Akngwertnarre

Akngwertnarre (Morris Soak)

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

- 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
- Power and Water Corporation Indigenous Community Engineering Guidelines (2008)
- Essential Services Infrastructure Assessment and Upgrade Guidelines (for Town Camps in Urban Communities), Power and Water Corporation, February 2009.
- Power and Water Corporation Standard Drawings
- Australian Standards

Water supply

- 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 Standard Drawings
- Essential Services Infrastructure Assessment and Upgrade Guidelines (for Town Camps in Urban Communities), Power and Water Corporation, February 2009.
- 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.

- Alice Springs Town Council – Subdivision and Development Guidelines, November 2012

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,
- Alice Springs Town Camp Sewage Pumping Station Assessments, Byrne Design, 2014,
- 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 Morris Soak community on 18 November 2016 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 sewer infrastructure at Morris Soak is owned by the Akngwertnarre Association Incorporated, however is the responsibility of Ingkerreke Outstations Resource Services to maintain.

Power and Water Corporation (PWC) own the connection and the external town sewer network up to manhole 4(1/7). PWC is not responsible for sewer infrastructure within the community.

It appears as though some of the sewerage infrastructure has been upgraded recently as the manholes are stamped with a 2010 date. PWC did not have any as constructed drawings of the upgrades and they noted that the work done was not to bring the infrastructure up to full PWC standards.

5.1.1 Connection methods and billing

PWC advised that they currently charge a single sewerage bill based on the number of houses, which for Morris Soak is 10, although there are 15 houses. The sewerage bill is charged to the Department of Housing and Community Development.

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 manhole covers, as all other sewerage infrastructure is below ground. A total of seven 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
Manhole			2	4	1	7

Figure 1 Sewer manhole, condition: *very good*

Figure 2 Sewer manhole, condition: *poor*

The sewer manholes were generally in very good condition. However, some were located within property boundaries which is not permitted as per PWC standards.

5.3 Current performance and risks

5.3.1 Current sewer network performance

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 Morris Soak is 15, this multiplied by 9 EP per house gives a total current EP of 135.

Sewer layout drawings were available which showed that the pipe is DN150 uPVC, with grade 1%, which is compliant with PWC standards.

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 PWC minimum slope (%)	Q_{full} (L/s)	Current Q (L/s)	Current capacity (%)
Catchment 1	135	150	1.0	16.50	1.72	10%

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

According to the SLAP map (refer Appendices), the sewer network is currently located within property boundaries and does not follow the road reserve, although there are no formal road reserves. This is not compliant with PWC standards. An easement should be created over the sewerage infrastructure if the assets are to be gifted to PWC.

5.4 Future demands

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

5.5 Recommended works

No immediate maintenance works are required. As the pipe size and grade complies with PWC standards, and the current capacity is sufficient, it is not recommended that the pipe is upgraded so that it can be rebuilt within the road reserves. If substantial future development is foreseen for this town camp, then the location of pipework may need to be reconsidered.

6 Water supply

6.1 Ownership and boundaries

The water supply infrastructure was upgraded as part of the SIHIP program. The existing water main servicing Morris Soak is a DN150 PVC ring main (refer Appendices).

The water supply assets with Morris Soak are believed to be owned by Akngwertnarre Association Incorporated, but are the responsibility of Ingkerreke Outstations Resource Services to maintain. The water is supplied from PWC pipes outside of the community.

6.1.1 Connection methods and billing

A single bulk water meter was found at the main entrance to the community. PWC have advised they currently maintain water assets up to this bulk water meter. It is understood that the bulk meter is used to measure the water usage for the entire community. Therefore, a single bill would be provided by PWC to the Akngwertnarre Association Incorporated. This does not comply with PWC Essential Services Infrastructure Assessment Guidelines (2009) for town camps, which state that shared meters should be removed and services to be measured for individual lots. It is not known what contribution the residents make towards the water bill.

It is proposed that PWC continues measuring 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 Akngwertnarre Association Incorporated for Morris Soak. It will be up to governing body to assign bills to residents accordingly.

It is recommended that the individual lot meters are installed in addition to the proposed use of bulk water meters. The lot meters will assist the governing body with 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.

Bennett Design reported 15 dwellings in the community. Therefore, 15 water meters are required to ensure each lot has its own meter. Note, some water meters may have been present however, not visible due to overgrown flora or restricted property access. Consequently, water meters may not have been discovered during the inspection.

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. The assessment was limited to services that could be assessed above ground; no below ground services were inspected.

A comprehensive review of all available documentation, including reviewing as-constructed drawings and having discussions with Power and Water Corporation was conducted. The following table compares the assets that have been constructed, according to the as-constructed drawings, and the assets assessed during the inspections conducted by Aurecon.

Table 4 Water supply assets inspected

Asset type	Number of assets as per documentation	Number of assets assessed during inspection
Fire hydrants	5	5
Water meter (residential lots)	16	0
Air valves	-	1
Water meter (bulk)	-	1

As per Table 4 no water meters were assessed during the inspections which appears to be due to being located underground. The condition of each asset is as follows:

Table 5 Water asset condition assessment

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

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

Figure 4 Air valve, condition: *poor*

Figure 5 Fire hydrant, condition: *good*

The fire hydrants at Morris Soak appeared to be relatively new and the only maintenance required is some general clearing of leaves and dirt partially covering two hydrants.

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 1300 L/capita/day, based on PWC's supplement to WSA 03 2002. This value is for the southern region of NT. It was assumed that the nominal peak day flow of 1300 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 6 shows the calculated demand.

Table 6 Current water demand

Total dwellings	EP	Demand (l/s)	Peak hour demand (l/s)
15	135	2.03	6.08

The existing DN150 water main is expected to meet PWC flow requirements (peak hour and fire flow).

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 Morris Soak no additional hydrants are required at this stage.

The water reticulation is believed to have sufficient capacity and it appears that the pipe sizes are compliant with PWC standards. The as-constructed drawings show a section of the water main is installed in a dedicated water main easement, however the Land Title indicates no formal easements are located within the community.

6.4 Future demands

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

6.5 Recommended works

The following works are recommended to upgrade the current infrastructure;

- Clear dirt from two fire hydrants

The community is viewed overall as a large single lot and as previously detailed, proposed to have the water usage measured accordingly. In order to measure the water usage as a single lot, a bulk water meter should be installed. Since the existing network has two supply points, one should be disconnected with dead ends reconnect to create network looping. This allows the single remaining supply to be metered. The cost estimates for upgrades at Morris Soak include;

- Disconnect secondary supply points and loop endpoints
- Install new DN150 bulk water meter at community boundary
- Install 15 new residential lot water meters

7 Roadworks

7.1 Ownership and boundaries

It is the current understanding that the road infrastructure at Morris Soak is owned by the Akngwertnarre Association Incorporated, however is the responsibility of Ingkerreke Outstations Resource Services to maintain.

7.2 Existing infrastructure condition assessment

The road network within Akngwertnarre (Morris Soak) community consists primarily of poorly sealed roads. The community has two entrances which are both sealed and functional. There are also numerous tracks which appear to be used frequently which are not included in the inspection and report. Road furniture including signs and speed humps were also inspected. Table 7 below summarise the condition of the road furniture 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
Signs		3		1		4

Figure 6 Sign, condition: *very good*

Figure 7 Sign, condition: *poor*

The signs within Akngwertnarre are all in poor condition with the exception of the custom entrance sign that is in very good condition.

Figure 8 Pavement, condition: *poor*

Figure 9 Pavement (edge breaks), condition: *poor*

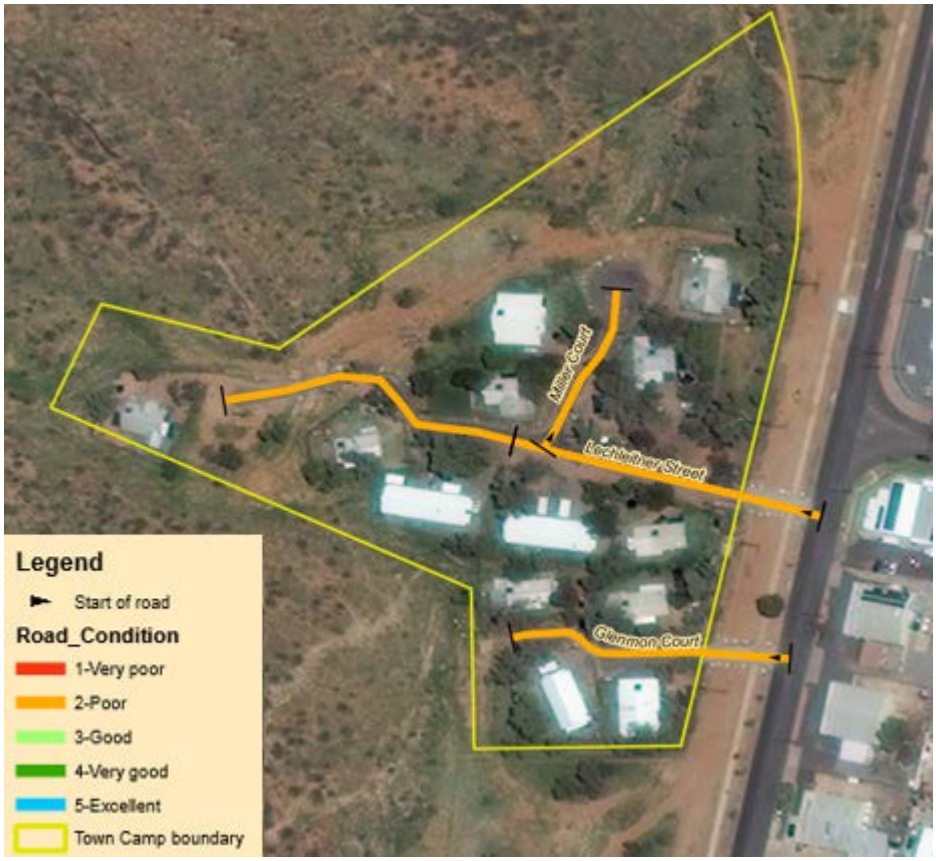


Figure 10 Morris Soak community road network

Table 8 below details the condition of the roads within Akngwertnarre community for specific segments. Figure 10 shows a map of Akngwertnarre community's road network with the condition ratings, road name, and chainage direction. Note, the percentage refers to the percentage of that particular road segment which experiences the defect.

Table 8 Road network condition assessment

Road name	Chainage start (km)	Chainage end (km)	Condition (1 to 5)	Defects and associated condition
Lechleitner Street	0.0	0.1	2	-5% of the road has surface cracking (3) -50% of the road has edge breaks (2)
	0.1	0.2	2	-5% of the road has surface cracking (3) -20% of the road has edge breaks (2)
Miller Court	0.0	0.06	2	-50% of the road has edge breaks (2) -1 significant pothole (3)
Glenmon Court	0.0	0.09	2	-stone loss (1)

7.3 Current performance and risks

The road network is sufficient for the current number of houses. 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.

The most common defect within Morris Soak is edge breaks alongside the road, it is recommended that this defect be repaired to prevent any further damage from occurring and allowing the road to stay as safe as possible.

During the inspections through the communities road network it was noted that there was very little road lines and minimal typical road signs such as give way and speed restriction signs. It is 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 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;

- Repair 45 m2 of surface cracking
- Repair 100 m of edge breaks
- Fill and reseal one pothole

- Replace three signs
- Clean entrance sign

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 Akngwertnarre community is 4.4 m, this means that all 350 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 Morris Soak are owned by the Akngwertnarre Association Incorporated, however are the responsibility of Ingkerreke Outstations Resource Services to maintain.

Any stormwater drainage outside of the community is owned and maintained by Alice Springs Town Council.

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). Only the above ground infrastructure was assessed. As the inspection was undertaken outside of a storm event and no CCTV of the pipes was undertaken, flooding due to blockages or damage 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 condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Swale		1	2			3
Culvert				1		1
Letterbox pit		1				1

Figure 11 Letterbox pit, condition: *poor*

Figure 12 Swale, condition: *good*

The letterbox pit was in poor condition due to being 90% blocked. It is recommended that this is cleaned out to prevent further blockages in the underground pipes.

One swale was rated in poor condition due to having debris (logs, tyres, etc.) within the drain. It is recommended that the debris is removed so the swale works effectively.

8.3 Current performance and risks

The detailed performance of the stormwater network cannot be fully analysed without significant hydraulic and hydrodynamic modelling, which is outside the scope of this project. However based on the condition of the stormwater infrastructure assessed it would appear to be operating adequately.

There were no side entry pits at Morris Soak. The Alice Springs Town Council's general design philosophy for stormwater drainage is that the system is based on a network of sealed roads, kerb and gutters, side entry pits and underground drainage pipes, including grassed open channels and diversion drains. It is recommended that kerbs and gutters, side entry pits and underground pipes are installed to help reduce flooding in the community. The cost estimates allow for 400 m of stormwater drainage.

8.4 Future demands

As no new developments are currently planned for the 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:

- Construct kerb and gutters, side entry pits, and underground drainage.
- Clear blockages from letterbox pit
- Clear blockages from swale

9 Community structures

9.1 Ownership and boundaries

The community structures within Morris Soak are owned by the Akngwertnarre Association Incorporated, however is the responsibility of Ingkerreke Outstations Resource Services to maintain.

9.2 Existing infrastructure condition assessment

The site investigation for the community structures included assessing the condition and features of the BBQ area and playground. The following table 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
BBQ area				1		1
Playground				1		1

Figure 13 BBQ Area, condition: *very good*

Figure 14 Playground, condition: *very good*

9.3 Current performance and risks

The current community structures are sufficient for the population and are all in very good condition.

9.4 Future demands

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

9.5 Recommended works

The following works are recommended to upgrade the community structures:

- General clean up around BBQ and playground area

10 Electrical services

10.1 Ownership and boundaries

The following points, from Network Policy NP003 Installation Rules Section 3, 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, and aerial low voltage infrastructure where installed with 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.

PWC advise that most of Tennant Creek/Alice Springs Town Camps have undergone upgrades under the SIHIP program with the intent to normalise the services to look like an urban subdivision but have never been formally handed over to PWC for operations and maintenance.

The Akngwertnarre community electrical reticulation systems is supplied by an overhead reticulation scheme to individual houses and street lights. Prepaid meters are utilised in Larapinta Valley dwellings.

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

PWC recommend that a GBS (Gas Break Switch) be provided upstream of the first transformer to establish a demarcation point.

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.

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

10.2 Existing infrastructure condition assessment

The Table 11 shows the condition rating given to the Distribution Panels. The distribution board had minor repairs required of fixing the door latch.

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 street lights were of a low voltage overhead feeder design, sodium lamp type S70D, with lamp covers protected by cages. The street lights have an 87.5% operational rating and 12.5% non-operational rating.

Table 12 Street light condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Street light	1		7			8

Table 13 shows the condition rating given to the street lights. The street lights on OH poles were of a low voltage overhead feeder design, sodium lamp type S70D, with lamp covers protected by cages. The street lights have a 90% operational rating and 10% non-operational rating.

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	9			10

Table 14 shows the condition rating given to the Overhead poles. The overhead poles are of Weld Construction (Universal Pole construction) and steel LV construction. The overhead poles have 91% operational rating from the visual inspection and non-operable rating is 9%.

Table 14 Overhead pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Overhead pole		1	10			11

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			9			9
Switchboard			2			2

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	3			5

The details of the individual inspections and photographs of each piece of infrastructure are in the 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 Akngwertnarre community transformer is 23% of rated capacity based on 4.5kVA/dwelling.

Preparation of record drawings showing the actual reticulation downstream of the transformers is recommended.

Table 17 Akngwertnarre current demand load vs transformer ratings

Community name	Dwellings	Transformer (kVA)	kVA Total @ 4.5kVA	kVA Total @ 7kVA	Comments
Akngwertnarre (Morris Soak)	15	300	67.5	105	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].

A tabulated summary of all community transformers is included in the 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 community, there are no additional upgrades required to cater for future demand.

10.5 Recommended works

The following maintenance works and upgrades are recommended:

- Replace two 70W street lights.
- Replace one switchboard
- Replace two switchboards associated to dwellings
- Install new street lighting - approximately 18 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. There were no telephone booths found at Morris Soak.

The Appendices contain 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			2

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 Akngwertnarre is displayed in the Figure 15 below. NBN is available to residents via a fixed telecommunication line on application to an appropriate NBN access provider.

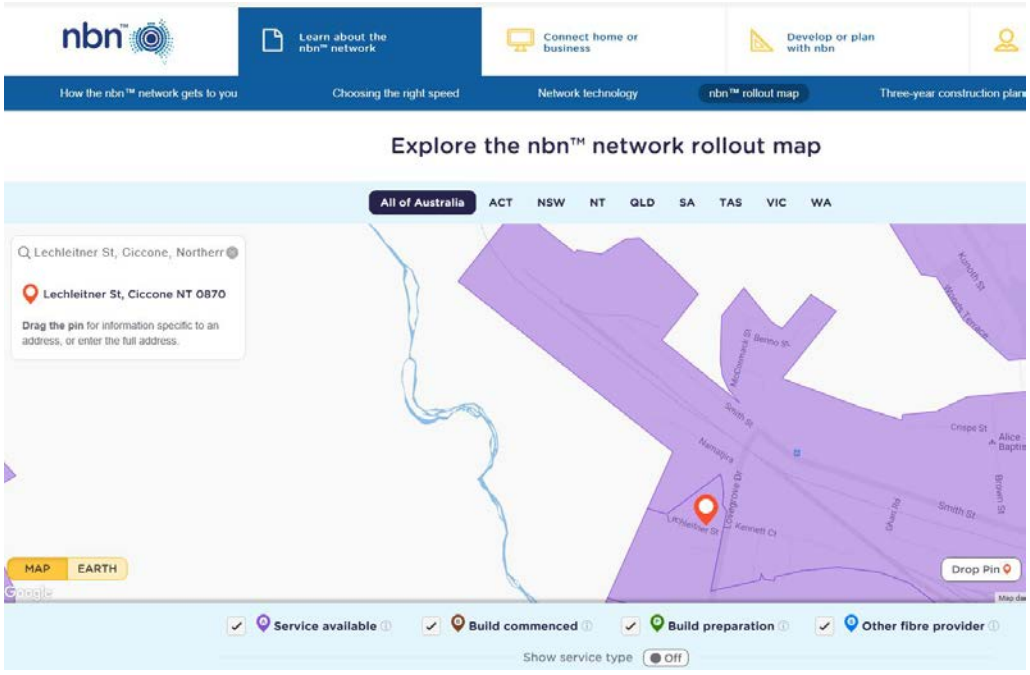


Figure 15 NBN Network Availability map

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 Akngwertnarre 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. The estimates take into account a 30% contingency, are inclusive of GST, and a location factor has been applied to town camps outside of Darwin.

Table 19 Cost estimates

Infrastructure	Maintenance of existing infrastructure	Upgrades to meet current design
Sewerage	$ 0	$ 0
Water supply	$ 1,000	$ 72,000
Roadworks	$ 39,000	$ 426,000
Stormwater drainage	$ 5,000	$ 486,000
Community structures	$ 1,000	$ 0
Electrical	$ 9,000	$ 257,000
Communications	$ 0	$ 0
Miscellaneous provisions	$ 16,000	$ 159,000
Total (including GST)	**$ 71,000**	**$ 1,400,000**
Grand total	**$ 1,471,000**	

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

The following works are recommended for Akngwertnarre community:

Sewerage

- No works required

Water supply

- Clear dirt from two fire hydrants
- Disconnect secondary supply points and loop endpoints
- Install new DN150 bulk water meter at community boundary
- Install 15 new residential lot water meters

Roadworks

- Repair 40 m2 of surface cracking
- Repair 100 m of edge breaks
- Fill and reseal one pothole
- Replace three signs
- Clean entrance sign

Stormwater drainage

- Construct kerb and gutters, side entry pits, and underground drainage.
- Clear blockages from letterbox pit
- Clear blockages from swale

Community structures

- General clean up around BBQ and playground area

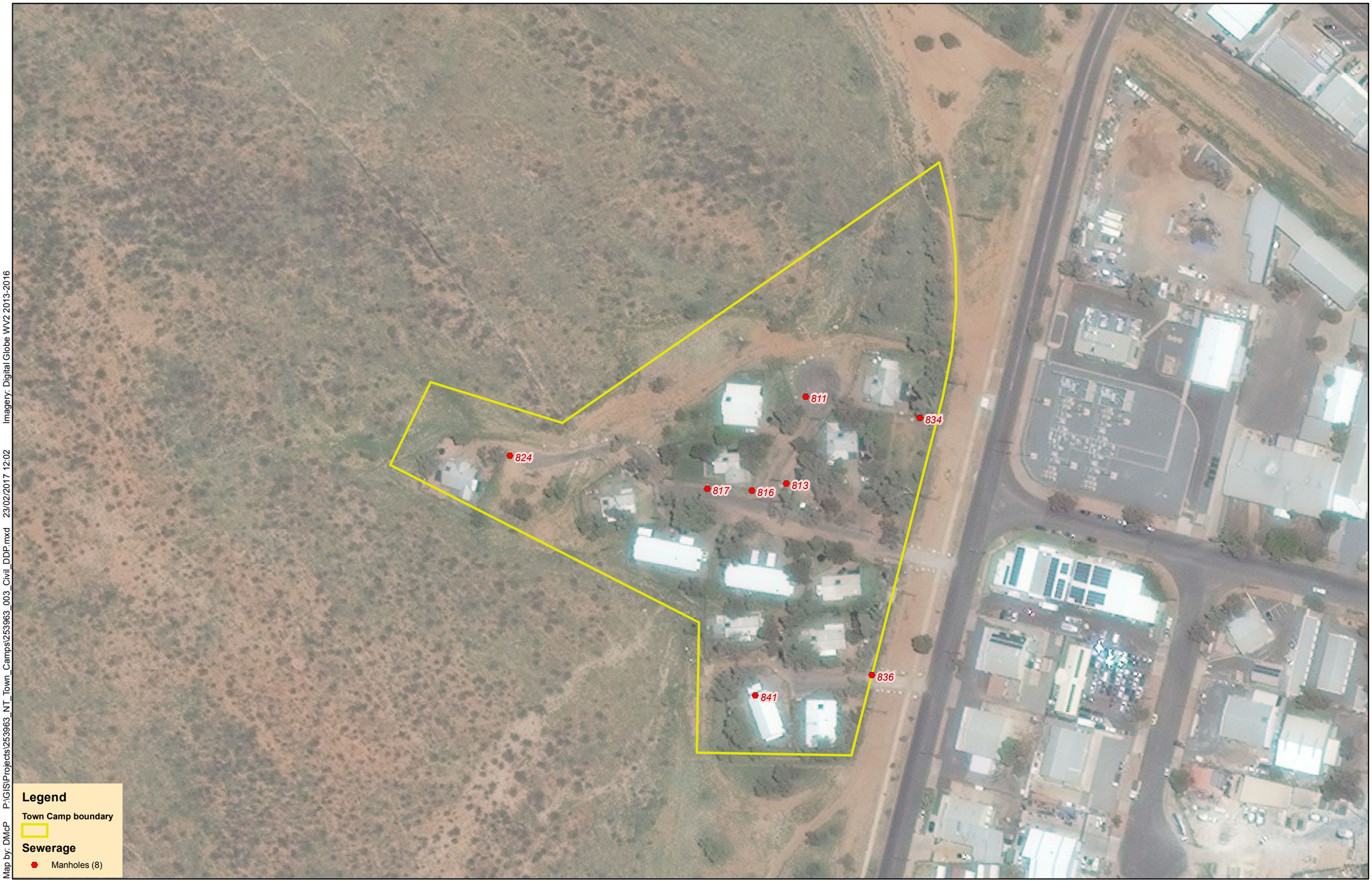
Electrical services

- Replace two 70W street lights.
- Replace one switchboard
- Replace two switchboards associated to dwellings
- Install new street lighting - approximately 18 poles

Communications

- No works are required because NBN is available to residents 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 12:02 Imagery: Digital Globe WV2 2013-2016

Legend

Town Camp boundary

Sewerage

Manholes (8)

A3 scale: 1:1,500

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

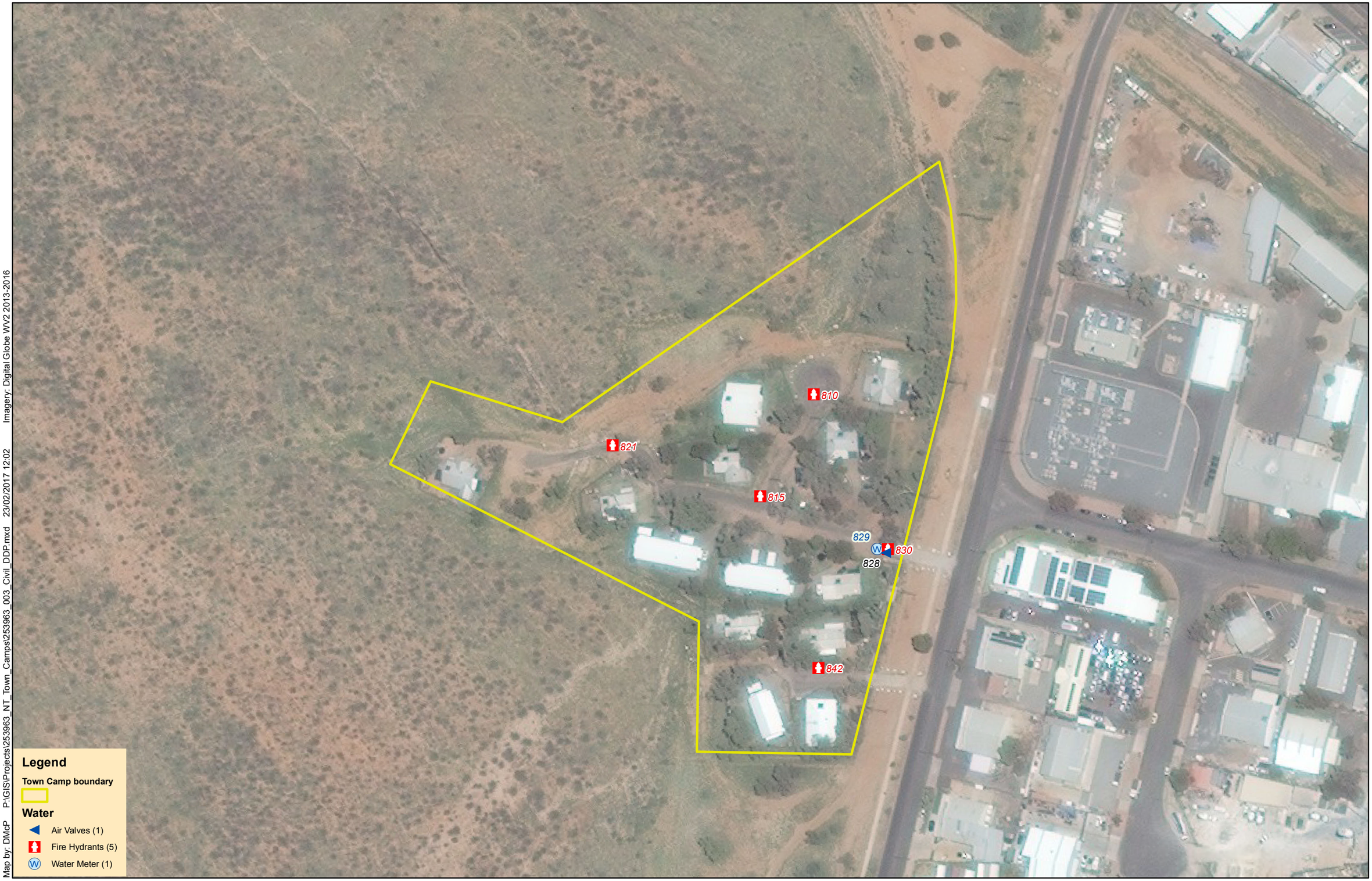
Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Sewerage

3 - Akngwertnarre (Alice Springs)

1776



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

Legend

Town Camp boundary

Water

- Air Valves (1)
- Fire Hydrants (5)
- Water Meter (1)

A3 scale: 1:1,500

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

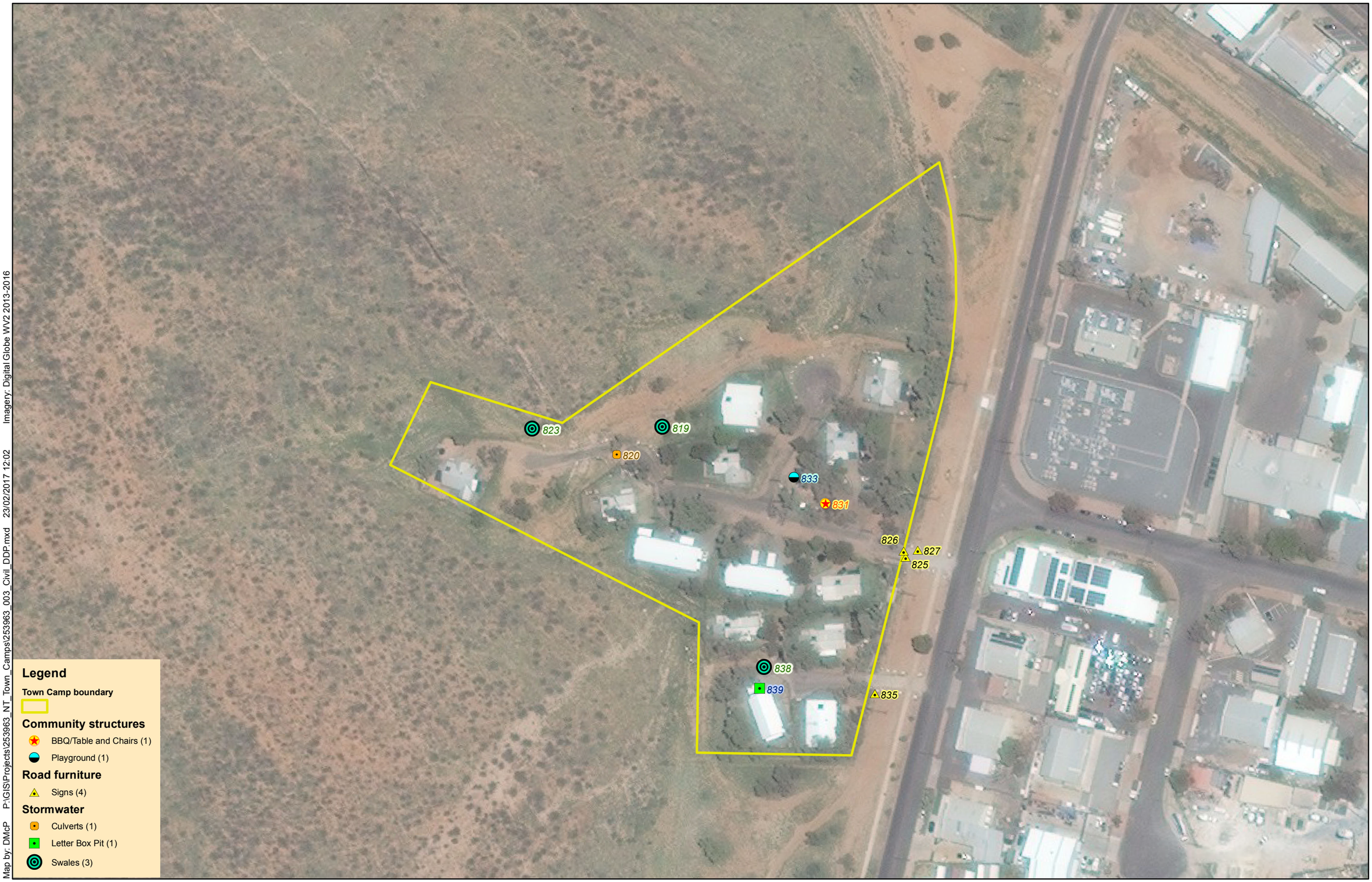
Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Water

3 - Akngwertnarre (Alice Springs)

1777



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

Legend

Town Camp boundary

Community structures
- BBQ/Table and Chairs (1)
- Playground (1)

Road furniture
- Signs (4)

Stormwater
- Culverts (1)
- Letter Box Pit (1)
- Swales (3)

A3 scale: 1:1,500

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments
Road furniture, stormwater drainage & community structures
3 - Akngwertnarre (Alice Springs)

1778

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:13:11 PM

Insp ID: 828	Group 4 - Alice Springs	Akngwertnarre

What Water Asset Are you Capturing: Air Valves

Air Valve Diameter (mm):	150
Air Valve Make:	Eagle
Air Valve Leak:	Yes
Air Valve Condition:	2 - Poor
Air Valve Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:13:11 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:34:07 PM

