:	First 50m of road in poor condition, last 100m in good condition

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Potholes	5	3 - Good	5% of road has potholes , varying size

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed					

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 9/11/2016 10:57:51 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 9/11/2016 10:57:51 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 9/11/2016 11:09:51 AM

Insp ID: 184 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Road Name:	825_2
What are you inspecting:	Pavements
Ch From (km):	0.15
Ch To (km):	0.3
Road Type:	Sealed - spray seal
Section Width (m):	4
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Undulation/Settlement	50		50% of road has undulations
Potholes	10	2 - Poor	10 % of road has potholes

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed					

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 9/11/2016 11:09:51 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 9/11/2016 11:09:51 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:06:16 PM

Insp ID: 151 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Sewerage Asset are you capturing:	Pump Station
No of Pumps in Pump Station:	2
Cabinet Condition:	4 - Very Good
Cabinet Comment:	
Alarm Light:	No
Alarm Light Condition:	
Overhead Light:	Yes
Overhead Light Condition:	4 - Very Good
Light Comments:	
Davit Crane Present:	Yes
Davit Crane Capacity (kg):	
Davit Crane Condition:	2 - Poor
Davit Crane Comments:	Surface rust
Fence TYPE:	Standard Security Fence (3 Strands barbed)
PS Fence Height (m):	1.8
PS Gates Locked:	Yes
PS Fence Condition:	3 - Good
Fence Comment:	
Flow meter type:	
Flow meter condition:	
Flow meter comments:	Not accessible
Macerator Pump Make/Model:	
Manufacturers Date:	
Macerator Pump:	No Access
Macerator Pump Condition:	
Macerator Pump Comments:	
Outgoing Pipe Diameter (mm):	
Valves:	
Outgoing Pipe Comments:	
Water Supply to pump station:	Yes
Fire hose reel:	No
Access cover locked:	Yes
Safety grid beneath access cover:	No Access

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:06:16 PM

Condition:	
Cabinet Locked:	Yes
Cabinet Lock Condition:	4 - Very Good
Hand rails around entrance:	Yes
Fixed or removable:	fixed
Rail Condition:	
Safety Comments:	

Pump Station Pumps section

Pump Capacity	Pump Make	Manufacture Date	Pump Chain	Condition	Comments
					Pump station not accessible

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:06:16 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:06:16 PM

Northern Territory Camps

Civil Infrastructure

Inspection Date 8/11/2016 1:34:34 PM

Insp ID: 143 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Inspection Type:	Shade Structure
Shade Structure Type:	Basket Ball Court
Shade Floor Type:	Concrete
Roof Type:	Not Covered
Width (mm):	
Length (mm):	
Appearance:	3
Appearance Comment:	No nets on basketball ring
Condition:	3 - Good
Comment:	

Northern Territory Camps

Civil Infrastructure

Inspection Date 8/11/2016 2:58:02 PM

Insp ID: 158 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Inspection Type:	Shade Structure
Shade Structure Type:	Play ground
Shade Floor Type:	Rubber Mats
Roof Type:	Shadecloth
Width (mm):	
Length (mm):	
Appearance:	3
Appearance Comment:	
Condition:	3 - Good
Comment:	Torn shadecloth

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 3:11:33 PM

Insp ID: 156 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Road Name:	Minmarama Park
What are you inspecting:	Signs
Type of Sign:	Welcome to Minmarama
Sign Condition:	2 - Poor
Sign Comment:	Graffitied
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 1:45:15 PM

Insp ID: 146	Group 1 - Darwin, Jabiru, Adelaide River	Minmarama Park

Stormwater Infrastructure:	Swales
Type of lining:	Concrete
Are dimensions uniform along drain:	Yes
Base Width (m):	2.4
Overall Width (m):	2.4
Swale Depth (m):	600
Length of Batter 1 (m):	0
Length of Batter 2 (m):	0
Swale Condition:	4 - Very Good
Swale Ponding:	No
Drain flooded at time of inspection:	No
Swale Comments:	Halikos private property

