

# Civil ENGINEERING

## ASSESSMENT REPORT

Solar Farm  
1 Dingo Lane, Myocum, NSW 2481 | Lot 15 on DP1178892

Client: Byron Shire Council  
By Planit Consulting Pty Ltd

**December 2021**

J6558 | EA01



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**Project Details**

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## 1 Executive Summary

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This Engineering Assessment (EA) has been prepared in support of Byron Shire Council's proposed solar farm at 1 Dingo Lane, Myocum, NSW 2481 which falls within the Byron Shire Council (BSC) Local Government Area. Planit was engaged by Byron Shire Council (BSC) to assess and report on the civil engineering matters associated with this development.

Acid Sulfate Soils (ASS) were found onsite and accordingly appropriate management of soils during the construction is required.

The area is subject to flooding and accordingly flood mapping of the site has been carried out to identify flood levels. These flood levels have been considered as part of the design.

Minor bulk earthworks are proposed to accommodate proposed turn around areas, passing bays and the inverter and storage areas. It is proposed to keep topography generally consistent between the existing and proposed scenarios.

A Stormwater quantity assessment determined that no detention is required. Stormwater treatment devices are not proposed during the operation phase given that the site achieves full re-establishment of vegetation post construction. To achieve appropriate revegetation during the construction phase and minimise scour and sedimentation, sediment and erosion controls are proposed.

No water or sewer infrastructure is proposed as part of the project and therefore no new connections are required.

Relocation of a telecommunications cable is required.

All power components are to be located above the 1% AEP flood level. Augmentation of the power network is anticipated.

Based on the assessment undertaken, it is believed that the proposed development can readily serviced in a sustainable way.

## 2 Introduction

### 2.1 Project Background

This Engineering Assessment (EA) has been prepared in support of Byron Shire Council's proposed solar farm at 1 Dingo Lane, Myocum, NSW 2481 which falls within the Byron Shire Council (BSC) Local Government Area. Planit was engaged by Byron Shire Council (BSC) to assess and report on the civil engineering matters associated with this development.

The proposed development involves construction of approximately 11Ha of solar panels and associated infrastructure including solar inverter, viewing platform, access roads and parking. Refer to Table 1 below for additional development detail. The proposed project site is presented in Figure 1. Additionally, refer to Appendix C for the sites concept civil plans, and the Plan of Subdivision provided in Appendix A.

**Table 1 – Site Details Summary**

Component	Details
Applicant	Byron Shire Council (BSC)
Street Address	1 Dingo Lane, Myocum, NSW 2481
Local Government Area	Byron Shire Council (BSC)
Climatic Region	Subtropical
Zoning	RU2 – Rural Landscape
Proposed development type	Solar Farm
Total Site Area	40Ha
Map Reference	Lot 15 on DP1178892



**Figure 1- Proposed Solar Farm**

## 2.2 Project Scope

This report presents the results of an assessment of:

- The subject site including:
  - Locality.
  - Existing Services.
  - Legislation.
  - Topography.
  - Soil characteristics.
- Preliminary earthworks design including:
  - Bulk earthworks.
  - Service trenching requirements.
  - Preliminary driveway and crossover design.
- Stormwater management including:
  - Analyses of the existing site and proposed project.
  - Hydraulic calculations and modelling to determine the required detention storage.
  - Provide recommendations for stormwater conveyance.
  - Provide stormwater quality comments.
- Services assessment including:
  - Potable water.
  - Sewer.
  - Power.
  - Telecommunication.

To accompany and further detail the proposed design civil plans are presented in Appendix C.

## 3 Civil Site Assessment

### 3.1 Site Description

The subject site (Figure 2) currently contains:

- General grazing farmland.
- Scattered vegetation.
- Access road.
- Residence at the southern end of the site.

The proposed development includes the following:

- Approximately 11 Ha of solar panel arrays.
- Solar inverter.
- Access road and 5 x formalised and 5 x unformalised carparks, and 1 coach bus.
- Viewing platform.
- Landscape screening.
- Security fencing.
- Retained residence and associated access.

The surrounding areas of the site include:

- Dingo Lane (BSC owned road) bounds the site to the north.
- General grazing farmland to the west.
- Macadamia plantation to the south.
- Resource recovery to the south east.
- Quarry to the east.
- General grazing farmland to the north east.

It should be noted that the speed limit in the surrounding area is 80km/h.



Figure 2- Subject Site



### 3.2 Existing Services

To confirm the locations of existing services, a 'Dial Before You Dig' (DBYD) search has been requested within the vicinity of the development area, the results of which are included in Appendix B. In addition, a site survey has been completed and is available in Appendix A.

Survey Information and dial before you dig records indicate the following services within the proximity to the subject site:

- Stormwater:
  - There is stormwater infrastructure located on the development site. Currently there is a driveway present with culvert crossings in 4 locations to convey water from upstream.
- Water:
  - There is no council owned potable water infrastructure within vicinity of the subject site with the current residence been serviced via an onsite rain water tank.
- Sewer:
  - There is no council owned sewer infrastructure within vicinity of the subject site with the current residence been serviced via an onsite system.
- Power:
  - Overhead power is located within the vicinity of the subject site with the existing onsite residence serviced via this service.
- Telecommunications:
  - Records indicate that telecommunication services are located within the subject site. It is assumed that the cable is live and servicing the existing onsite residence, however, this is to be confirmed.

For locations of services, refer to Appendix A for the site specific survey and Appendix B for the DBYD records.

### 3.3 Engineering Constraints

All civil works shall be in accordance with the BSC Engineering Specifications including the Subdivision Specifications and Standard Drawings as well as all codes and standards referenced in these documents.

#### 3.3.1 Acid Sulfate Soils

The site is mapped as having presence of Acid Sulfate Soils (Class 4) below the natural surface (Figure 3). Accordingly, Australian Soil Concrete Testing (A.S.C.T.) were engaged to carry out an ASS investigation to determine the presence of ASS below the surface.

The ASS investigation concluded that the soils consist of Potential Acid Sulfate Soils (PASS) and Actual Acid Sulfate Soils (AASS) and require management via liming application upon excavation. Refer to Appendix D for the ASS investigation.

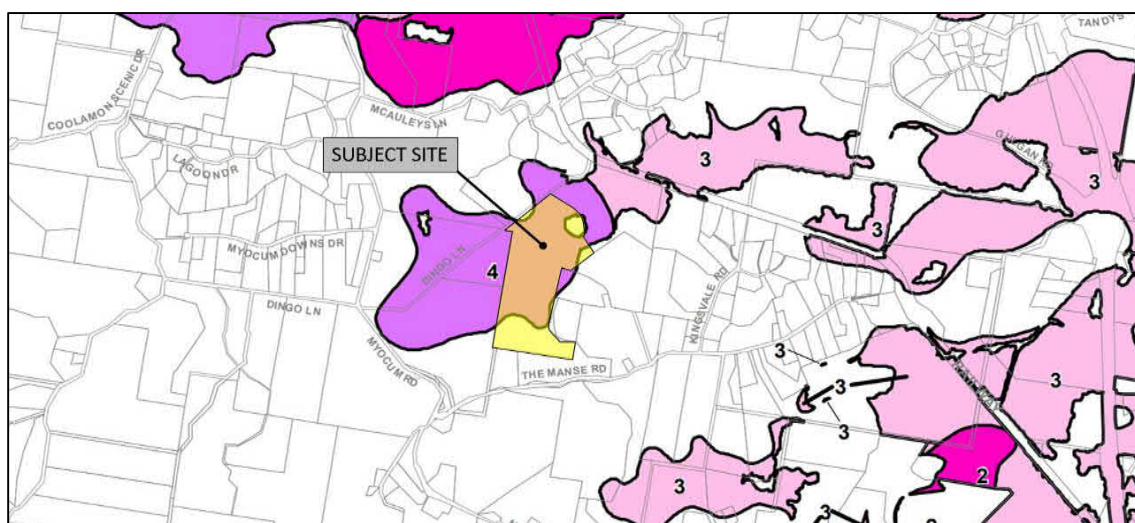


Figure 3- Subject Site Presence of Acid Sulphate Soils



### 3.3.2 Flood

The subject site is located in an area that is subject to flood inundation. Accordingly, BMT was engaged to complete flood mapping for the subject site. Refer to the extract from the BMT flood study report shown in Figure 4.

Furthermore, Planit is aware that since the completion of this flood study, Myocum road has undergone major upgrades to improve safety and efficiency, the upgrades have resulted in changes of road levels and culverts within the mapped flood affected area. Planit understands a flood study has been carried out as part of the Myocum upgrades. It is therefore, assumed no adverse flood impacts will occur to the subject site based on the new road design levels.

Refer to Appendix E for BMT's flood mapping 1% AEP water levels, depths, and velocities.

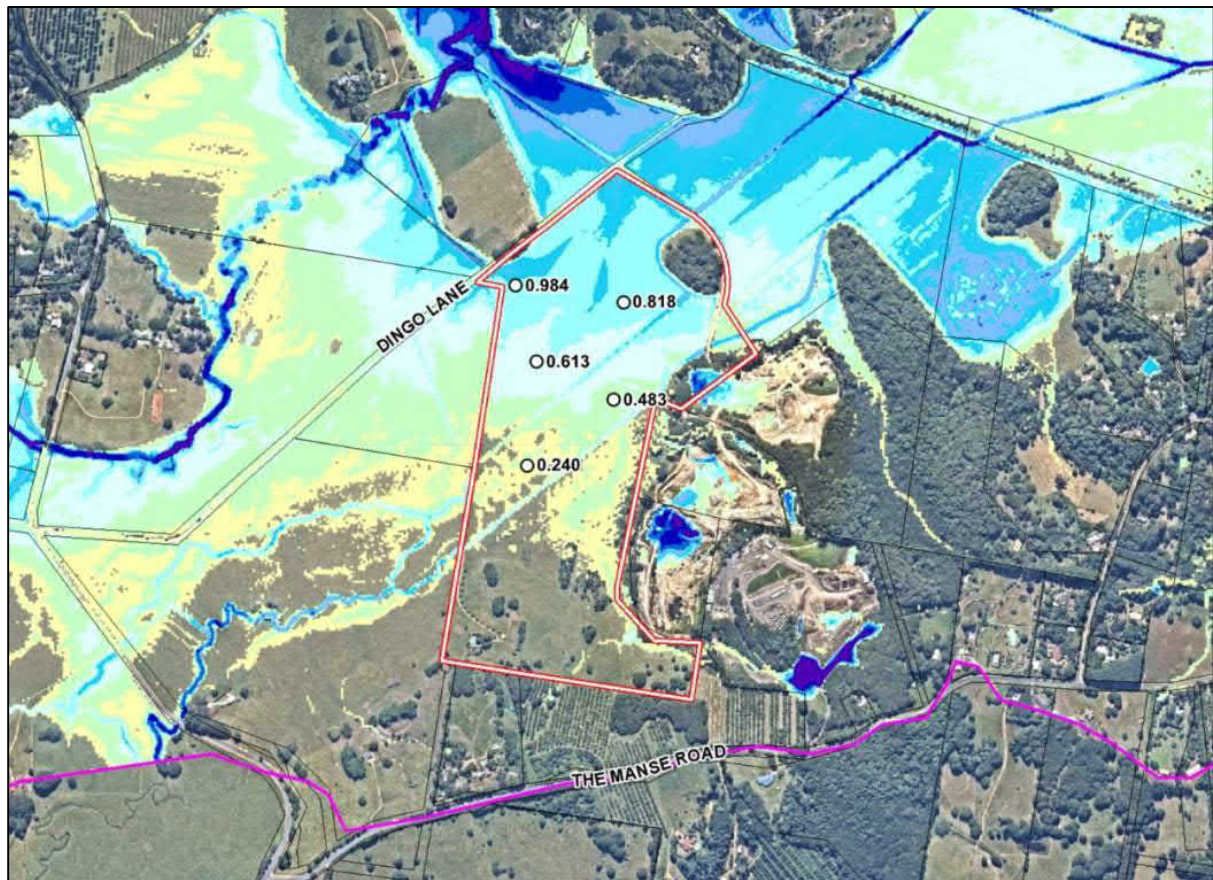


Figure 4- BMT Flood Mapping 1% AEP Water Depths

## 4 Earth and Roadworks

### 4.1 Bulk Earthworks

Two small sections of roadway are proposed as part of the project, they include:

- New section at site entrance to allow for the manoeuvring of a coach and providing car parking spaces for educational purposes (i.e. university field trips).
- New section of roadway around the solar inverter and storage area in the south area of the subject site.