Insp ID: 820	Group 4 - Alice Springs	Akngwertnarre

Stormwater Infrastructure:	Culverts
Culvert Type:	RCBC
Diameter (mm):	
Width (mm):	1200
Culvert Depth (mm):	300
Culvert Length (m):	8
Culvert Condition:	4 - Very Good
Culvert Blockage (%):	10
Culvert Comments:	
Culvert Head Wall:	Yes
Safety Grate:	No
Headwall Blockage:	
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 18/11/2016 4:03:37 PM

Insp ID: 810	Group 4 - Alice Springs	Akngwertnarre

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	Single
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	Yes
FH Condition:	5 - Excellent
FH Comment:	Location bollard

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:03:37 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:50:27 PM

Insp ID: 815 Group 4 - Alice Springs Akngwertnarre

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	Single
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	Yes
FH Condition:	4 - Very Good
FH Comment:	Car parked on top of hydrant

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:32:39 PM

Insp ID: 821 Group 4 - Alice Springs Akngwertnarre

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	Single
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	Yes
FH Condition:	5 - Excellent
FH Comment:	

Northern Territory Town Camps

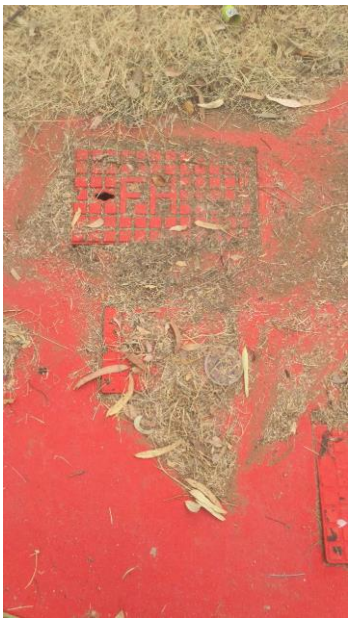
Civil Infrastructure

Inspection Date 18/11/2016 4:11:55 PM

Insp ID: 830	Group 4 - Alice Springs	Akngwertnarre

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	Single
Sluice Valve:	Yes
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	Yes
FH Condition:	4 - Very Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:35:18 PM

Insp ID: 842	Group 4 - Alice Springs	Akngwertnarre

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	Single
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	
Bollards around hydrant:	Yes
FH Condition:	4 - Very Good
FH Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:37:12 PM

Insp ID: 839	Group 4 - Alice Springs	Akngwertnarre

Stormwater Infrastructure:	Letter Box Pit
Length (mm):	900
Height (mm):	200
Blockage Percentage (%):	90
LB Condition:	2 - Poor
LB Comments:	Structure okay, mostly blocked

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:02:29 PM

Insp ID: 811 Group 4 - Alice Springs Akngwertnarre

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:	3 - Good
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:55:20 PM

Insp ID: 813 Group 4 - Alice Springs Akngwertnarre

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 18/11/2016 3:49:09 PM

Insp ID: 816	Group 4 - Alice Springs	Akngwertnarre

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:	3 - Good
Notes on Lid:	
Comments:	

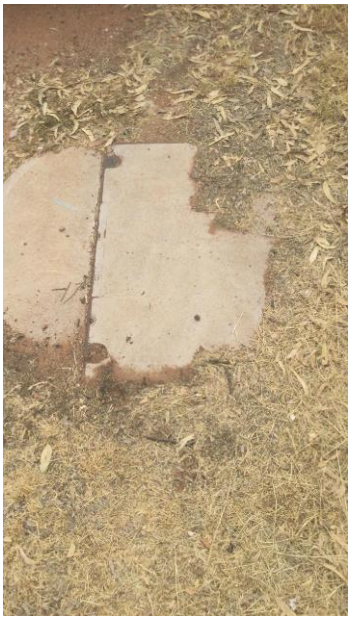
Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:48:13 PM

Insp ID: 817 Group 4 - Alice Springs Akngwertnarre

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:	3 - Good
Notes on Lid:	
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:21:56 PM

Insp ID: 824 Group 4 - Alice Springs Akngwertnarre

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 18/11/2016 4:21:27 PM

Insp ID: 834	Group 4 - Alice Springs	Akngwertnarre

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:	5 - Excellent
Notes on Lid:	
Comments:	Appears to be very new, some dirt on top

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:44:13 PM

Insp ID: 836 Group 4 - Alice Springs Akngwertnarre

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:	Class d
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:44:13 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:36:18 PM

Insp ID: 841	Group 4 - Alice Springs	Akngwertnarre

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 18/11/2016 3:57:47 PM

Insp ID: 812 Group 4 - Alice Springs Akngwertnarre

Road Name:	Miller Court
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.06
Road Type:	Sealed - spray seal
Section Width (m):	4.4
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks	50	2 - Poor	50 percent of the road
Potholes	1	3 - Good	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Flush Kerb		

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed		40			

Linemarking Section

Obstruction Section

Northern Territory Town Camps

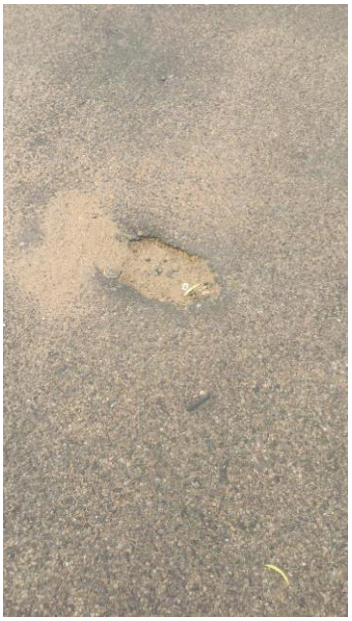
Civil Infrastructure

Inspection Date 18/11/2016 3:57:47 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:57:47 PM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:42:18 PM

Insp ID: 818 Group 4 - Alice Springs Akngwertnarre

Road Name:	Lechleitner Street
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.1
Road Type:	Sealed - spray seal
Section Width (m):	4.4
Road Condition:	2 - Poor
General Comment:	3 speed humps no signs

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Surfacing Cracks	5	3 - Good	5 percent

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Flush Kerb	2 - Poor	

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:42:18 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:42:18 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:42:18 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:27:55 PM

Insp ID: 822 Group 4 - Alice Springs Akngwertnarre

Road Name:	Lechleitner Street
What are you inspecting:	Pavements
Ch From (km):	0.1
Ch To (km):	0.2
Road Type:	Sealed - spray seal
Section Width (m):	3.9
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Surfacing Cracks	5	3 - Good	5 percent
Edge Breaks	20	2 - Poor	20 percent of section

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Flush Kerb	2 - Poor	

Shoulders Section

Linemarking Section

Obstruction Section

Road Obstruction	Other Road Obstruction
Trees	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:27:55 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:27:55 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:27:55 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:40:31 PM

Insp ID: 837 Group 4 - Alice Springs Akngwertnarre

Road Name:	Glenmon Court
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.09
Road Type:	Sealed - spray seal
Section Width (m):	4.4
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Stone Loss		1 - Very Poor	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Flush Kerb	3 - Good	

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed		30		3	

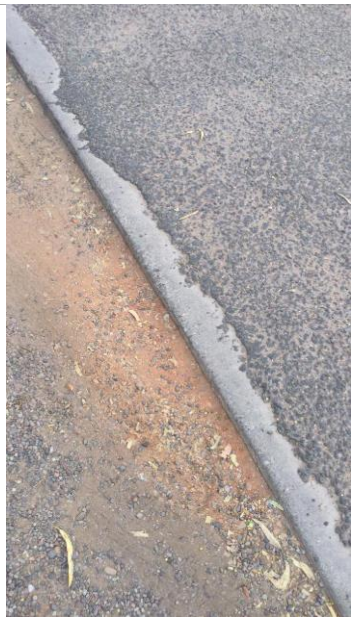
Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:40:31 PM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:40:31 PM

Northern Territory Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:10:21 PM

Insp ID: 831	Group 4 - Alice Springs	Akngwertnarre

Inspection Type:	Shade Structure
Shade Structure Type:	BBQ Area
Shade Floor Type:	Natural ground
Roof Type:	Not Covered
Width (mm):	4
Length (mm):	1
Appearance:	4
Appearance Comment:	
Condition:	4 - Very Good
Comment:	

Northern Territory Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:07:59 PM

Insp ID: 833 Group 4 - Alice Springs Akngwertnarre

Inspection Type:	Shade Structure
Shade Structure Type:	Play ground
Shade Floor Type:	Rubber Mats
Roof Type:	Shadecloth
Width (mm):	7
Length (mm):	7
Appearance:	4
Appearance Comment:	Small amount of rubbish
Condition:	4 - Very Good
Comment:	

Northern Territory Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:07:59 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:19:11 PM

Insp ID: 825	Group 4 - Alice Springs	Akngwertnarre

Road Name:	Lechleitner Street
What are you inspecting:	Signs
Type of Sign:	Crossing
Sign Condition:	2 - Poor
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:18:05 PM

Insp ID: 826 Group 4 - Alice Springs Akngwertnarre

Road Name:	Lechleitner Street
What are you inspecting:	Signs
Type of Sign:	20 kph
Sign Condition:	2 - Poor
Sign Comment:	Fading
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:16:47 PM

Insp ID: 827	Group 4 - Alice Springs	Akngwertnarre

Road Name:

What are you inspecting: Signs

Type of Sign: Community signs

Sign Condition: 4 - Very Good

Sign Comment:

General Comment:

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:45:43 PM

Insp ID: 835	Group 4 - Alice Springs	Akngwertnarre

Road Name:	Glenmon Court
What are you inspecting:	Signs
Type of Sign:	20kph
Sign Condition:	2 - Poor
Sign Comment:	
General Comment:	

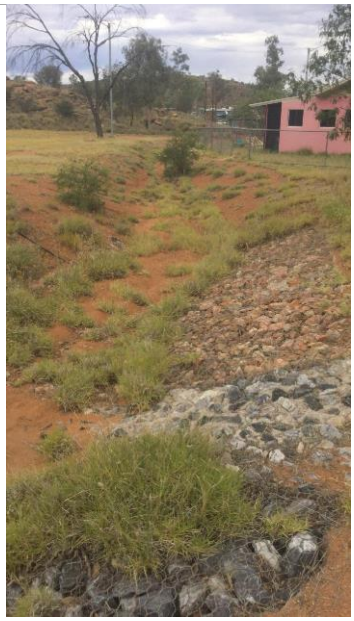
Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:39:58 PM

Insp ID: 819 Group 4 - Alice Springs Akngwertnarre

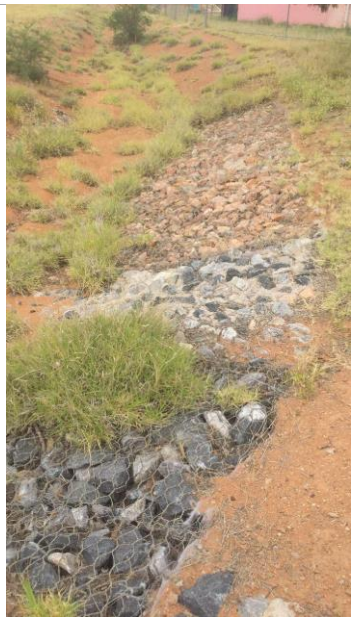
Stormwater Infrastructure:	Swales
Type of lining:	Natural Grasses
Are dimensions uniform along drain:	Yes
Base Width (m):	1.5
Overall Width (m):	5.5
Swale Depth (m):	1
Length of Batter 1 (m):	2
Length of Batter 2 (m):	2
Swale Condition:	3 - Good
Swale Ponding:	No
Drain flooded at time of inspection:	No
Swale Comments:	Erosion evident



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:39:58 PM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 3:24:05 PM

Insp ID: 823	Group 4 - Alice Springs	Akngwertnarre

Stormwater Infrastructure:	Swales
Type of lining:	Natural Grasses
Are dimensions uniform along drain:	Yes
Base Width (m):	1
Overall Width (m):	5
Swale Depth (m):	0.6
Length of Batter 1 (m):	2
Length of Batter 2 (m):	2
Swale Condition:	3 - Good
Swale Ponding:	No
Drain flooded at time of inspection:	No
Swale Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:38:59 PM

Insp ID: 838	Group 4 - Alice Springs	Akngwertnarre

Stormwater Infrastructure:	Swales
Type of lining:	No Lining
Are dimensions uniform along drain:	Yes
Base Width (m):	4
Overall Width (m):	8
Swale Depth (m):	0.2
Length of Batter 1 (m):	2
Length of Batter 2 (m):	2
Swale Condition:	2 - Poor
Swale Ponding:	No
Drain flooded at time of inspection:	No
Swale Comments:	Obstacles in swale

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:13:21 PM

Insp ID: 829	Group 4 - Alice Springs	Akngwertnarre

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Bulk
Bulk Water Meter Size (mm):	150
Bulk Water Meter Condition:	3 - Good
Bulk Water Meter Comment:	RPZD installed
Lot Number:	
Lot Water Meter Size:	
Lot Water Meter Condition:	
Lot Water Meter Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 18/11/2016 4:13:21 PM

Electrical inspection reports

Legend

Electrical infrastructure

- 11KV HV/LV Pole
- 11KV Line Pole
- 11KV Link
- 11kV 3Phase Generator
- 11kV Air break switch
- 11kV Circuit Breaker
- 11kV Current transformer
- 11kV Package Substation
- 11kV Switch Fuse
- 11kV Switchgear
- Cable Joint
- LV Metering
- LV Line Pole
- LV Service Pole
- LV switch
- Street Lighting on HV Pole
- Transformer
- Town Camp roads
- NT cadastre
- Town Camp boundary

Electrical survey points

- 1234 Other Values
- 1234 Distribution Panel
- 1234 Overhead Poles
- 1234 Street Light
- 1234 Transformers

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_004_Elec_DDP_report.mxd 23/02/2017 12:22

A3 scale: 1:1,500

0 20 40 60 80 100 m

Date: 23/02/2017 Version: 3

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Electrical

3 - Akngwertnarre (Alice Springs)

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 5:00:33 PM

Insp ID: 362 Group 4 - Alice Springs Akngwertnarre

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:	2
Underground Comments:	Cover broken

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:59:12 PM

Insp ID: 363	Group 4 - Alice Springs	Akngwertnarre

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 18/11/2016 4:18:36 PM

Insp ID: 373 Group 4 - Alice Springs Akngwertnarre

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:	80A
What is the main incoming cable type/Size to Distribution Panel:	Unknown
What is the condition of switchboard:	2
Condition Comments:	Door lock broken.
What is the condition of cables/glands into switchboard:	
Cable/Gland Condition Comments:	Unknown
Distribution Panels name plate access:	Yes

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:18:36 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 10:04:46 AM

Insp ID: 3455 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing: Electrical Meters

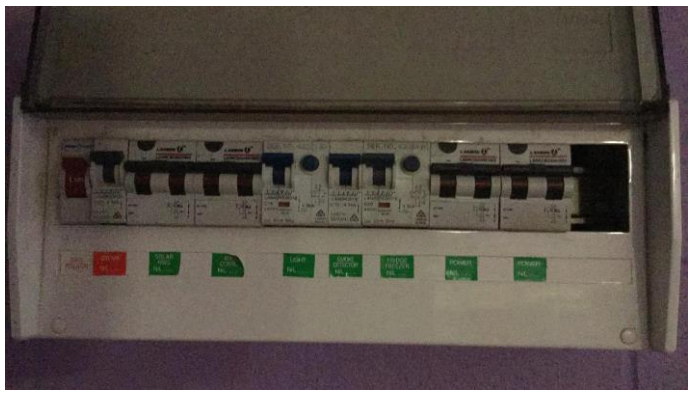
Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed. Indoor SB, Cond 2, Blank plates are missing on CB slot.

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 10:19:57 AM

Insp ID: 3456 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed. Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 10:13:48 AM

Insp ID: 3457	Group 4 - Alice Springs	Akngwertnarre

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 23/11/2016 10:08:38 AM

Insp ID: 3458 Group 4 - Alice Springs Akngwertnarre

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 23/11/2016 10:41:18 AM

Insp ID: 3459 Group 4 - Alice Springs Akngwertnarre

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 23/11/2016 10:21:57 AM

Insp ID: 3460	Group 4 - Alice Springs	Akngwertnarre

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid	
Meter Switchboard Cond:		
Meter Condition:	3	
Meter Comment:	Condition of CB not assessed.	Indoor SB, Cond 2, Blank plates are missing on CB slot.
Comments:		

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 10:09:59 AM

Insp ID: 3461	Group 4 - Alice Springs	Akngwertnarre

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 23/11/2016 10:43:43 AM

Insp ID: 3468 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing: Electrical Meters

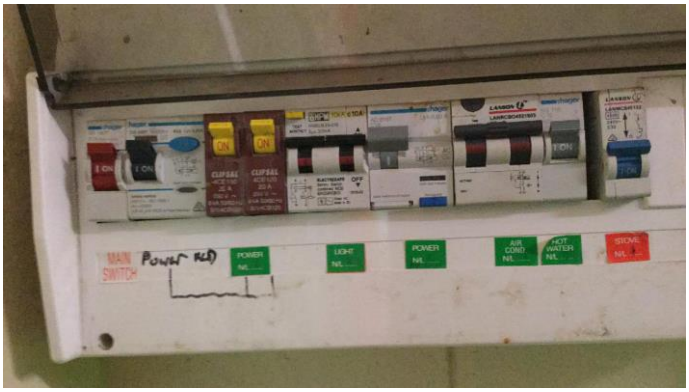
Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed. Indoor SB, Cond 3

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 10:25:09 AM

Insp ID: 3469 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed. Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 5:12:04 PM

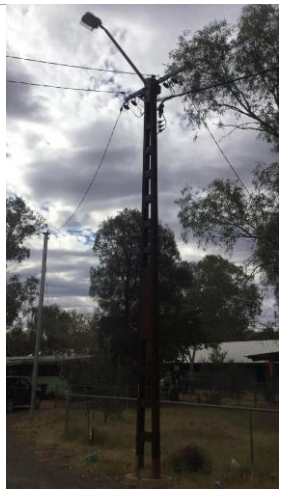
Insp ID: 360 Group 4 - Alice Springs Akngwertnarre

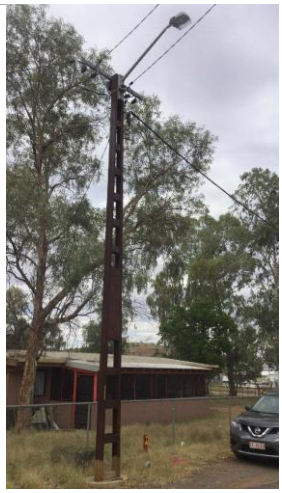
What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 15
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	
What is the Condition:	3
How many Lots are connected to this pole:	4
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 5:12:04 PM





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 5:12:04 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 5:07:15 PM

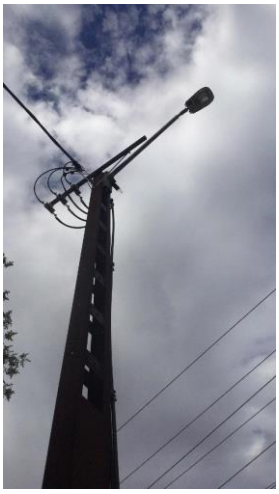
Insp ID: 361 Group 4 - Alice Springs Akngwertnarre

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:	Yes
Street Light Power Supply:	
Street Light Type	S70D 12
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
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:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 5:07:15 PM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:57:10 PM

Insp ID: 364 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	2
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:	Single
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:	
How many Lots are connected to this pole:	0
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:57:10 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:48:57 PM

Insp ID: 366 Group 4 - Alice Springs Akngwertnarre

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:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11 S70D 15
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
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:	
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:48:57 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:48:57 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:34:22 PM

Insp ID: 370 Group 4 - Alice Springs Akngwertnarre

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:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
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:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:34:22 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:31:22 PM

Insp ID: 371 Group 4 - Alice Springs Akngwertnarre

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:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11 S70D 15
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
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:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:31:22 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:24:40 PM

Insp ID: 372 Group 4 - Alice Springs Akngwertnarre

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:	Yes
Street Light Power Supply:	
Street Light Type	S70D 03
Street Light Watts	70
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
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:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:24:40 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:12:50 PM

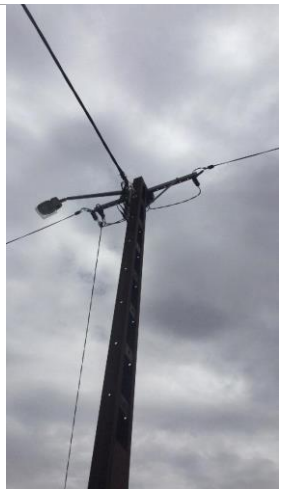
Insp ID: 374 Group 4 - Alice Springs Akngwertnarre

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:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
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:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:12:50 PM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:09:33 PM

Insp ID: 375 Group 4 - Alice Springs Akngwertnarre

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:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
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:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:09:33 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:01:14 PM

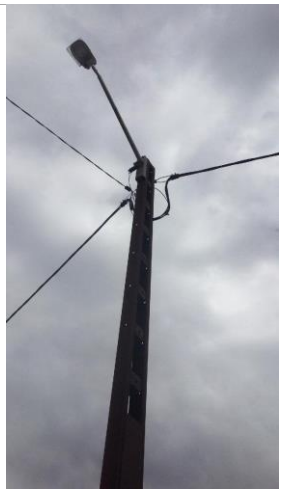
Insp ID: 378 Group 4 - Alice Springs Akngwertnarre

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:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
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:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:01:14 PM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 3:57:53 PM

Insp ID: 379 Group 4 - Alice Springs Akngwertnarre

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:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
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:	1
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 3:57:53 PM

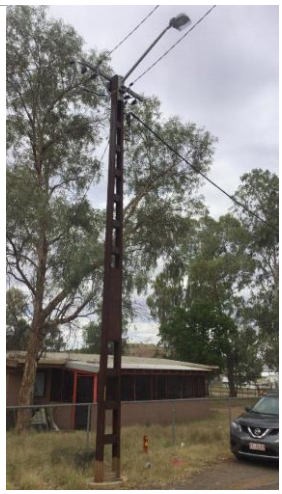
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 5:12:04 PM

Insp ID: 360 Group 4 - Alice Springs Akngwertnarre

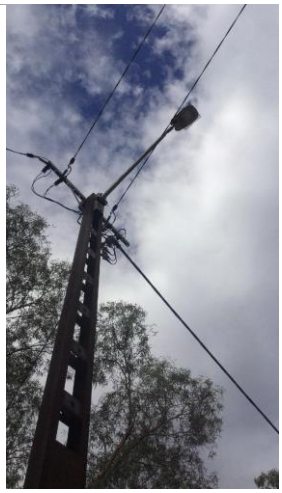
What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 15
Street Light Watts	70
Street Light Condition	3
Street Light Height	

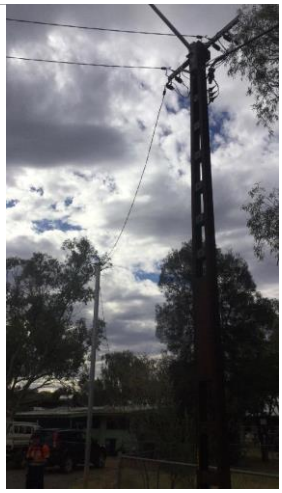


Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 5:12:04 PM





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 5:07:15 PM

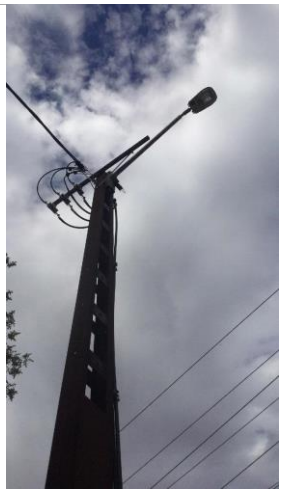
Insp ID: 361 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 12
Street Light Watts	70
Street Light Condition	3
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 5:07:15 PM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:48:57 PM

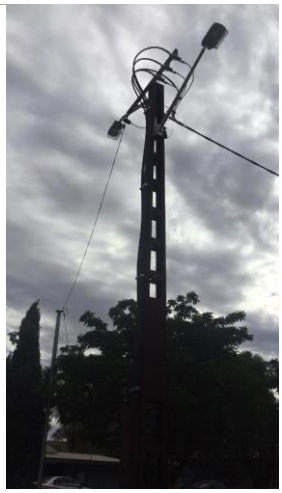
Insp ID: 366	Group 4 - Alice Springs	Akngwertnarre

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11 S70D 15
Street Light Watts	70
Street Light Condition	3
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:48:57 PM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:34:22 PM

Insp ID: 370 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	3
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:34:22 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:31:22 PM

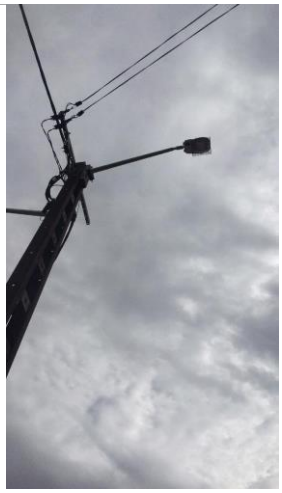
Insp ID: 371 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11 S70D 15
Street Light Watts	70
Street Light Condition	3
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:31:22 PM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:24:40 PM

Insp ID: 372 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 03
Street Light Watts	70
Street Light Condition	2
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:24:40 PM

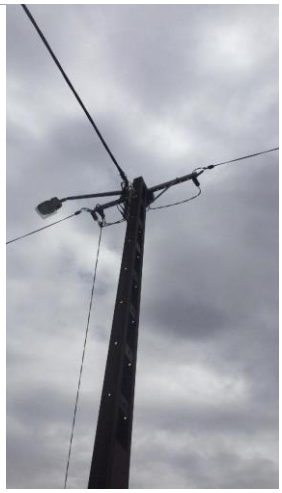
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:12:50 PM

Insp ID: 374	Group 4 - Alice Springs	Akngwertnarre

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	3
Street Light Height	



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:12:50 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:09:33 PM

Insp ID: 375	Group 4 - Alice Springs	Akngwertnarre

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	3
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:09:33 PM

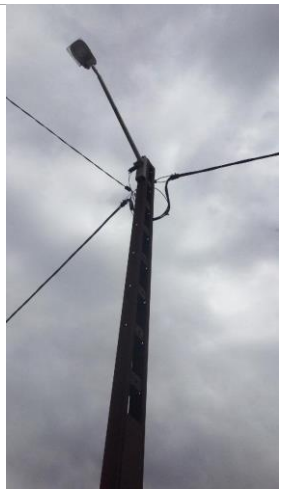
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:01:14 PM

Insp ID: 378	Group 4 - Alice Springs	Akngwertnarre

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	3
Street Light Height	



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:01:14 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 3:57:53 PM

Insp ID: 379	Group 4 - Alice Springs	Akngwertnarre

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70D 11
Street Light Watts	70
Street Light Condition	3
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 3:57:53 PM

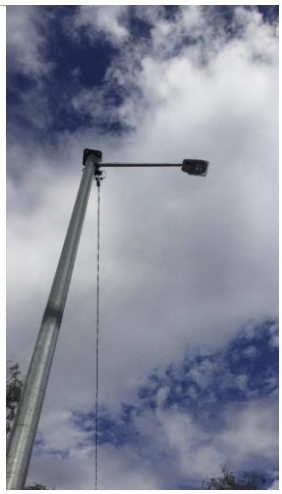
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 5:14:13 PM

Insp ID: 359 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70D 15
What Wattage is the lamp:	70
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	7



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:53:12 PM

Insp ID: 365 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	No lamp
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 18/11/2016 4:41:41 PM

Insp ID: 367 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	50M V
What Wattage is the lamp:	50
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	7

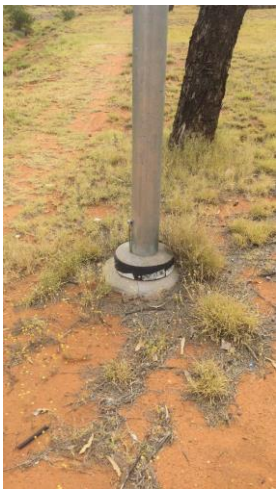
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:38:22 PM

Insp ID: 368 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70D 15
What Wattage is the lamp:	70
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 18/11/2016 4:36:32 PM

Insp ID: 369 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70D 15
What Wattage is the lamp:	70
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 18/11/2016 4:05:23 PM

Insp ID: 376 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70D 15
What Wattage is the lamp:	70
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	8

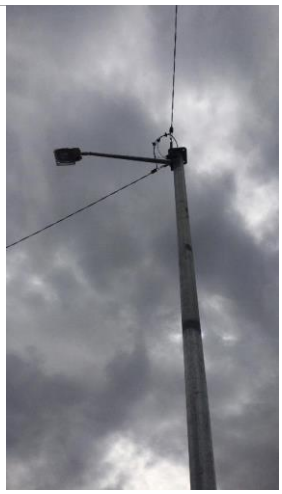
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 18/11/2016 4:03:16 PM

Insp ID: 377 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70D 15
What Wattage is the lamp:	70
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	8



Northern Territory Town Camps

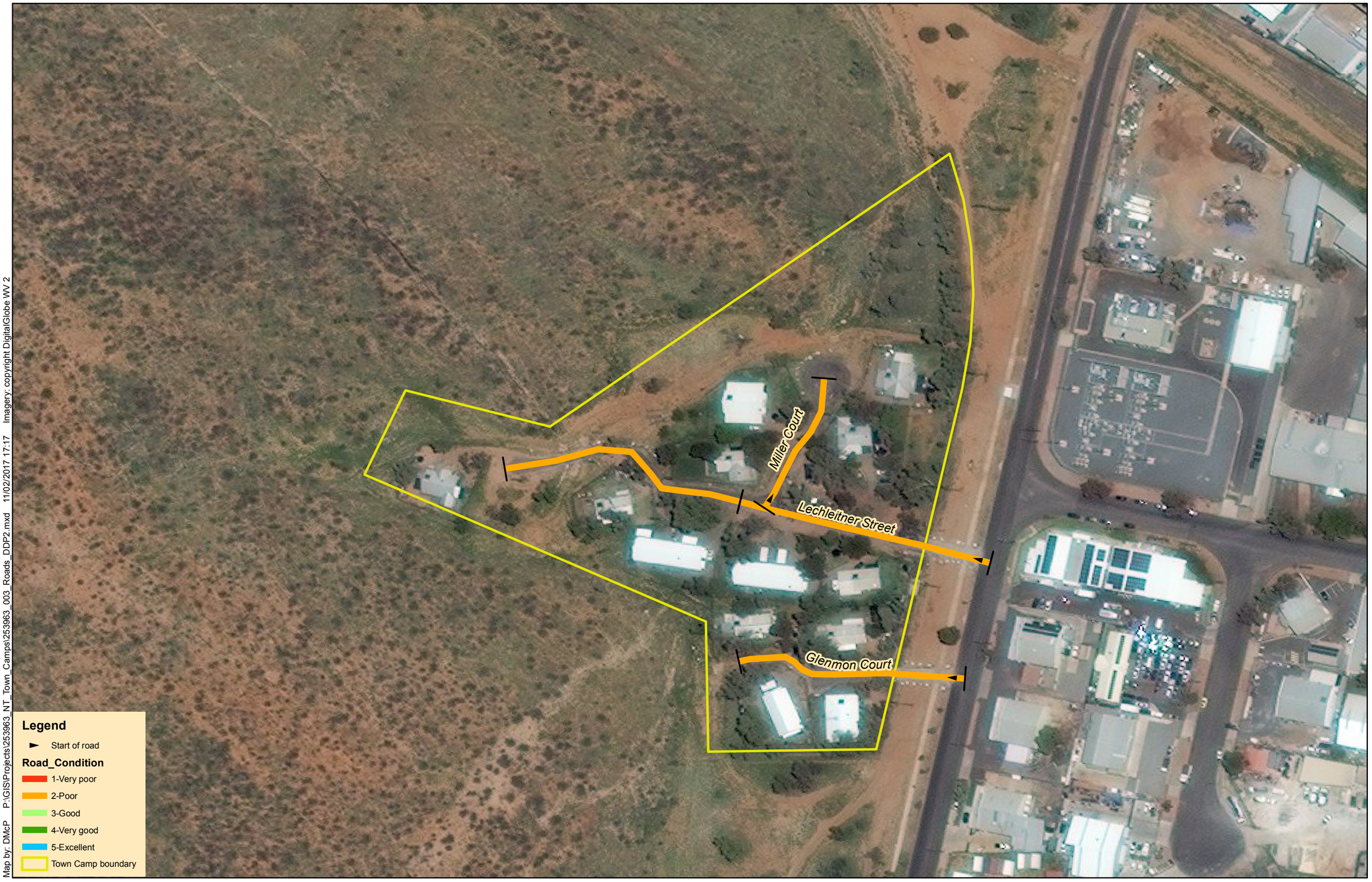
Electrical Infrastructure

Inspection Date 18/11/2016 3:54:35 PM

Insp ID: 381 Group 4 - Alice Springs Akngwertnarre

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70D 14
What Wattage is the lamp:	70
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	8

Road map



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Roads_DDP2.mxd 11/02/2017 17:17 Imagery: copyright DigitalGlobe WV 2

A3 scale: 1:1,500

0 20 40 60 80 100 m

Date: 11/02/2017 Version: 1

Coordinate system: GDA 1994

NT Town Camp Road Assessments

3 - Akngwertnarre (Alice Springs)

1893

Existing drawings

-23°41'25"
383 750 E
384 000 E
7 379 500 N
7 379 250 N
8078
8092
8074
8070
CICCONE
ARALUEN
TOWN OF ALICE SPRINGS
Shed
Shelter
Playground
Community Uses
Ablution
LECHLEITNER STREET
GLENMON COURT
LOVEGROVE DRIVE
SMITH STREET
KENNETT COURT
SHIRLEY COURT
DOWDY COURT
1
2
3
4
5
6
11
12
14
5150
10066
10067
10068
10069
10070
10071
10072
10073
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10082
9104
9198
9199
9200
9201
9202
10026
9103
9106
6453
9283
7463
7462
7441
7442
7448
7449
7440
7443
7447
7450
7439
7444
7438
9360
9015
9016
9359
4918
4920
7452
7453

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.