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 9/11/2016 11:17:57 AM

Insp ID: 187 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

Stormwater Infrastructure:	Swales
Type of lining:	No Lining
Are dimensions uniform along drain:	Yes
Base Width (m):	1.5
Overall Width (m):	4.5
Swale Depth (m):	1.2
Length of Batter 1 (m):	1.5
Length of Batter 2 (m):	1.5
Swale Condition:	2 - Poor
Swale Ponding:	Yes
Drain flooded at time of inspection:	Yes
Swale Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 9/11/2016 11:17:57 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 3:09:36 PM

Insp ID: 157	Group 1 - Darwin, Jabiru, Adelaide River	Minmarama Park

What Water Asset Are you Capturing: Taps

Diameter(mm):	25
Tap Leakage:	No
Tap Condition:	1 - Very Poor
Tap Comment:	No tap handle

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 1:40:20 PM

Insp ID: 144	Group 1 - Darwin, Jabiru, Adelaide River	Minmarama Park

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Bulk
Bulk Water Meter Size (mm):	150
Bulk Water Meter Condition:	4 - Very Good
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	
Lot Water Meter Condition:	
Lot Water Meter Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 1:40:20 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 8/11/2016 1:43:50 PM

Insp ID: 145	Group 1 - Darwin, Jabiru, Adelaide River	Minmarama Park

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	25
Bulk Water Meter Condition:	4 - Very Good
Bulk Water Meter Comment:	Beside larger water meter
Lot Number:	
Lot Water Meter Size:	
Lot Water Meter Condition:	
Lot Water Meter Comment:	