In addition, passing bays are proposed along the existing driveway. Based on the new sections of roadway and passing bays, it is anticipated that earthworks volumes shall be minimal with only minor cutting and filling required.

### 4.2 Service Trenching

Assuming the Telecommunication cable is live, service trenching will be required to relocate the telecommunications cable passing through the subject site. The new alignment is proposed to follow the existing driveway and connect back to the previous alignment.

In addition, service trenching will be required to connect the internal solar infrastructure to the inverter and also connect the solar farm to the electricity grid.

Refer to Appendix C for the site civil plans.

### 4.3 Driveway Access

New circulation driveways shall be designed and constructed in accordance with AS2890 and NRLG standards and specifications.

Key design parameters include but not limited to:

- Driveways with low traffic volumes are required to be a minimum width of 3m and provide passing opportunities every 30m. It should be noted that the use of the driveway past the viewing platform will be minimum with only authorised personnel and the tenants at the existing residence will be utilising this driveway. In addition, the driveway is straight meaning sightlines to approaching vehicles can be seen from over 30m away and accordingly there is opportunity to increase the passing opportunity interval;
- Maximum Grade – 1 in 6 (desirable) 1 in 4 (absolute maximum).
- Maximum carpark grade - 10%;
- Coach turn around area to ensure coach can enter and exit the site in a forward motion while tyres remain on the pavement; and
- Solar inverter turn around area to ensure a Light Rigid Vehicle can enter and exit the site in a forward motion while tyres remain on the pavement.

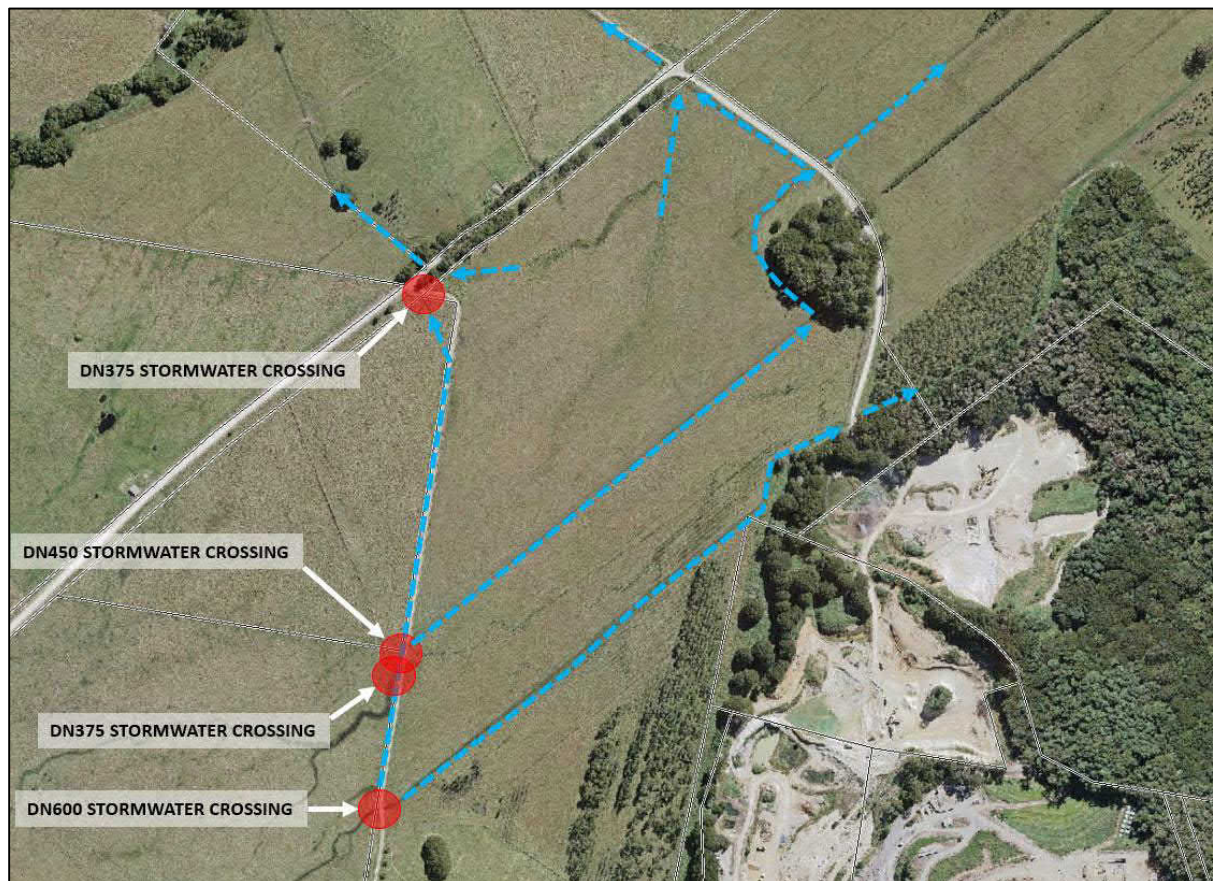
For additional details regarding the proposed driveway, refer to Planit's Traffic Impact Statement (J6558-DINGO\_LN-TIS01).



## 5 Stormwater Management

### 5.1 Stormwater Conveyance

The subject site topography has areas of steep grade ( $>10\%$ ) in the southern area of the lot and areas of shallow grade ( $<1\%$ ) in the northern areas of the site. There is stormwater infrastructure located on the development site. Currently, there is a driveway present with culvert crossings in 4 locations to convey water from upstream. Refer to Figure 5 below for a visual of the existing flow paths. Note that these flow paths shown below are subject to flooding and become inundated in major events.

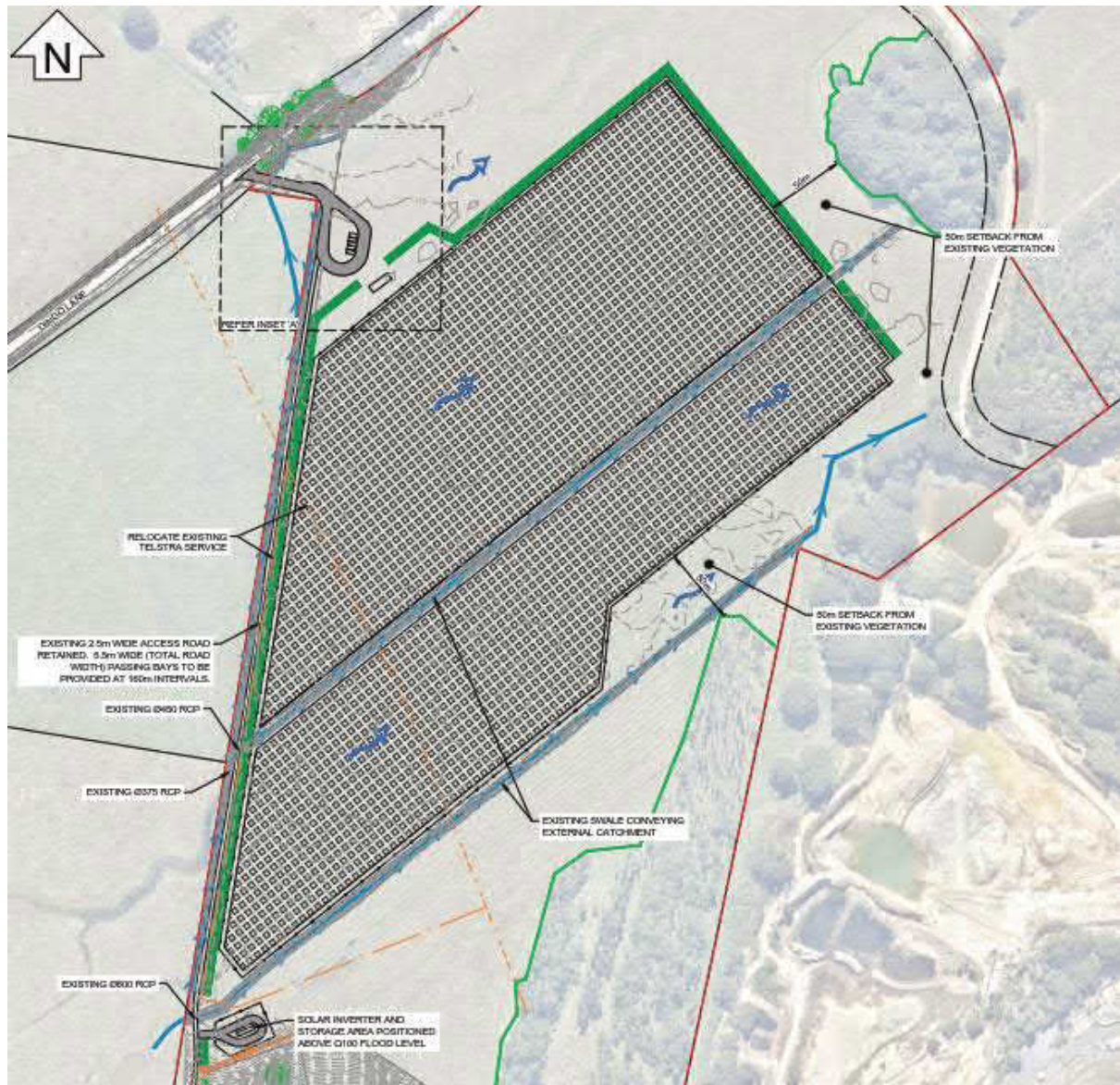


**Figure 5- Existing Site Conveyance**

It should be noted that the proposed solar farm shall generally be located in the shallow low lying areas with only the inverter to be located on the steeper slope to ensure it is located above the 1% AEP flood event.

In addition, the proposed project finished surface levels are to remain generally consistent with the existing topography as to minimise the impact to upstream and downstream waterways/infrastructure. Refer to Figure 6 below for a concept layout of the proposed solar farm.





**Figure 6- Proposed Site Conveyance**

## 5.2 Stormwater Quantity Assessment

It is proposed to increase the impervious area of the subject site and accordingly a stormwater quantity assessment has been carried out to determine detention requirements. Based on the proposed design, it is anticipated to increase the impervious area as per Table 2.

**Table 2 – Site Surface Breakdown**

Scenario	Area (ha)	Solar Farm area @ 50% impervious area (ha)	Coach turn around hardstand (ha)	Inverter hardstand (ha)	Total impervious area (ha)	Total % impervious
*Existing	24.55	0	0	0	0	0%
Proposed	24.55	11.00	0.15	0.06	5.71	23%

\*The existing gravel driveway is considered as 0% imp

To determine detention and conveyance requirements for the site, a hydraulic assessment was carried out using DRAINS software. Refer below for inputs for the DRAINS model.

### 5.2.1 Model type

Horton/ILSAX model has been utilised with parameters as per Figure 7 below.

Horton/ILSAX type hydrological model

Model name: DINGO LN ILSAX (KINEMATIC)

Paved (impervious) area depression storage (mm): 1

Supplementary area depression storage (mm): 1

Grassed (pervious) area depression storage (mm): 5

Soil Type:

- ☒ Normal (1 to 4) 3.5
- ☐ You specify

For overland flow use:

- ☐ Friend's equation
- ☒ Kinematic wave equation

Note: The overland flow equation is only used if you choose to specify more detailed catchment data.

Buttons: OK, Cancel, Help

**Figure 7- Hydraulic Model Parameters**

#### Notes:

- 3.5 has been assigned as the soil type as geotechnical information suggests silty clay soils.
- The time of concentrations have been calculated within DRAINS using the Kinematic wave equation as the site is generally uniform in slope and roughness.