© NORTHERN TERRITORY OF AUSTRALIA

CADASTRE
- Current — 123
- Proposed — 123
- Locality — LOCALITY

UTILITY SERVICES
- ELECTRICITY
  - LOW VOLTAGE — LV
  - HIGH VOLTAGE — HV
- WATER RETICULATION
  - WATER MAIN — W
  - WATER RISING MAIN — WRM
- SEWER
  - SEWER MAIN — S
  - SEWER RISING MAIN — SRM

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 — 25
- 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 shown in their true plan relationship 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 +/-0.2m 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 Darwin/Katherine: 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.dplt@nt.gov.au

Cadastral Information:
Office of the Surveyor-General
Dept of Lands and Planning
TEL: (08) 8995 5305, FAX: (08) 8995 5395
Email: landinfo.dplt@nt.gov.au

Power, Water or Sewer Information:
Remote Queenstown Planning Branch
Power and Water Corporation
TEL: (08) 8924 5084, 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: tee.dhlgrs@nt.gov.au

SOURCE INFORMATION

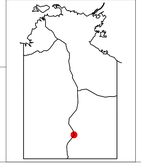
CONTOUR INTERVAL :		CURRENCY OF TOPOGRAPHY :	10 June 2007
HORIZONTAL DATUM :		SOURCE MAP SCALE :	2500
VERTICAL DATUM :		ZONE UTM :	53
PROJECTION :	Transverse Mercator	DATE GENERATED :	18 June 2012

N

GDA

0 10 20 30 40 50

Locality Diagram



SERVICED LAND AVAILABILITY PROGRAM
SLAP Map
Akngwertnarre (Alice Springs Town Camp)

Morris Soak

Alice Springs Town Council

Community ID: 3

SEWER TABLE:-

MANHOLES	LENGTH (m)	DIAMETER (mm)	MATERIAL TYPE	CLASS	GRADE	YEAR INSTALLED
MH9 – MH8	66·0	150	UPVC	SH	30 – 10	1990
MH8 – MH7	20·2	150	UPVC	SH	10 – 10	1990
MH7 – MH6	38·9	150	UPVC	SH	–	1990
MH6 – MH5	29·5	150	UPVC	SH	–	1990
MH5 – MH4	37·0	150	UPVC	SH	–	1990
MH4 – 1/A	26·0	150	UPVC	SH	10 – 10	1990
1/A – 1/B	14·5	150	UPVC	SH	10 – 10	1990
1/A – 2/A	33·5	150	UPVC	SH	10 – 10	1990
2/A – 2/B	13·0	150	UPVC	SH	10 – 10	1990

→ (contains Vertical Curve)

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

H Existing Residential Development (or as highlighted 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.

SCALE 1:250@A1

15 0 15 30 45 60 Metres

N

COMMUNITY MAP

AKNGWERTNARRE

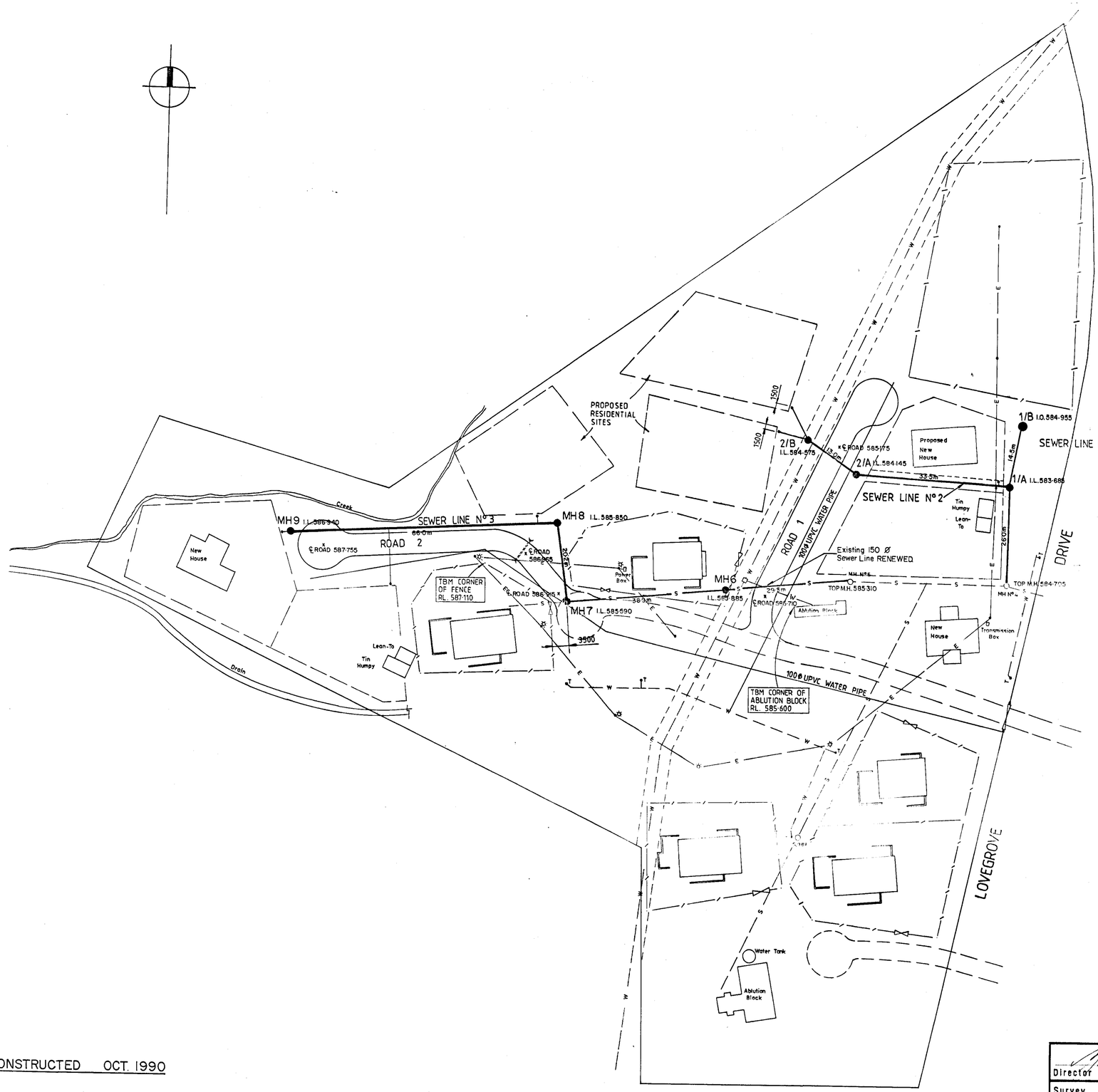
(MORRIS SOAK)

003

1896

CONNECTING NEIGHBOURS PROJECT - PROPOSED SERVICES LAYOUT

FIGURE F27 - MORRIS SOAK



LEGEND

- NEW 150ΦUPVC SEWER
- NEW MANHOLE
- EXISTING SEWER
- EXISTING WATER SERVICES
- EXISTING ELECTRICITY LINES
- EXISTING MANHOLE

STANDARD DRAWINGS	
DRG. N°	DESCRIPTION
W(S)78-201/1	TRENCH AND THRUST BLOCK DETAILS
W(S)78-210/2	PRECAST MANHOLE DETAILS
W(S)78-211/2	MANHOLE DROP TYPES
WD-88-10-7010	RECTANGULAR MANHOLE DETAILS
W(S)84-213/	SEWER PROPERTY CONNECTION
W(S)86/246	STANDARD INSPECTION OPENING

NOTE

1. ALL LEVELS ARE TO A.H.D.(AUSTRALIAN HEIGHT DATUM).
2. PRIOR TO EXCAVATING FOR PIPES, THE CONTRACTOR IS TO FIELD CHECK INVERT LEVELS OF EXIST'NG STUBS INCORPORATED IN THE WORKS.
3. THE LOCATION OF UNDERGROUND SERVICES ARE INDICATIVE ONLY, CONTRACTOR TO DETERMINE EXACT LOCATION AND LEVEL PRIOR TO EXCAVATION.
4. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND ASSOCIATED DRAWINGS
5. CONNECTIONS TO EXISTING SEWERS ARE TO BE CARRIED OUT UNDER THE SUPERVISION OF THE SUPERINTENDENT.
6. TOPS OF SEWER MANHOLES SHALL BE FINISHED FLUSH WITH FINISHED SURFACE LEVEL IN ROAD RESERVES. FINISH 150mm ABOVE ELSEWHERE.
7. ALL SEWER PROPERTY CONNECTIONS TO BE TYPE 1

AS CONSTRUCTED OCT. 1990

NOTE All dimensions to be checked on site

Issue	Amendment	Drawn	Date	Chk'd	App'd

Director		
Survey		
Drawn	CGW	6/89
Design	CGW	6/89
Checked		8/89
Principal		

LANGE, DAMES AND CAMPBELL AUSTRALIA PTY. LTD.
CONSULTING ENGINEERS AND PLANNERS
Cnr. GREGORY TCE. & BATH ST. ALICE SPRINGS N.T. 0870. Phone N° (089) 529376

THE TANGENTYERE COUNCIL INC.
AKNGWERTNARRE
ALICE SPRINGS

SEWER LAYOUT PLAN

Scale 1 : 500 Dwg. No 400-89-13-2171 3 of 6

1897

MANHOLE NUMBER	MH7	MH8		MH9
MANHOLE & COVER TYPE	RRH	RRL		RRL
MANHOLE DROP TYPE	1	1		1
LOCATION	ROAD 2			
PIPE TYPE & CLASS	u.P.V.C.- SH	u.P.V.C.- SH	u.P.V.C. - SH	u.P.V.C - SH
DIA.-LENGTH - GRADE (mm) (m) (mm/m)	150 -2020- 10·0	150 - 39·3 - 10·0	150 - ~~6·0~~	150 - ~~16·1~~ - 30·0
DATUM R.L.. 582·000			VERTICAL CURVE	

| | | |

| | | |

GENERAL NOTES

1. DESIGN AND CONSTRUCTION OF THE WATER AND SEWERAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE POWERWATER CONNECTION CODE AND ASSOCIATED DOCUMENTS
2. ALL LEVELS GIVEN ARE TO AHD
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN
4. MINIMUM COVER TO PIPE IS 750mm IN TRAFFICABLE AREA, 600mm IN OTHER AREAS
PRIOR TO COMMENCEMENT OF WORKS THE CONSTRUCTOR SHALL CHECK THE LOCATION OF ALL UNDERGROUND SERVICES AND CONFIRM FINISHED SURFACE LEVELS TO BE INCORPORATED IN THE WORKS
5. IT IS NOT GUARANTEED THAT ALL SERVICES ARE SHOWN ON THE DRAWING
6. OBTAIN PERMIT(S) FROM THE RELEVANT ROAD AUTHORITY PRIOR TO ROAD EXCAVATION
7. ALL WATER (HYDRAULIC) WORKS SHALL BE CARRIED OUT AS SHOWN ON THE LATEST AMENDMENT OF THE DESIGN DRAWINGS. CONSTRUCTION SITE DRAWINGS MUST BE SIGNED AS 'APPROVED FOR CONSTRUCTION' BY A LAND DEVELOPMENT OFFICER
8. SEVEN (7) DAYS NOTICE HAS TO BE GIVEN TO LAND DEVELOPMENT, POWERWATER WITH A 'NOTICE OF INTENTION TO START WORK' PRIOR TO COMMENCEMENT OF WORK
NORTHERN REGION-FACSIMILE 89 247212
SOUTHERN REGION-FACSIMILE 89 517347
9. ANY CHANGES TO THIS DRAWING, REQUIRED OR DESIRED DURING THE CONSTRUCTION PHASE MUST BE AUTHORISED BY A LAND DEVELOPMENT OFFICER
10. ALL MATERIALS USED IN THE CONSTRUCTION OF WORKS TO BE CONNECTED TO POWERWATER INFRASTRUCTURE ARE TO BE AS NOMINATED IN POWERWATER'S "WATER AND SEWER MAINS PRODUCT MANUAL"
11. 'AS CONSTRUCTED' DRAWINGS MUST BE PROVIDED TO LAND DEVELOPMENT, POWERWATER PRIOR TO HANDOVER INSPECTION
12. DESIGNER TO CONTACT LAND DEVELOPMENT, POWERWATER TO ARRANGE FOR HANDOVER INSPECTIONS. SEVEN (7) DAYS NOTICE MUST BE PROVIDED PRIOR TO HANDOVER INSPECTIONS
13. CONNECTIONS TO EXISTING WATER MAINS WILL ONLY BE CARRIED OUT WHEN ALL WORKS UPSTREAM OF THE CONNECTION ARE COMPLETE (IE. TESTED, DISINFECTED WHERE APPLICABLE, BACKFILLED AND CERTIFICATES SUBMITTED) IN ACCORDANCE WITH THE APPROVED DESIGN DRAWINGS AND HAVE SATISFACTORILY PASSED FINAL HANDOVER INSPECTION
14. POWERWATER PERSONNEL SHALL INSTALL ALL WATER CONNECTIONS TO EXISTING MAINS ONLY AFTER ACCEPTANCE OF THE WORK HAS BEEN ACHIEVED. THE CONSTRUCTOR IS RESPONSIBLE FOR ALL CONNECTION FEES, MATERIALS AND LABOUR FOR EXCAVATION, BACKFILLING AND REINSTATEMENT

SCHEDULE OF PARTS

NAME	EASTING	NORTHING	DESCRIPTION
1	10012.50	4966.74	DN200 FLANGED TEE
2	9951.95	4976.98	DN150 11.25° BEND
3	9931.78	4974.58	DN150 45° BEND + DN150 11.25° BEND
4	9909.54	4924.77	DN150 11.25° BEND
5	9906.70	4913.12	DN150 90° BEND
6	9878.88	4919.90	DN150 11.25° BEND
7	9852.86	4933.33	DN150 11.25° BEND
8	9834.01	4939.24	DN150 22.5° BEND
9	9803.47	4934.13	DN150 90° BEND + DN150 -11.25° BEND
10	9803.34	4931.08	DN150 90° BEND
11	9845.85	4926.94	DN150 22.5° BEND
12	9871.38	4913.53	DN150 11.25° BEND
13	9963.77	4891.00	DN150 90° BEND
14	9954.00	4845.03	DN150 90° BEND + DN150 11.25° BEND
15	9915.24	4845.47	DN150 90° BEND
16	9915.15	4837.27	DN150 90° BEND
17	9948.20	4836.89	DN150 11.25° BEND
18	9983.04	4829.83	DN200 FLANGED TEE

WATER

1. WATER PIPES SHALL BE DUCTILE IRON CEMENT LINED (DICL)(CLASS 9) OR PVC-M, WITH DICL FITTINGS, UNLESS NOTED OTHERWISE
2. WATER MAINS SHALL BE OFFSET FROM PROPERTY BOUNDARIES AT A DISTANCE OF 2.4m IN ROAD RESERVES AND 1.5m IN PRIVATE PROPERTY, EXCEPT WHERE SHOWN OTHERWISE ON THE DRAWINGS
3. THE SUPERINTENDENT SHALL DETERMINE WATER PIPE BEDDING TYPE AFTER INSPECTION OF THE EXCAVATED TRENCH
4. ALL BENDS TO BE SUPPORTED BY THRUST BLOCKS
5. ALL UNDERGROUND DICL, FITTINGS AND PIPE TO BE POLYETHYLENE SLEEVED TO POWERWATER STANDARD DRAWING NO'S W1-2-17A AND W1-2-17B
6. 1.6mm STAINLESS STEEL TRACE WIRE TO BE INSTALLED IN TRENCH DIRECTLY ABOVE MARKER TAPE, FULL LENGTH OF WATER MAIN. JOIN WIRE WITH PURPOSE MADE LUGS TO ACHIEVE FULL ELECTRICAL CONTINUITY. BRING TRACE WIRE TO SURVACE AT ALL VALVE & HYDRANT LOCATIONS AND LOOP MIN 1.0m LENGTH. ENSURE WIRE DOES NOT INTERFERE WITH OPERATION OF VALVE OR HYDRANTS. AT COMPLETION OF WORKS, WIRE IS TO BE TESTED FOR ELECTRICAL CONTINUITY.
7. INSTALL MARKER POSTS AT ALL VALVES & HYDRANTS.
STOP VALVES - 75x75x2 SHS GALVANISED POST
HYDRANTS - 100x50x2 RHS GALVANISED POST
REFER PWC PRODUCT MANUAL AND STD DWG W1-2-03D & W1-2-03F.

APPROVED FOR CONSTRUCTION. POWER AND WATER DWG. NO. B07-3858

SIGNED .....

DATE .....

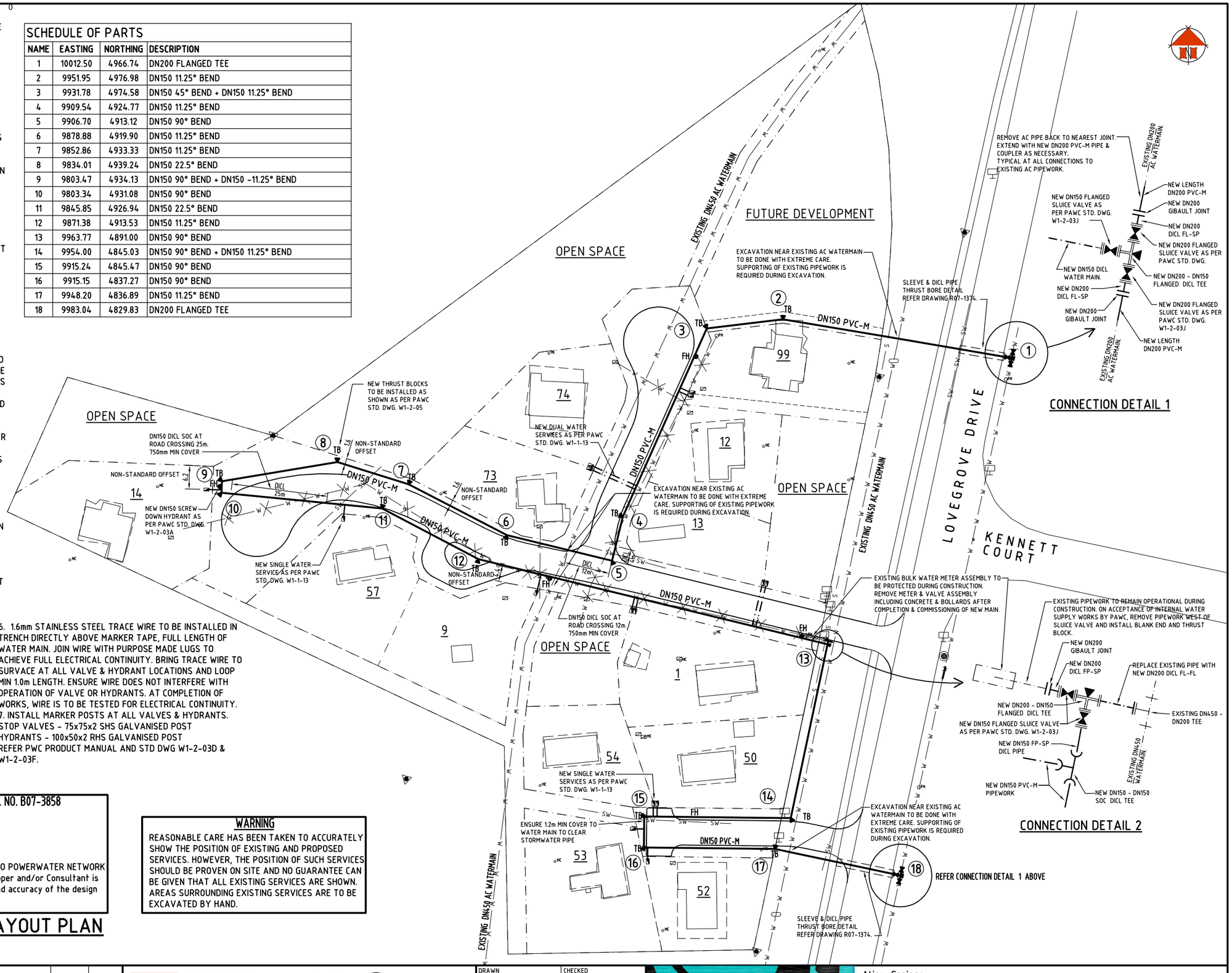
ON BEHALF OF LAND DEVELOPMENT FOR INCORPORATION INTO POWERWATER NETWORK
This Permission to Use is given on the basis that the Developer and/or Consultant is not absolved from full responsibility for the correctness and accuracy of the design and/or documents so associated

WARNING

REASONABLE CARE HAS BEEN TAKEN TO ACCURATELY SHOW THE POSITION OF EXISTING AND PROPOSED SERVICES. HOWEVER, THE POSITION OF SUCH SERVICES SHOULD BE PROVEN ON SITE AND NO GUARANTEE CAN BE GIVEN THAT ALL EXISTING SERVICES ARE SHOWN. AREAS SURROUNDING EXISTING SERVICES ARE TO BE EXCAVATED BY HAND.

WATER SUPPLY OVERALL LAYOUT PLAN

5m 0m 5m 10m 15m 20m 25m
1:500 AT A1.



No.	DESCRIPTION	DATE	INIT.
C	ISSUED FOR APPROVAL	15.08.2008	JTH
B	ISSUED FOR 90% REVIEW REVIEW	08.06.2007	RWJ
A	ISSUED FOR 30% REVIEW REVIEW	12.02.2007	RWJ

AMENDMENTS

06D311006-MORRIS SOAK
QANTEC McWILLIAM consulting engineers
2nd Floor, TCG Centre
Mitchell Street
GPO Box 4083
Darwin NT 0801
Telephone 08 8981 7500
Facsimile 08 8941 1862
Email darwin@qmcw.com.au
ABN 79 086 342 065 ACN 086 342 065
Brisbane • Gayndah • Gladstone • Maroochydore • Maryborough • Rockhampton • Darwin • Alice Springs
The Association of Consulting Engineers Australia

DRAWN	RWJ	CHECKED	
DATE	DEC 06	DATE	
DESIGNED	AWW	CHECKED	
DATE	DEC 06	DATE	
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

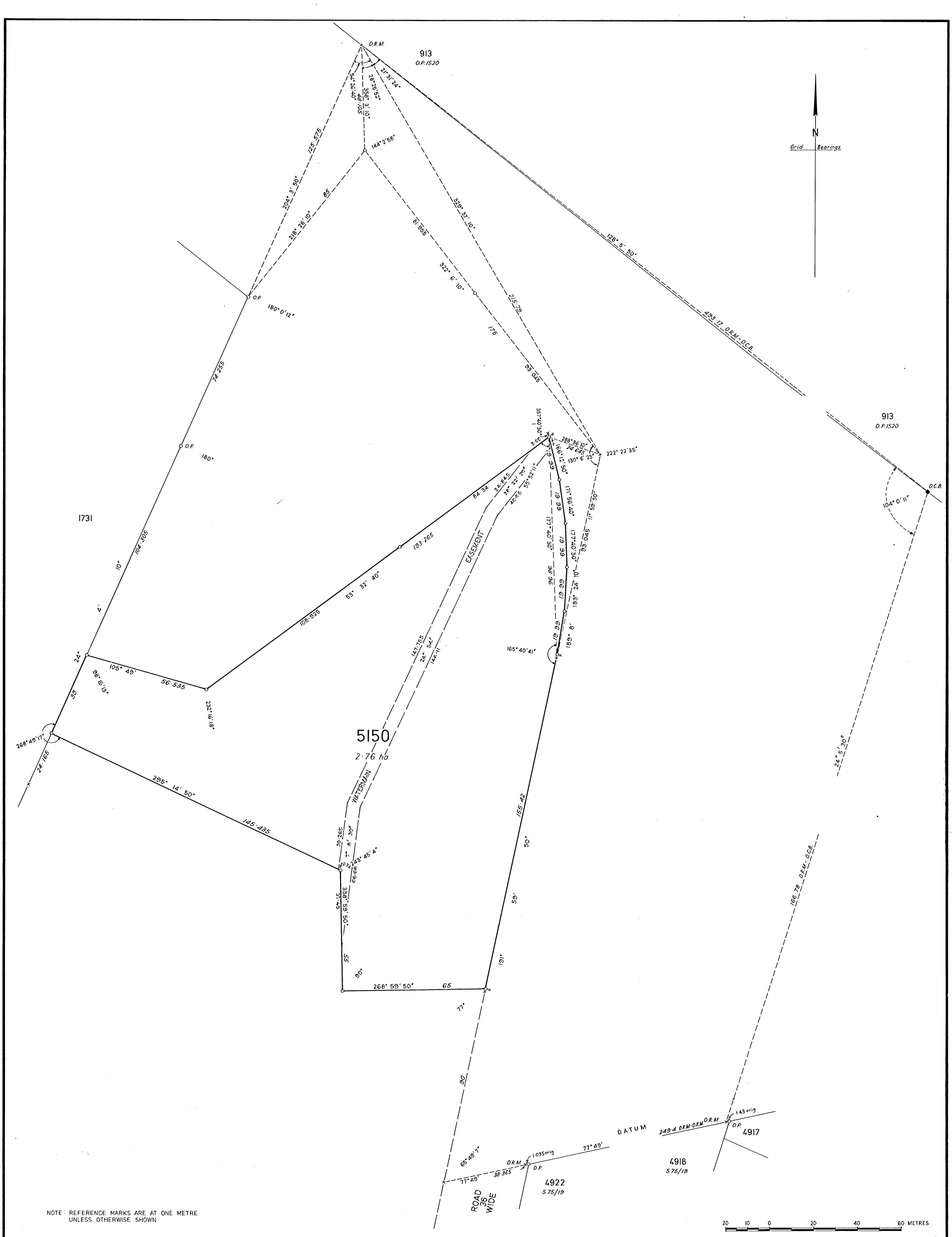
Northern Territory Government
Department of Planning and Infrastructure

Alice Springs
Akngwertnarre (Morris Soak)

Water Supply Layout Plan

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	19 OF -	R07-1370	C	A1

A1000



NOTE: REFERENCE MARKS ARE AT ONE METRE UNLESS OTHERWISE SHOWN

SURVEYOR'S CERTIFICATE

I T. L. Gadsby hereby certify that the survey represented on this plan was carried out by me or under my immediate supervision and was completed on 8-8-77 and that this survey has been executed in accordance with the Licensed Surveyors Ordinance 1933-1937 and the Regulations thereunder.

Date 15-8-77 T. L. Gadsby Licensed Surveyor

SURVEY APPROVED

Date 26.9.1977 Surveyor-General

File No. } S.77/35
Field Book No. }
Index Plan Alice Springs 2400 Sht 22A
Drawn B. Dyer 15-8-77
Examined [signature] 8.77
Calculation Book No.

Passed [signature] ASSISTANT CHIEF DRAFTSMAN
Date 26.9.77

AMENDMENTS

No	REFERENCE	DETAILS	APPROVED	DATE
1	File S 77/35 Folio 81	Watermain Easement addition to lot 5150	A. N. Wilson	23-1-78

LOT 5150

TOWN OF ALICE SPRINGS

LEGEND

Concrete Block ■
Survey Post □
Peg or Stake O
Reference Mark ×
Locksplt ▸◂
Fence Post ⊗

AZIMUTH

A. Assumed from S.75/19
B. ~~Observed at ..... and related~~ to the ..... Meridian of Longitude. Convergence ..... of arc.
C. From Latitude Datum ..... at ..... derived from .....

SCALE 1 : 750

S.77 / 35

COPY TO L.T.O. 6-11-78

26 / 1 / 78

Date Registered: 09/06/2010 **Volume** 747 **Folio** 785
Duplicate Certificate as to Title issued? No

SEARCH CERTIFICATE

SPECIAL PURPOSES LEASE 00438

Lot 5150 Town of Alice Springs from plan(s) S 77/035
Area under title is 2 hectares 7600 square metres

Owner:
Akngwertnarre Association Incorporated
of PO Box 8070, Alice Springs NT 0871

Easements:
Water supply Easement to Power and Water Authority

Registered Date	Dealing Number	Description
		Previous title is **Volume** 622 **Folio** 176
09/06/2010	728354	Underlease to Northern Territory of Australia - expiring 02/12/2012 (728333)
09/06/2010	728333	Sublease to Executive Director of Township Leasing - expiring 02/12/2049
End of Dealings		

Commencement Date: 22 December 1977

Expiry Date: In Perpetuity

Reservations:

(a) A right of entry in favour of the Minister, or an officer authorised in writing by the Minister, at all reasonable times and in any reasonable manner, to enter upon the leased land or any part of it and to inspect the leased land or any part of it and any improvements on it.

(b) All minerals and mineral substances in or on the leased land including gold, silver, copper, tin, other metals, ores, and substances containing metals, gems, precious stones, coal, shale, mineral oils and valuable earths or substances, together with the right to authorise any persons to enter upon the land to mine, work for, win, recover and remove them or any of them and to do all things necessary or convenient for those purposes.

(c) A power of resumption.

(d) A right of entry and inspection for the purposes of providing and maintaining water, sewer, electricity and other services on the leased land or on other lands.

Provisions:

To hold unto the lessee in perpetuity yielding and paying therefor an annual rental of ten cents if and when demanded by the Minister subject to re-appraisement in accordance with Section 11A of the Special Purposes Leases Act.

And it is hereby declared that -

The lessee, having paid all rent due under this lease, may at any time surrender this lease in accordance with the provisions of the Special Purposes Leases Act and the Regulations thereunder.

If the rent (other than the rent for the first year) is not paid on or before the expiry of three months from the date on which it becomes payable by the lessee, an additional amount (which shall be deemed to be recoverable as rent) at the rate of

five per centum per annum from the expiry of that period shall become payable by the lessee in respect of the rent overdue, if demanded by the Minister.

This lease is granted under and subject to the Special Purposes Leases Act and the Regulations for the time being in force thereunder and is conditional upon compliance by the lessee with the covenants and conditions to be complied with by the lessee and may, subject to the Special Purposes Leases Act and the Regulations, be forfeited for non-compliance with any such covenant or condition.

Covenants:

The lessee covenants with the Minister as follows -

1. That the lessee will pay the rent annually in advance.

2. That the lessee will use the land only for the purposes for which it is leased; viz: Communal Settlement, Camping and Ancillary.

3. That the lessee will pay all rates and taxes which may at any time become due in respect of the leased land.

4. That the lessee will observe and comply with the Regulations under the Special Purposes Leases Act for the time being in force.

5. That the lessee will by the first day of July, 1979 or within such further time as may be approved in writing by the Minister commence to erect improvements suitable to the purpose of the lease on the said land (with the necessary and usual outbuildings and fences) at a cost of not less than the sum of forty thousand dollars and in accordance with plans and specifications prepared by the lessee and previously submitted to and approved in writing by the Minister and complete the erection of the said improvements at a cost not less than the said sum and in accordance with any Act, Ordinance or Regulation by the first day of July, 1980 or within such further time as may be approved in writing by the Minister and thereafter maintain all improvements to the satisfaction of the Minister.