Northern Territory Town Camps

Civil Infrastructure

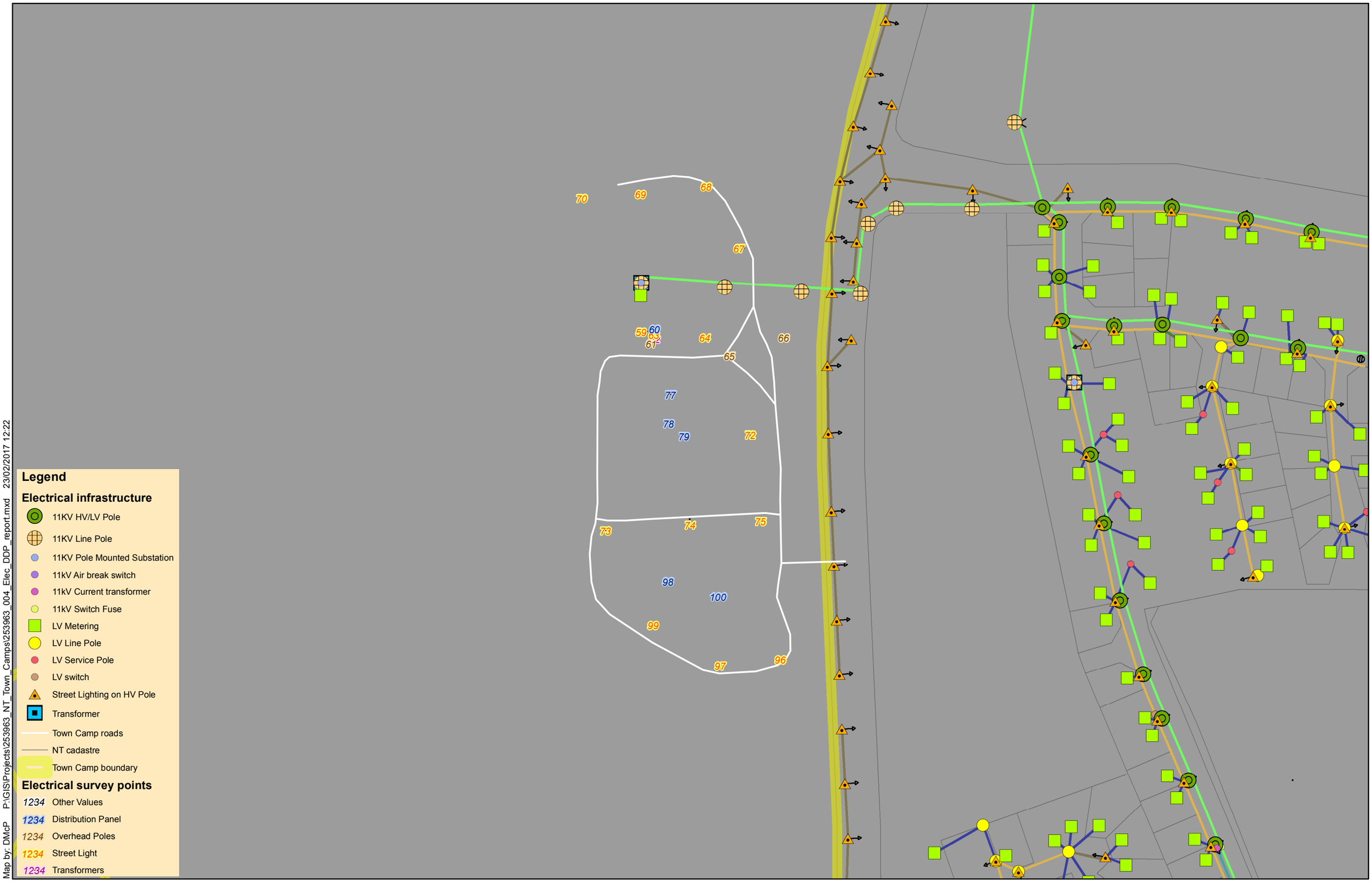
Inspection Date 8/11/2016 2:02:15 PM

Insp ID: 149 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	2
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	2 side by side, within property boundary

Electrical inspection report



A3 scale: 1:2,500

0 20 40 60 80 100 m

Date: 23/02/2017 Version: 3

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Electrical

825 - Minmarama Park (Darwin)

7142

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:03:27 PM

Insp ID: 60 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Distribution Panel
What is Main Distribution Panel installation method:	Outdoor
Is the distribution panel labelled:	No
What is Distribution Panel main CB Rating:	Unknown
What is the main incoming cable type/Size to Distribution Panel:	Unknown
What is the condition of switchboard:	3
Condition Comments:	Surrounding needs cleaning.
What is the condition of cables/glands into switchboard:	
Cable/Gland Condition Comments:	Unknown
Distribution Panels name plate access:	No

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:03:27 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 3:30:26 PM

Insp ID: 76	Group 1 - Darwin, Jabiru, Adelaide River	Minmarama Park

What Comms Category are you capturing:	Distribution
What is distribution method to households:	Underground
Is it Shared with PWC:	
Is there Anti-climb barrier provided for this pole:	
What is Pole construction type:	
Is street light fitted:	
Is there concrete collar around the base of pole:	
What is the condition of tap off to house:	
What is the condition of pole:	
How many Lots are connected to this pole:	
Is there access to Pits to take a photo:	No
What is Pit Condition:	3
Underground Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 3:37:01 PM

Insp ID: 77 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Distribution Panel
What is Main Distribution Panel installation method:	Outdoor
Is the distribution panel labelled:	Yes
What is Distribution Panel main CB Rating:	
What is the main incoming cable type/Size to Distribution Panel:	
What is the condition of switchboard:	3
Condition Comments:	Door bent and corroded
What is the condition of cables/glands into switchboard:	
Cable/Gland Condition Comments:	
Distribution Panels name plate access:	No

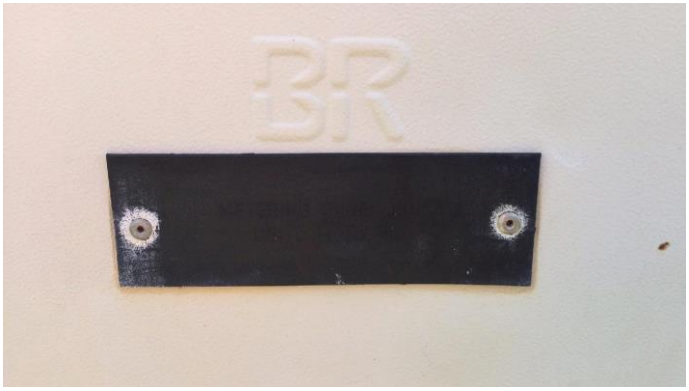
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 3:43:43 PM