#### Rainfall data

Rainfall data was collected from the ARR data hub at the following latitude and longitude:

- Latitude: -28.588
- Longitude: 153.508



## 5.2.2 Catchments

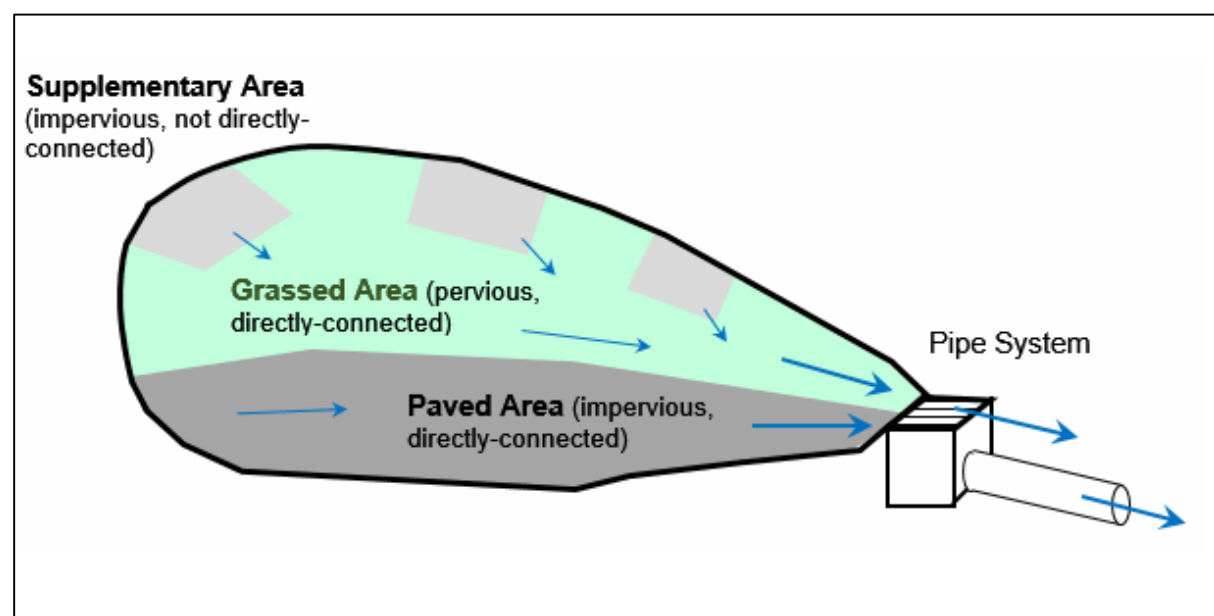
To quantify the peak flow rates from the existing and proposed sites, a lumped catchment approach was carried out. Catchments have been assigned as per Figure 8 below.

Existing Scenario				Proposed Scenario			
<b>Sub-Catchment Data</b> Sub-catchment name: <b>EXISTING</b> Sub-catchment area (ha): 24.55 Hydrological Model: <input checked="" type="radio"/> Default model <input type="radio"/> You specify Use: <input type="radio"/> abbreviated data <input checked="" type="radio"/> more detailed data Note: The additional times you specify will be added to the times calculated from flow path length, slope and roughness to get the total times of concentration.				<b>Sub-Catchment Data</b> Sub-catchment name: <b>PROPOSED</b> Sub-catchment area (ha): 24.55 Hydrological Model: <input checked="" type="radio"/> Default model <input type="radio"/> You specify Use: <input type="radio"/> abbreviated data <input checked="" type="radio"/> more detailed data Note: The additional times you specify will be added to the times calculated from flow path length, slope and roughness to get the total times of concentration.			
DINGO LN ILSAX (KINEMATIC)				DINGO LN ILSAX (KINEMATIC)			
	Paved	Supplementary	Grassed		Paved	Supplementary	Grassed
Percentage of area	0	0	100	Percentage of area	0	23	77
Additional time (mins)	0	0	5	Additional time (mins)	0	5	5
Flow path length (m)	0	0	200	Flow path length (m)	0	200	200
Flow path slope (%)	0	0	0.5	Flow path slope (%)	0	0.5	0.5
Retardance coefficient n*	0.01	0.15	0.15	Retardance coefficient n*	0.01	0.15	0.15

**Figure 8- DRAINS Catchments**

### Notes:

- Refer to Figure 9 below for the definition of each surface type (Paved, Supplementary, and Grassed areas).
- Assigned parameters to determine the time of concentrations have been assigned as the following in accordance with QUDM:
  - 200m is assumed to be the maximum sheet flow length before forming concentrated flows.
  - Flow path slope has been assigned based on site conditions.
  - Retardance coefficient has been assigned in accordance with Table 4.6.5 of the QUDM.
  - 5 minutes of additional time has been added to account for travel times of concentrated flows (based on speed relationship (3m/s over 1000m)).
- As minimal earthworks are proposed, stormwater runoff shall generally be as per the existing conditions.
- It is assumed rainfall that lands on solar panels will run off to the ground and form sheet flow as the existing topography is relatively flat (<1%).



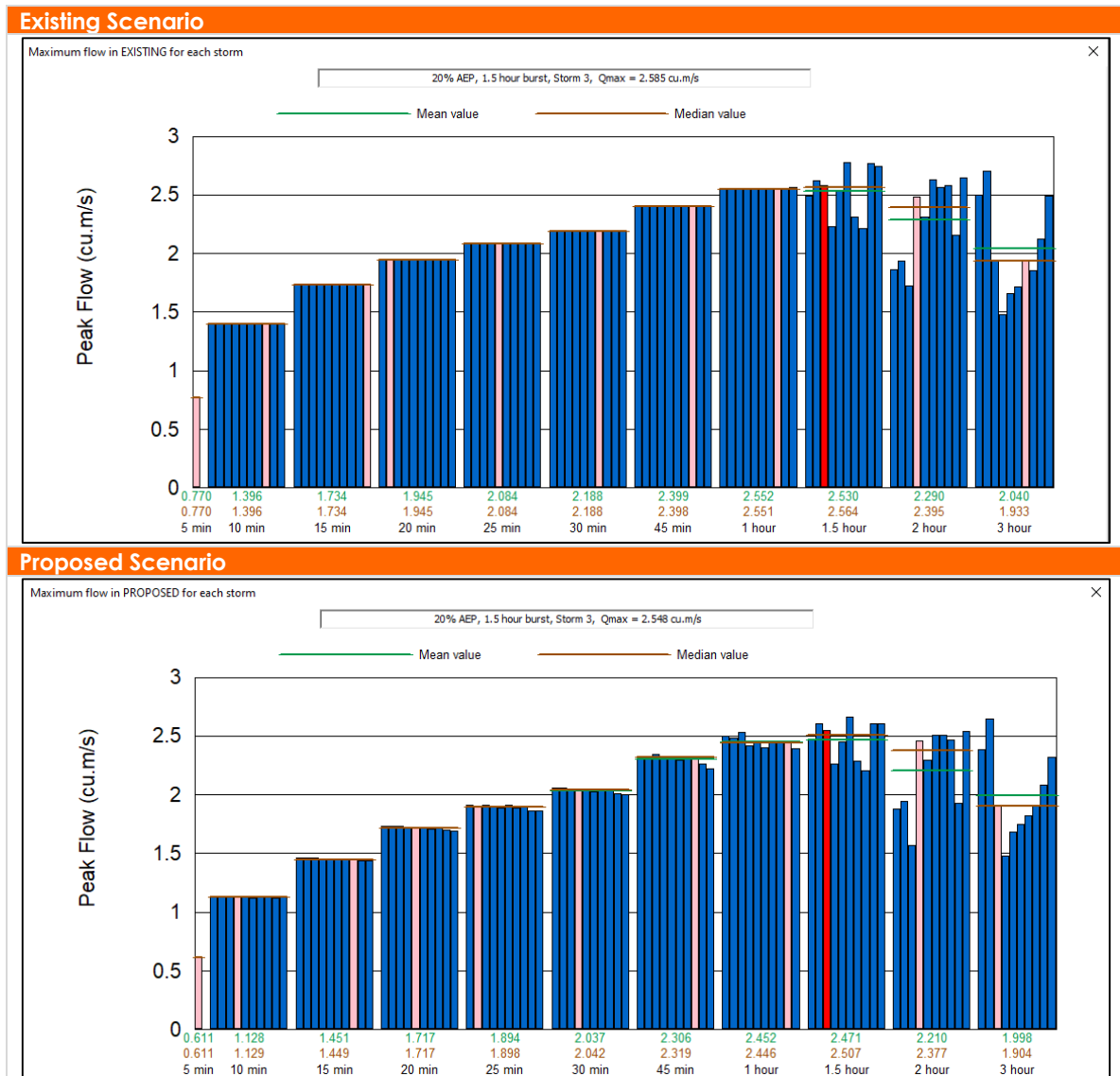
**Figure 9- Surface Type Definition**

### 5.2.3 Results

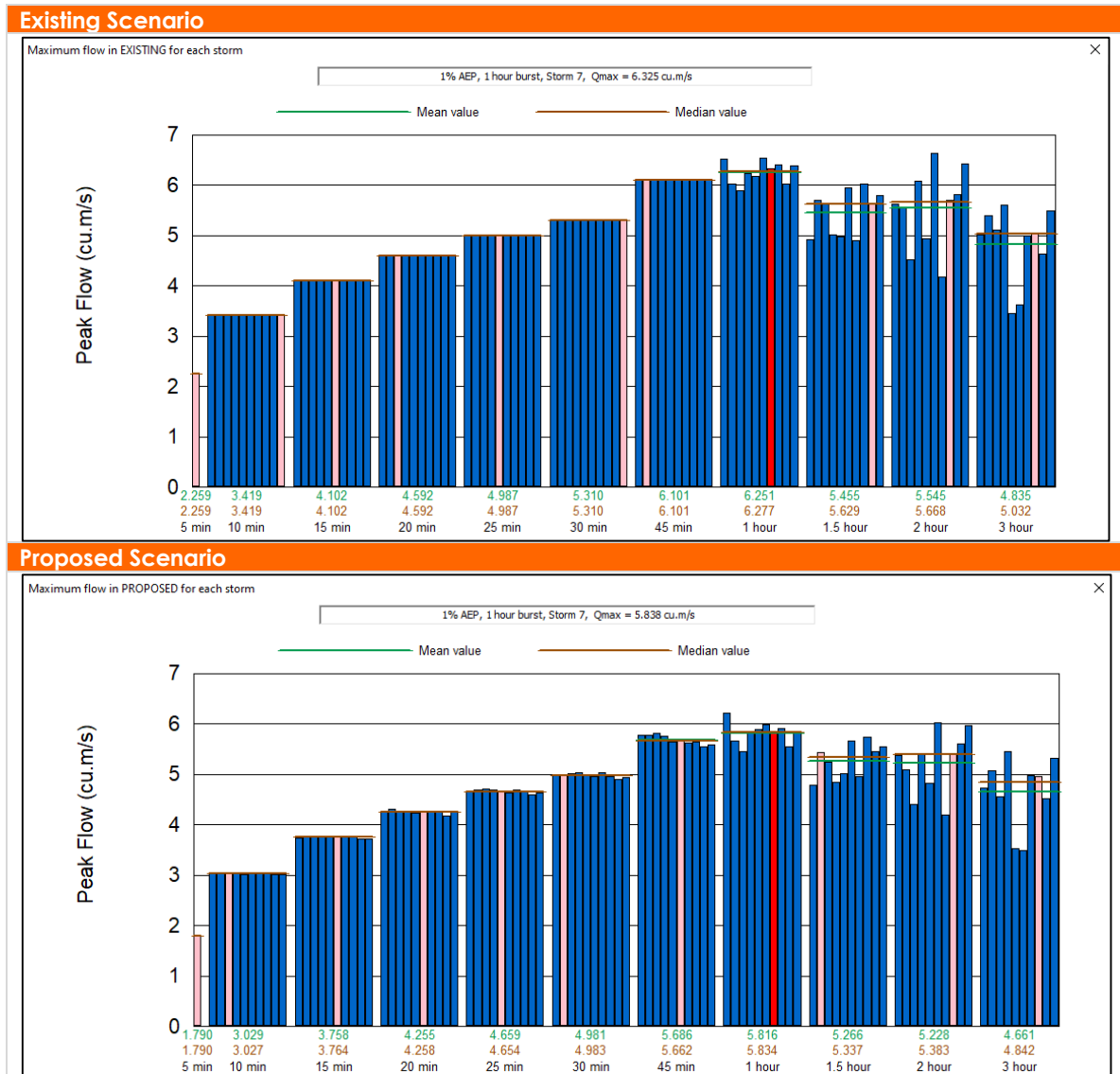
Results from the hydraulic assessment reveal peak flow rates generated from each scenario. Refer to Table 3 below for a comparison between the pre and post development flow rates for equivalent storm events from the minor to major events (20% AEP to the 1% AEP). In addition, refer to Figure 10 and 11 for the minor and major peak flow charts.