6. That the lessee will by the first day of July, 1983 or within such further time as may be approved in writing by the Minister raise the value of improvements on the leased land to the value of not less than one hundred and sixty thousand dollars and in accordance with plans and specifications prepared by the lessee and previously submitted to and approved in writing by the Minister and the lessee will at all times maintain and repair and keep in repair all improvements on the said land to the satisfaction of the Minister.

7. That the lessee will submit detailed sketch plans for the development of the site to the Planning Unit, Department of Lands and Housing for approval prior to the commencement of development. Such plans will contain all details of intended improvements and proposed landscaping.

8. That developed areas of the leased land will be dust suppressed and drained for stormwater to the satisfaction of the Minister by the first day of July, 1980 or within such further time as may be approved by the Minister and all such works shall thereafter be maintained to the satisfaction of the Minister.

9. That all internal roads and pathways will be well drained and of good all weather construction and shall be maintained to the satisfaction of the Minister.

10. That no building, structure or vehicle will be situated within seven and six tenths metres of any frontage. The set back areas so formed on road frontages shall be landscaped with trees and shrubs to the satisfaction of the Minister by the first day of July, 1980 or within such further time as may be approved in writing by the Minister and all such landscaping shall thereafter be maintained to the satisfaction of the Minister.

11. That all water and sewerage works will be carried out in accordance with the standards required by the Local Authority and the Department of Health. The disposal of garbage, sewage, waste water and sullage within the boundaries of the site must accord with the requirements of the Department of Health and the Local Authority.

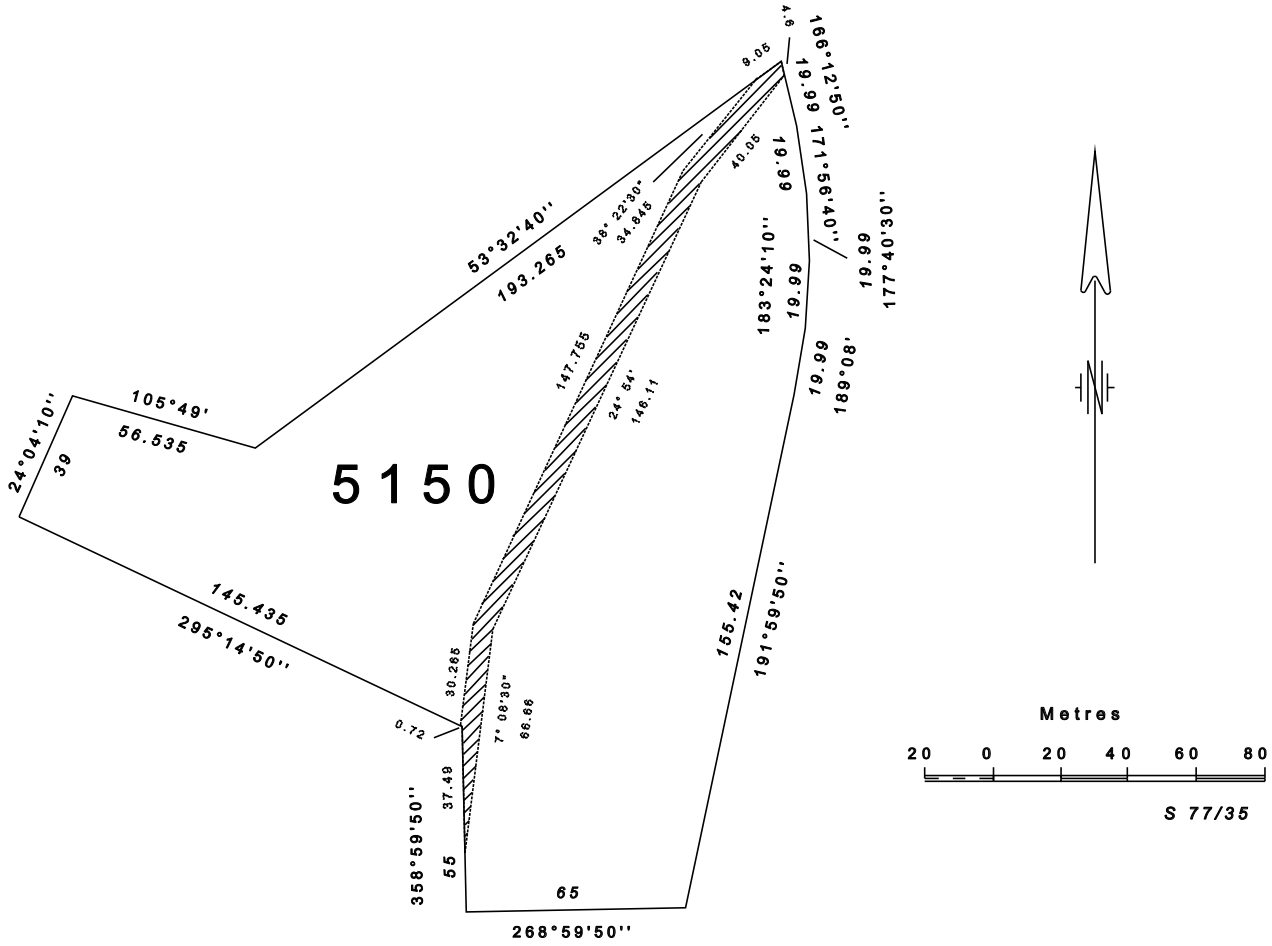
12. That adequate fire fighting equipment shall be provided on the site and shall be easily accessible from any development. Such equipment shall be approved by the Local Authority and thereafter maintained to the satisfaction of the Minister.

Date Registered: 09/06/2010 **Volume** 747 **Folio** 785

Duplicate Certificate as to Title issued? No

13. That for every ten individual camping sites or part thereof there shall be provided the following minimal facilities - 1 water point 1 water closet for use by males 1 urinal 1 water closet for use by females 1 shower with hot and cold water, for use by males 1 shower with hot and cold water, for use by females 1 handbasin with hot and cold water for each water closet provided 1 wash trough with hot and cold water.

14. That all electrical reticulation must conform to the following regulations: (a) Australian Standard 3000, Pt 1 1976 S.A.A. Wiring Rules (b) N.T. Electrical Supply Regulation No. 11, 1953 (c) S.A.A. Code cc7, 1966



NORTHERN TERRITORY OF AUSTRALIA

Record of Administrative Interests and Information

Record of Administrative Interests and Information
The information contained in this record of Administrative Interests only relates to the below parcel reference.

Parcel Reference: Lot 05150 Town of Alice Springs plan(s) S 77/035

(See section 38 of the Land Title Act)

Note: The Record of Administrative Interests and Information is not part of the Land Register and is not guaranteed by the Northern Territory of Australia, and the NT Government accepts no Liability for any omission, misstatement or inaccuracy contained in this statement.

Registrar General

Government Land Register
(none found)

Custodian - Registrar General (+61 8 8999 6252)

Current Title
CUFT 747 785 (order 1)

Tenure Type
SPECIAL PURPOSES LEASE 438

Tenure Status
Current

Area Under Title
2 hectares 7600 square metres

Owners
Akngwertnarre Association Incorporated
PO Box 8070, Alice Springs NT 0871

Easements
Water supply Easement to Power and Water Authority

Scheme Name
(none found)

Scheme Body Corporate Name
(none found)

Reserved Name(s)
(none found)

Unit Entitlements
(none found)

Transfers
(none found)

Tenure Comments
(none found)

Historic Titles
CUFT 622 176 (order 2)
CUFT 622 176 (order 1)
CUCL 158 010 (order 2)
CUCL 158 010 (order 1)
Visit the website http://www.nt.gov.au/justice/bdm/land_title_office/

Custodian - Surveyor General (+61 8 8995 5362)

Address
79 LOVEGROVE DR, ARALUEN

Survey Plan
S 77/035

Survey Status
Approved

Parcel Status
CURRENT

Parcel Area
2 hectares, 7600 square metres

Map Reference
Code 010 Scale 2500 Sheet 29.33

Parent Parcels
(none found)

Parcel Comments
ABORIGINAL LAND APPLICATION S77/35/2, LAP 6944. INTERNAL ROADS NAMED NTG G33 17/08/2011. ADMIN LOTS 10066 - 10083 ALLOCATED ON FOLIO 111 FILE 98/9249. ADMINISTRATIVE LOTS 10066 TO 10083 AND 10299 SURVEYED - S2012/11.

Survey Comments
(none found)

Proposed Easements
(none found)

Municipality
ALICE SPRINGS MUNICIPALITY

Region
ALICE SPRINGS

Custodian - Valuer General (+61 8 8995 5375)

Owner's Last Known Address
CEO Housing & Department of Lands and Planning, ATTENTION: CHIEF FINANCE OFFICER, GPO BOX 4621, DARWIN NT 0801

Parcels in Valuation
Lot 05150 Town of Alice Springs

Unimproved Capital Value
$405,000 on 01/07/2015
$444,000 on 01/07/2012
$423,000 on 01/07/2009
$282,000 on 01/07/2006
$152,000 on 01/07/2003
$120,000 on 01/07/2000
$125,000 on 01/07/1997
$100,000 on 01/07/1994
$90,000 on 01/07/1991
$85,000 on 01/01/1989
$81,000 on 01/01/1986
$50,000 on 01/01/1983
$20,500 on 01/07/1980
$12,000 on 14/03/1978

Valuation Improvements
28/05/1990 House x 8
28/05/1990 Ablution block
28/05/1990 Hall
14/03/1987 House
01/01/0001 Land
Improvement type(P)

Custodian - Property Purchasing (+61 8 8999 6631)

Acquisitions
(none found)

Custodian - Building Advisory Service (+61 8 8999 8965)

Building Control Areas

BBASP001 - Building Control Area	ALICE SPRINGS BUILDING AREA

Building Permits

Application Number:	23 of 23
Description:	dismantle shade structure & erect in new location
Number of Residental Units:	
Australian Bureau of Statistics Type:	(none found)
Building Class:	Non-habitable building
Area:	35 square metres
Certification:	Non-habitable building - Occupancy Permit - *issued on* 28/04/2016

Application Number:	22 of 23
Description:	MS 53 - New concrete and steel residential 3 bedroom dwelling (Type H6AS) and verandah
Number of Residental Units:	1
Australian Bureau of Statistics Type:	Separate House
Building Class:	Single Dwelling Non-habitable building
Area:	136 square metres
Certification:	Single Dwelling - Full Code - *issued on* 02/11/2011 Non-habitable building - Full Code - *issued on* 02/11/2011

Application Number:	20 of 23
Description:	Dwelling Alterations [House 3] including new kitchens, wet areas, florr linings, windows & doors, air conditioning & heating
Number of Residental Units:	1
Australian Bureau of Statistics Type:	Separate House
Building Class:	Single Dwelling Non-habitable building
Area:	(none found)
Certification:	Single Dwelling - Full Code - *issued on* 24/10/2011 Non-habitable building - Full Code - *issued on* 24/10/2011

Application Number:	19 of 23
Description:	Reburshment [House 6,11,12,14]
Number of Residental Units:	1
Australian Bureau of Statistics Type:	Separate House
Building Class:	Single Dwelling
Area:	(none found)
Certification:	Single Dwelling - Full Code - *issued on* 15/11/2011

Application Number:	18 of 23
Description:	Refurbishment [House 1,5]
Number of Residental Units:	1
Australian Bureau of Statistics Type:	Separate House
Building Class:	Single Dwelling

Area: (none found)
Certification: Single Dwelling - Full Code - *issued on* 16/09/2011

Application Number: 17 of 23
Description: New Concrete & Steel Residental Dwelling [9A]
Number of Residental Units: 2
Australian Bureau of Statistics Type: Semi-detached town house of one storey
Building Class: Single Dwelling
Area: 205 square metres
Certification: Single Dwelling - Full Code - *issued on* 09/02/2011

Application Number: 16 of 23
Description: New Concrete & Steel Residential Dwelling
Number of Residental Units: 2
Australian Bureau of Statistics Type: Semi-detached town house of one storey
Building Class: Single Dwelling
Area: (none found)
Certification: Single Dwelling - Full Code - *issued on* 09/02/2011

Application Number: 15 of 23
Description: Dwelling alterations to house 02 including new kitchens, wet areas, floor linings, windows and doors, air conditioning and heating
Number of Residental Units: 1
Australian Bureau of Statistics Type: Separate House
Building Class: Single Dwelling
Area: (none found)
Certification: Single Dwelling - Full Code - *issued on* 05/08/2010

Application Number: 14 of 23
Description: House 2 and House 14 only. Wall Cladding, Awnings and Pergola.
Number of Residental Units: 1
Australian Bureau of Statistics Type: Separate House
Building Class: Single Dwelling
Non-habitable building
Area: (none found)
Certification: Single Dwelling - Full Code - *issued on* 17/12/2008
Non-habitable building - Full Code - *issued on* 17/12/2008

Application Number: 13 of 23
Description: Dwelling Alterations - House 4
Number of Residental Units: 1
Australian Bureau of Statistics Type: Separate House
Building Class: Single Dwelling
Area: (none found)
Certification: Single Dwelling - Full Code - *issued on* 02/07/2009

Application Number:	12 of 23
Description:	NEW DWELLING and demolish
Number of Residental Units:	1
Australian Bureau of Statistics Type:	Separate House
Building Class:	Single Dwelling
Area:	220 square metres
Certification:	Single Dwelling - Full Code - *issued on* 14/11/2003

Application Number:	11 of 23
Description:	CONSTRUCTION OF A DWELLING
Number of Residental Units:	1
Australian Bureau of Statistics Type:	Separate House
Building Class:	Single Dwelling
Area:	0 square metres
Certification:	Single Dwelling - Full Code - *issued on* 06/03/2001

Application Number:	10 of 23
Description:	ADD & ALTER TO DWELLING
Number of Residental Units:	0
Australian Bureau of Statistics Type:	(none found)
Building Class:	Single Dwelling
Area:	17 square metres
Certification:	Single Dwelling - Full Code - *issued on* 07/12/1995

Visit the website http://www.nt.gov.au/building/

Custodian - Town Planning and Development Assessment Services (+61 8 8999 6046)

Planning Scheme Zone
CL (Community Living)

Interim Development Control Orders
(none found)

Planning Notes
(none found)

Planning Applications
(none found)

Custodian - Power and Water Corporation (1800 245 092)

Meters on Parcel

Power Water - Electricity	11
Power Water - Water	12

For Account balances, contact the Power and Water Corporation.

Custodian - Pool Fencing Unit (+61 8 8924 3641)

Swimming Pool/Spa Status
(none found)

For more information, contact the Pool Fencing Unit (+61 8 8924 3641).

Custodian - Mines and Energy (+61 8 8999 5322)

For information on possible Exploration Licences, contact Mines & Energy or visit the website http://www.nt.gov.au/d/Minerals_Energy/

For information on possible Petroleum Titles, contact Mines & Energy for further details.

Custodian - NT Environment Protection Authority (+61 8 8924 4218)

Results of site contamination assessment
(none found)

For further information contact Environment Protection Authority or visit the website https://ntepa.nt.gov.au/waste-pollution/contaminated-land

Custodian - Heritage Branch (+61 8 8999 5039)

Heritage Listing:
(none found)

For further information on heritage places contact Heritage Branch or visit the website https://nt.gov.au/property/land/heritage-register-search-for-places-or-objects

Other Interests

For Account balances, contact Alice Springs Town Council

9108
NAMATJIRA
9104
8078
8092
9283
5150
LECHLEITNER STREET
LOVEGROVE DRIVE
KENNETT COURT
7441
7442
7440
7443
GLENMON COURT
7439
7444
SHIRLEY COURT
8074
7438
9015
9016
4920

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".

Anthelk Ewlpaye (Charles Creek)

Anthelk Ewlpaye (Charles Creek)

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.

- Alice Springs Town Council – Subdivision and Development Guidelines, November 2012

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,
- Alice Springs Town Camp Sewage Pumping Station Assessments, Byrne Design, 2014,
- 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 Charles Creek community on the 22 and 23 November 2016 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 sewerage infrastructure within Charles Creek is owned by Anthelk-Ewlpaye Association Incorporated, but is the responsibility of Ingkerreke Outstations Resource Services to maintain.

PWC own a DN150 PVC gravity main at the boundary between Charles Creek community and Kunoth community, and along Ulpaya Road, as shown in Figure 1. It is understood that the internal sewer network in Charles Creek connects to the PWC town sewer, however PWC do not own any sewerage infrastructure within the community.

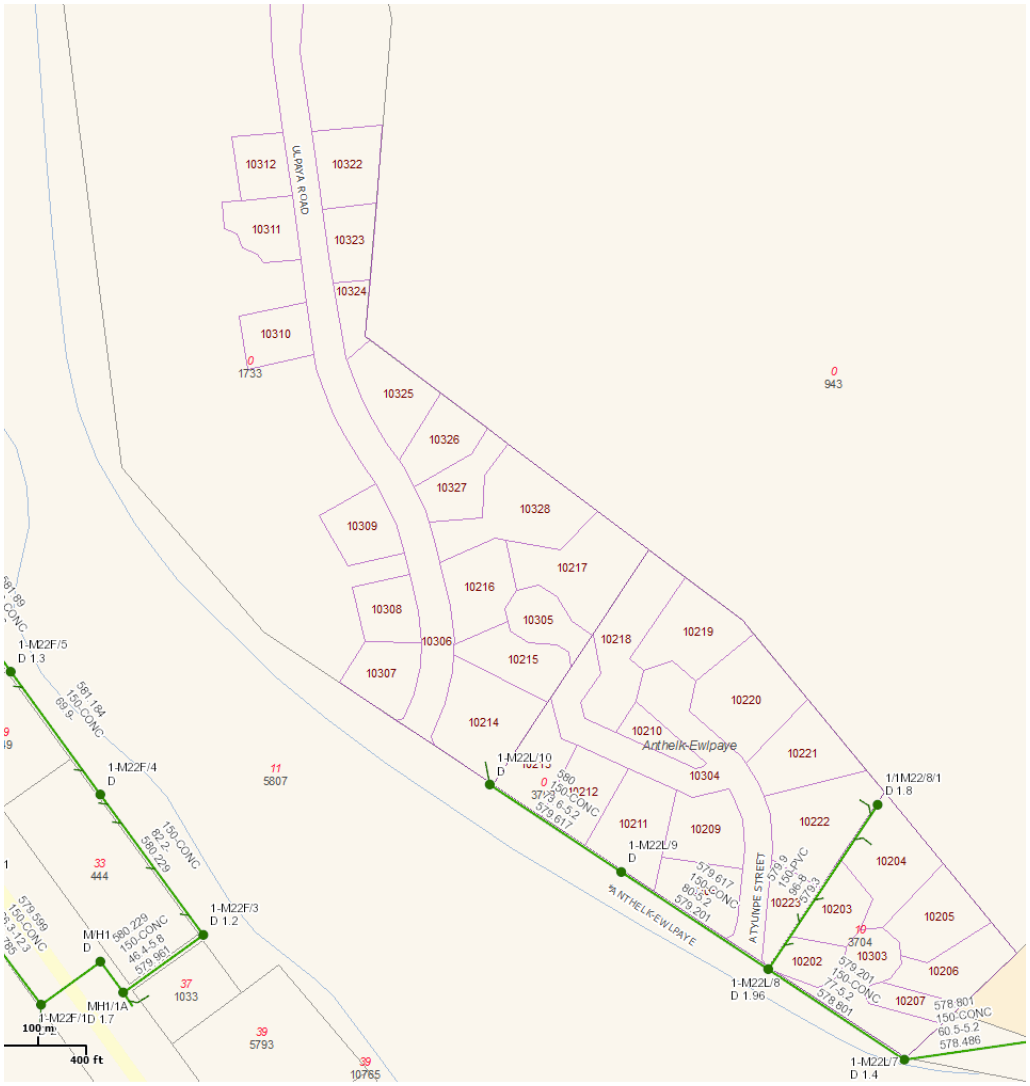


Figure 1 PWC owned sewer infrastructure

5.1.1 Connection methods and billing

PWC advised that they currently charge a single sewerage bill based on the number of houses, which for Charles Creek is 15 houses plus one other which has two fixtures. The sewerage bill is charged to the Department of Housing and Community Development.

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 manhole covers, as all other sewerage infrastructure is below ground. The assets that were inspected had the following conditions:

Table 2 Sewer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Manhole		2	6	2		10

Figure 2 Sewer manhole, condition: *good*

Figure 3 Sewer manhole, condition: *good*

5.3 Current performance and risks

5.3.1 Current sewer network performance

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 Charles Creek is 24, this multiplied by 9 EP per house gives a total current EP of 216. Sewer layout drawings (refer Appendices) showed that the pipe size was DN150 PVC, the grade of 1.0% was assumed.

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 PWC minimum slope (%)	Q_{full} (L/s)	Current Q (L/s)	Current capacity (%)
Catchment 1	216	150	1.0	16.50	2.44 (Charles Creek) + 0.87 (Hoppys Camp) =3.31	20%

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

The sewer layout drawings (refer Appendices), show that the sewer pipework has not been constructed in the road alignment. To be in accordance with PWC standards, the network, including manholes, should be within the road reserve or in easements if the assets are to be gifted to PWC.

5.4 Future demands

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

5.5 Recommended works

As the existing pipe complies with PWC standards for diameter, and has sufficient capacity, no upgrades are recommended. If substantial developments are expected then the alignment of the pipe should be reconsidered and potentially relocated to the road reserve. For the current demand, this is not recommended.

6 Water supply

6.1 Ownership and boundaries

The existing water main servicing Charles Creek is a DN150 PVC pipe. The water main passes through the community and services Kunoth, Hoppys as well as other sections of Alice Springs.

PWC have advised that the water reticulation network at Charles Creek is a part of the PWC network, however is not strictly up to current standards. PWC maintain the water assets up to the housing meters although there is no formal agreement to conduct this maintenance. It is believed the remaining water infrastructure is owned by Anthelk-Ewlpaye Association Incorporated, but are the responsibility of Ingkerreke Outstations Resource Services to maintain.

Figure 4 shows the extent of water services for Charles Creek and Kunoth.

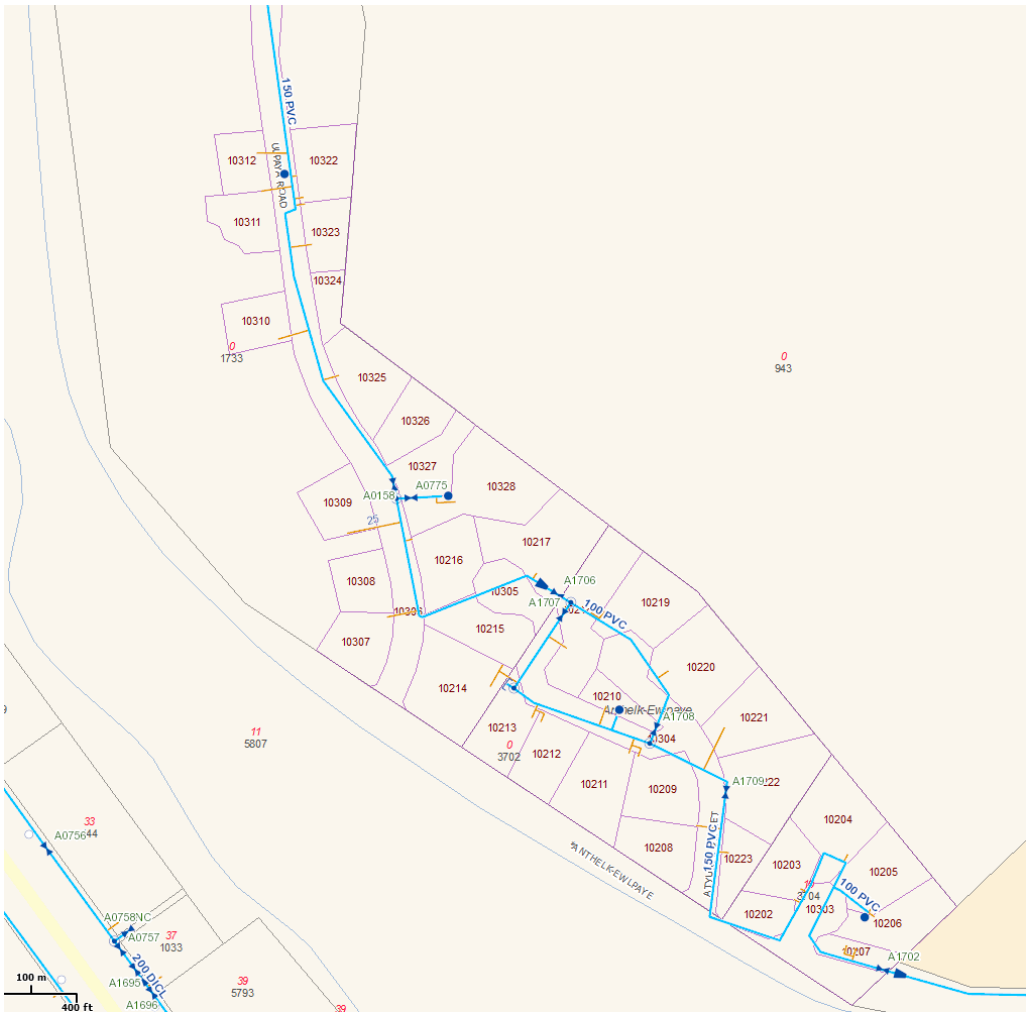


Figure 4 Charles Creek community water supply

6.1.1 Connection methods and billing

Through consultation with PWC, it has been determined that the water supply to Charles Creek is currently charged using a fixed daily rate for a total of ten lot water meters. The water bills for Charles Creek are issued to the Department of Housing and Community Development. It is not known what contributions are made by the residents.

It is intended that upgrades are undertaken to isolate the water supply to the community which would allow PWC to measure usage for the entire community, as opposed to individual lots within the community. This would require the installation of a bypass main. It is expected that the installation of a bypass main is not economically viable. Therefore, the current practice of measuring water usage at lot meters is seen to be the most practical.

A total of three water meters were found and assessed during the inspection. There are currently 24 dwellings in the community, therefore up to an additional 22 residential water meters are required. Note, some water meters may have been present however not visible due to overgrown flora, restricted property access or being buried blow ground in small pits. Consequently water meters may have not been discovered during the inspection.

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. 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 asset condition assessment

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

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

Figure 6 Fire hydrant, condition: *good*

The two fire hydrants found in Charles Creek were assessed as being in good condition. Both hydrants required repainting on the concrete cover.

Minor maintenance works are also required on one of the residential water meters which needs to have excess grass removed.

6.3 Current performance and risks

The current demand of the community was calculated based on the following design assumptions:

- The nominal peak day flow is 1300 L/capita/day, based on PWC's supplement to WSA 03 2002. This value is for the Southern Region of NT. It was assumed that the nominal peak day flow of 1300 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 calculated demand.

Table 5 Current water demand

Total dwellings	EP	Demand (l/s)	Peak hour demand (l/s)
24	216	3.11	9.32

Given the demand on the system is relatively low, it is expected that the network will supply adequate pressure throughout the community.

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. Additional fire hydrants are required at Anthelk Ewlpaye to provide adequate coverage throughout the community. Four new fire hydrants have been incorporated into the cost estimates.

It should be noted that there are significant concerns with the existing layout. The issues regarding safety concerns and access limitations detailed in Section 3 are directly relevant to the water network at Charles Creek.

6.4 Future demands

As no new developments are currently planned for the community, 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;

- Clear overgrown grass from one residential lot water meter
- Repaint two fire hydrants

Upgrades to isolate the town camp water supply are highly recommended. With respect to the current water main layout, the simplest foreseeable method to isolate the community water supply from the main network is to install a bypass main. It is expected that this will come with significant cost and not be economically viable. Therefore, the recommended upgrades to the community water supply include;

- Install four new fire hydrants
- Install additional 22 residential water meters

7 Roadworks

7.1 Ownership and boundaries

It is the current understanding that the roads and road furniture within Charles Creek are owned by Anthelk-Ewlpaye Association Incorporated, but are the responsibility of Ingkerreke Outstations Resource Services to maintain.

7.2 Existing infrastructure condition assessment

The road network within Anthelk Ewlpaye (Charles Creek) community consists of a mix of sealed and unsealed roads. There are also numerous informal tracks which appear to be used frequently but are not covered in this inspection and report.

Road furniture was also inspected. 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
Manholes	3	2	1	1		7

Figure 7 Sign 1, condition: *very poor*

Figure 8 Sign 2, condition: *very poor*

The only road furniture within Anthelk-Ewlpaye are a collection of seven signs with the majority in poor or very poor condition, these signs will need to be repaired or replaced.

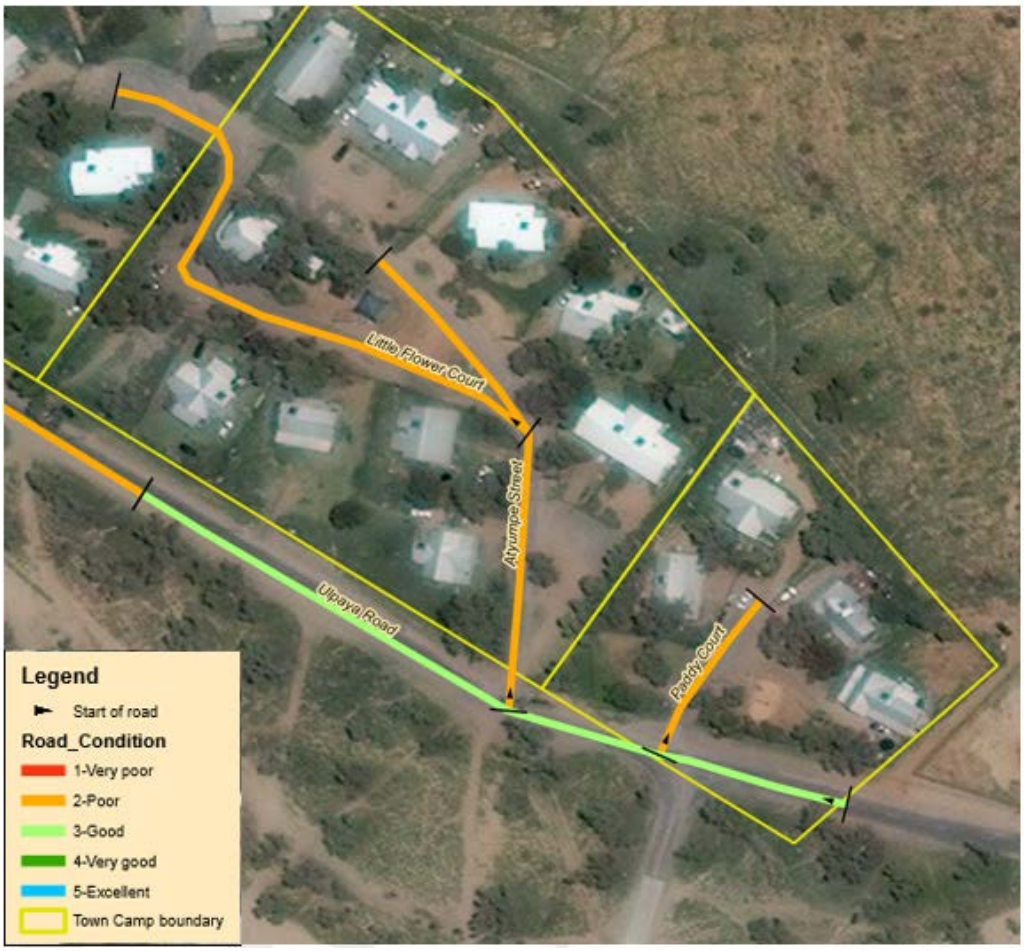


Figure 9 Community road network

Table 7 below details the condition of the roads within Anthelk Ewlpaye (Charles Creek) community for specific segments. Figure 9 shows a map of the community's road network with the condition ratings, road name, and chainage direction. Note, the percentage refers to the percentage of that particular road segment which experiences the defect.