Insp ID: 78 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Distribution Panel
What is Main Distribution Panel installation method:	Outdoor
Is the distribution panel labelled:	Yes
What is Distribution Panel main CB Rating:	Unclear
What is the main incoming cable type/Size to Distribution Panel:	Unknown
What is the condition of switchboard:	3
Condition Comments:	Rusted points on body .
What is the condition of cables/glands into switchboard:	
Cable/Gland Condition Comments:	Unknown
Distribution Panels name plate access:	No



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 3:43:43 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 10:08:25 AM

Insp ID: 79 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Distribution Panel
What is Main Distribution Panel installation method:	Outdoor
Is the distribution panel labelled:	No
What is Distribution Panel main CB Rating:	63
What is the main incoming cable type/Size to Distribution Panel:	
What is the condition of switchboard:	3
Condition Comments:	Minor corrosion
What is the condition of cables/glands into switchboard:	
Cable/Gland Condition Comments:	
Distribution Panels name plate access:	Yes

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:37:43 AM

Insp ID: 98 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Distribution Panel
What is Main Distribution Panel installation method:	Outdoor
Is the distribution panel labelled:	NA
What is Distribution Panel main CB Rating:	
What is the main incoming cable type/Size to Distribution Panel:	
What is the condition of switchboard:	3
Condition Comments:	
What is the condition of cables/glands into switchboard:	
Cable/Gland Condition Comments:	Unknown
Distribution Panels name plate access:	No

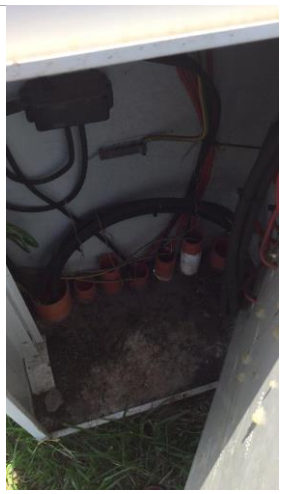
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:53:02 AM

Insp ID: 100 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Distribution Panel
What is Main Distribution Panel installation method:	Outdoor
Is the distribution panel labelled:	No
What is Distribution Panel main CB Rating:	100
What is the main incoming cable type/Size to Distribution Panel:	
What is the condition of switchboard:	2
Condition Comments:	Able to access back of switchboard
What is the condition of cables/glands into switchboard:	3
Cable/Gland Condition Comments:	
Distribution Panels name plate access:	No



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:53:02 AM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:50:59 AM

Insp ID: 3293 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid
Meter Switchboard Cond:	2
Meter Condition:	3
Meter Comment:	Blank plates are missing on CB slot.
Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 2:59:08 PM

Insp ID: 3294 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment:

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 2:44:54 PM

Insp ID: 3295 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: 4 digital meters. Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 2:10:00 PM

Insp ID: 3296 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Bulk Meter

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: One Analogue Meter + 2 Digital Meters. Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

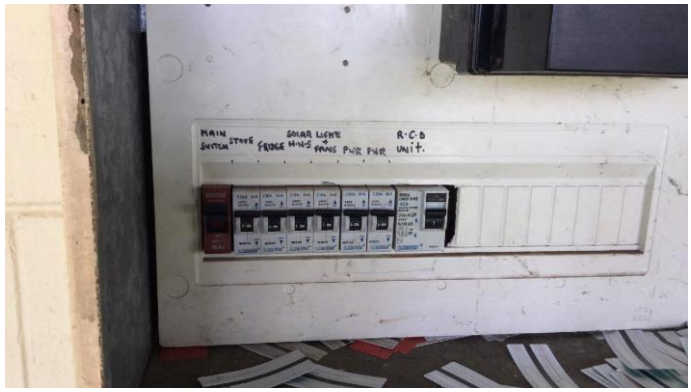
Electrical Infrastructure

Inspection Date 9/11/2016 11:35:21 AM

Insp ID: 3381 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid
Meter Switchboard Cond:	2
Meter Condition:	3
Meter Comment:	Blank plates are missing on CB slot.
Comments:	