**Table 3 – Existing and Proposed Scenario Peak Flow Rate Comparison**

Scenario	20% AEP (m3/s)	10% AEP (m3/s)	5% AEP (m3/s)	2% AEP (m3/s)	1% AEP (m3/s)
Existing	2.590	3.410	4.270	5.430	6.330
Proposed	2.550	3.240	3.970	5.060	5.840
Impact	-0.040	-0.170	-0.300	-0.370	-0.490



**Figure 10- Minor Event (20% AEP) Peak Flow Chart**



**Figure 11- Major Event (1% AEP) Peak Flow Chart**

Results from the hydraulic assessment reveal a reduced peak flow for the major and minor events. Based on the results, the supplementary areas and grassed areas become less concentrated due to the different surface types. Accordingly, the hydraulic assessment concluded that no detention is required and upon completion of the project (operation phase) stormwater runoff characteristics shall be generally as per the existing scenario.

### 5.3 Stormwater Quality Assessment (Operational)

The proposed solar farm is not expected to experience extensive traffic movements (refer to Planit's Traffic Impact Statement (J6558-DINGO\_LN-TIS01), nor does the project propose a high percentage of indirectly connected hardstand areas (refer to section 5.2 of this document). Therefore, pollutant loading on roadways will be minimal and is anticipated to flow over grass (receiving treatment) prior to discharging offsite. In addition, solar panels will not collect extensive quantities of pollutants and runoff from solar panels will be required to sheet flow over grass (receiving treatment) and discharge offsite.

Based on the proposed solar farm and the above assumptions, it is not proposed to install stormwater treatment devices as any impact to water quality downstream shall be negligible.

Although no stormwater treatment devices are proposed during the operation phase of the project, during construction, sediment and erosion control measures will be required to ensure vegetation onsite is re-established to avoid scour and erosion of streams.

Refer to section 5.4 below for details of the proposed controls to be implemented during the construction phase.

## 5.4 Stormwater Quality Assessment (Construction)

The aim of the following controls is to achieve a no worsening impact of stormwater quality and achieve no reduction in the environmental values of the downstream receiving waters caused by construction activities on the subject site during the construction of the development.

Stormwater quality during construction activities shall be achieved through the implementation of Erosion and Sediment Controls in accordance with the requirements of the Landcom 'Soils and Construction Volume 1 – Managing Urban Stormwater: Soils and Construction' (i.e. Blue Book). The measures are to be implemented before the commencement of any subdivision works and should be inspected regularly, and after heavy storm events to ensure they are achieving their desired purpose. The measures to be used on site include:

- Minimise the number of site access points and provide stabilised site access.
- Stabilised site access to be provided at access to shake down all vehicles entering and leaving the site, minimising the transport of sediment off-site. All vehicles must use the designated site access to enter or leave the site.
- Installation of downstream sediment barriers prior to commencement of any works.
- Sediment fences are to be installed downstream of works and exposed soils to ensure contaminated run-off is filtered and sediment captured before it can make its way into the downstream receiving environment.
- Turf Strips where required.
- Cut-off drains are to be formed at the top of batter slopes (Cut-off drains will allow the discharge of water to be conveyed and directed to the most desirable points of discharge to ensure suitable sediment treatment is achieved).
- External catchment is to be conveyed around the area of works and discharged at appropriate location.
- Stabilise and protect earthwork areas immediately once earthwork profiles are achieved.
- Stockpile materials in protected locations away from overland flow paths and protected by sediment fence boundaries.
- Stockpile locations will be located in an elevated, level area nominally 5m away from any water body or channel. Upslope protection measures (i.e. sandbags or equal) are to be used to divert run-off in the event of rain, and sediment fences are to be installed downstream of any erodible stockpile. At the end of each day or in the event of rain or high winds, stockpiles are to be covered and secured. Appropriate locations of stockpiles are to be determined by the site manager at the time of construction.
- Sediment fence to be used on low side of any areas of soil disturbance (e.g. road formation, house pad, soil stockpiles, etc).
- Rock filter dams and gypsum filled bags, flock blocks or equivalent placed on low side of check dam spillway, are to be provided in key locations to treat stormwater run-off from the works area.
- Site is to be watered during the construction phase to minimise the generation of dust onsite.
- When wind speeds reach 35km/h, all dust generating construction activities must cease onsite.

The following inspection program shall be established by the Site Contractor and monthly Check Sheet reports shall be submitted to the Supervising Engineer:

- Daily inspection of the site Stabilised Access point and amendments as necessary.
- Formal weekly inspection of erosion and sediment controls.
- Inspections after 10mm rainfall events in 24 hours.
- Testing runoff after significant rainfall events to ensure a max. discharge of 50mg/L suspended solids.

In addition to the inspection details, the following information will be recorded:

- List frequency and method of removal of material from stabilised access point.
- Volume of material removed from in/around sediment controls.
- Location of site where materials are disposed.
- Any repairs/additions as appropriate.

Refer to Appendix C for the proposed sediment and erosion control plan, including locations of proposed treatment devices.



## 6 Services Assessment

### 6.1.1 Potable Water

No amenities are proposed as part of the project with the existing residence having access to water through the use of rainwater tanks. Accordingly, there is no potable water provisions for the site and a connection is not required.

### 6.1.2 Sewer

No amenities are proposed as part of the project with the existing residence having assumed to have an onsite system. Accordingly, there is no provisions for additional sewer connections.

### 6.1.3 Power

The solar farm shall be connected to the existing infrastructure available in the south area of the subject site. It is expected that augmentation/modification to the existing infrastructure will be required as part of this project, however this is to be confined by the service provider.

It should be noted that all power components (i.e. solar panels, cables, joints etc.) shall be kept above the 1% AEP flood level. Refer to Appendix E for BMT's 1% AEP flood mapping.

### 6.1.4 Telecommunications

As records indicate a telecommunication cable crossing the subject site in the area where the solar panels are proposed, it is proposed to realign the cable to avoid possible clashes with solar panels. It is proposed to relocate this cable as per Figure 12 below.

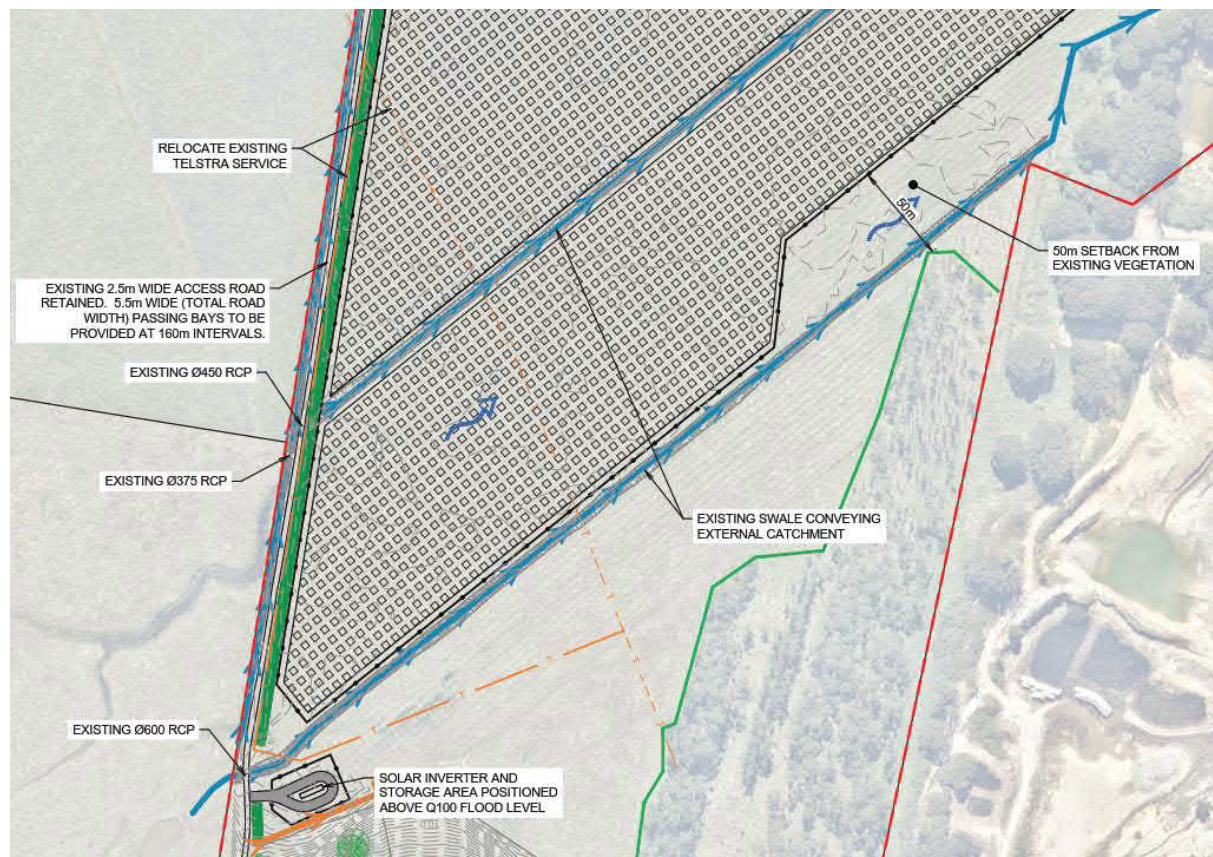


Figure 12- Proposed Telecommunications Cable Realignment

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## 7 Conclusion/Recommendations

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The assessment outlines the constraints of the site and the proposed strategy to successfully complete earthworks, convey stormwater, and provide water, sewer, electricity, and telecommunication connections to the proposed development. Additionally, a Stormwater Management Plan has been prepared and is presented in Section 5 of this document, detailing treatment and detention requirements to minimise the impacts of the project both during its construction and operational phase.

Planit has designed this project in accordance with Byron Shire Council standards (including Northern River Local Government Development design/construction manuals and standard drawings), Queensland Urban Drainage Manual (QUDM), and the 'Blue Book'. Accordingly, Planit recommends the following:

### Earthworks/Road works:

- Minor earthworks to accommodate the proposed coach turn around area, the solar inverter roadway and passing bays on the existing driveway.
- Topography within the solar array area to remain consistent with the existing scenario as to minimise the impact of site hydraulics.
- Construction of compliant access driveways for the site from Dingo Lane.

### Stormwater:

- Hydraulic assessment determined that detention is not required.
- Sediment and erosion control devices are required during the construction of the project to ensure full re-vegetation upon completion of the project.
- Stormwater treatment during the operation phase is not required given that vegetation achieved full re-establishment.

### Additional Services:

- Ensure the inverter and all electrical components will be constructed above the 1% AEP flood event.
- Service trenching to relocate telecommunications cable and provide connections to power.
- No sewer or water infrastructure is proposed and therefore no additional sewer or water connections are required.

Based on the assessment undertaken, it is believed that the proposed development can readily be serviced in a sustainable way.