Table 7 Road network condition assessment

Road name	Chainage start (km)	Chainage end (km)	Condition (1 to 5)	Defects and associated condition
Atyumpe Street	0	0.14	2	-5% of the road at the end of the street has significant surface failure (1) -20% of the road has edge breaks (2)
Little Flower Court	0	0.17	2	-30% of the road in isolated sections have very poor condition edge breaks (1) -5% of the road has undulations (2) -10 potholes (no rating)
Ulpaya Road	0.6	0.85	2	-5% of the road has surface cracking (3) -10% of the road has edge breaks (2) -5 potholes (3)
	0.85	1.09	3	-10% of the road has edge breaks (4) -1 pothole (4) -5% of the road has longitudinal cracking (3)

Road name	Chainage start (km)	Chainage end (km)	Condition (1 to 5)	Defects and associated condition
	0.4	0.6	2	-5% of the road has surface cracking (3) -10 potholes (3) -20% of the road has edge breaks (1)
	0.2	0.4	2	-5% of the road has surface cracking (1) 10% of the road has edge breaks (2)
	0	0.2	3	-10% of the road has transverse cracking (2) -5% of the road has edge breaks in an isolated section very poor condition (1) -10% of the road has longitudinal cracking (2)

Figure 10 Pavement, condition: *good*

Figure 11 Pavement, condition: *poor*

7.3 Current performance and risks

The main road into Anthelk-Ewlpaye, Atyumpe Street, was rated as having poor condition, there were significant edge breaks and some potholes. The road network is in an overall poor condition and requires significant maintenance and/or upgrades. As the roads have undulation 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.

The layout of the road network is sufficient for the current number of houses, although the condition of the road is generally 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 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 maintenance works are recommended to upgrade the current infrastructure;

- Complete total reseal of 45 m2 to repair the serious surface failure
- Repair 200 m of edge breaks
- Fill and reseal 26 potholes
- Repair 370 m2 of surface, longitudinal and transverse cracking
- General clean up (removal of rubbish/dirt) of 1400 m of road reserve

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 Anthelk Ewlapye community is 6 m, this means that all 1400 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

There were no stormwater drainage assets within Charles Creek.

8.2 Current performance and risks

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

The Alice Springs Town Council's general design philosophy for stormwater drainage is that the system is based on a network of sealed roads, kerb and gutters, side entry pits and underground drainage pipes, including grassed open channels and diversion drains. It is recommended that kerbs and gutters, side entry pits and underground pipes are installed to help reduce flooding in the community. The cost estimates allow for 850 m of stormwater drainage.

8.3 Future demands

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

8.4 Recommended works

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

- Construct kerbs and gutters, side entry pits, and underground drainage pipes.

9 Community structures

9.1 Ownership and boundaries

The community structures within Charles Creek are owned by Anthelk-Ewlpaye Association Incorporated, but are the responsibility of Ingkerreke Outstations Resource Services to maintain.

9.2 Existing infrastructure condition assessment

The site investigation for the community structures included assessing the condition and features of playgrounds, basketball courts and shade structures. The following table shows the condition rating given to the community structures.

Table 8 Community structures condition assessment

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

Figure 12 BBQ Area, condition: *very poor*

Figure 13 Playground 1, condition: *poor*

Figure 14 Basketball Court, condition: *poor*

Figure 15 Playground 2, condition: *poor*

Figure 16 Bubbler, condition: *very poor*

9.3 Current performance and risks

The community structures are generally in poor and very poor condition. This is due to rubbish, broken glass, and graffiti on the structures, and some of the items not functioning property (i.e., BBQ does not appear to be in working condition, basketball court not completely sealed).

9.4 Future demands

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

9.5 Recommended works

The following works are recommended to upgrade the community structures:

- General clean and maintenance of the basketball court
- Concrete more area of the basketball court
- Repaint lines on basketball court
- New net for basketball ring
- General clean and maintenance of the BBQ area
- Repair BBQ
- Patch 10-20 holes in shade sail over BBQ area and one of the playgrounds
- Repair the bubbler and return to working order
- General clean and maintenance of both playgrounds
- General maintenance of both playground to ensure all equipment is working such as swings
- Repaint of all playground equipment in both playgrounds

10 Electrical services

10.1 Ownership and boundaries

The following points, from Network Policy NP003 Installation Rules Section 3, 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, and aerial low voltage infrastructure where installed with 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.

PWC advise that most of Tennant Creek/Alice Springs Town Camps have undergone upgrades under the SIHIP program with the intent to normalise the services to look like an urban subdivision but have never been formally handed over to PWC for operations and maintenance.

The Anthelk Ewlpaye community electrical reticulation systems is supplied by a combination of overhead reticulation scheme and underground reticulation to the individual houses. Prepaid meters are utilised in Anthelk Ewlpaye community.

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

PWC recommend that a GBS (Gas Break Switch) be provided upstream of the first transformer to establish a demarcation point.

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.

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

10.2 Existing infrastructure condition assessment

The Table 9 shows the condition rating given to the distribution panels

Table 9 Distribution panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Distribution panels			2			4 (status unknown for 2)

Table 10 shows the condition rating given to the street lights. The street lights were of a low voltage overhead feeder design, sodium lamp type S70D, with lamp covers protected by cages. The street lights have an 86.7% operational rating and 13.3% un-operational rating.

Table 10 Street light condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Street light		2		13		15

Table 11 shows the condition rating given to the street lights. The street lights on OH poles were of a low voltage overhead feeder design, sodium lamp type S70D, with lamp covers protected by cages. The street lights have a 100% operational rating.

Table 11 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			7			7

Table 12 shows the condition rating given to the Overhead poles. The overhead poles are of Weld Construction (Universal Pole construction) and steel LV construction. The overhead poles have 100% operational rating from the visual inspection.

Table 12 Overhead pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Overhead pole			3	5		8

Table 13 shows the condition ratings given to electrical pit. LV supply connection pit was constructed of concrete.

Table 13 Pit condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Pit						1(status unknown)

Table 14 shows the condition rating given to the metering panels. All assessed meters in this community are prepaid digital meters.

Table 14 Meter panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Pre-paid meter			16			16
Switchboard			11			11

Table 15 shows the condition rating given to the switchboards associated to dwellings.

Table 15 Switchboard condition assessment (Housing footprint)

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

The details of the individual inspections and photographs of each infrastructure item are included in the 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 Anthelk Ewlpaye community transformer is 24% of rated capacity based on 4.5kVA/dwelling. The calculated maximum demand is within the total capacity of the substation on site.

Table 16 Anthelk Ewlpaye current demand load vs transformer ratings

Community name	Dwellings	Transformer (kVA)	kVA Total @ 4.5kVA	kVA Total @ 7kVA	Comments
Anthelk Ewlpaye (Charles Creek)	17	315	76.5	119	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp used].

A tabulated summary of all community transformers is included in the 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 community, there are no additional upgrades required to cater for future demand.

10.5 Recommended works

The following maintenance works and upgrades are recommended:

- Replace two 70W street lights.
- Install new street lighting - approximately 70 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 17 Telecommunication pit condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Telecommunication pit						0

Table 18 Telephone booth condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Phone booth						1 (status unknown)

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 Anthelk Ewlpaye is displayed in the Figure 17 below. NBN is available to residents via a fixed telecommunication line on application to an appropriate NBN access provider.

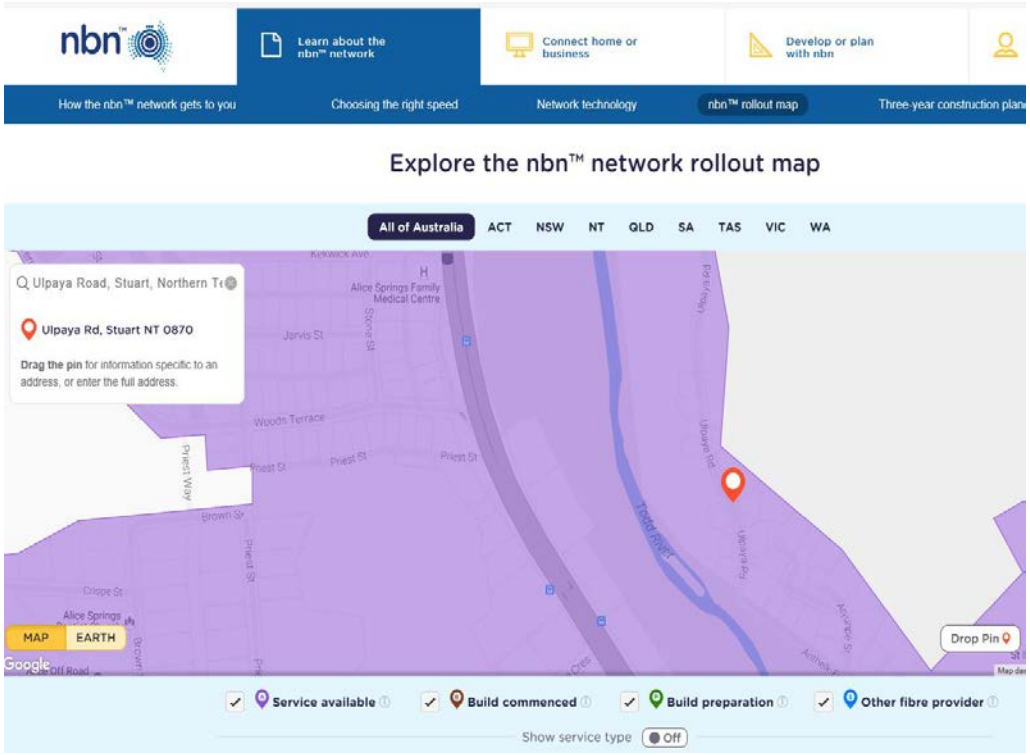


Figure 17 NBN network availability map

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 Anthelk Ewlpaye 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. The estimates take into account a 30% contingency, are inclusive of GST, and a location factor has been applied to town camps outside of Darwin.

Table 19 Cost estimates

Infrastructure	Maintenance of existing infrastructure	Upgrades to meet current design
Sewerage	$ 0	$ 0
Water supply	$ 1,000	$ 60,000
Roadworks	$ 89,000	$ 1,692,000
Stormwater drainage	$ 0	$ 1,001,000
Community structures	$ 67,000	$ 0
Electrical	$ 2,000	$ 1,001,000
Communications	$ 0	$ 0
Miscellaneous provisions	$ 29,000	$ 460,000
Total (including GST)	**$ 188,000**	**$ 4,214,000**
Grand total	**$ 4,402,000**	

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

The following works are recommended for Anthelk Ewlpaye community:

Sewerage

- No immediate maintenance works or upgrades required

Water supply

- Clear overgrown grass from one residential lot water meter
- Repaint two fire hydrants
- Install four new fire hydrants
- Install up to an additional 22 residential water meters

Roadworks

- Complete total reseal of 45 m2 to repair the serious surface failure
- Repair 200 m of edge breaks
- Fill and reseal 26 potholes
- Repair 370 m2 of surface, longitudinal and transverse cracking
- General clean up (removal of rubbish/dirt) of 1400 m of road reserve
- 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

- Construct kerbs and gutters, side entry pits, and underground drainage pipes.

Community structures

- General clean and maintenance of the basketball court
- Seal area surrounding basketball court
- Repaint lines on basketball court
- New net for basketball ring
- General clean and maintenance of the BBQ area
- Repair BBQ
- Patch holes in shade sail over BBQ area and one of the playgrounds
- Repair the bubbler and return to working order
- General clean and maintenance of both playgrounds
- General maintenance of both playground to ensure all equipment is working
- Repaint of all playground equipment in both playgrounds

Electrical services

- Replace two 70W street lights.
- Install new street lighting - approximately 70 poles

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 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:1,200

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Sewerage

16 - Anthelk Ewlpaye (Alice Springs)

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:1,200

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Water

16 - Anthelk Ewlpaye (Alice Springs)

Legend

Town Camp boundary

Community structures

- Bubblers (1)
- BBQ/Table and Chairs (1)
- Basketball court (1)
- Playground (1)

Road furniture

- Signs (6)

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:1,200

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments
Road furniture, stormwater drainage & community structures
16 - Anthelk Ewlpaye (Alice Springs)

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:47:34 PM

Insp ID: 966	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

Inspection Type:	Bubblers
Leaking bubbler:	No
Bubbler Condition:	1 - Very Poor
Bubbler Comments:	Not working

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:48:15 PM

Insp ID: 965 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	Single
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:31:41 PM

Insp ID: 978 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	Single
Sluice Valve:	No
Above or Below ground:	
FH Leakage:	No Access
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Need re-painting

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:52:41 PM

Insp ID: 962	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Round
Manhole Cover Diam (mm):	250
Manhole Length (mm):	
Manhole Width (mm):	
Manhole Condition:	2 - Poor
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:52:41 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:51:18 PM

Insp ID: 963 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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:	3 - Good
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:34:04 PM

Insp ID: 970 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Square
Manhole Cover Diam (mm):	
Manhole Length (mm):	800
Manhole Width (mm):	800
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:27:18 PM

Insp ID: 981 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Round
Manhole Cover Diam (mm):	600
Manhole Length (mm):	
Manhole Width (mm):	
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:21:49 PM

Insp ID: 983 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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:	Lid not sitting flush

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:09:36 PM

Insp ID: 985 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Round
Manhole Cover Diam (mm):	600
Manhole Length (mm):	
Manhole Width (mm):	
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:07:58 PM

Insp ID: 986 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Round
Manhole Cover Diam (mm):	600
Manhole Length (mm):	
Manhole Width (mm):	
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:03:19 PM

Insp ID: 991 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Round
Manhole Cover Diam (mm):	600
Manhole Length (mm):	
Manhole Width (mm):	
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 1:59:53 PM

Insp ID: 992	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

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:	Lots of graffiti

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 1:57:40 PM

Insp ID: 993 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Round
Manhole Cover Diam (mm):	600
Manhole Length (mm):	
Manhole Width (mm):	
Manhole Condition:	2 - Poor
Notes on Lid:	
Comments:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 12:21:44 PM

Insp ID: 939 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Road Name:	Ulpaya Road
What are you inspecting:	Pavements
Ch From (km):	0.6
Ch To (km):	0.85
Road Type:	Sealed - spray seal
Section Width (m):	3.8
Road Condition:	2 - Poor
General Comment:	3 speed humps in section, no signs for speed humps

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Surfacing Cracks	5	3 - Good	5 percent
Edge Breaks	10	2 - Poor	10 percent of section
Potholes	5	3 - Good	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Flush Kerb	2 - Poor	Covered by spray seal, kerb not straight

Shoulders Section

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

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 12:21:44 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 12:21:44 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 12:21:44 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 11:23:39 AM

Insp ID: 957 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Road Name:	Ulpaya Road
What are you inspecting:	Pavements
Ch From (km):	0.85
Ch To (km):	1.09
Road Type:	Sealed - spray seal
Section Width (m):	5.1
Road Condition:	3 - Good
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks	10	4 - Very Good	10 percent of section
Potholes	1	4 - Very Good	
Transverse Cracks	5	3 - Good	5 percent

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Flush Kerb	3 - Good	Some breakage along kerb, mostly covered by spray

Shoulders Section

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

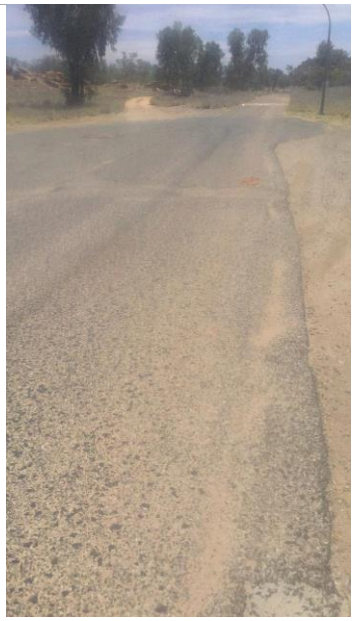
Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 11:23:39 AM



Northern Territory Town Camps

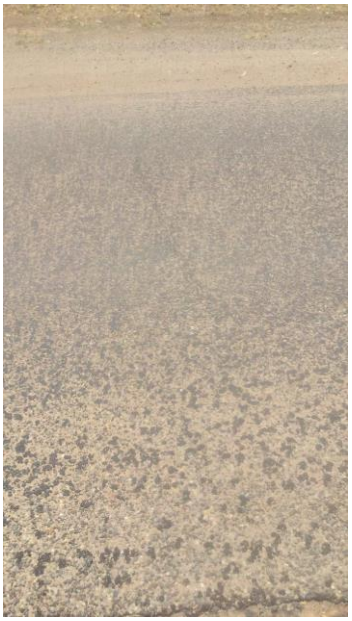
Civil Infrastructure

Inspection Date 22/11/2016 11:23:39 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 11:23:39 AM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 11:23:39 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:53:55 PM

Insp ID: 960 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Road Name:	Atyumpe Street
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.14
Road Type:	Sealed - spray seal
Section Width (m):	6
Road Condition:	2 - Poor
General Comment:	2 speed hump, no signs. Community leaders asking for bollards to stop dangerous driving

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Surfacing Failure	5	1 - Very Poor	End of stree had significant surfance failure
Edge Breaks	20	2 - Poor	20 percent

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Flush Kerb	2 - Poor	

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed				1	Area of significant erosion

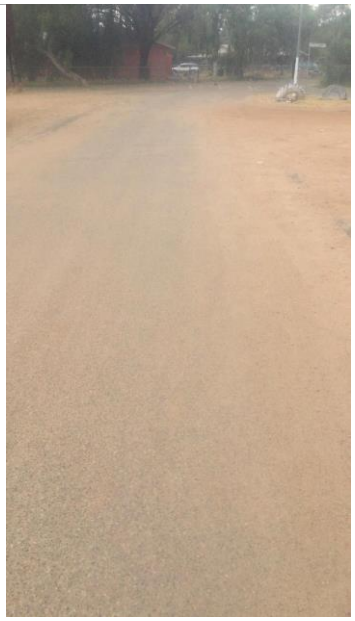
Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:53:55 PM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:53:55 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:53:55 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:27:23 PM

Insp ID: 971 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Road Name:	Little Flower Court
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.17
Road Type:	Sealed - spray seal
Section Width (m):	4.8
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks	30	1 - Very Poor	30 % isolated sections of very poor condition
Undulation/Settlement	5	2 - Poor	5 percent
Potholes	10		

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Flush Kerb	2 - Poor	Kerb in first 100m of road only

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed		70			

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:27:23 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:27:23 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:33:12 PM

Insp ID: 977 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Road Name:	Ulpaya Road
What are you inspecting:	Pavements
Ch From (km):	0.4
Ch To (km):	0.6
Road Type:	Sealed - spray seal
Section Width (m):	5.8
Road Condition:	2 - Poor
General Comment:	2 speed humps in section, no speed hump signs

Road Defects Section

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Flush Kerb	2 - Poor	

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed		80		2	Large Areas of dirt over road

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:33:12 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:33:12 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:16:40 PM

Insp ID: 984 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Road Name:	Ulpaya Road
What are you inspecting:	Pavements
Ch From (km):	0.2
Ch To (km):	0.4
Road Type:	Sealed - spray seal
Section Width (m):	4.4
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Surfacing Cracks	5	1 - Very Poor	5 percent
Edge Breaks	10	2 - Poor	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
Flush Kerb	1 - Very Poor	

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed		70			

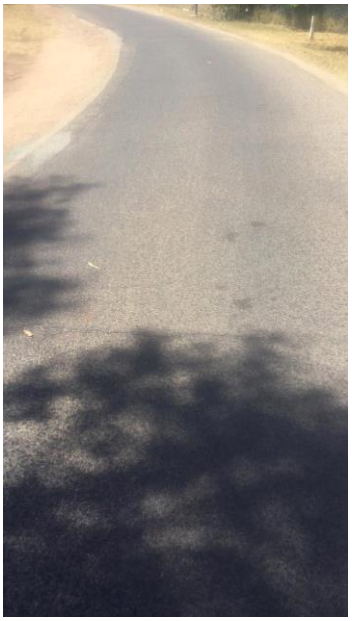
Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:16:40 PM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:16:40 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 1:52:15 PM

Insp ID: 994 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Road Name:	Ulpaya Road
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.2
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
Transverse Cracks	10	2 - Poor	10 percent
Edge Breaks	5	1 - Very Poor	5 percent, isolated section of very poor conditi
Longitudinal Cracks	10	2 - Poor	10 percent

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Shoulder Type	Width	Dropoff(mm)	Erosion	Condition	Shoulder Comments
Unsealed		40		3	

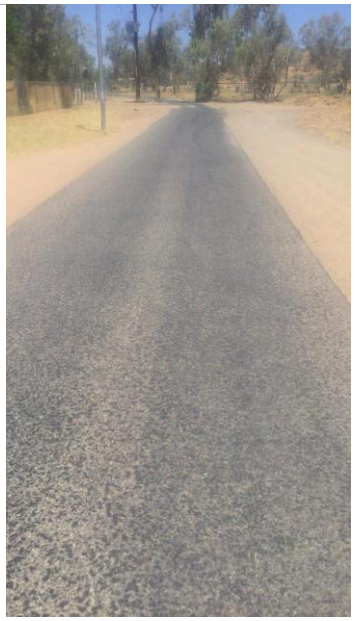
Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 1:52:15 PM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 1:52:15 PM

Northern Territory Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:49:15 PM

Insp ID: 964 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Inspection Type:	Shade Structure
Shade Structure Type:	BBQ Area
Shade Floor Type:	Natural ground
Roof Type:	Shadecloth
Width (mm):	7
Length (mm):	9
Appearance:	1
Appearance Comment:	Broken glass and rubbish
Condition:	3 - Good
Comment:	Lots of holes in shade cloth

Northern Territory Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:49:15 PM

Northern Territory Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:42:31 PM

Insp ID: 967 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Inspection Type:	Shade Structure
Shade Structure Type:	Play ground
Shade Floor Type:	Rubber Mats
Roof Type:	Tin Roof
Width (mm):	8
Length (mm):	15
Appearance:	1
Appearance Comment:	Rubbish, old clothing, graffiti
Condition:	2 - Poor
Comment:	Swings broken

Northern Territory Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:42:31 PM

Northern Territory Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:37:24 PM

Insp ID: 969 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Inspection Type:	Shade Structure
Shade Structure Type:	Basket Ball Court
Shade Floor Type:	Concrete
Roof Type:	Not Covered
Width (mm):	10
Length (mm):	29
Appearance:	2
Appearance Comment:	Basketball court not completely concrete
Condition:	2 - Poor
Comment:	

Northern Territory Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:23:57 PM

Insp ID: 982 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Inspection Type:	Shade Structure
Shade Structure Type:	Play ground
Shade Floor Type:	
Roof Type:	Shadecloth
Width (mm):	15
Length (mm):	20
Appearance:	2
Appearance Comment:	Rubbish and some broken glass
Condition:	2 - Poor
Comment:	

Northern Territory Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:23:57 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 3:03:14 PM

Insp ID: 961	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

Road Name:	Little Flower Court
What are you inspecting:	Signs
Type of Sign:	Street name
Sign Condition:	3 - Good
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 3:23:35 PM

Insp ID: 973	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

Road Name:	Atyumpe Street
What are you inspecting:	Signs
Type of Sign:	40 kph
Sign Condition:	1 - Very Poor
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:37:37 PM

Insp ID: 976 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Road Name:	Ulpaya Road
What are you inspecting:	Signs
Type of Sign:	20 kph
Sign Condition:	1 - Very Poor
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:08:13 PM

Insp ID: 987 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Road Name:	Ulpaya Road
What are you inspecting:	Signs
Type of Sign:	Pedestrian Sign
Sign Condition:	2 - Poor
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:07:07 PM

Insp ID: 988 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Road Name:

What are you inspecting: Signs

Type of Sign: 20 kph

Sign Condition: 1 - Very Poor

Sign Comment:

General Comment:

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:05:31 PM

Insp ID: 989 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Road Name:	Ulpaya Road
What are you inspecting:	Signs
Type of Sign:	Community sign
Sign Condition:	4 - Very Good
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:04:05 PM

Insp ID: 990 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

Road Name:	Ulpaya Road
What are you inspecting:	Signs
Type of Sign:	Community
Sign Condition:	2 - Poor
Sign Comment:	
General Comment:	

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 22/11/2016 2:40:33 PM

Insp ID: 968	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

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:

Lot Water Meter Size:

Lot Water Meter Condition: 2 - Poor

Lot Water Meter Comment:

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 23/11/2016 2:30:32 PM

Insp ID: 979	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

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:	
Lot Water Meter Size:	20
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	

Northern Territory Town Camps

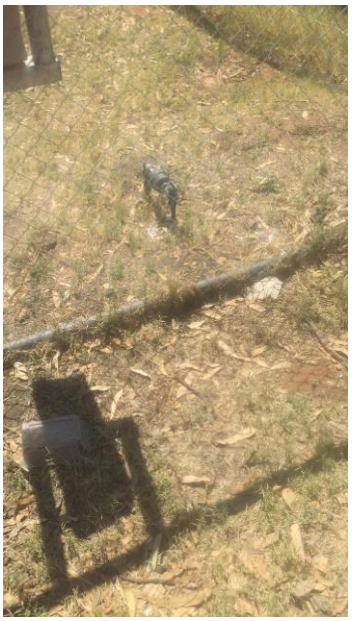
Civil Infrastructure

Inspection Date 23/11/2016 2:29:16 PM

Insp ID: 980	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

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:	19
Lot Water Meter Size:	20
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	



Electrical inspection report

2007

A3 scale: 1:1,200

0 20 40 60 80 100 m

Date: 23/02/2017 Version: 3

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Electrical

16 - Anthelk Ewlpaye (Alice Springs)

2008

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 3:06:08 PM

Insp ID: 501 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing: Distribution Panel

What is Main Distribution Panel installation method: Outdoor

Is the distribution panel labelled: No Access

What is Distribution Panel main CB Rating:

What is the main incoming cable type/Size to Distribution Panel:

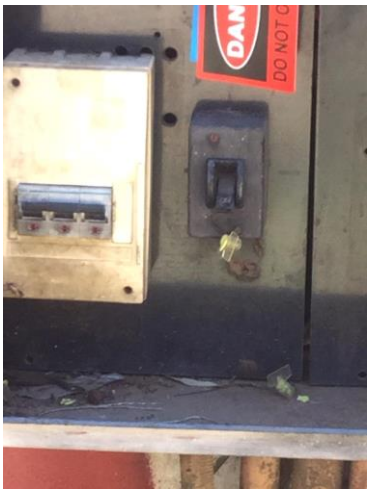
What is the condition of switchboard:

Condition Comments:

What is the condition of cables/glands into switchboard:

Cable/Gland Condition Comments:

Distribution Panels name plate access: No Access



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:34:29 PM

Insp ID: 510 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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:	
What is the main incoming cable type/Size to Distribution Panel:	
What is the condition of switchboard:	2
Condition Comments:	
What is the condition of cables/glands into switchboard:	
Cable/Gland Condition Comments:	
Distribution Panels name plate access:	No Access

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:34:29 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:55:04 PM

Insp ID: 516 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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:

What is the main incoming cable type/Size to Distribution Panel:

What is the condition of switchboard:

Condition Comments:

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 22/11/2016 3:55:04 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:49:40 PM

Insp ID: 518 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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:	
What is the main incoming cable type/Size to Distribution Panel:	
What is the condition of switchboard:	2
Condition Comments:	
What is the condition of cables/glands into switchboard:	
Cable/Gland Condition Comments:	
Distribution Panels name plate access:	No Access

Northern Territory Town Camps

Communications Infrastructure

Inspection Date 22/11/2016 3:44:40 PM

Insp ID: 520	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

What Comms Category are you capturing:	General
Telstra Comms Drawing Available:	No
Facility upgrade not in drawings:	NA
Which telecoms carriers are present in the town camp:	Telstra
How many Communications Pit(s) are allocated in this town camp:	

Northern Territory Town Camps

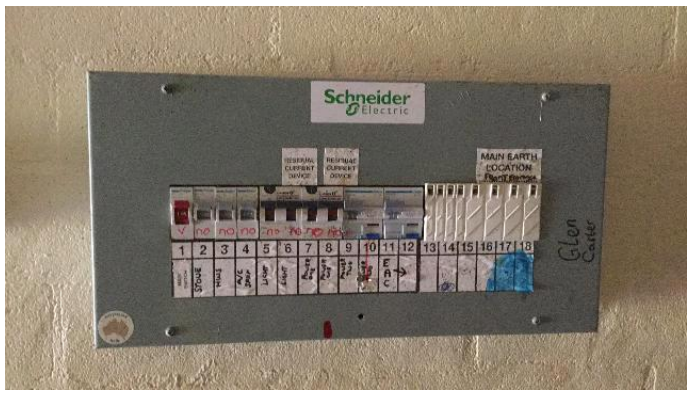
Electrical Infrastructure

Inspection Date 17/01/2017 8:18:04 AM

Insp ID: 3590	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

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 17/01/2017 3:31:42 PM

Insp ID: 3593 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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 17/01/2017 3:12:01 PM

Insp ID: 3595 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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 17/01/2017 2:36:28 PM

Insp ID: 3596 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing: Electrical Meters

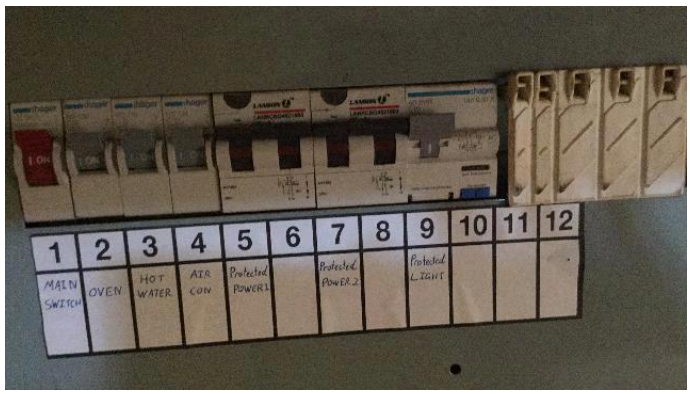
Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: Indoor SB, Cond 3

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 17/01/2017 1:52:10 PM

Insp ID: 3597 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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 17/01/2017 8:52:01 AM

Insp ID: 3604 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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 17/01/2017 8:34:11 AM

Insp ID: 3605 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing: Electrical Meters

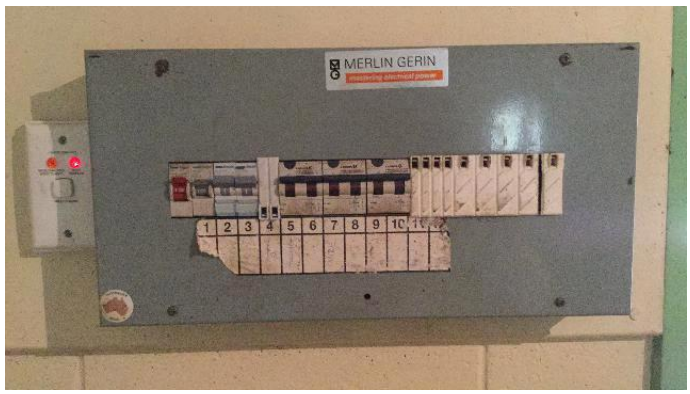
Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: Indoor SB, Cond 3

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 17/01/2017 8:34:11 AM

Insp ID: 3606 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing: Electrical Meters

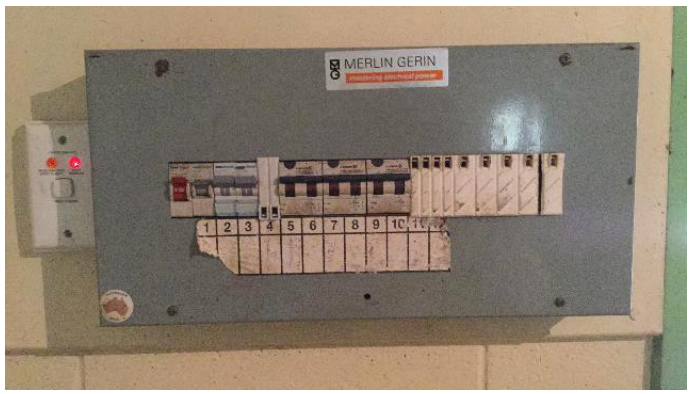
Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: Indoor SB, Cond 3

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 17/01/2017 3:21:13 PM

Insp ID: 3630 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing: Electrical Meters

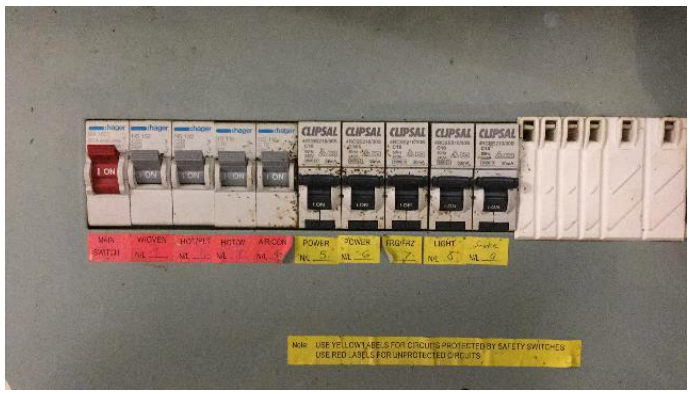
Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed. Indoor SB, Cond 3