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 12:10:19 PM

Insp ID: 3382 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: Assumed prepaid meter is servicing, and analogue is out of service. To be confirmed. Ind Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 12:22:57 PM

Insp ID: 3383 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Electrical

Meter Switchboard Cond:

Meter Condition:

Meter Comment: Switchboard Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 12:08:42 PM

Insp ID: 3384 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Electrical

Meter Switchboard Cond:

Meter Condition:

Meter Comment: Switchboard Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:57:20 AM

Insp ID: 3385 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Electrical

Meter Switchboard Cond:

Meter Condition:

Meter Comment: Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:37:48 AM

Insp ID: 3386 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid	
Meter Switchboard Cond:	3	
Meter Condition:	3	
Meter Comment:	One Analogue Meter + Two Digital Meters.	Indoor SB, Cond 3
Comments:		

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:23:20 AM

Insp ID: 3387 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed.

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 12:04:21 PM

Insp ID: 3388 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:50:33 AM

Insp ID: 3389 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: Assumed prepaid meter is servicing, and analogue is out of service. To be confirmed. In Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:33:16 AM

Insp ID: 3390 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed.

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:17:23 AM

Insp ID: 3391 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 2

Meter Condition: 3

Meter Comment: Assumed prepaid meter is servicing, and analogue is out of service. To be confirmed. Blan

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:03:48 AM

Insp ID: 3392 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

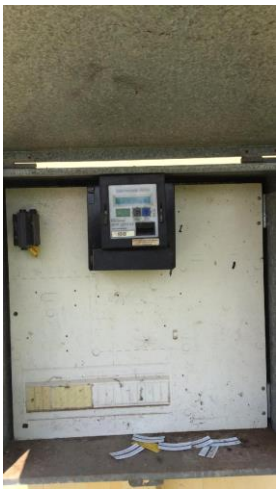
What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: Assumed prepaid meter is servicing, and analogue is out of service. To be confirmed. Ind Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 10:49:13 AM

Insp ID: 3393	Group 1 - Darwin, Jabiru, Adelaide River	Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid
Meter Switchboard Cond:	3
Meter Condition:	3
Meter Comment:	Indoor SB, Cond 3
Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 10:37:12 AM

Insp ID: 3394 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: Assumed prepaid meter is servicing, and analogue is out of service. To be confirmed. Ind Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:09:16 AM

Insp ID: 3395 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid
Meter Switchboard Cond:	3
Meter Condition:	3
Meter Comment:	Indoor SB, Cond 3
Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 10:41:14 AM

Insp ID: 3396 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid
Meter Switchboard Cond:	2
Meter Condition:	3
Meter Comment:	Blank plates are missing on CB slot.
Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:08:05 PM

Insp ID: 61 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:08:05 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:18:37 PM

Insp ID: 65 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted.

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:18:37 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:23:06 PM

Insp ID: 66 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:23:06 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:36:21 PM

Insp ID: 71 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Pump and Motors

What is Main Distribution Panel installation method:

What is Motor installation method: Outdoor

Is there access to Pump/Motors name plate to take a photo: No

What is Motor Rating:

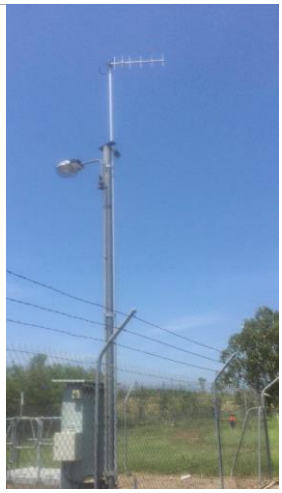
What is cable type/size connected to Motor terminal box:

What is the condition of the pump:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:36:21 PM