## Appendix A

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### Site Survey







This plan has been prepared to satisfy the project specific level provided by the client and is not to be used for any other purpose. The plan and the information contained herein remains the property of Usher & Company Pty Ltd and all rights are reserved in full. Usher & Company Pty Ltd agrees to grant a limited licence to the client to use the plan and the information contained herein for the purpose of the project only. Unless agreed to by license any plans, electronic files and survey data cannot be reproduced, edited upon or amended without the express permission of Usher & Company Pty Ltd.

LEGEND

- U3 TRUNK DIAMETER FOR LANE SPREADER HEIGHT
- TREE SIZES ARE ESTIMATES ONLY
- ELECTRICITY (OVERHEAD)
- UNDERGROUND COMMUNICATIONS
- UNDERGROUND STORMWATER
- TOP OF BANK
- BOTTOM OF BANK
- POWER POLE
- TELECOM PIT
- SEAL
- BENCHMARK
- PHOTO LOCATION & DIRECTION
- SURFACE LEVEL
- D.I.O
- 1.0m DEPTH TO L SERVICE



Scale 1:250 - Lengths are in metres

USHER & COMPANY

Surveying & Land Development Consultants

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Phone (07) 5535 6246

Fax (07) 5535 6247

Email admin@usherandcompany.com.au

APPROVED

DATE	BY	REVISION
05/02/2020	05/02/2020	05/02/2020

Amendments

DETAILS

PLAN OF SITE DETAIL AND LEVELS

AT DINGO LANE SOLAR FARM

BELONG LOT 15 ON DP1178892

SHEET 2 OF 29

LOC:

BYRON

MYOCUM

SSM 62392

RL 30.917 AHD

CLASS LC, ORDER L3

REDUCTION RATIO:

1:250 (A1)

AHD

DATE OF SURVEY:

19-05-2020

SD & TC

DRAWN BY:

TM

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PLAN REFERENCE

10823

REVISION

A



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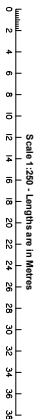
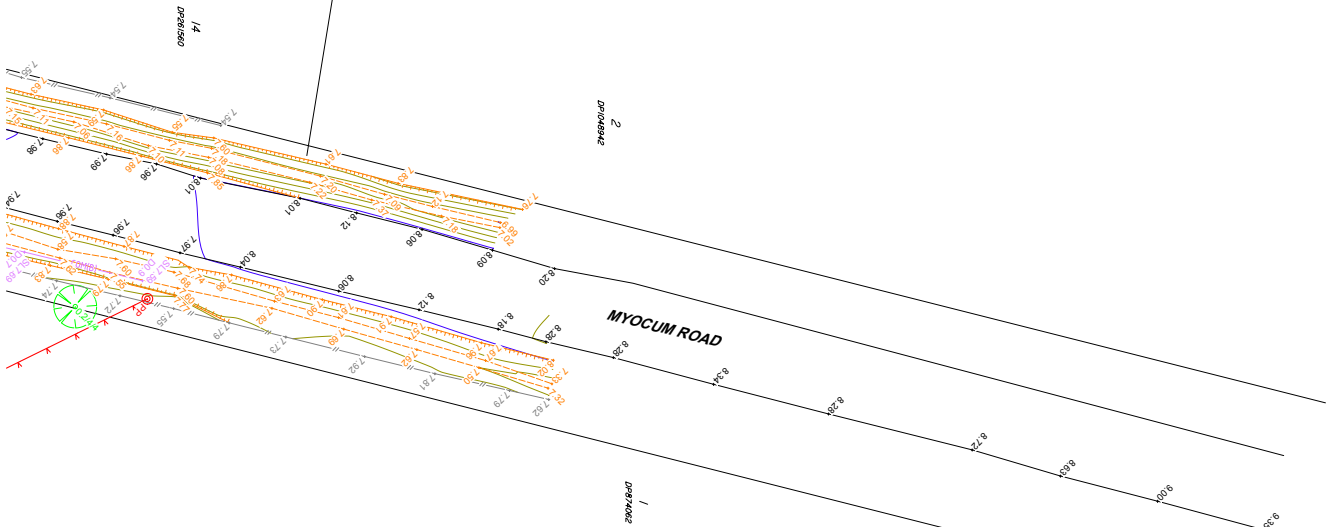
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PLAN OF SITE DETAIL AND LEVELS  
AT DINGO LANE SOLAR FARM  
BEING LOT 15 ON DP1178692  
SHEET 3 OF 29

LG#:	BYRON
SUBURB:	MYOCUM
ORIGIN:	SSM 62392 RL 30.917 AHD CLASS LC, ORDER L3

REDUCTION RATIO:	1:250 (A1)
DATUM:	AHD
DATE OF SURVEY:	19-05-2020
SURVEYED BY:	SD & TC
DRAWN BY:	TM

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LTD  
PLAN REFERENCE  
10823



**LEGEND**

0.3 THINQ CHAINMASTER PLUS/ACE SPREADER HEIGHT  
TREE SIZES ARE ESTIMATES ONLY

**Tree Sizes**

**Electrical**

**Underground Communications**

**Underground Stormwater**

**Top of Bank**

**Bottom of Bank**

**Fence**

**Powder Pile**

**Tetra Pile**

**Sign**

**Benchmark**

**Photo Location & Direction**

**Surface Level**

**D110**

**1m Depth to Service**

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
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
**LEGEND**


0.3 TRUNK DIAMETER PER VOLTAGE SPREAD/8m HEIGHT  
THREE SAMPLE ESTIMATES ONLY


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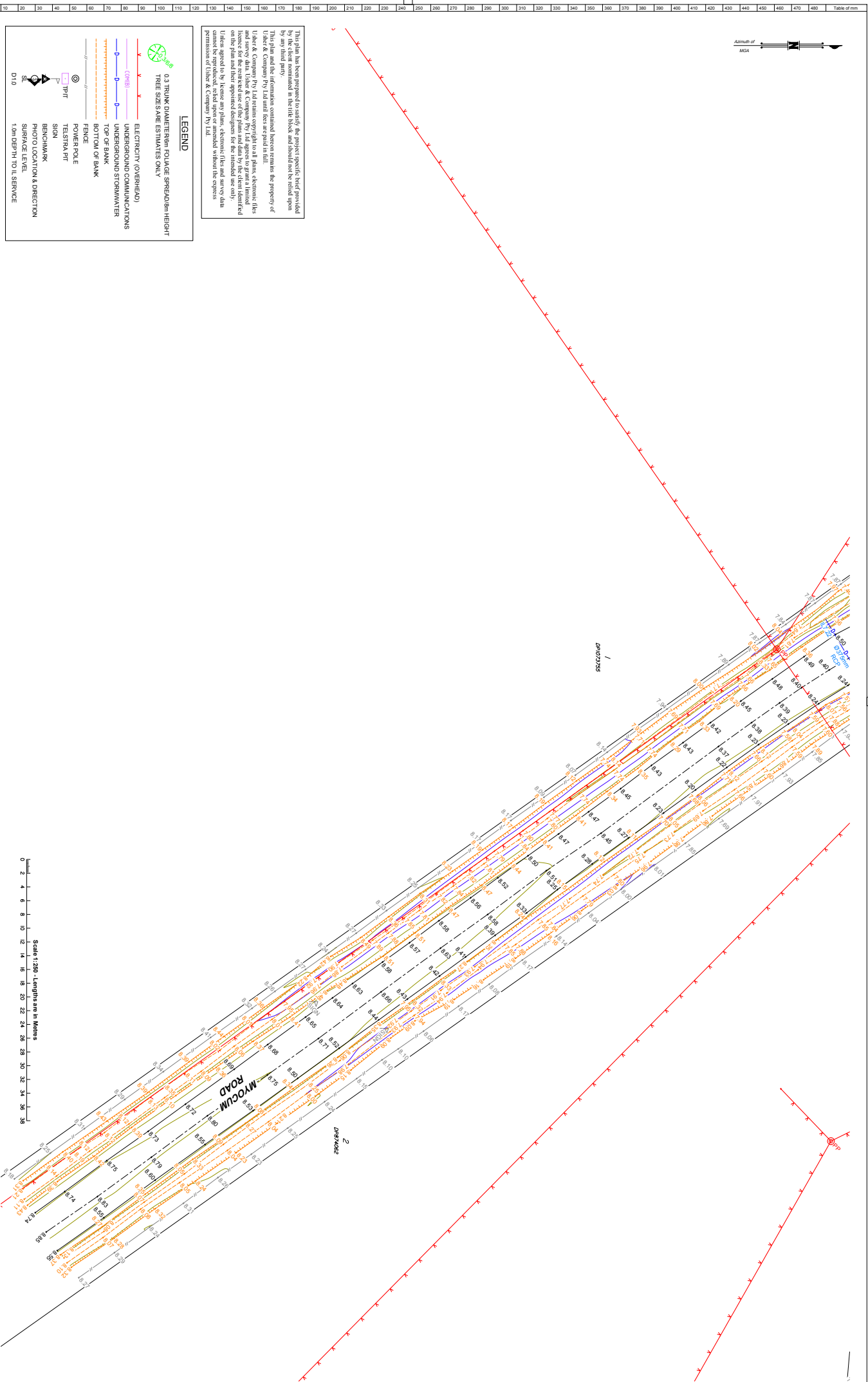
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0.3 TRUNK DIAMETER/6m FOLIAGE SPREAD/8m HEIGHT  
TREE SIZES ARE ESTIMATES ONLY

The diagram illustrates three types of utility lines and their placement relative to the ground surface:

- ELECTRICITY (OVERHEAD):** Represented by a red line with three 'X' markers above the ground line, indicating it is an overhead line.
- UNDERGROUND COMMUNICATIONS (COMB):** Represented by a purple line with three 'D' markers below the ground line, indicating it is an underground line.
- UNDERGROUND STORMWATER:** Represented by a blue line with three 'D' markers below the ground line, indicating it is an underground line.

TOP OF BANK

BOTTOM OF BANK

\_\_\_\_//\_\_\_\_//\_\_\_\_ **FENCE**

⊙ **POWER POLE**

TPIT TELSTRA PIT  
SIGN

**BENCHMARK**  
**PHOTO LOCATION & DIRECTION**

SL	SURFACE LEVEL
D1.0	1.0m DEPTH TO IL SERVICE

---

**SHER & COMPANY**

Surveying & Land Development Consultants  
A.B.N. 70 228 414 000

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Box 756 Burlington Heads Q.L.D. 4220

5535 8346  
5535 8155

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TITLE		LOC		REDUCTION RATIO		THIS PLAN FOR THE EXCLUSIVE USE OF	
Amendments		BYRON		1:250 (A1)		PLANT CONSULTING PTY LTD	
ISSUE	DATE	SUBMITTER	DATE OF SUBMITTAL	AMEND		PLAN REFERENCE	
A	05/04/2020	MYOCOM	19/05/2020	SD & TC		10823	
AT DINGO LANE SOLAR FARM BEING LOT 15 ON DP1178892		OKEN	SSM 62382 RL 30.917 AHD	DRAWN BY: TM		ISSUE	
SHEET 5 OF 29		CLASS LC ORDER L3				A1	
APPROVED						A	