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 17/01/2017 11:49:27 AM

Insp ID: 3631 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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 17/01/2017 2:25:46 PM

Insp ID: 3632 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed. Indoor SB, Cond 3

Comments:

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 17/01/2017 1:41:05 PM

Insp ID: 3633 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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

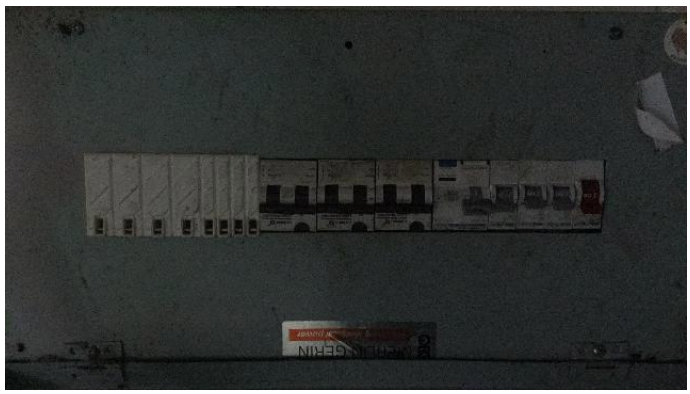
Electrical Infrastructure

Inspection Date 17/01/2017 8:07:14 AM

Insp ID: 3638 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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

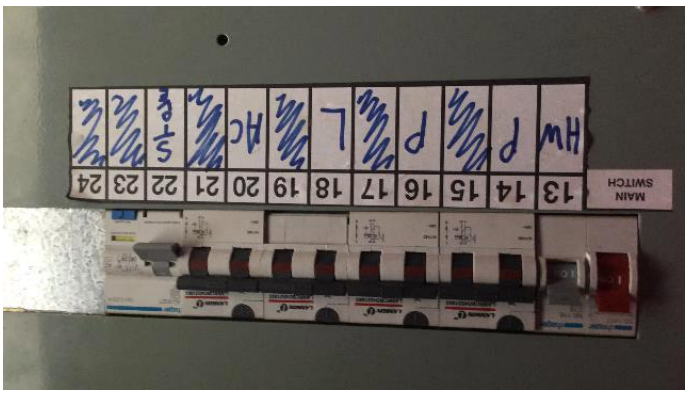
Electrical Infrastructure

Inspection Date 25/01/2017 11:51:48 AM

Insp ID: 3690 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing: Electrical Meters

Meter Type:	Prepaid	
Meter Switchboard Cond:		
Meter Condition:	3	
Meter Comment:	Condition of CB not assessed.	Indoor SB, Cond 3
Comments:		



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 25/01/2017 12:09:05 PM

Insp ID: 3691 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing: Electrical Meters

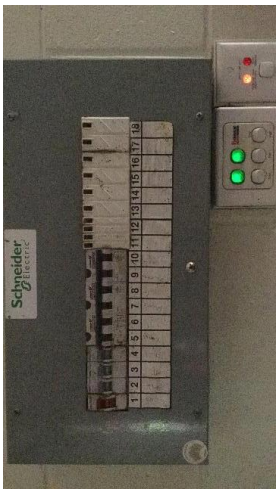
Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed. Indoor SB, Cond 3

Comments:



Northern Territory Town Camps

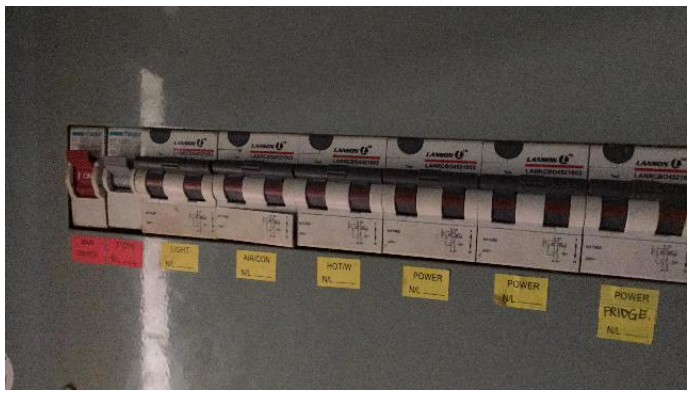
Electrical Infrastructure

Inspection Date 25/01/2017 12:05:43 PM

Insp ID: 3693 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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 23/11/2016 3:02:48 PM

Insp ID: 502 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	4
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:	Single
What is the HV voltage level:	
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	
What is the Condition:	
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 3:02:48 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:59:56 PM

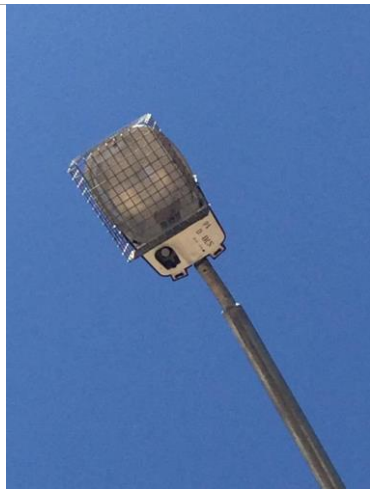
Insp ID: 503 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	4
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70 D14
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Single
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:	
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:59:56 PM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:47:19 PM

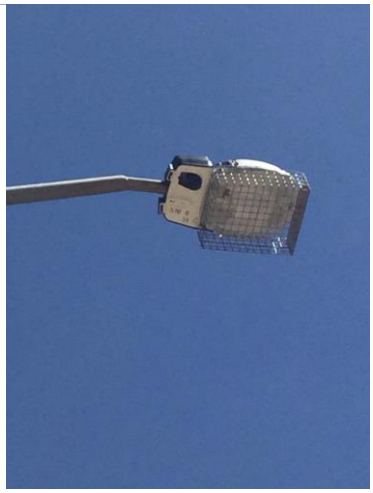
Insp ID: 506 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	4
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70 D14
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Single
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:	
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:47:19 PM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:42:12 PM

Insp ID: 508 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	4
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70 D14
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Single
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:	
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:42:12 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:39:27 PM

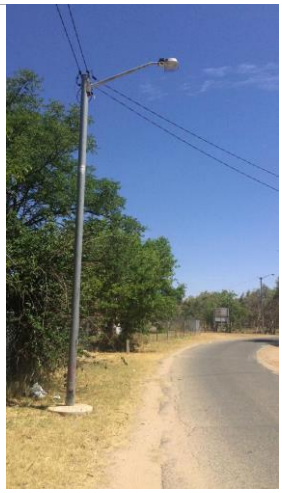
Insp ID: 509 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

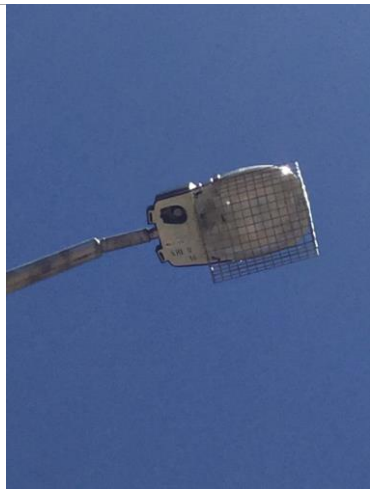
What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	4
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70 D14
Street Light Watts	70
Street Light Condition	3
Street Light Height	
What is the type of service:	Single
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:	
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:39:27 PM





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:50:20 PM

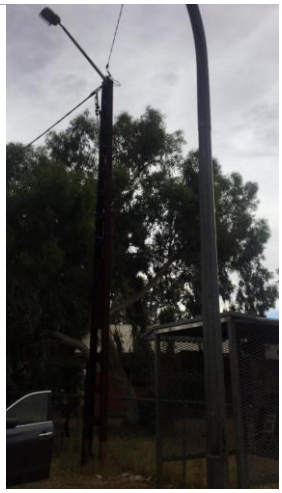
Insp ID: 517 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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:	
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70 D 14
Street Light Watts	70
Street Light Condition	3
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:	
How many Lots are connected to this pole:	
Overhead Pole Comments:	Vegetation needs removed

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:50:20 PM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:24:25 PM

Insp ID: 521 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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:	Yes
Street Light Power Supply:	
Street Light Type	S70 D 14
Street Light Watts	70
Street Light Condition	3
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:	
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:24:25 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:17:35 PM

Insp ID: 523 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

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:	Yes
Street Light Power Supply:	
Street Light Type	S70 D14
Street Light Watts	70
Street Light Condition	3
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:	
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:17:35 PM

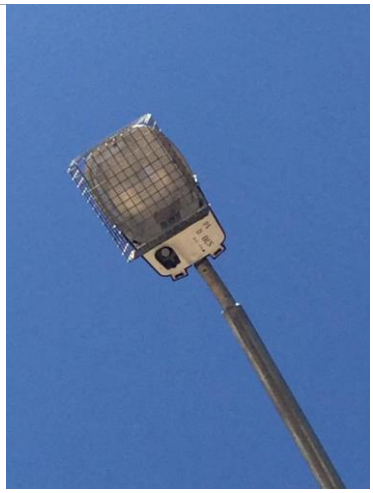
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:59:56 PM

Insp ID: 503	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70 D14
Street Light Watts	70
Street Light Condition	3
Street Light Height	



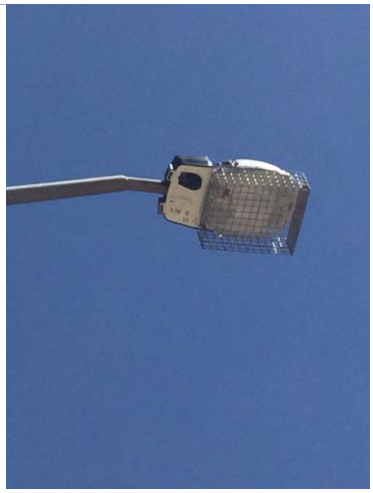
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:47:19 PM

Insp ID: 506 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70 D14
Street Light Watts	70
Street Light Condition	3
Street Light Height	



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:42:12 PM

Insp ID: 508	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70 D14
Street Light Watts	70
Street Light Condition	3
Street Light Height	

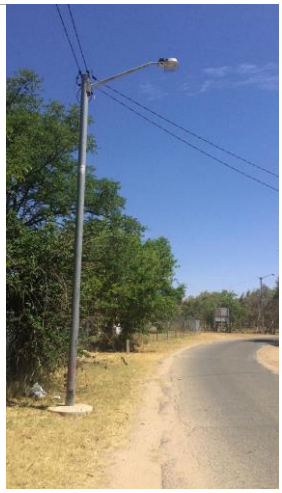
Northern Territory Town Camps

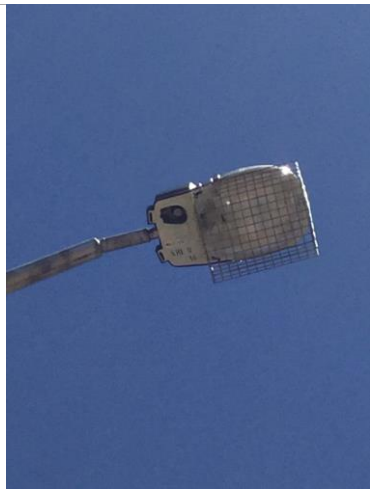
Electrical Infrastructure

Inspection Date 23/11/2016 2:39:27 PM

Insp ID: 509	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70 D14
Street Light Watts	70
Street Light Condition	3
Street Light Height	





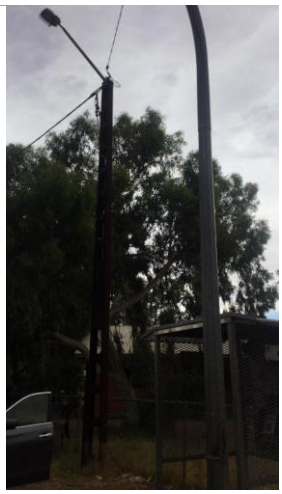
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:50:20 PM

Insp ID: 517 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70 D 14
Street Light Watts	70
Street Light Condition	3
Street Light Height	



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:24:25 PM

Insp ID: 521 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70 D 14
Street Light Watts	70
Street Light Condition	3
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:17:35 PM

Insp ID: 523 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S70 D14
Street Light Watts	70
Street Light Condition	3
Street Light Height	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:17:35 PM

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:57:16 PM

Insp ID: 515	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

What Category are you capturing: Pits and Conduits

Comments: Directly opposite camps gates ,on the other side of road

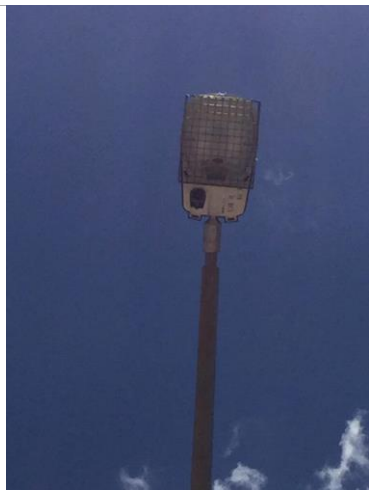
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 3:11:31 PM

Insp ID: 499 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D14
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8



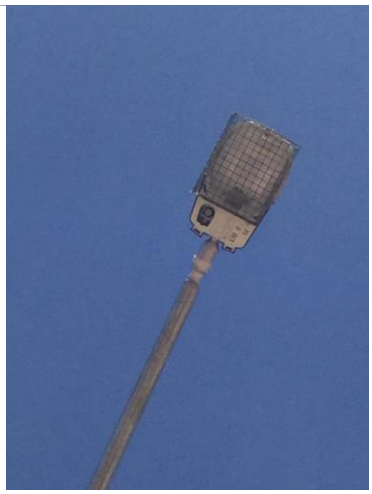
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 3:09:03 PM

Insp ID: 500	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D11
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8



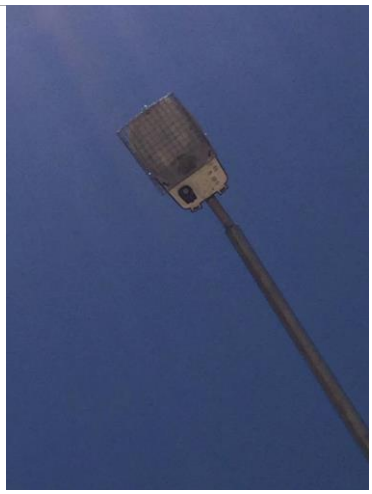
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:54:02 PM

Insp ID: 504 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D14
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8



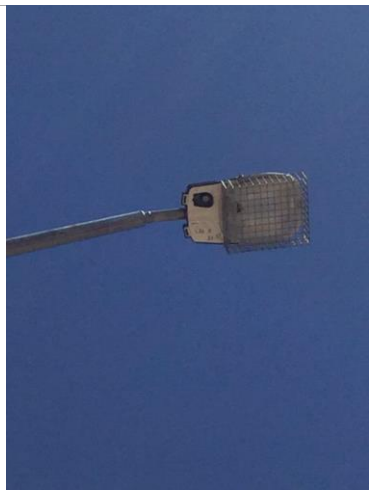
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:50:50 PM

Insp ID: 505 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D14
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8



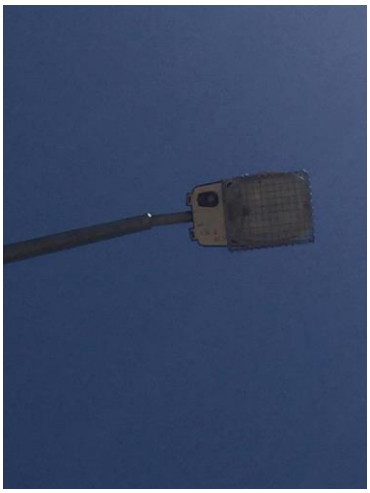
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:31:06 PM

Insp ID: 511 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D14
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8



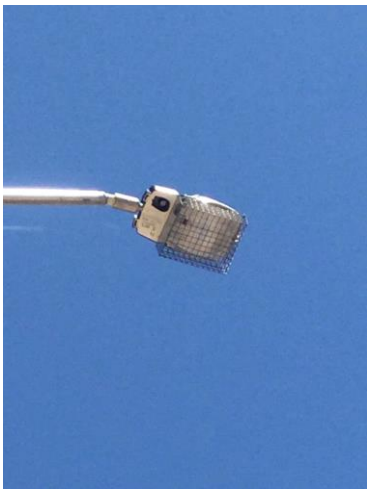
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:28:09 PM

Insp ID: 512 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D 14
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8



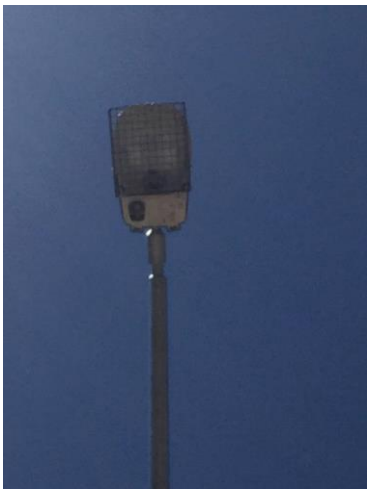
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 23/11/2016 2:24:42 PM

Insp ID: 513 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D14
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 4:01:38 PM

Insp ID: 514	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D14
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:46:28 PM

Insp ID: 519	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	S50
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 22/11/2016 3:20:48 PM

Insp ID: 522 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	
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 22/11/2016 3:08:31 PM

Insp ID: 524 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D14
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:06:00 PM

Insp ID: 525 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D14
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:03:32 PM

Insp ID: 526 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D14
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 22/11/2016 3:00:10 PM

Insp ID: 527	Group 4 - Alice Springs	Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D14
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8

Northern Territory Town Camps

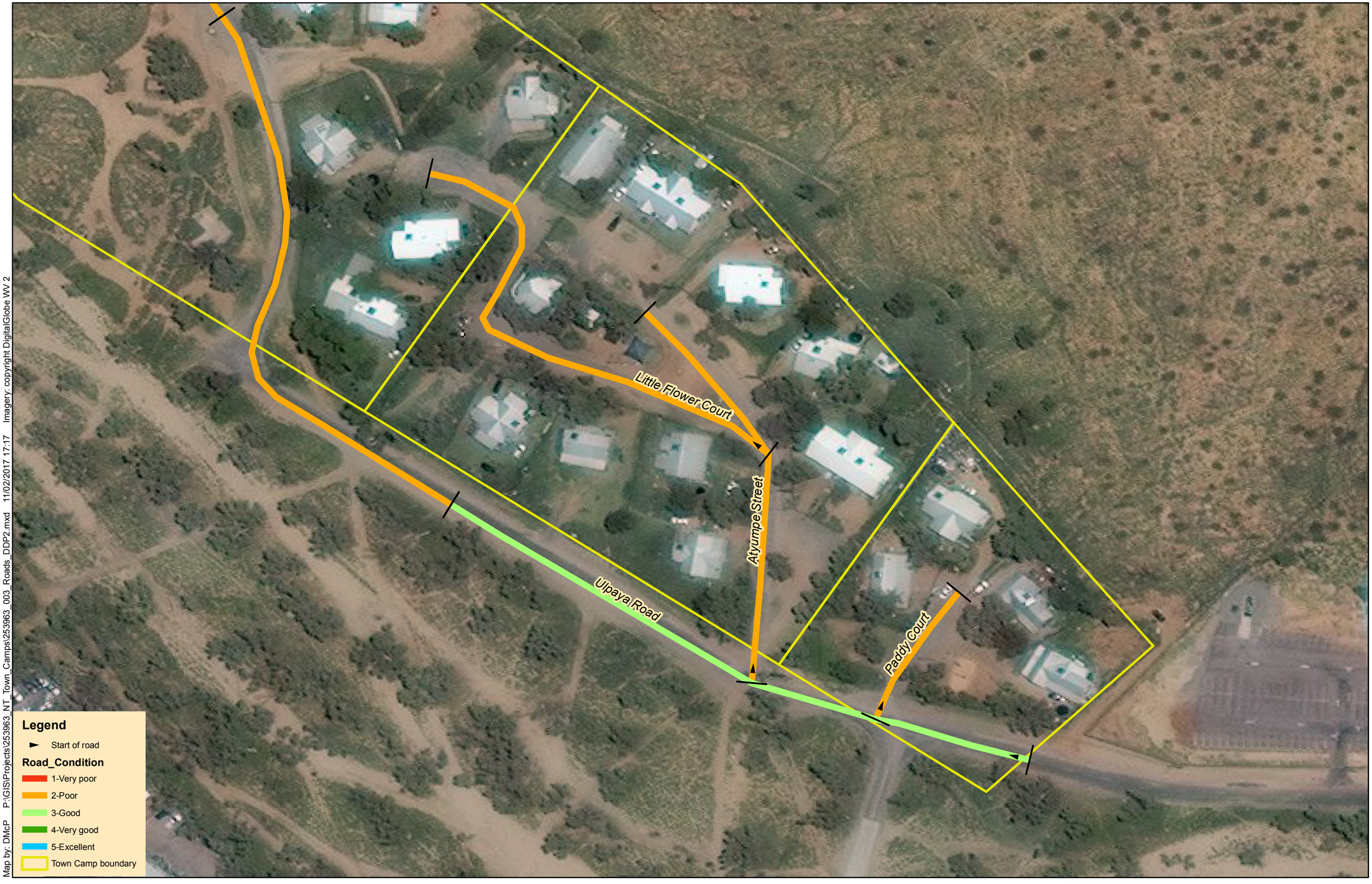
Electrical Infrastructure

Inspection Date 22/11/2016 2:57:02 PM

Insp ID: 528 Group 4 - Alice Springs Anthelk Ewlpaye (Charles Creek)

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	S70 D 14
What Wattage is the lamp:	70
What is the condition of street lights:	4
What is Street Lighting pole installation height (approximate):	8

Road map



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Roads_DDP2.mxd 11/02/2017 17:17 Imagery: copyright DigitalGlobe WV 2

A3 scale: 1:1,200

0 20 40 60 80 100 m

Date: 11/02/2017 Version: 1

Coordinate system: GDA 1994

NT Town Camp Road Assessments

16 - Anthelk Ewlpaye (Alice Springs)

2073

Existing drawings

-23°41'12"
385 500 E
385 750 E
-23°41'12"
7 379 750 N
7 379 500 N
-23°41'34"
385 500 E
385 750 E
-23°41'34"

Community Use
11
10
32
24
23
9
25
29
10216
10217
Recreation Hall
10219
8
10215
10218
STUART
Community Facility
Pensioner Unit
17
10220
22
Duplex
10214
LITTLE FLOWER COURT
TOWN OF ALICE SPRINGS
21
10213
3702
10221
6
10212
5
4
10211
3
10209
2
ATTUNPE STREET
10222
7
10204
10208
16
10223
1
10203
10205
26
28
3704
10202
PADDY COURT
10206
10207
ULPAYA ROAD
CRESCENT
SCHWARZ
ALICE SPRINGS
8199
7431
8060
SCHWARZ
CRESCENT
SCHWARZ CRESCENT
5184
349
5807
1494
1605
1031
5793
5794
1033
444
532
9337
8068
526
436
STUART HIGHWAY
SMITH STREET
CICCONE
943
1733

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

© NORTHERN TERRITORY OF AUSTRALIA

Locality Diagram

AVAILABLE FROM AND PRODUCED BY:

Northern Territory Government

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.

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

Topographic information:
Land Information Division
Dept of Lands and Planning
TEL: (08) 8995 5331
FAX: (08) 8995 5366
Email: landinfo.dpl@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.dpl@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 and Planning
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 :	10 June 2007
SOURCE MAP SCALE :	2500
ZONE UTM :	53
CONTOUR INTERVAL :	
HORIZONTAL DATUM :	
VERTICAL DATUM :	
PROJECTION :	Transverse Mercator
DATE GENERATED :	18 June 2012

N

GDA

0 10 20 30 40 50
metres

SERVICED LAND AVAILABILITY PROGRAM

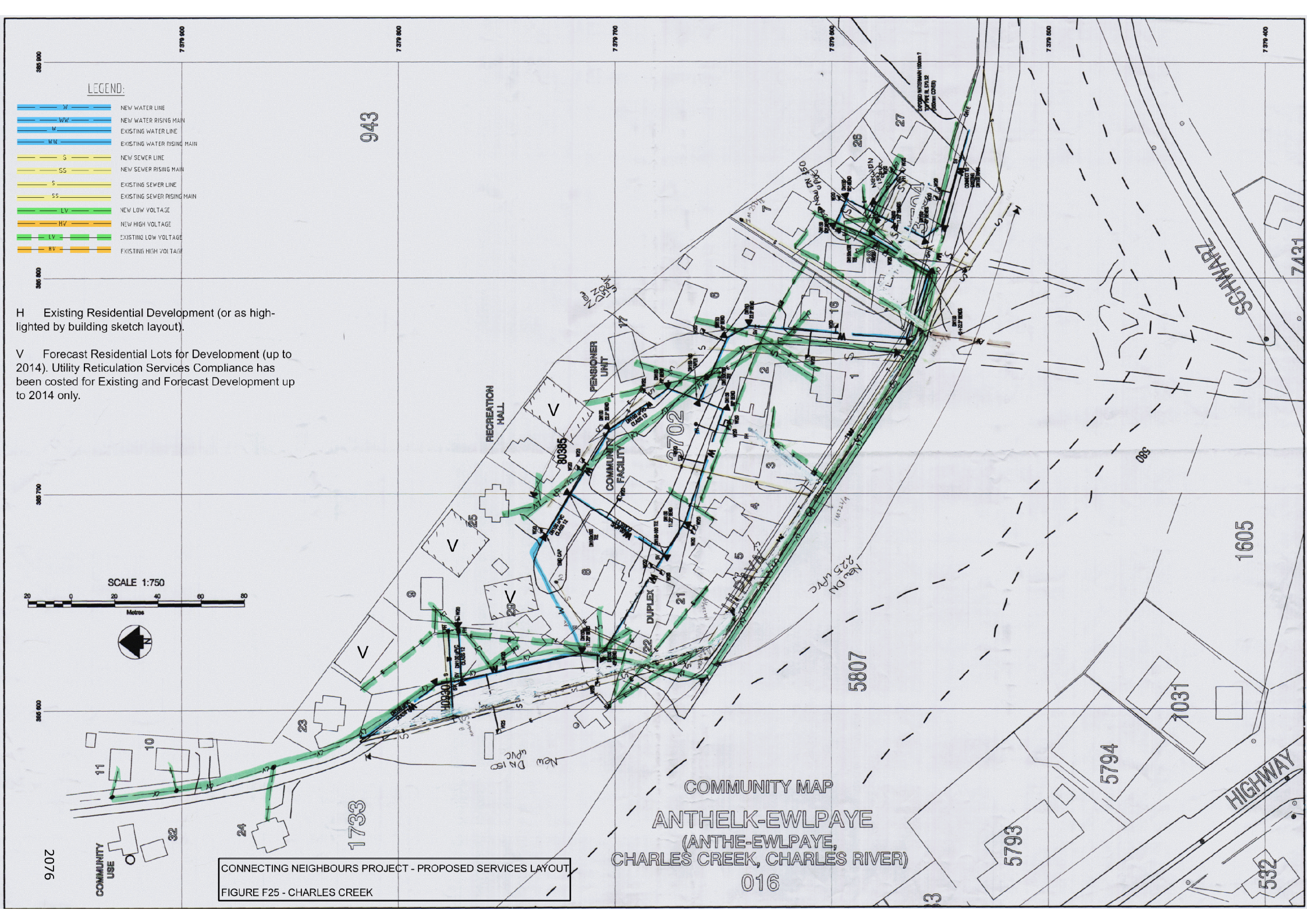
SLAP Map

Anthe-Ewlpaye (Alice Springs Town Camp)

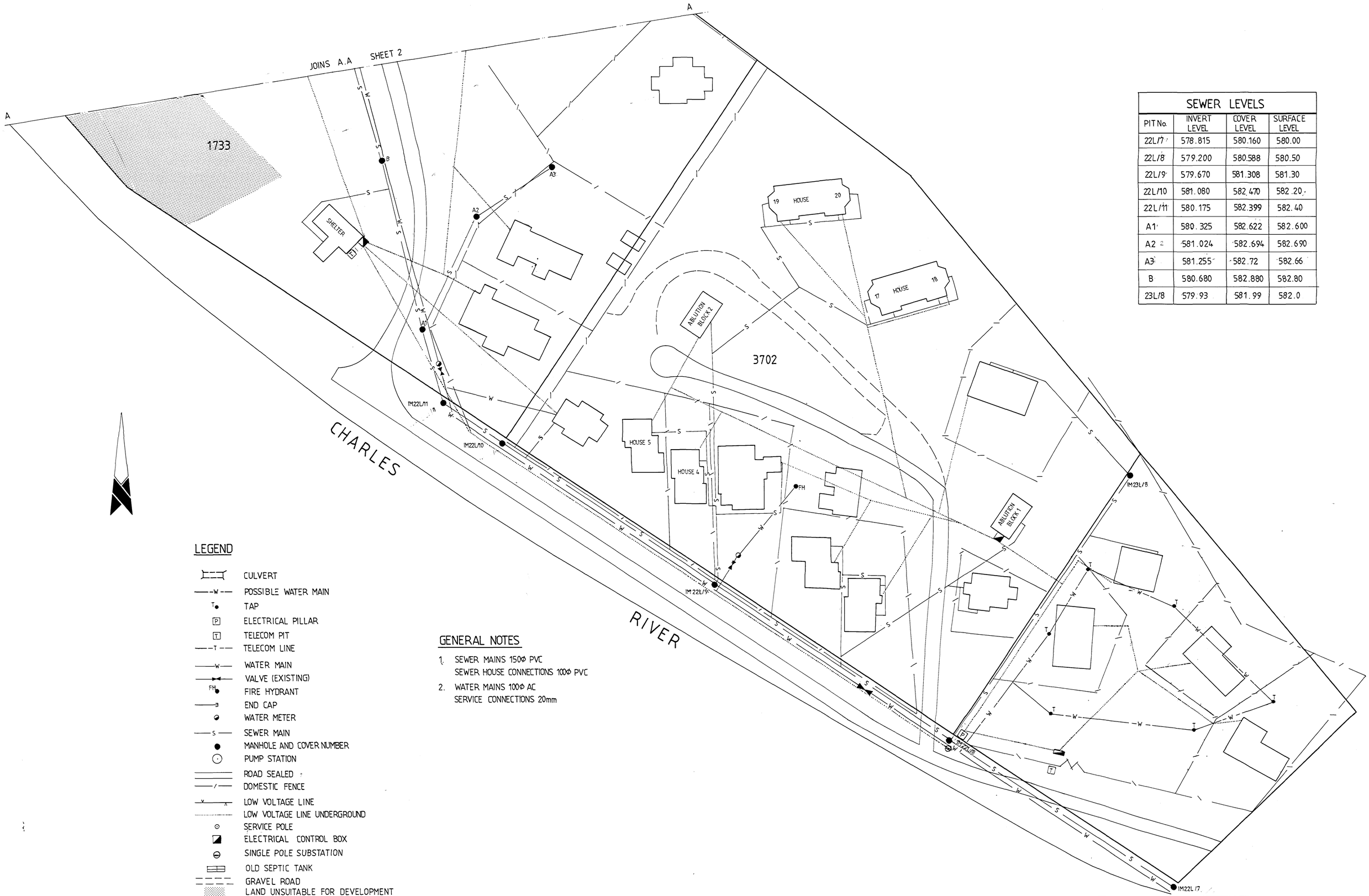
Anthe Ewlpaye

Alice Springs Town Council

Community ID : 16


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
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.
SCALE 1:750
Metres
RECREATION HALL
PENSIONER UNIT
COMMUNITY FACILITY
DUPLEX
COMMUNITY USE
SCHWARZ
HIGHWAY
943
1733
5807
1605
1031
5794
5793
532
7431
2076
COMMUNITY MAP
ANTHELK-EWLPAYE
(ANTHE-EWLPAYE, CHARLES CREEK, CHARLES RIVER)
016
CONNECTING NEIGHBOURS PROJECT - PROPOSED SERVICES LAYOUT
FIGURE F25 - CHARLES CREEK

SEWER LEVELS			
PIT No.	INVERT LEVEL	COVER LEVEL	SURFACE LEVEL
22L/7	578.815	580.160	580.00
22L/8	579.200	580.588	580.50
22L/9	579.670	581.308	581.30
22L/10	581.080	582.470	582.20
22L/11	580.175	582.399	582.40
A1	580.325	582.622	582.600
A2	581.024	582.694	582.690
A3	581.255	582.72	582.66
B	580.680	582.880	582.80
23L/8	579.93	581.99	582.0



LEGEND

- CULVERT
- POSSIBLE WATER MAIN
- TAP
- ELECTRICAL PILLAR
- TELECOM PIT
- TELECOM LINE
- WATER MAIN
- VALVE (EXISTING)
- FIRE HYDRANT
- END CAP
- WATER METER
- SEWER MAIN
- MANHOLE AND COVER NUMBER
- PUMP STATION
- ROAD SEALED
- DOMESTIC FENCE
- LOW VOLTAGE LINE
- LOW VOLTAGE LINE UNDERGROUND
- SERVICE POLE
- ELECTRICAL CONTROL BOX
- SINGLE POLE SUBSTATION
- OLD SEPTIC TANK
- GRAVEL ROAD
- LAND UNSUITABLE FOR DEVELOPMENT

GENERAL NOTES

1. SEWER MAINS 150Ø PVC
   SEWER HOUSE CONNECTIONS 100Ø PVC
2. WATER MAINS 100Ø AC
   SERVICE CONNECTIONS 20mm

ISSUE	TITLE	INTS.	DATE
AMENDMENTS			

CODE	TITLE
ASSOCIATED DRAWINGS	

SCALE 1:500 | DESIGNED | DRAWN | CHECKED

FILE No. | PROJECT OFFICER

SPEC. No. | CHIEF ENGINEER

TITLE

ANTHELKE EWLPAYE
SERVICE LOCATION PLAN
SHEET 1

POWER AND WATER AUTHORITY

400-89-71 - 2096

A1

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".