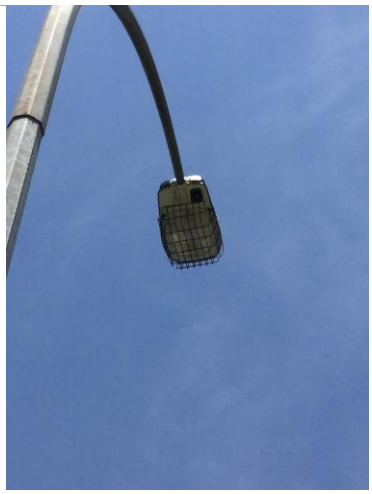
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 1:58:12 PM

Insp ID: 59 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	Unknown
What Wattage is the lamp:	
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	8



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:09:26 PM

Insp ID: 63	Group 1 - Darwin, Jabiru, Adelaide River	Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	Unknown
What Wattage is the lamp:	
What is the condition of street lights:	1
What is Street Lighting pole installation height (approximate):	8

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:18:11 PM

Insp ID: 64	Group 1 - Darwin, Jabiru, Adelaide River	Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	M80D 11
What Wattage is the lamp:	80
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	6

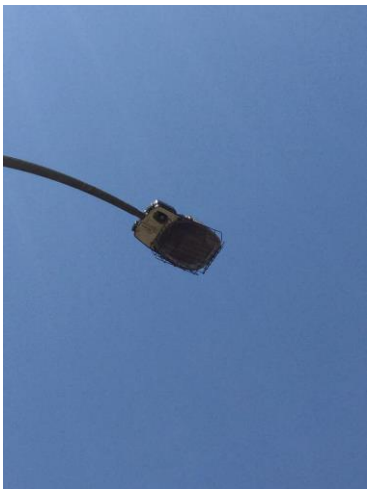
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:24:01 PM

Insp ID: 67	Group 1 - Darwin, Jabiru, Adelaide River	Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	M80D11
What Wattage is the lamp:	80
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	6



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:27:09 PM

Insp ID: 68	Group 1 - Darwin, Jabiru, Adelaide River	Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	M80D11
What Wattage is the lamp:	80
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	6

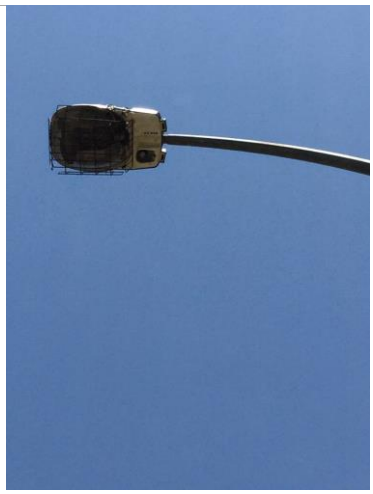
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:30:25 PM

Insp ID: 69 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	M80 D 11
What Wattage is the lamp:	80
What is the condition of street lights:	2
What is Street Lighting pole installation height (approximate):	8



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:35:49 PM

Insp ID: 70 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	M80D 01
What Wattage is the lamp:	80
What is the condition of street lights:	2
What is Street Lighting pole installation height (approximate):	8

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:41:11 PM

Insp ID: 72 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	M80D 01
What Wattage is the lamp:	80
What is the condition of street lights:	2
What is Street Lighting pole installation height (approximate):	8

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 3:10:55 PM

Insp ID: 73 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	MD80 01
What Wattage is the lamp:	
What is the condition of street lights:	2
What is Street Lighting pole installation height (approximate):	6

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 3:15:03 PM

Insp ID: 74 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	M80D 01
What Wattage is the lamp:	80
What is the condition of street lights:	2
What is Street Lighting pole installation height (approximate):	8

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 3:19:11 PM

Insp ID: 75 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	MD8001
What Wattage is the lamp:	80
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	6

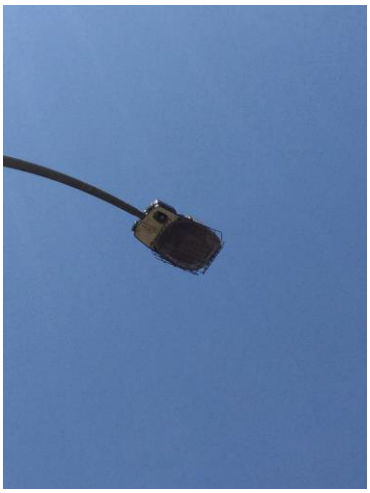
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:30:26 AM