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0.3 TRUNK DIAMETER @ 1.3m HEIGHT  
TREE SIZES ARE ESTIMATES ONLY

ELECTRICITY OVERHEAD

UNDERGROUND COMMUNICATIONS

UNDERGROUND STORMWATER

TOP OF BANK

BOTTOM OF BANK

FENCE

POWER POLE

TELEGRAPH

SIGN

BENCHMARK

PHOTO LOCATION & DIRECTION

SURFACE LEVEL

100 DEPTH TO L SERVICE

0.3 TRUNK DIAMETER @ 1.3m HEIGHT  
TREE SIZES ARE ESTIMATES ONLY

ELECTRICITY OVERHEAD

UNDERGROUND COMMUNICATIONS

UNDERGROUND STORMWATER

TOP OF BANK

BOTTOM OF BANK

FENCE

POWER POLE

TELEGRAPH

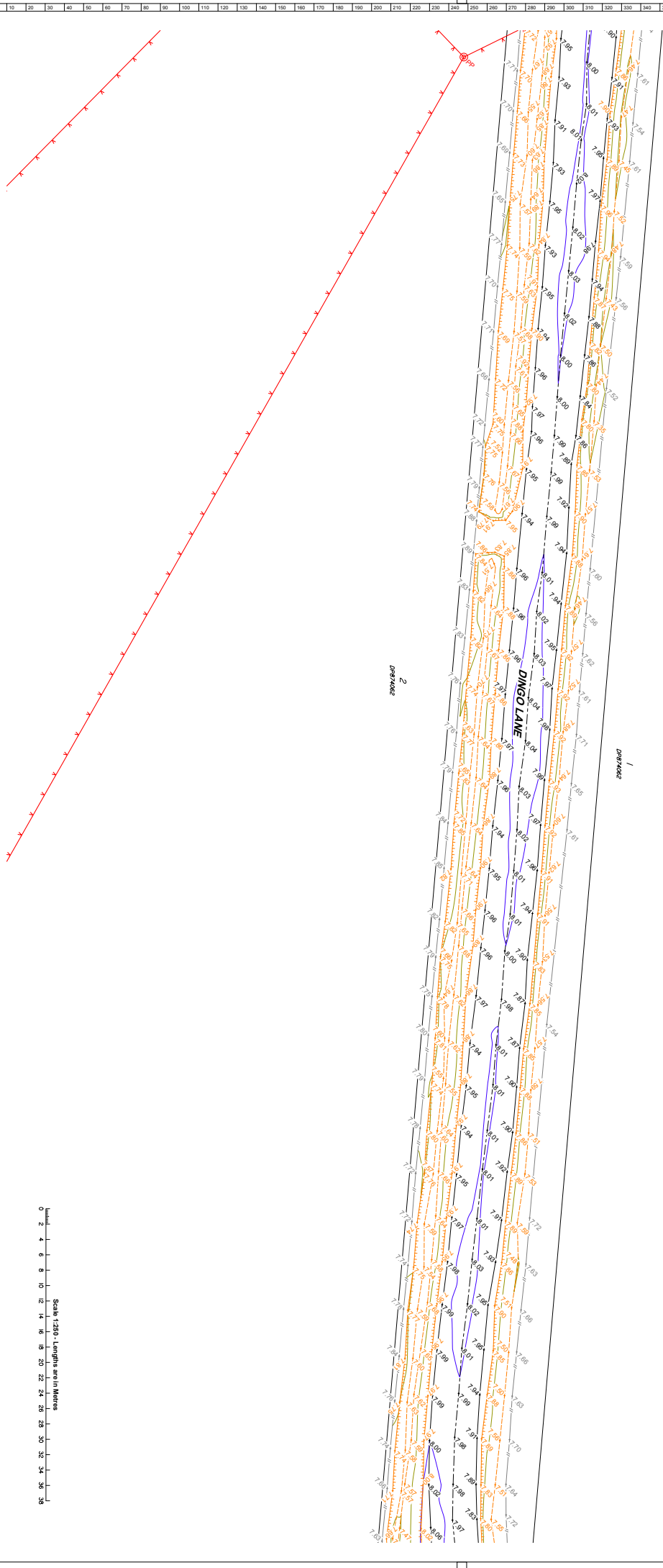
SIGN

BENCHMARK

PHOTO LOCATION & DIRECTION

SURFACE LEVEL

100 DEPTH TO L SERVICE



Scale 1:250 - Lengths are in Metres

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38

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Amendments	
NO.	DATE
1	07/02/2020
2	07/02/2020
3	07/02/2020
4	07/02/2020
5	07/02/2020
6	07/02/2020
7	07/02/2020
8	07/02/2020
9	07/02/2020
10	07/02/2020

APPROVED

PLAN OF SITE DETAIL AND LEVELS  
AT DINGO LANE SOLAR FARM  
BEING LOT 15 ON DP1178892  
SHEET 6 OF 29

BYRON

MYOQUI

DATE OF SURVEY

19-05-2020

SURVEYED BY

SD & TC

DRAWN BY

TM

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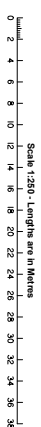
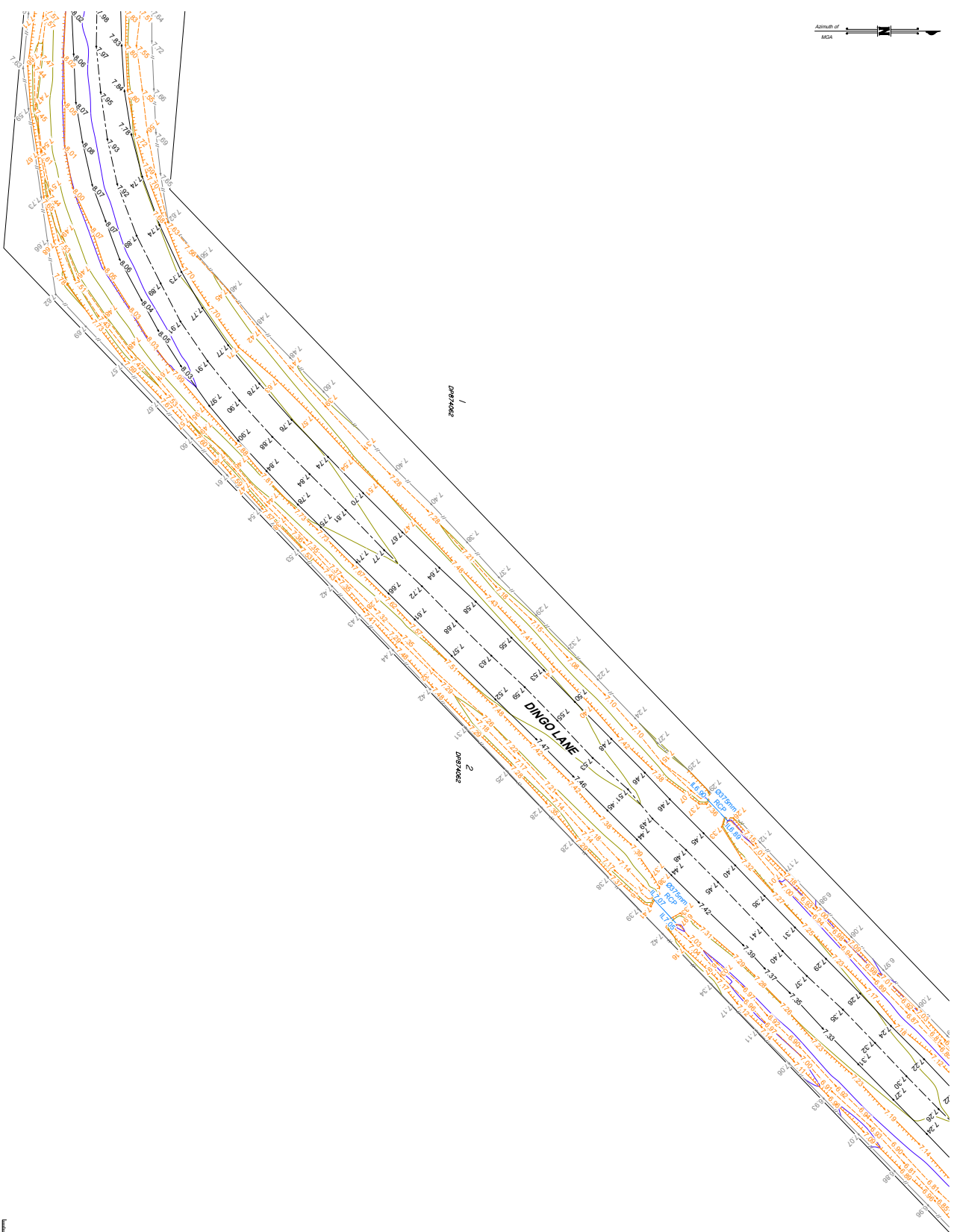
PLANT CONSULTING PTY LTD

PLAN REFERENCE

10823

SCALE

A1



**LEGEND**

0.1 TRUNK QUANTITIES EQUAL SPREAD AREA HEIGHT  
 TREE SIZES ARE ESTIMATES ONLY

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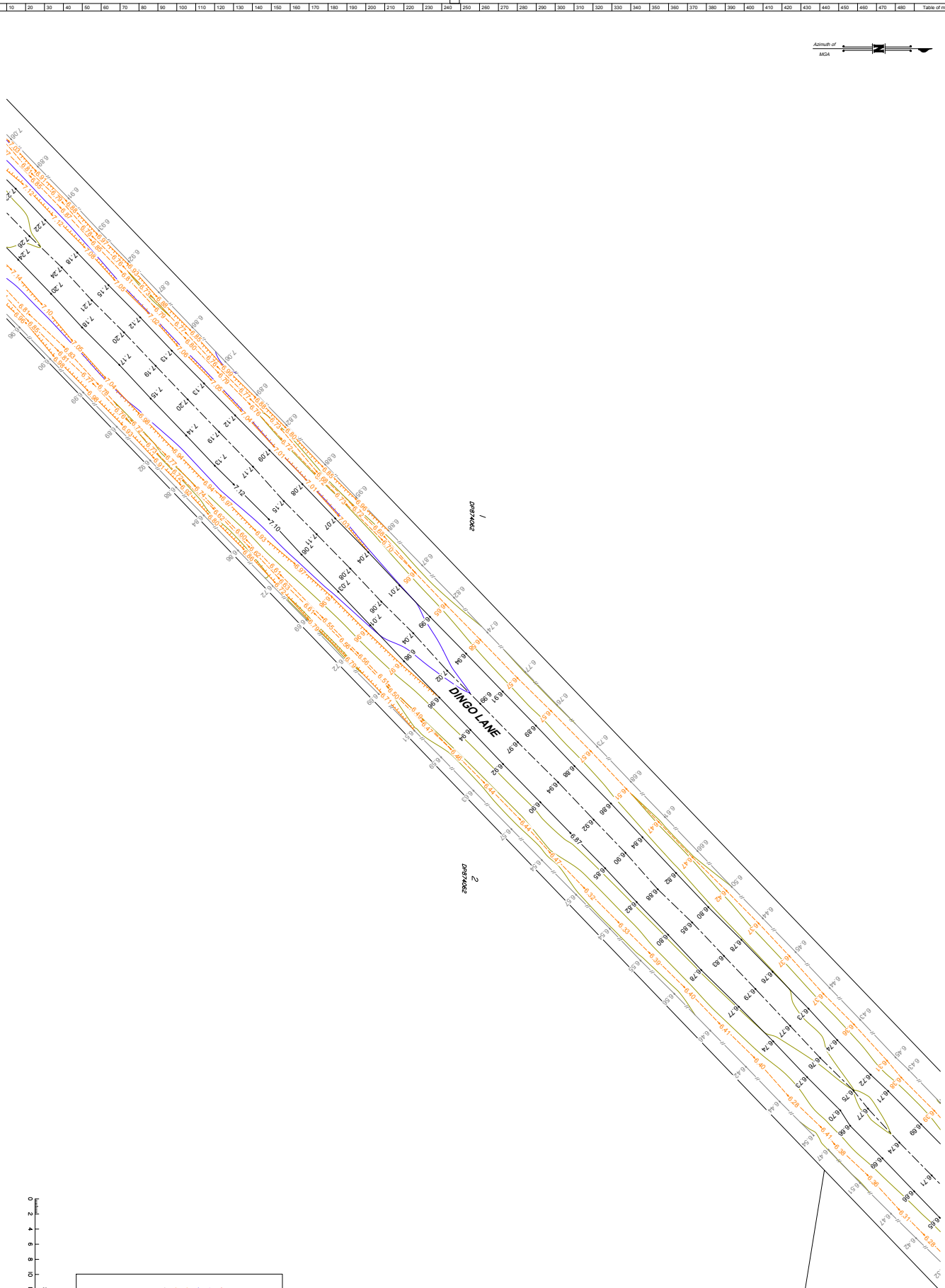
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Fax: (07) 5535 8155  
Email: [admin@usherandcompany.com.au](mailto:admin@usherandcompany.com.au)