Anthepe

Anthepe

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.

- Alice Springs Town Council – Subdivision and Development Guidelines, November 2012

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,
- Alice Springs Town Camp Sewage Pumping Station Assessments, Byrne Design, 2014,
- Drawings supplied by NT Department of Infrastructure - Technical Records,
- Drawings supplied by Power and Water Corporation,
- Bennett Design inspection reports and population data.

Aurecon could not undertake an inspection of Anthepe, due to a ceremony taking place which restricted access to the camp. This report assesses the current capacity of infrastructure based on available drawings. The sewage pump station was inspected at an earlier date so has been included in this report.

5 Sewerage

5.1 Ownership and boundaries

The sewer infrastructure within Anthepe is the property of Anthepe Housing Association Incorporated, but is the responsibility of Ingkerreke Outstations Resource Services to maintain.

Anthepe has a pump station which connects to a DN80 PVC rising main. PWC noted that they have been maintaining the sewage pump station, although there is no maintenance agreement in place.

The sewage pump station was inspected with a PWC representative on Monday 14 November 2016.

5.1.1 Connection methods and billing

PWC advised that they currently charge a single sewerage bill based on the number of houses, which for Anthepe is 15 houses. The sewerage bill is charged to the Department of Housing and Community Development.

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 pump station, as access to the camp was restricted. The assets that were inspected had the following conditions:

Table 2 Sewer condition assessment

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

Figure 1 Sewage pump station, condition: *good*

Figure 2 Sewage pump station, condition: *good*

The pump station appeared to be in good working condition. It was noted that the high level alarm light was broken, maintenance for this is included in Section 10.

5.3 Current performance and risks

5.3.1 Current sewer network performance

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.
- As Anthepe disposes to a pump station, the capacity of the pump station has also been assessed.

The current number of houses in is 15, this multiplied by 9 EP per house gives a total current EP of 135. Available drawings which were 'detail design issue' showed the pipework was to be upgraded to a DN150 reticulation main. These works have

not proceeded so it was assumed that the current pipe size is DN100 and non-compliant with PWC standards.

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 PWC minimum slope (%)	Q_{full} (L/s)	Current Q (L/s)	Current capacity (%)
Catchment 1	135	100	1.0	5.60	1.72	30%

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

5.3.2 Current sewage pump station performance

The capacity of the pump station was checked against the following criteria, based on PWC guidelines:

- Less than 12 pump starts per hour (for pumps less than 15kW),
- Minimum velocity 0.9 m/s,
- Maximum velocity 2.5 m/s,
- Overflow storage equal to three hours of peak dry weather flow.

Using the current EP of 135, and available drawings, the capacity of the pump station was assessed. It appears as though the pump station has sufficient capacity, and complies with PWC guidelines with respect to minimum and maximum velocity, number of pump starts and overflow storage capacity. No upgrades are required.

It should be noted that an investigation was undertaken by Byrne Design in 2014 to confirm the capacity and compliance of the sewage pump stations. The Byrne Design report details the works required to the pump station wet well, collection chamber, and generally around the compound (e.g. lighting, hand rails, etc) to bring it up to relevant standards. PWC confirmed that none of the recommended upgrades from the Byrne Design report have been constructed.

5.4 Future demands

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

5.5 Recommended works

It is recommended that the current sewerage infrastructure is upgraded to a DN150 PVC reticulation main with new house connections, manholes and connection to pump station. No upgrades are required for the sewage pump station.

6 Water supply

6.1 Ownership and boundaries

The existing water reticulation network has a DN100 PVC looped water main, refer Appendices.

The water supply assets within Anthepe are believed to be owned by Anthepe Housing Association Incorporated, but are the responsibility of Ingkerreke Outstations Resource Services to maintain. The water is supplied from PWC owned water mains outside of the community.

6.1.1 Connection methods and billing

PWC have advised that they currently maintain to the bulk meter and it is understood that this is the point at which they measure water usage.

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 Anthepe Housing Association Incorporated for Anthepe. It will be up to governing body to assign bills to residents accordingly.

It is recommended that the individual lot meters are installed and maintained in addition to the proposed use of bulk water meters. This will assist the governing body with 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 condition assessment

A water supply upgrade design to PWC standards was conducted under the SIHIP program (refer Appendices). However, this upgrade does not appear to have been constructed. There is limited information available on the existing network. The water supply upgrade plan shows the layout of the existing network which is non-compliant with PWC standards as it is not located within the road reserve. The existing pipe sizes are believed to be DN100 which is also not compliant with PWC standards.

It is recommended that the existing network is replaced with a DN150 PVC looped main constructed in accordance to PWC standards.

6.3 Current performance and risks

The current demand of the community was calculated based on the following design assumptions:

- The nominal peak day flow is 1300 L/capita/day, based on PWC's supplement to WSA 03 2002. This value is for the southern region of NT. It was assumed that the nominal peak day flow of 1300 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 4 shows the water demand for Anthepe.

Table 4 Current water demand

Total dwellings	EP	Demand (l/s)	Peak hour demand (l/s)
15	135	2.03	6.08

Given the low demand it is expected that the existing network will supply adequate pressure for peak hour demands however is expected to not be sufficient for fire flow 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. The existing water reticulation network at Anthepe is undersized and non-complaint with PWC standards and cannot sustain fire hydrants.

6.4 Future demands

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

6.5 Recommended works

It is proposed that a DN150 PVC looped water main installed to PWC standards replaces the existing network. The cost estimates for upgrades include;

- Replace existing network with DN150, approximately 500 m

7 Roadworks

7.1 Ownership and boundaries

It is the current understanding that the roads within Anthepe is the property of Anthepe Housing Association Incorporated, but is the responsibility of Ingkerreke Outstations Resource Services to maintain.

7.2 Existing infrastructure condition assessment

The road network within Anthepe community was not able to be assessed as the community could not be accessed at the time of inspection due to traditional reasons. From the aerial satellite photo below there are two entrance/exit intersections. Figure 3 below summarise the internal road network.

Figure 3 Road network

7.3 Current performance and risks

The road network plan shows that the road network is sufficient for the current number of houses as each house has road access.

7.4 Future demands

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

7.5 Concept design

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 Anthepe community is estimated to be approximately 5.5 m, this means that all approximately 700 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 infrastructure at Anthepe could not be inspected. Images from Google Earth show that there is currently no kerbs and gutters or side entry pits at the main road into Anthepe, so it is assumed that there is no stormwater drainage assets within the community.

8.2 Current performance and risks

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

The Alice Springs Town Council's general design philosophy for stormwater drainage is that the system is based on a network of sealed roads, kerb and gutters, side entry pits and underground drainage pipes, including grassed open channels and diversion drains. It is recommended that kerbs and gutters, side entry pits and underground pipes are installed to help reduce flooding in the community. The cost estimates allow for 700 m of stormwater drainage.

8.3 Future demands

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

8.4 Recommended works

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

- Construct kerbs and gutters, side entry pits, and underground drainage. This will also require the road to be upgraded to two lanes.

9 Community structures

9.1 Ownership and boundaries

The community structures within Anthepe are the property of Anthepe Housing Association Incorporated, but are the responsibility of Ingkerreke Outstations Resource Services to maintain. However the community structures were not assessed at Anthepe.

9.2 Future demands

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

10 Electrical services

10.1 Ownership and boundaries

The following points, from Network Policy NP003 Installation Rules Section 3, 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, and aerial low voltage infrastructure where installed with 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.

PWC advise that most of Tennant Creek/Alice Springs Town Camps have undergone upgrades under the SIHIP program with the intent to normalise the services to look like an urban subdivision but have never been formally handed over to PWC for operations and maintenance.

No site investigation was undertaken at Anthepe due to the community being closed for ceremony whilst Aurecon personnel were in Alice Springs.

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

PWC recommend that a GBS (Gas Break Switch) be provided upstream of the first transformer to establish a demarcation point.

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.

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

10.2 Existing infrastructure condition assessment

The sewage pump station was able to be inspected with PWC representatives.

Table 5 shows the condition rating given to the Distribution Panel in pump station. The distribution panel has 100% operational rating.

Table 5 Distribution panel condition assessment

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

Table 6 shows the condition rating given to the Overhead poles. The overhead poles is steel LV distribution pole in sewage pump station.

Table 6 Overhead pole condition assessment

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

Metering panel & switchboard associated to dwellings data are extracted from bennet design reports.

Table 7 shows the condition rating given to the Metering panels. All assessed meters in this community are prepaid digital meters.

Table 7 Meter Panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Pre-paid Meter			6			6
Switchboard			5			5

Table 8 shows the condition rating given to the switchboards associated to dwellings.

Table 8 Switchboard condition assessment (Housing footprint)

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

The details of the individual inspections and photographs of each infrastructure item are included in the 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.
- Street lighting loads were ignored as they are not significant.

The calculated maximum demand of the Anthepe community transformer is 21% of rated capacity based on 4.5kVA/dwelling. The calculated maximum demand is within the total capacity of the substation on site.

Table 9 Anthepe current demand load vs transformer ratings

Community name	Dwellings	Transformer (kVA)	kVA Total @ 4.5kVA	kVA Total @ 7kVA	Comments
Anthepe	15	200 315	67.5	105	Data extracted from PWC asset information.

A tabulated summary of all community transformers is included in the 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 community, there are no additional upgrades required to cater for future demand.

10.5 Recommended works

The following maintenance works and upgrades are recommended:

- Install new street lighting - approximately 35 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

No site investigation was undertaken at Anthepe due to the community being closed for ceremony whilst Aurecon personnel were in Alice Springs.

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 Anthepe is displayed in the Figure 4 below. NBN is available to residents via satellite on application to an appropriate NBN access provider.

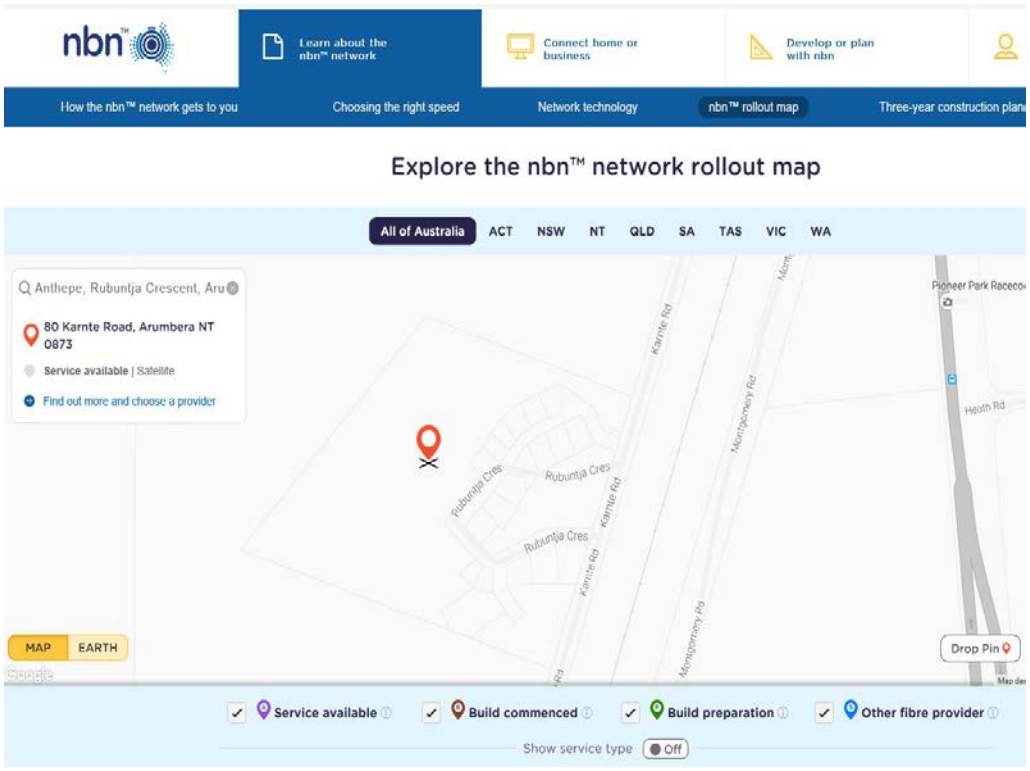


Figure 4 NBN network availability map

NBN is available to residents via satellite 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 Anthepe because NBN is available to residents via satellite on application to an appropriate NBN access provider.

12 Cost estimates

Table 10 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. The estimates take into account a 30% contingency, are inclusive of GST, and a location factor has been applied to town camps outside of Darwin.

Table 10 Cost estimates

Infrastructure	Maintenance of existing infrastructure	Upgrades to meet current design
Sewerage	$ 0	$ 601,000
Water supply	$ 0	$ 358,000
Roadworks	$ 0	$ 848,000
Stormwater drainage	$ 0	$ 829,000
Community structures	$ 0	$ 0
Electrical	$ 0	$ 501,000
Communications	$ 0	$ 0
Miscellaneous provisions	$ 0	$ 386,000
Total (including GST)	**$ 0**	**$ 3,523,000**
Grand total	**$ 3,523,000**	

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

The following works are recommended for Anthepe community:

Sewerage

- Upgrade network to DN150 PVC reticulation main, including new manholes, house connections and connection to existing pump station.

Water supply

- Replace existing network with DN150 ring main, approximately 500 m
- Install DN150 bulk water meter at community boundary

Roadworks

- 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

- Construct kerbs and gutters, side entry pits, and underground drainage.

Community structures

- No upgrades required

Electrical services

- Install new street lighting - approximately 35 poles

Communications

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

Civil inspection reports

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/11/2016 3:29:37 PM

Insp ID: 247 Group 4 - Alice Springs Anthepe

What Sewerage Asset are you capturing:	Pump Station
No of Pumps in Pump Station:	2
Cabinet Condition:	4 - Very Good
Cabinet Comment:	
Alarm Light:	Yes
Alarm Light Condition:	1 - Very Poor
Overhead Light:	No
Overhead Light Condition:	
Light Comments:	High level alarm light broken
Davit Crane Present:	Yes
Davit Crane Capacity (kg):	500
Davit Crane Condition:	4 - Very Good
Davit Crane Comments:	
Fence TYPE:	Standard Security Fence (3 Strands barbed)
PS Fence Height (m):	1.8
PS Gates Locked:	Yes
PS Fence Condition:	4 - Very Good
Fence Comment:	
Flow meter type:	
Flow meter condition:	
Flow meter comments:	
Macerator Pump Make/Model:	
Manufacturers Date:	
Macerator Pump:	Yes
Macerator Pump Condition:	
Macerator Pump Comments:	
Outgoing Pipe Diameter (mm):	100
Valves:	
Outgoing Pipe Comments:	
Water Supply to pump station:	
Fire hose reel:	Yes
Access cover locked:	Yes
Safety grid beneath access cover:	No

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/11/2016 3:29:37 PM

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

Pump Station Pumps section

Pump Capacity	Pump Make	Manufacture Date	Pump Chain	Condition	Comments
			Yes		

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/11/2016 3:29:37 PM

Northern Territory Town Camps

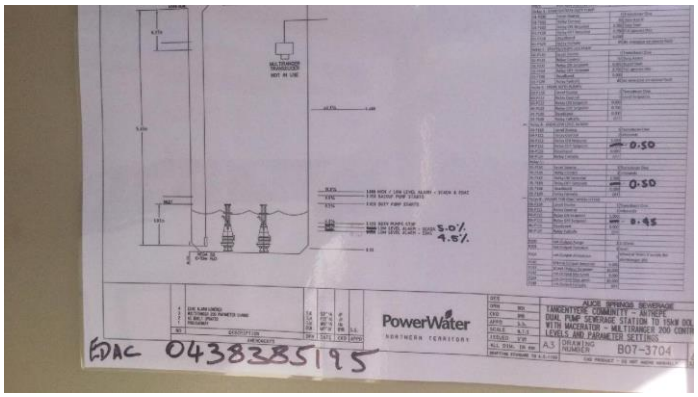
Civil Infrastructure

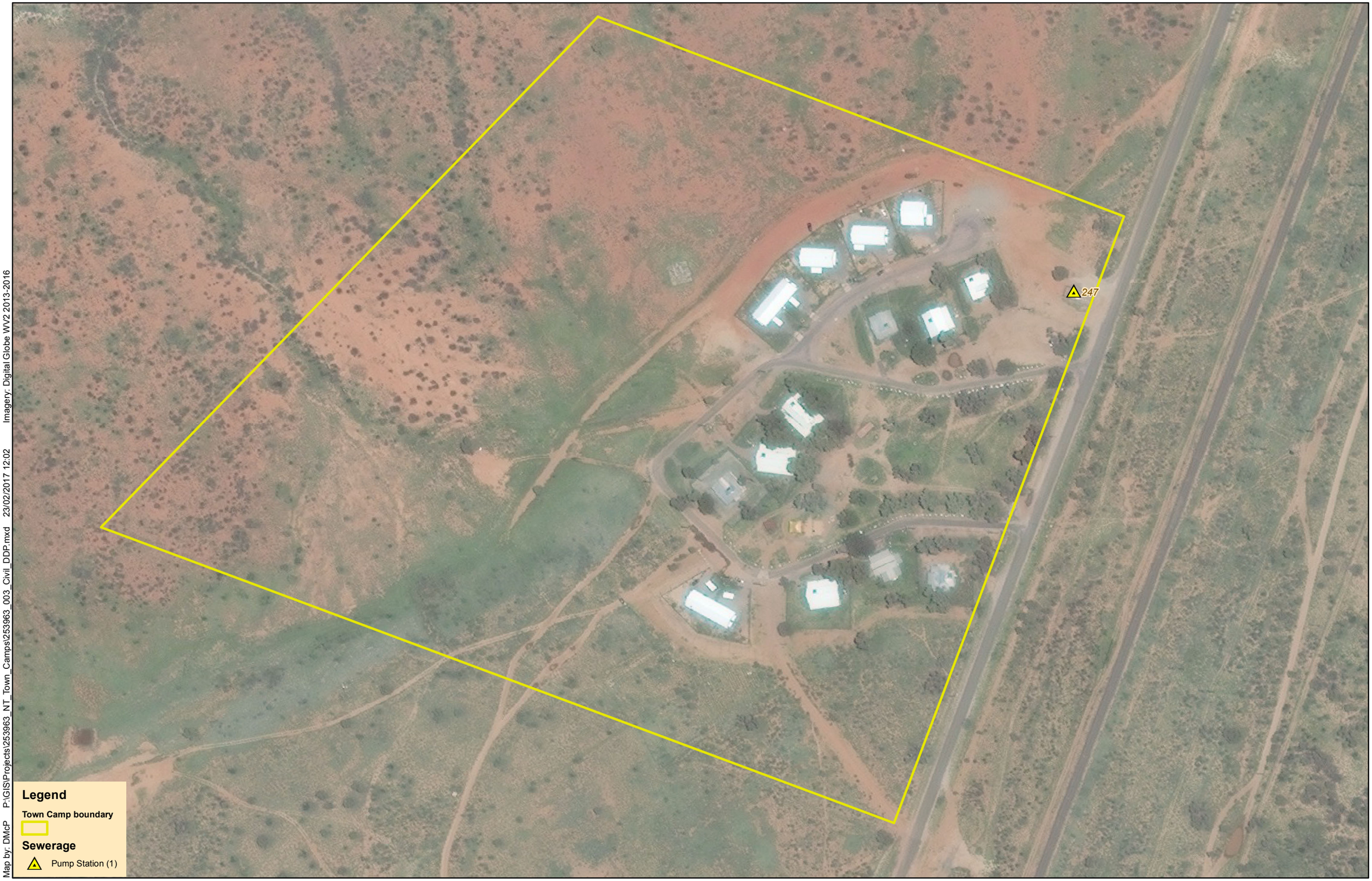
Inspection Date 14/11/2016 3:29:37 PM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/11/2016 3:29:37 PM





Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Sewerage

17 - Anthepe (Alice Springs)

2109

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

Legend

Town Camp boundary

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Water

17 - Anthepe (Alice Springs)

2110

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

Legend

Town Camp boundary

A3 scale: 1:2,000

0 20 40 60 80 100 m

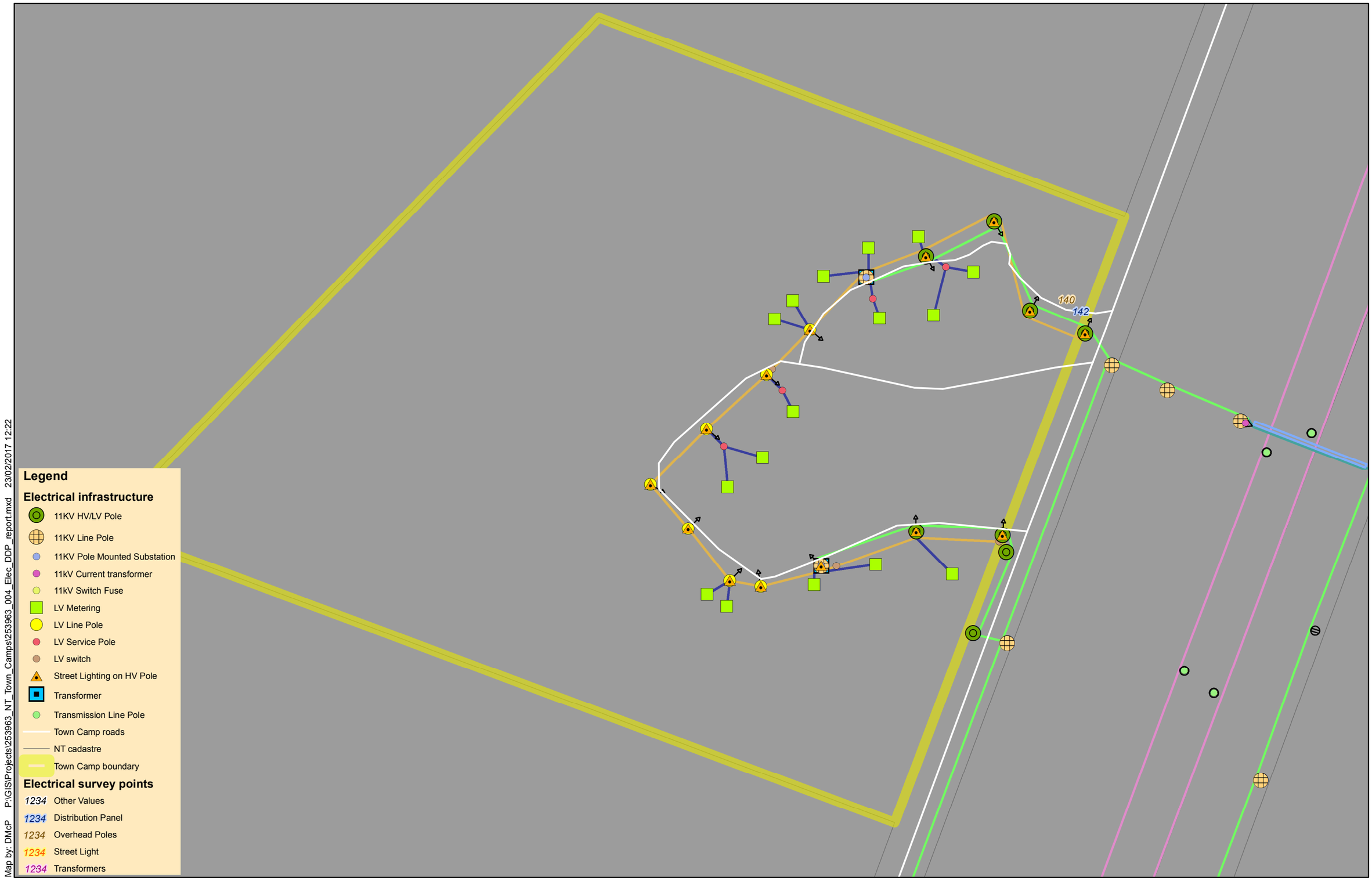
Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments
Road furniture, stormwater drainage & community structures
17 - Anthepe (Alice Springs)

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

17 - Anthepe (Alice Springs)

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/11/2016 4:05:28 PM

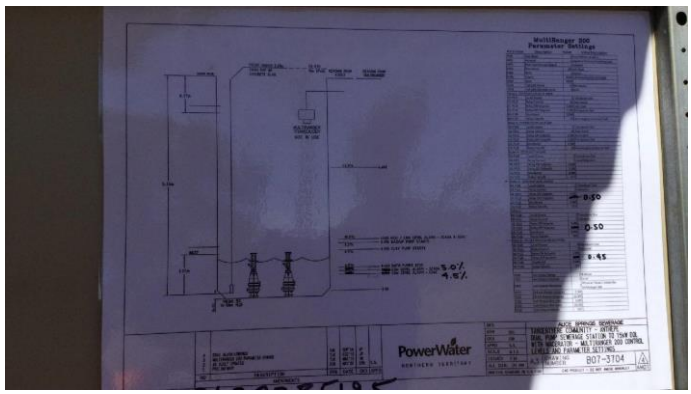
Insp ID: 142 Group 4 - Alice Springs Anthepe

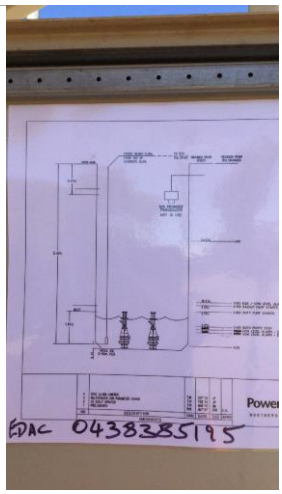
What Category are you capturing:	Distribution Panel
What is Main Distribution Panel installation method:	Outdoor
Is the distribution panel labelled:	Yes
What is Distribution Panel main CB Rating:	
What is the main incoming cable type/Size to Distribution Panel:	100A
What is the condition of switchboard:	4
Condition Comments:	
What is the condition of cables/glands into switchboard:	
Cable/Gland Condition Comments:	Unknown
Distribution Panels name plate access:	Yes

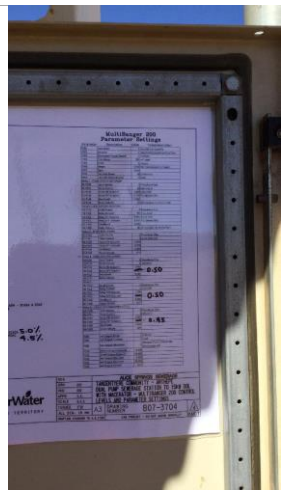
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/11/2016 4:05:28 PM







Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 19/01/2017 10:56:37 AM

Insp ID: 3613 Group 4 - Alice Springs Anthepe

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 19/01/2017 10:39:41 AM

Insp ID: 3614 Group 4 - Alice Springs Anthepe

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 19/01/2017 10:38:34 AM

Insp ID: 3654 Group 4 - Alice Springs Anthepe

What Category are you capturing: Electrical Meters

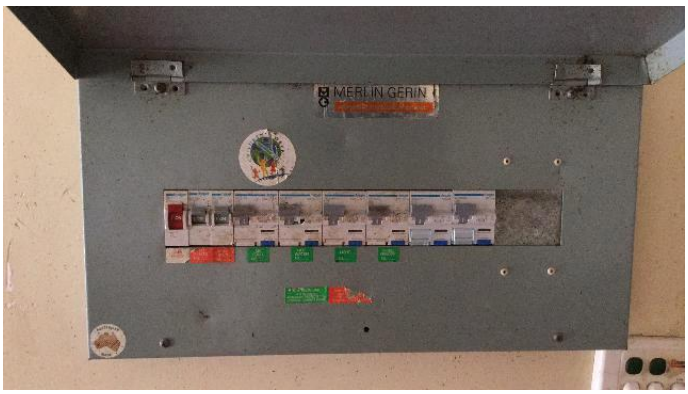
Meter Type: Prepaid

Meter Switchboard Cond:

Meter Condition: 3

Meter Comment: Condition of CB not assessed. Indoor SB, Cond 3

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 19/01/2017 10:52:10 AM

Insp ID: 3655 Group 4 - Alice Springs Anthepe

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 19/01/2017 11:08:07 AM

Insp ID: 3656 Group 4 - Alice Springs Anthepe

What Category are you capturing: Electrical Meters

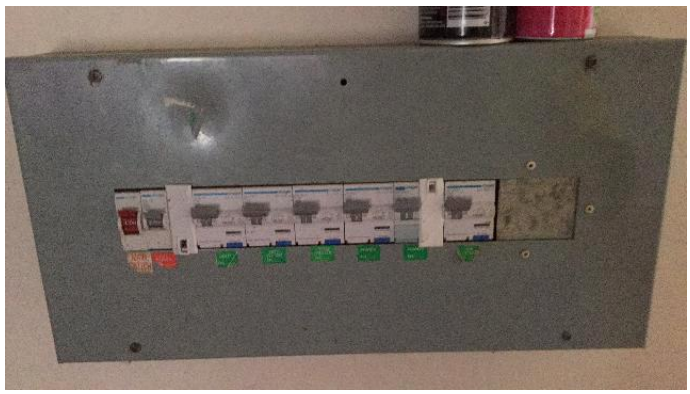
Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: Indoor SB, Cond 3

Comments:



Northern Territory Town Camps

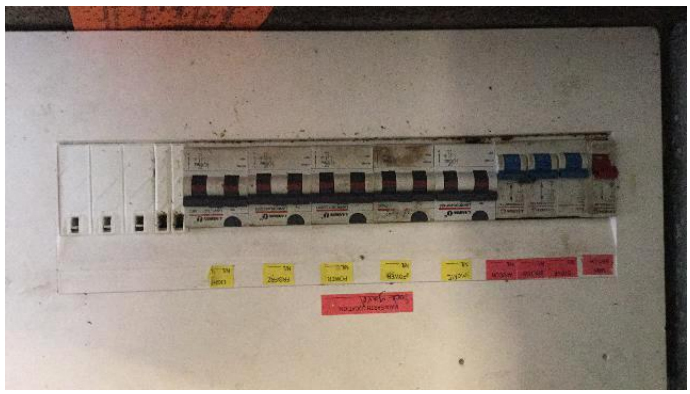
Electrical Infrastructure

Inspection Date 24/01/2017 7:48:02 AM

Insp ID: 3673 Group 4 - Alice Springs Anthepe

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 24/01/2017 7:47:24 AM

Insp ID: 3685 Group 4 - Alice Springs Anthepe

What Category are you capturing: Electrical Meters

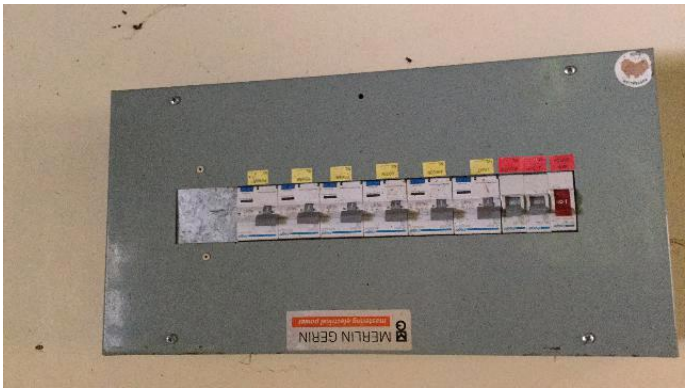
Meter Type: Prepaid

Meter Switchboard Cond: 3

Meter Condition: 3

Meter Comment: Indoor SB, Cond 3

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/11/2016 4:11:38 PM

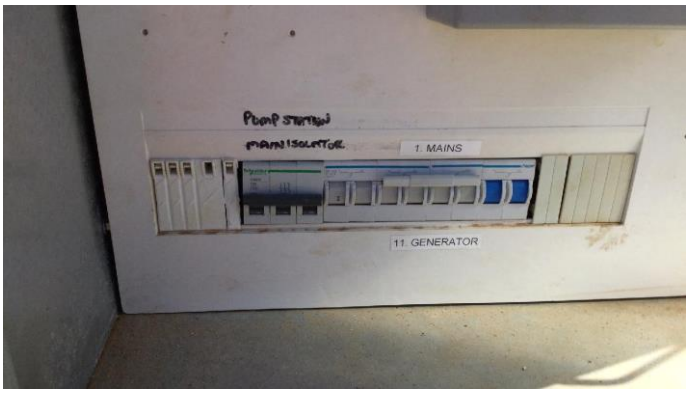
Insp ID: 140 Group 4 - Alice Springs Anthepe