Insp ID: 96 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	
What Wattage is the lamp:	80
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	6



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:34:31 AM

Insp ID: 97 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	M80D
What Wattage is the lamp:	80
What is the condition of street lights:	1
What is Street Lighting pole installation height (approximate):	8

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 9/11/2016 11:41:37 AM

Insp ID: 99 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	M80 D
What Wattage is the lamp:	80
What is the condition of street lights:	1
What is Street Lighting pole installation height (approximate):	8

Northern Territory Town Camps

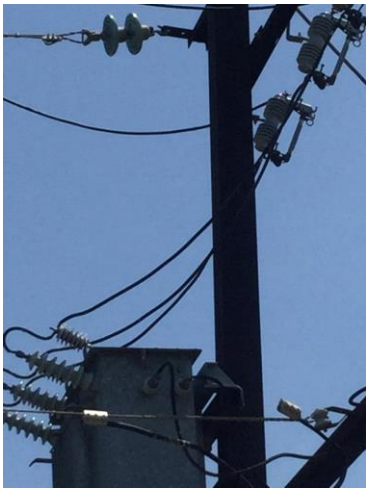
Electrical Infrastructure

Inspection Date 8/11/2016 2:02:49 PM

Insp ID: 62 Group 1 - Darwin, Jabiru, Adelaide River Minmarama Park

What Category are you capturing: Transformers

What is Transformer installation method:	Pole
If method know:	11SS1P
What is the condition of the mounting:	3
What is Transformer Rating:	Unknown
Is there access to transformers name plate to take a photo:	No
What is the condition of transformer:	3
What is cable type to transformer:	Black insulated single core
What is cable size to transformer:	
Is there switch gear or fusing associated with the transformer:	Drop out fuses
Transformer Comment:	



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 8/11/2016 2:02:49 PM

Road map

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Roads_DDP2.mxd 20/02/2017 16:41 Imagery: Nearmap 11/06/2016

A3 scale: 1:2,500

0 20 40 60 80 100 m

Date: 20/02/2017 Version: 1

Coordinate system:MGA52

NT Town Camp Road Assessments

825 - Minmarama Park (Darwin)

7198

Existing drawings

-12°24'31"
700 872 E
700 929 E
700 986 E
701 043 E
701 100 E
701 157 E
701 214 E
-12°24'31"
13°5'05"
13°51'05"
8 627 520 N
8 627 463 N
8 627 406 N
8 627 349 N
8 627 292 N
8 627 235 N
8 627 178 N
8 627 121 N
8 627 064 N
8 627 007 N
-12°24'50"
700 872 E
700 929 E
700 986 E
701 043 E
701 100 E
701 157 E
701 214 E
-12°24'50"
13°5'05"
13°51'05"

5182

FITZER DRIVE

DRIVE

WARD

DICK

Park

1
2
3
4
5
7
8
9
10
33
34

TOWN OF DARWIN

LUDMILLA

11
12
13
14
15
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31
32

5182

5182

LEGEND

LAND USE PLANNING:

APPROX. POSITION OF BUILDING constructed since date of photography

LAND EXCLUDED FROM DEVELOPMENT

GENERAL EXCLUSION/BUFFERS

CULTURAL EXCLUSION AREAS:

Unauthorised entry, works on or use of land where there is a sacred site is an offence under the Northern Territory Aboriginal Sacred Sites Act. For conditions relating to works on or use of land within a Cultural Exclusion Area contact the Aboriginal Areas Protection Authority (AAPA): email enquiries.aapa@nt.gov.au or Phone 8999 4332.

This advice does not negate the need for entry, works, or use which may be required under the Aboriginal land Rights (NT) Act (In the case of Aboriginal Land), or another statute.