TITLE:			Amendments		
LOA	BYRON	REDUCTION RATIO	1:250 (A1)	DATE	28 JUL 23
SUBURBS	MYOCMAH	DATE:	A1D	DATE	28 JUL 23
ORDERN	SM 62392	DATE OF SUBMIT	19-06-2020	DATE	28 JUL 23
	RD 30.97 AND	SUBMITTED BY	SD & TC	DATE	28 JUL 23
	CLASS LC ORDER L3	DRAWN BY:	TM	DATE	28 JUL 23
<p>THIS PLAN IS FOR THE EXCLUSIVE USE OF  <b>PLANT CONSULTING PTY LTD</b></p>			<p>PLAN REFERENCE  <b>10823</b></p>		
<p><b>A1</b></p>			<p>ISSUE  <b>A</b></p>		





Scale 1:250 Lengths are in Meters

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38

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0.3 TRUNK DIAMETER/10m FOLIAGE SPREAD/10m HEIGHT

TREE SIZES ARE ESTIMATES ONLY

ELECTRICITY (OVERHEAD)

COMMUNICATIONS

UNDERGROUND STORMWATER

TOP OF BANK

BOTTOM OF BANK

FENCE

POWER POLE

TELSTRA PIT

SIGN

BENCHMARK

PHOTO LOCATION & DIRECTION

SURFACE LEVEL

10m DEPTH TO L SERVICE

LEGEND

USHER & COMPANY

Surveying & Land Development Consultants

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Email admin@usherandcompany.com.au

ALN 10 08 4 4002

AS/NZS 4469

APPROVED

DATE

19-05-2020

BY

SD & TC

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19-05-2020

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19-05-2020

BY

SD & TC

DATE

19-05-2020

BY

SD & TC

DATE

19-05-2020

BY

SD & TC

TITLE

PLAN OF SITE DETAIL AND LEVELS  
AT DINGO LANE SOLAR FARM  
BINGO LOT 15 ON DP1178892  
SHEET 8 OF 29

LOC.

BYRON

SUBURB

MYOCUM

PROJECT

SSM 62392  
RL 30.917 AND  
CLASS LOC. ORDER L3

REDUCED RATIO

1:250 (A1)

DATE OF SURVEY

19-05-2020

SURVEYED BY

SD & TC

DRAWN BY

TM

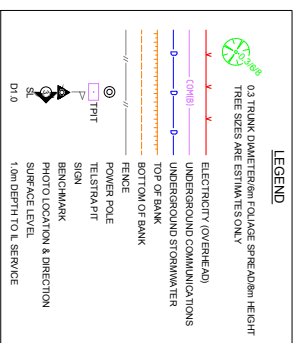
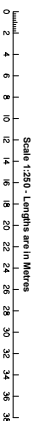
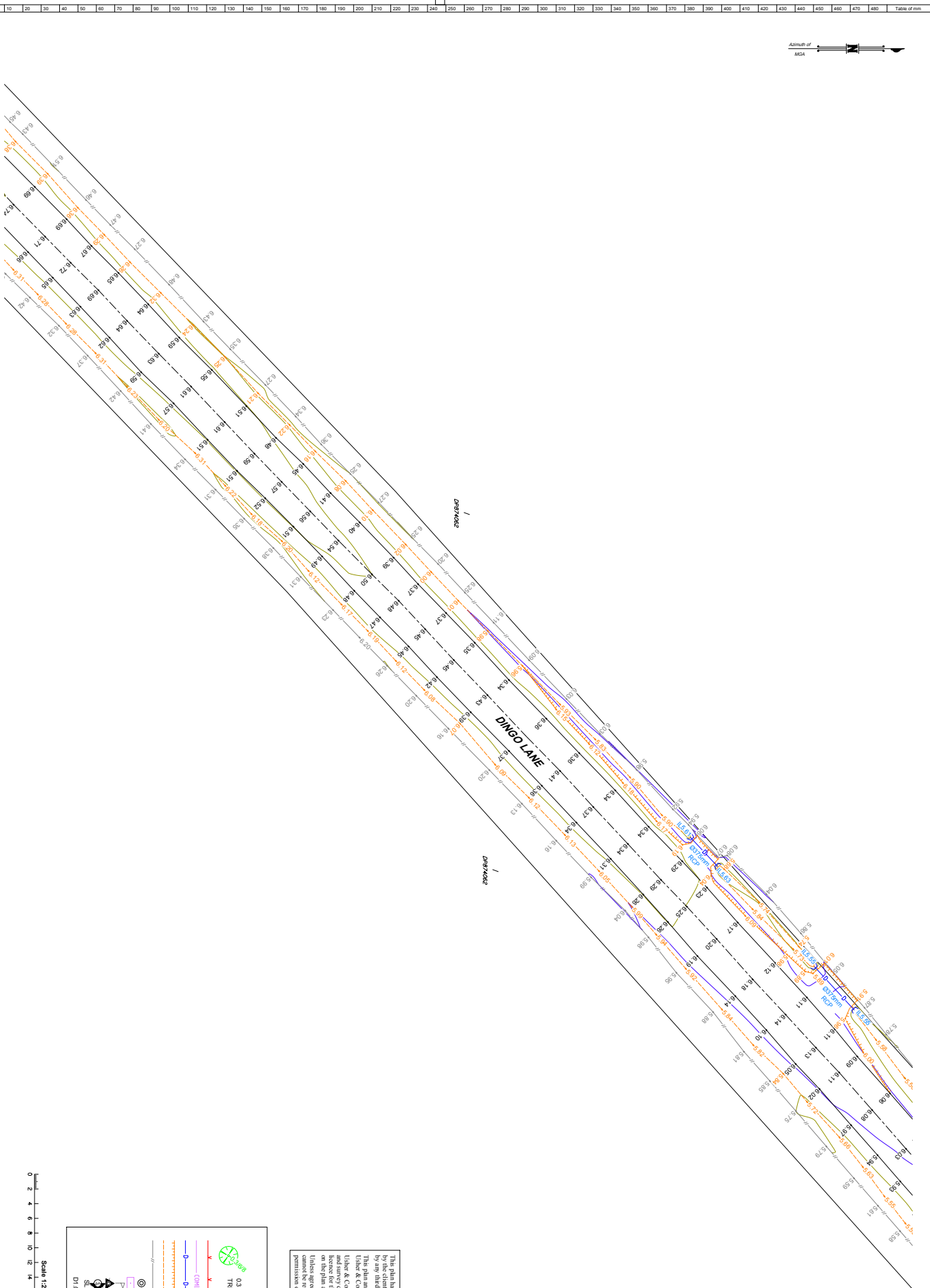
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SCALE

A1



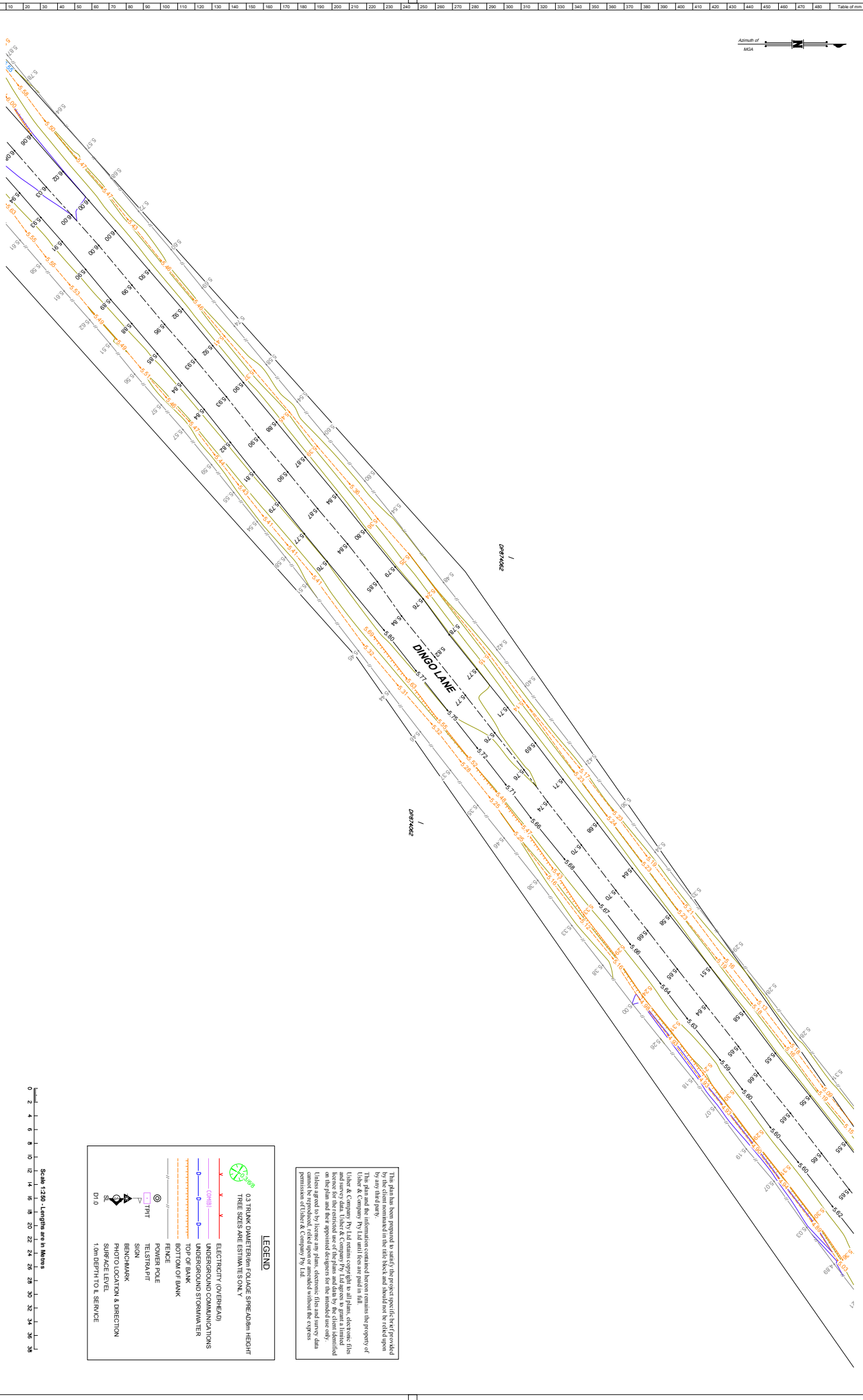
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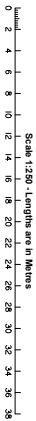
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**LEGEND**

0.3 TRUNK DIAMETER FOLIAGE SPREAD/BIOM HEIGHT  
TREE SIZES ARE ESTIMATES ONLY

- ELECTRICITY (OVERHEAD)
- UNDERGROUND COMMUNICATIONS
- UNDERGROUND STORMWATER
- TOP OF BANK
- BOTTOM OF BANK
- FENCE
- POWER POLE
- TELESTRA PIT
- SIGN
- BENCHMARK
- PHOTO LOCATION & DIRECTION
- SURFACE LEVEL
- DI 0
- 1.0m DEPTH TO L SERVICE



USHER & COMPANY

Surveying & Land Development Consultants

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Fax (07) 5535 6847

Email admin@usherandcompany.com.au

ALN 10 384 14002

APPROVED

Amendments

DETAILS

DATE

BY

DATE

BY

DATE

BY

DATE

BY

TITLE

PLAN OF SITE DETAIL AND LEVELS  
AT DINGO LANE SOLAR FARM  
BENING LOT 15 ON DP1178892  
SHEET 10 OF 29

LOC

BYRON

DATE

AHD

DATE OF SURVEY

19-05-2020

SURVEYED BY

SD & TC

DRAWN BY

TM

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PLAN REFERENCE

10823

SCALE

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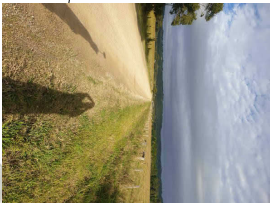