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:	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:	400
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:	0
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/11/2016 4:11:38 PM

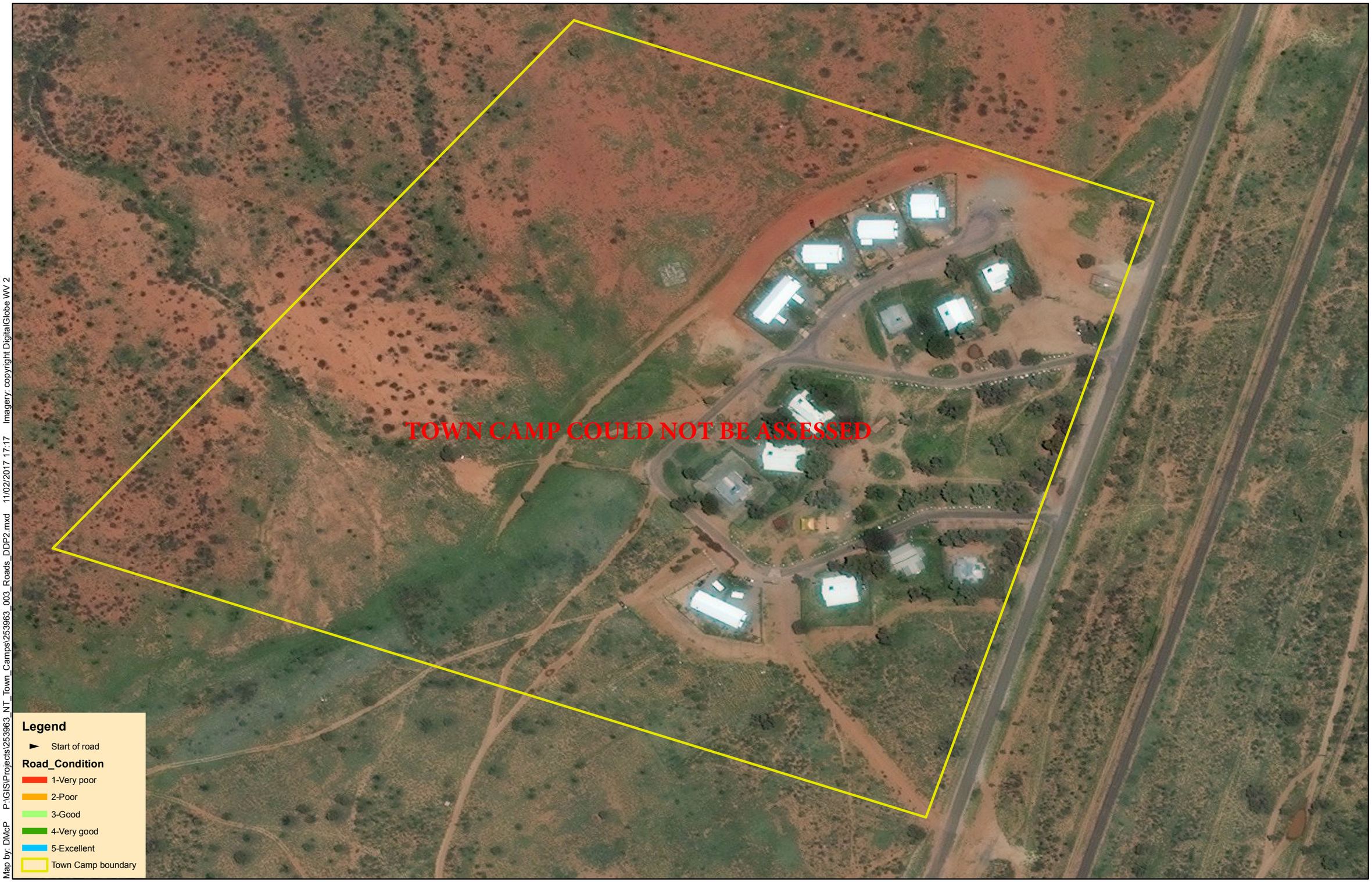


Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/11/2016 4:11:38 PM

Road map



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Roads_DDP2.mxd 11/02/2017 17:17 Imagery: copyright DigitalGlobe WV 2

A3 scale: 1:2,000

0 20 40 60 80 100 m

Date: 11/02/2017 Version: 1

Coordinate system: GDA 1994

NT Town Camp Road Assessments

17 - Anthepe (Alice Springs)

2127

Existing drawings

384 250 E
384 500 E
384 750 E
7 372 250 N
7 372 000 N
-23°46'08"
-23°46'38"
132°37'43"
132°38'13"

TOWN OF ALICE SPRINGS

Community Uses

Community Facility

Bush Tucker Farm

Alice Springs Town Council Playground

ALBUNITA CRESCENT

KANTE ROAD

MONTGOMERY ROAD

1 2 3 4 5 6 12 13

10228 10229 10230 10231 10232 10233 10235 10236 10237 10238 10239 10240 10241 10242 10243 10244 10245

8118 5146 1604 9157 8051 3788

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.

© NORTHERN TERRITORY OF AUSTRALIA

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
- 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 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, Customer Service and 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 5368
Email: landinfo.dlp@nt.gov.au

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

Cadastral Information:
Office of the Surveyor-General
Dept of Lands and Planning
TEL: (08) 8995 5353, FAX: (08) 8995 5395
Email: landinfo.dlp@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

Power, Water or Sewer Information:
Remote Operations Planning Branch
Power and Water Corporation
TEL: (08) 8924 5094, FAX: (08) 8924 5390

Housing Infrastructure Information:
Infrastructure Delivery Branch
Dept of Housing, Local Government, and Regional Services
TEL: (08) 8995 5013, FAX: (08) 8995 5170
Email: tim.dilgish@nt.gov.au

SOURCE INFORMATION

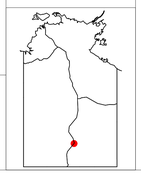
CONTOUR INTERVAL :		CURRENCY OF TOPOGRAPHY :	16 June 2008
HORIZONTAL DATUM :		SOURCE MAP SCALE :	2500
VERTICAL DATUM :		ZONE UTM :	53
PROJECTION :	Transverse Mercator	DATE GENERATED :	18 June 2012

N

0 20 40 60 80 100

GDA

Locality Diagram



SERVICED LAND AVAILABILITY PROGRAM

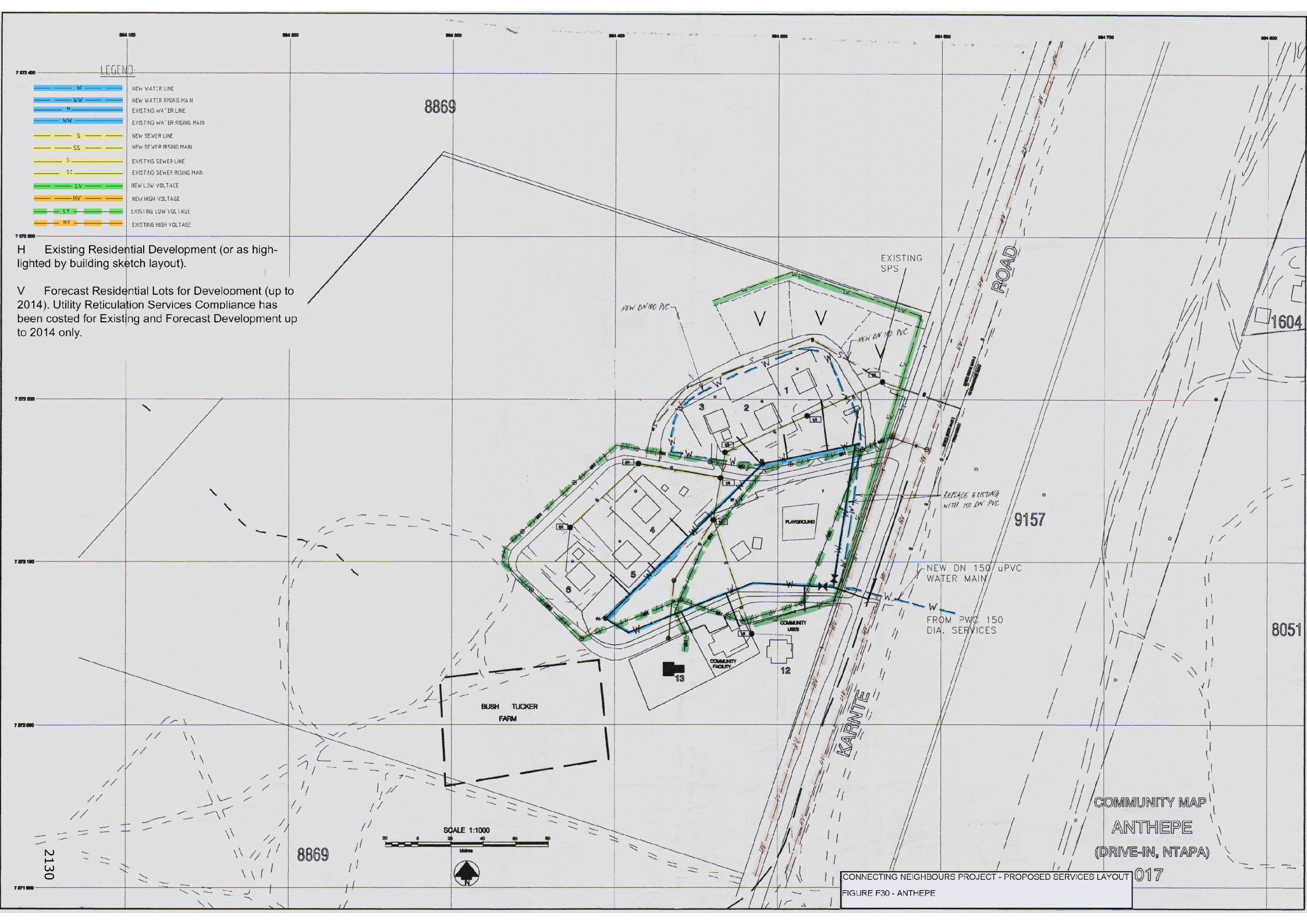
SLAP Map

Anthepe (Alice Springs Town Camp)

Drive In

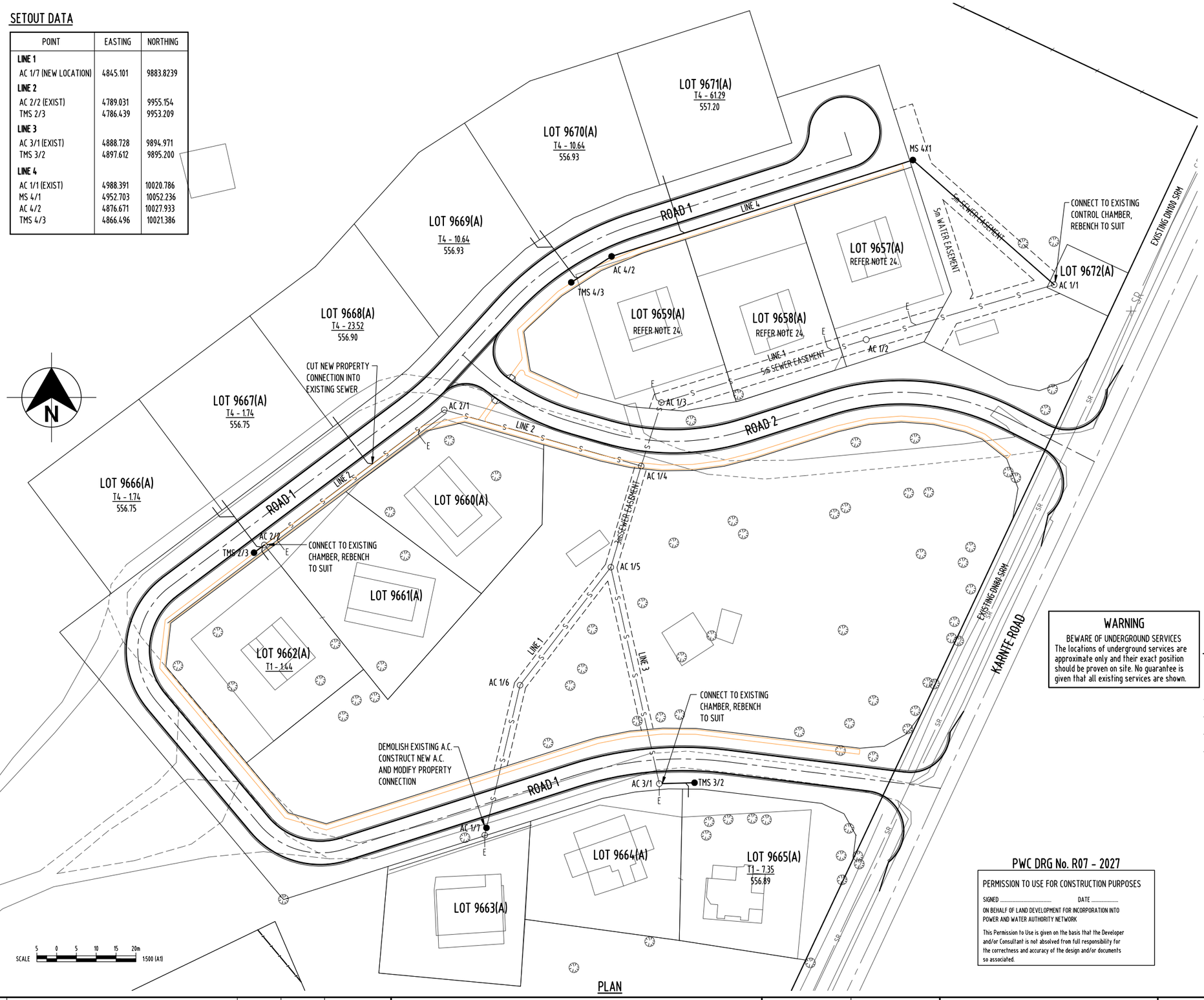
Alice Springs Town Council

Community ID: 17


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
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.
8869
EXISTING SPS
NEW DN100 PVC
NEW DN 150 PVC
ROAD
1604
9157
REPLACE EXISTING WITH 150 DN PVC
NEW DN 150 uPVC WATER MAIN
FROM PWC 150 DIA. SERVICES
8051
PLAYGROUND
COMMUNITY USES
COMMUNITY FACILITY
BUSH TUCKER FARM
KARNTE
SCALE 1:1000
Metres
8869
2130
COMMUNITY MAP
ANTHEPE
(DRIVE-IN, NTAPA)
017
CONNECTING NEIGHBOURS PROJECT - PROPOSED SERVICES LAYOUT
FIGURE F30 - ANTHEPE

SETOUT DATA

POINT	EASTING	NORTHING
LINE 1		
AC 1/7 (NEW LOCATION)	4845.101	9883.8239
LINE 2		
AC 2/2 (EXIST)	4789.031	9955.154
TMS 2/3	4786.439	9953.209
LINE 3		
AC 3/1 (EXIST)	4888.728	9894.971
TMS 3/2	4897.612	9895.200
LINE 4		
AC 1/1 (EXIST)	4988.391	10020.786
MS 4/1	4952.703	10052.236
AC 4/2	4876.671	10027.933
TMS 4/3	4866.496	10021.386



PLAN

NOTES

1. DESIGN AND CONSTRUCTION OF THE WATER AND SEWERAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE PWC CONNECTION CODE AND ASSOCIATED DOCUMENTS.
2. ALL LEVELS GIVEN TO A.H.D.
3. ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE.
4. MINIMUM COVER TO PIPE IS 750mm IN TRAFFICABLE AREAS, 600mm IN OTHER AREAS.
5. PRIOR TO COMMENCEMENT OF WORKS THE CONTRACTOR SHALL CHECK THE LOCATION OF ALL EXISTING UNDERGROUND SERVICES, AND CONFIRM FINISHED SURFACE LEVELS AND THE INVERT LEVELS OF EXISTING STUBS TO BE INCORPORATED IN THE WORKS.
6. IT IS NOT GUARANTEED THAT ALL SERVICES HAVE BEEN SHOWN ON THE DRAWING.
7. OBTAIN PERMIT(S) FROM THE RELEVANT ROAD AUTHORITY PRIOR TO ROAD EXCAVATION.
8. ALL WATER AND SEWERAGE (HYDRAULIC) WORKS SHALL BE CARRIED OUT AS SHOWN ON THE LATEST AMENDMENT OF THE DESIGN DRAWINGS.
9. CONSTRUCTION SITE DRAWINGS MUST BE SIGNED AS 'APPROVED FOR CONSTRUCTION' BY LAND DEVELOPMENT OFFICER.
10. SEVEN (7) DAYS NOTICE HAS TO BE GIVEN TO LAND DEVELOPMENT, PWC (FACSIMILE: 8924 7212 - NORTHERN REGION & 89517347 - SOUTHERN REGION), WITH A "NOTICE OF INTENTION TO START WORK" PRIOR TO COMMENCEMENT OF WORK.
11. ANY CHANGES TO THIS DRAWING, REQUIRED OR DESIRED DURING THE CONSTRUCTION PHASE MUST BE AUTHORISED BY A LAND DEVELOPMENT OFFICER.
12. 'AS CONSTRUCTED' DRAWINGS MUST BE PROVIDED TO LAND DEVELOPMENT, PWC, PRIOR TO HANDOVER INSPECTION.
13. DESIGNER TO CONTACT LAND DEVELOPMENT, PWC, TO ARRANGE FOR HANDOVER INSPECTIONS. SEVEN (7) DAYS NOTICE MUST BE PROVIDED PRIOR TO HANDOVER INSPECTION.
14. CONNECTIONS TO EXISTING WATER AND SEWER MAINS WILL ONLY BE CARRIED OUT WHEN ALL WORKS UPSTREAM OF THE CONNECTION ARE COMPLETE (ie. TESTED, DISINFECTED WHERE APPLICABLE, BACKFILLED AND CERTIFICATES SUBMITTED) IN ACCORDANCE WITH THE APPROVED DESIGN DRAWINGS, AND HAVE SATISFACTORILY PASSED FINAL HANDOVER INSPECTION.
15. PWC PERSONNEL SHALL INSTALL ALL WATER AND SEWER CONNECTIONS TO EXISTING MAINS ONLY AFTER ACCEPTANCE OF THE WORK HAS BEEN ACHIEVED. THE CONSTRACTOR IS RESPONSIBLE FOR ALL CONNECTION FEES, MATERIALS AND LABOUR FOR EXCAVATION, BACKFILLING AND REINSTATEMENT.
16. ALL GRAVITY SEWER PIPES SHALL BE uPVC CLASS SN8 WITH STYRENE-BUTADIENE RUBBER RING JOINTS (SBR), UNLESS NOTED OTHERWISE.
17. SEWERS SHALL BE OFFSET FROM PROPERTY BOUNDARIES A DISTANCE OF 1.6m IN ROAD RESERVES & 1.5m IN PRIVATE PROPERTY, EXCEPT WHERE SHOWN OTHERWISE ON THE DRAWINGS.
18. ALL GRAVITY SEWERS ARE DN150, UNLESS OTHERWISE SHOWN ON LONGITUDINAL SECTIONS.
19. THE SUPERINTENDENT SHALL DETERMINE SEWER PIPE BEDDING TYPE AFTER INSPECTION OF THE EXCAVATED TRENCH.
20. MAINTENANCE HOLE COVERS SLABS SHALL FINISH AT:
    a) FINISHED SURFACE LEVEL IN ROAD RESERVES AND FOOTPATH; AND
    b) 150mm ABOVE SURFACE LEVEL IN PRIVATE PROPERTY AND OPEN SPACE.
21. THE CONSTRACTOR SHALL INSCRIBE THE MAINTENANCE HOLE COVER WITH THE IDENTIFYING NUMBER AS SHOWN ON THE DRAWINGS.
22. ALL ACCESS CHAMBERS TO BE PRECAST & CIRCULAR ⌀1200.
23. ALL BACKFILL UNDER ROADS TO BE CLASS 3 GRAVEL COMPACTED IN 150mm MAX. LAYERS TO 95% M.M.D.D. TO SUBGRADE LEVEL.
24. RAISE ORGS TO SUIT NEW SURFACE LEVELS. ENSURE COMPLIANCE WITH NT PLUMBING AND DRAINAGE REGULATIONS.

WARNING

BEWARE OF UNDERGROUND SERVICES
The locations of underground services are approximate only and their exact position should be proven on site. No guarantee is given that all existing services are shown.

LEGEND

- EXISTING SEWER
- EXISTING ACCESS CHAMBER
- SEWER MAIN TO BE CONSTRUCTED
- AC 18/1 — NUMBERED ACCESS CHAMBER TO BE CONSTRUCTED
- MS 18/2 — NUMBERED MAINTENANCE SHAFT TO BE CONSTRUCTED
- TMS 18/3 — NUMBERED TERMINAL MAINTENANCE SHAFT TO BE CONSTRUCTED
- T2 - 21.20 / 31.40 — PROPERTY CONNECTION TO BE CONSTRUCTED (REFER TO LEGEND)
- E — EXISTING PROPERTY CONNECTION (TO REMAIN)

PROPERTY CONNECTION LEGEND

T2 - 44.0 / 21.20
- DISTANCE FROM DOWN STREAM MANHOLE
- I.L. OF HOUSE DRAIN CONNECTION POINT (TYPE T2 AND T4 ONLY)
- PROPERTY CONNECTION TYPE. REFER PAWC STD. DRAWING.

PWC DRG No. R07 - 2027

PERMISSION TO USE FOR CONSTRUCTION PURPOSES

SIGNED ..... DATE .....

ON BEHALF OF LAND DEVELOPMENT FOR INCORPORATION INTO POWER AND WATER AUTHORITY NETWORK

This Permission to Use is given on the basis that the Developer and/or Consultant is not absolved from full responsibility for the correctness and accuracy of the design and/or documents so associated.

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION
SUBJECT TO FINAL
VERIFICATION AND APPROVAL

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
04	DETAIL DESIGN ISSUE	19.05.08	SLK	DPI
03	TENDER ISSUE	05.02.08	SLK	DPI
02	DETAIL DESIGN ISSUE	29.10.07	SLK	DPI
01	DETAIL DESIGN ISSUE	19.10.07	NLC	DPI

AMENDMENTS

Connell Wagner
Connell Wagner Pty Ltd ABN 54 005 139 873
62 Cavenagh Street (PO Box 919) Darwin
Northern Territory 0800 Australia
Telephone: +61 8 8919 9777
Facsimile: +61 8 8919 9750
Email: cwdrw@conwag.com
CAD File No: FILE-No.
Plot Date: PLOT-DATE

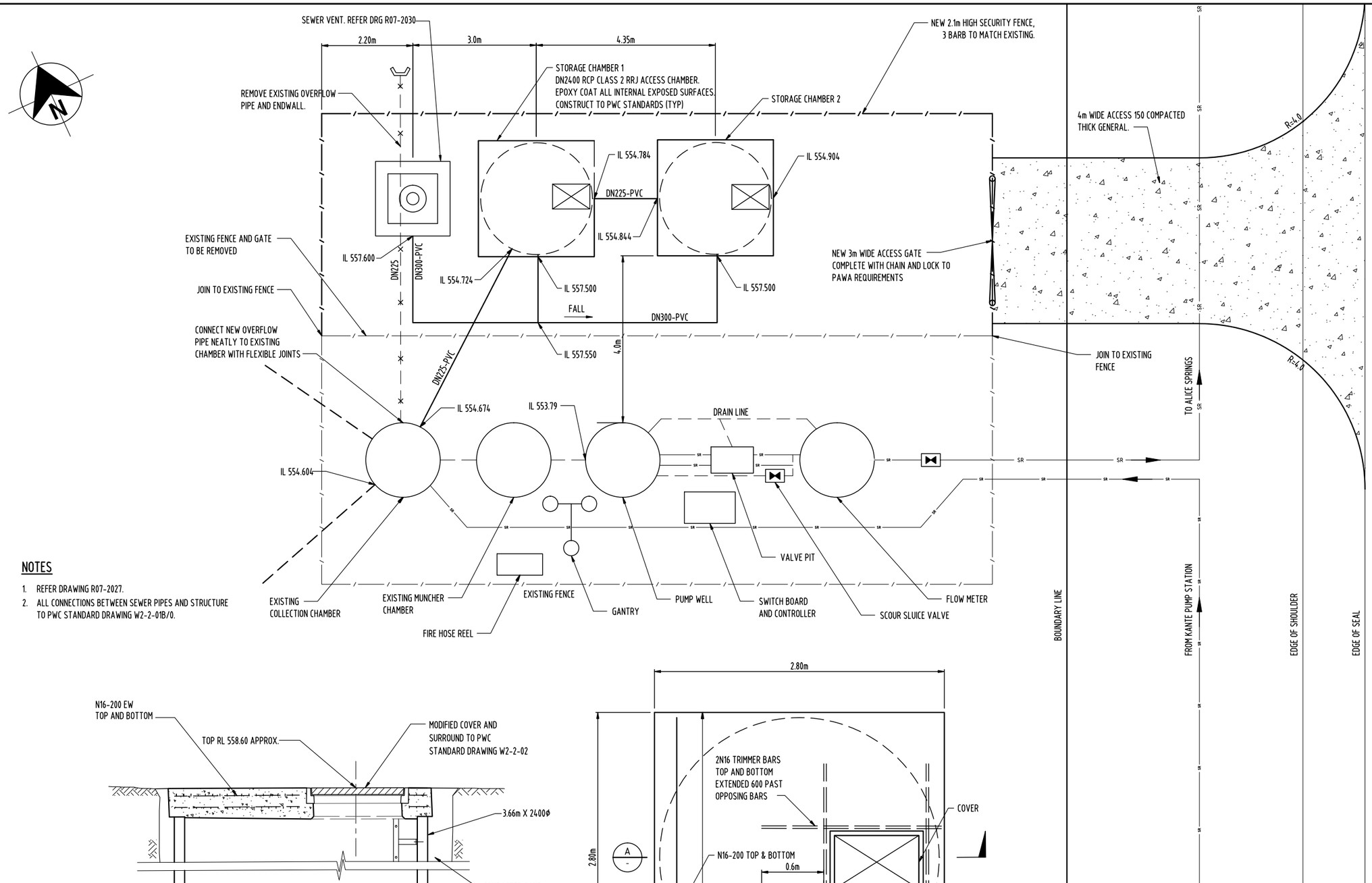
DRAWN	CHECKED
TWH	
DATE DEC 07	DATE
DESIGNED	CHECKED
PDG	
DATE DEC 07	DATE
DESIGN PROJECT LEADER	PROJECT OFFICER
DATE	DATE

Northern Territory Government
Department of Planning and Infrastructure

Alice Springs
Connecting Neighbours Program - Upgrade Works on Anthepe
SEWERAGE COMPILATION PLAN

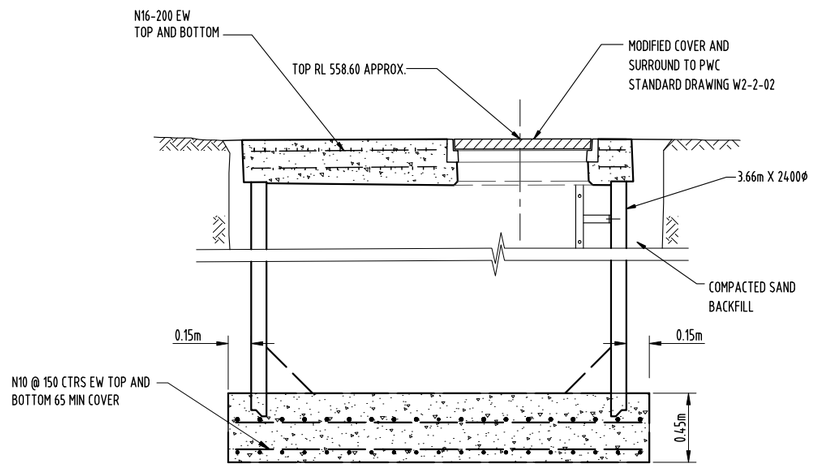
FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	16 OF 25	R07-2027	04	A1

2131

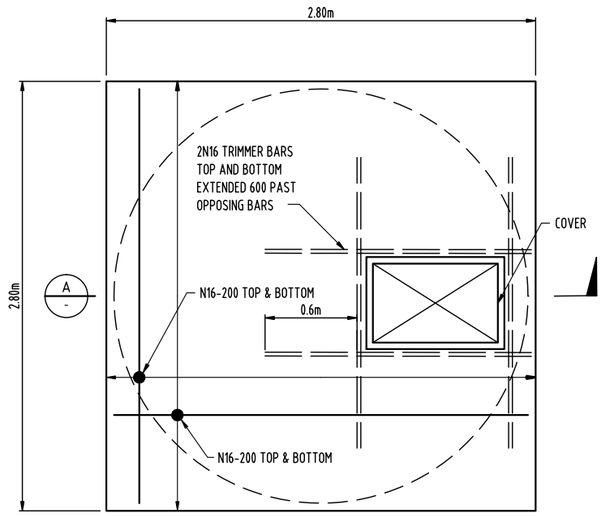


NOTES

1. REFER DRAWING R07-2027.
2. ALL CONNECTIONS BETWEEN SEWER PIPES AND STRUCTURE TO PWC STANDARD DRAWING W2-2-01B/0.



STORAGE CHAMBER - SECTION A
1:20



STORAGE CHAMBER - PLAN
1:20

PLAN
1:50

PWC DRG No. R07 - 2029

PERMISSION TO USE FOR CONSTRUCTION PURPOSES

SIGNED ..... DATE .....

ON BEHALF OF LAND DEVELOPMENT FOR INCORPORATION INTO POWER AND WATER AUTHORITY NETWORK

This Permission to Use is given on the basis that the Developer and/or Consultant is not absolved from full responsibility for the correctness and accuracy of the design and/or documents so associated.

SCALE 0.2 0 0.2 0.4 0.6 0.8m 1:20 (A1)

SCALE 0.5 0 0.5 1 1.5 2m 1:50 (A1)

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION
SUBJECT TO FINAL
VERIFICATION AND APPROVAL

No.	DESCRIPTION	DATE	NAME	DEPT/COMPANY
	AMENDMENTS			
05	DETAIL DESIGN ISSUE	19.05.08	SLK	DPI
04	ISSUED FOR APPROVAL	13.04.08	SLK	DPI
03	DETAIL DESIGN ISSUE	05.02.08	SLK	DPI
02	DETAIL DESIGN ISSUE	29.10.07	SLK	DPI
01	DETAIL DESIGN ISSUE	19.10.07	NLC	DPI

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CAD File No: FILE-No.
Plot Date: PLOT-DATE

DRAWN	TWH	CHECKED	
DATE	DEC 07	DATE	
DESIGNED	PDG	CHECKED	
DATE	DEC 07	DATE	
DESIGN PROJECT LEADER		PROJECT OFFICER	
DATE		DATE	

Northern Territory Government
Department of Planning and Infrastructure

Alice Springs
Connecting Neighbours Program - Upgrade Works on Anthepe

SEWERAGE PUMP STATION OVERFLOW TANK DETAILS

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
-	-	18 OF 25	R07-2029	05	A1

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