CADASTRE

Current 123

Proposed 123

Locality LOCALITY

TOPOGRAPHY

Road Sealed, Bridge

Road Unsealed, Track

Footpath, Drain, Culvert

Wall, Gate, Fence, Cattle Grid

Railway, Disused Railway

Aerodrome Tarmac, Landing Strip

Taxiway, Apron

Pipeline: Oil, Water, Undetermined Gas, Sewage

Building, Building-Shape unconfirmed

Shade Structure, Incomplete Building

Sewage Ponds, Tailings Pond

Oval, Arena, Swimming Pool

High Water Mark, Low Water Mark

Mine; Quarry, Surface Excavation

Contour; Index, Intermediate 75

Contour; Depression

Top of Bank, Bottom of Bank, Cliff

Watercourse; Perennial, Intermittent, Channel or Canal

Water Body; Perennial, Intermittent

Water Body; Reservoir, Water Hole

Swamp; Swamp Perennial, Swamp Intermittent

Flat; Mud Flat, Clay/Saltpan, STI

Pole; Power, General, Light,

Tank; Water, Elevated, Non-Water, Silo

Manhole, Pylon, Communication Tower, Bore.

UTILITY SERVICES

ELECTRICITY

LOW VOLTAGE LV

HIGH VOLTAGE HV

WATER RETICULATION

WATER MAIN W

WATER RISING MAIN W W

SEWER

SEWER MAIN S

SEWER RISING MAIN S S

DIAL BEFORE YOU DIG www.1100.com.au

Locality Diagram

AVAILABLE FROM AND PRODUCED BY:

Dept Lands, Planning and the Environment
Land Information Division
3rd Floor NAB House, Darwin
GPO Box 1680 Darwin NT 0801
http://www.nt.gov.au/dlpe

Northern Territory Government

General enquiries, corrections, updates, errors and omissions:

Indigenous Community Land Use Planning, Dept of Lands, Planning and the Environment
TEL: (08) 8999 1300, FAX: (08) 8999 7189, Email: planning@nt.gov.au

Topographic Information:
Land Information Division
Dept of Lands, Planning and the Environment
TEL: (08) 8995 5331
FAX: (08) 8995 5366
Email: landinfo@nt.gov.au

Cadastral Information:
Office of the Surveyor-General
Dept of Lands, Planning and the Environment
TEL: (08) 8995 5363
FAX: (08) 8995 5365
Email: landinfo@nt.gov.au

Power, Water or Sewer Information:
Remote Operations Planning Branch
Power and Water Corporation
TEL: (08) 8924 5094
FAX: (08) 8924 5360

Planning Information:
Indigenous Community Land Use Planning
Dept of Lands, Planning and the Environment
TEL: (08) 8999 1300
FAX: (08) 8999 7189
Email: planning@nt.gov.au

Aboriginal Areas Protection Authority:
The Registrar
Aboriginal Areas Protection Authority
TEL: (08) 8999 4332
Email: enquiries.aapa@nt.gov.au

Housing Infrastructure Information:
Infrastructure Delivery Branch
Dept of Housing, Local Government & Regional Services
TEL: (08) 8999 5013
FAX: (08) 8999 5110
Email: ies.dhlgrs@nt.gov.au

NOTES: POWER POLES, MANHOLES, SEPTIC TANKS, TOWERS/POSTS and other similar shaped objects are captured from Aerial Photography and have locations confirmed from aerial survey techniques. These features are suitable as LOCAL SURVEY CONTROL. Their ground location is expected to be within +/-0.3m of their mapped location.

DIAL BEFORE YOU DIG phone 1100 (freecall) or visit www.1100.com.au For water, sewer and power information and connection requirements for developments contact Power and Water Corporation, Indigenous Community Development on 1800 245 092, and visit http://www.powerwater.com.au/business

SOURCE INFORMATION

CURRENCY OF TOPOGRAPHY :	3 Jun 2011
SOURCE MAP SCALE :	570
ZONE UTM :	52
CONTOUR INTERVAL :	
HORIZONTAL DATUM :	GDA94
VERTICAL DATUM :	AHD
PROJECTION :	Transverse Mercator
DATE GENERATED :	18 June 2013

N

GDA

0 10 20 30 40 50
metres

SERVICED LAND AVAILABILITY PROGRAM

SLAP Map

Minmarama Park (Darwin Town Camp)

Darwin City Council

Community ID : 825