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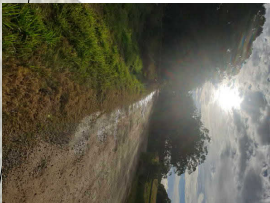


PHOTO 5

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**0.3 TRUNK DIAMETER@10m FOLiage SPREAD@10m**  
TREES SIZES ARE ESTIMATES ONLY

**ELECTRICITY (OVERHEAD)**

**UNDERGROUND COMMUNICATIONS**

**UNDERGROUND STORMWATER**

**TOP OF BANK**

**BOTTOM OF BANK**

**FENCE**

**POWER POLE**

**SIGN**

**TELSTRA PIT**

**BENCHMARK**

**PHOTO LOCATION & DIRECTION**

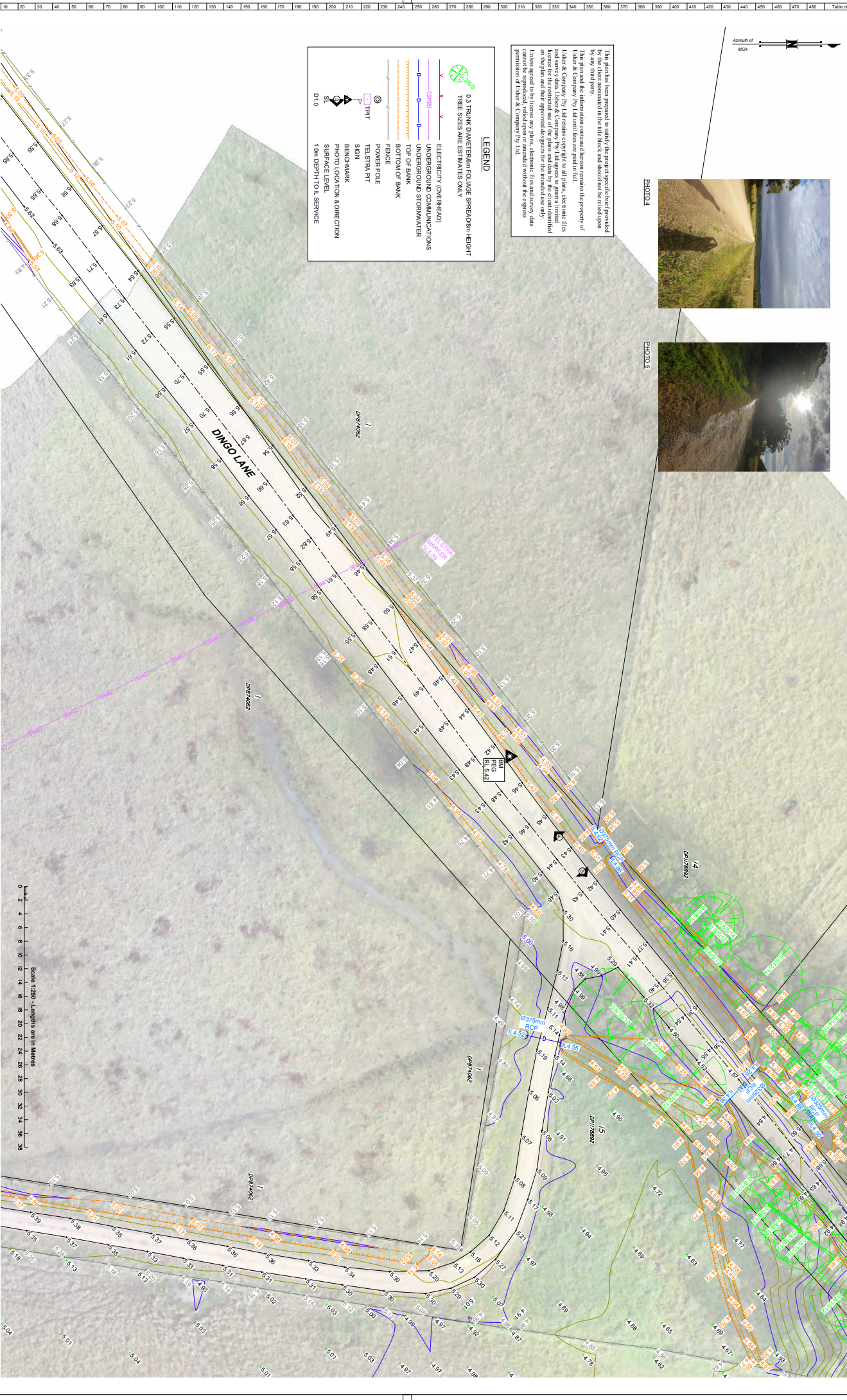
**SURFACE LEVEL**

**1m DEPTH TO L SERVICE**

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Phone (07) 5535 8246  
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**AMENDMENTS**  
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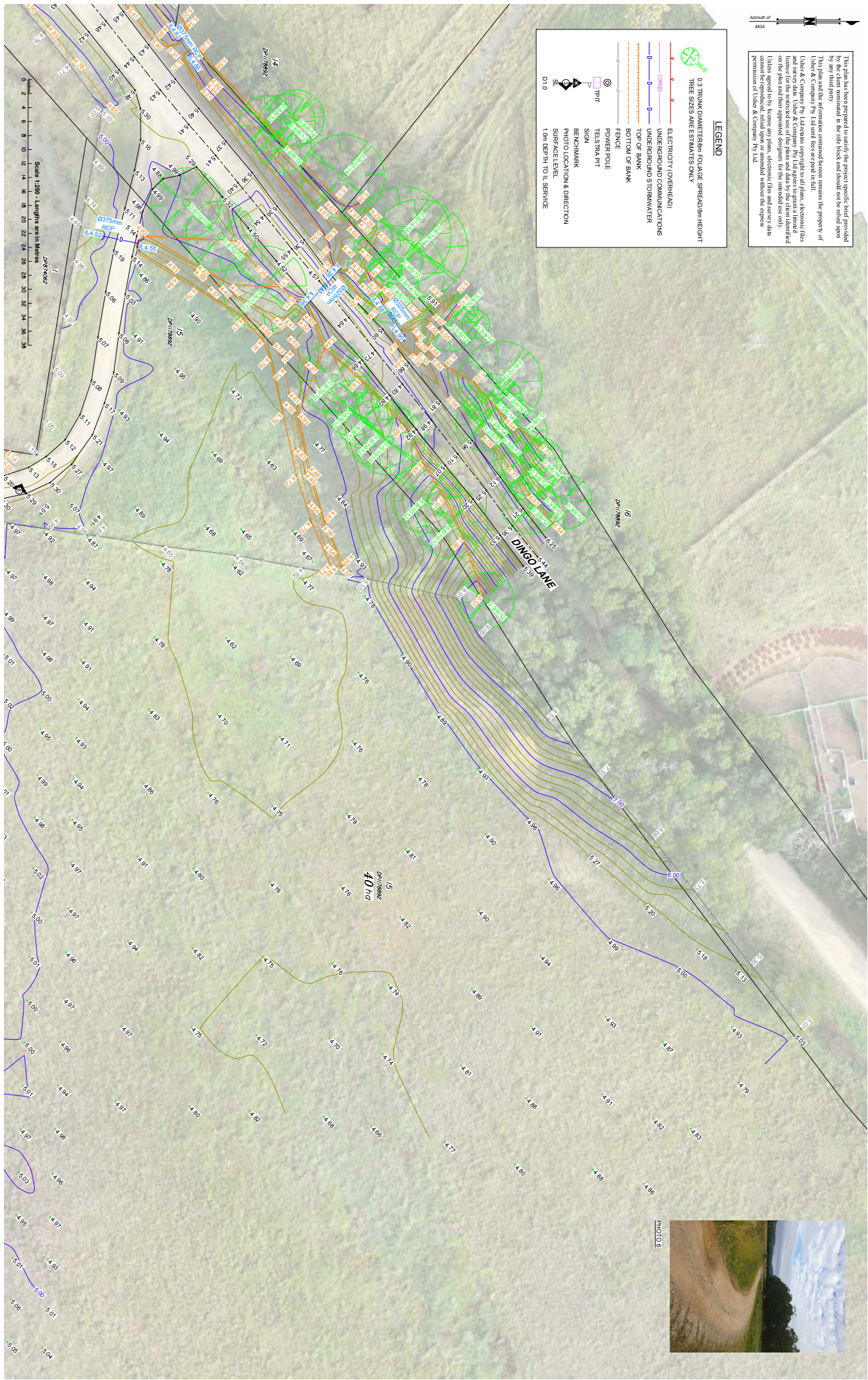


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LEGEND

- 0.3 TRUNK DIAMETER FOLIAGE SPREAD/EM HEIGHT  
TREE SIZES ARE ESTIMATES ONLY
- ELECTRICITY (OVERHEAD)
  - UNDERGROUND COMMUNICATIONS
  - UNDERGROUND STORMWATER
  - TOP OF BANK
  - BOTTOM OF BANK
  - FENCE
  - POWER POLE
  - TEST STRA PIT
  - SIGN
  - BENCHMARK
  - PHOTO LOCATION & DIRECTION
  - SURFACE LEVEL
  - 1.0m DEPTH TO IL SERVICE
  - D1.0



Scale 1:250 - Lengths are in Meters

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Amendments			
NO.	DATE	BY	REASON
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TITLE			
PLAN OF SITE DETAIL AND LEVELS AT DINGO LANE SOLAR FARM BINGO LOT 15 ON DP1778892 SHEET 12 OF 29			
LOC.		REDUCTION RATIO	
BYRON	BYRON	1:250 (A1)	
SHIRAZ	SHIRAZ	AHD	
WYOMING	WYOMING	DATE OF SURVEY	19-05-2020
SSM 62392	SSM 62392	SURVEYED BY	SD & TC
RL 30.917 AND	RL 30.917 AND	DRAWN BY	TM
CLASS LC, ORDER L3	CLASS LC, ORDER L3		
THIS PLAN IS FOR THE EXCLUSIVE USE OF		PLANT CONSULTING PTY LTD	
10823		PLAN REFERENCE	
A1		SHEET	
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I (User) agree to (i) license my plan, electronic files and survey data cannot be reproduced, relied upon or amended without the express permission of (User & Company, Pty Ltd)

The diagram shows a utility site layout with various symbols and labels. At the top right is a green circle with a white 'X' and the word 'DANGER' in green. Below it, text reads '0.3 INCH DIAMETER POLYURE SPREADER HEIGHT' and 'TREE SIZES ARE ESTIMATES ONLY'. A legend on the right lists symbols for: ELECTRICITY (OVERHEAD) represented by a red line with 'V' markers; OVERHEAD COMMUNICATIONS represented by a blue line with 'O' markers; UNDERGROUND STORMWATER represented by a blue line with 'U' markers; TOP OF BANK represented by a blue line with 'T' markers; BOTTOM OF BANK represented by a blue line with 'B' markers; FENCE represented by a black line with 'X' markers; POWER POLE represented by a circle with a dot; TELESTAY PIT represented by a circle with a cross; SIGN represented by a circle with a triangle; BENCHMARK represented by a circle with a square; PHOTO LOCATION & DIRECTION represented by a camera icon; SURFACE LEVEL represented by a triangle with a dot; and 1.0M FATHOM DEPTH SERVICE represented by a circle with a cross. The diagram itself shows a red line for overhead electricity, a blue line for overhead communications, a blue line for underground stormwater, a blue line for top of bank, a blue line for bottom of bank, a black line for fence, a circle with a dot for power pole, a circle with a cross for telestay pit, a circle with a triangle for sign, a circle with a square for benchmark, a camera icon for photo location and direction, a triangle with a dot for surface level, and a circle with a cross for 1.0m fathom depth service.

Scale 1:250 - Lengths are in Metres

Scale 1:250 - Lengths are in Metres

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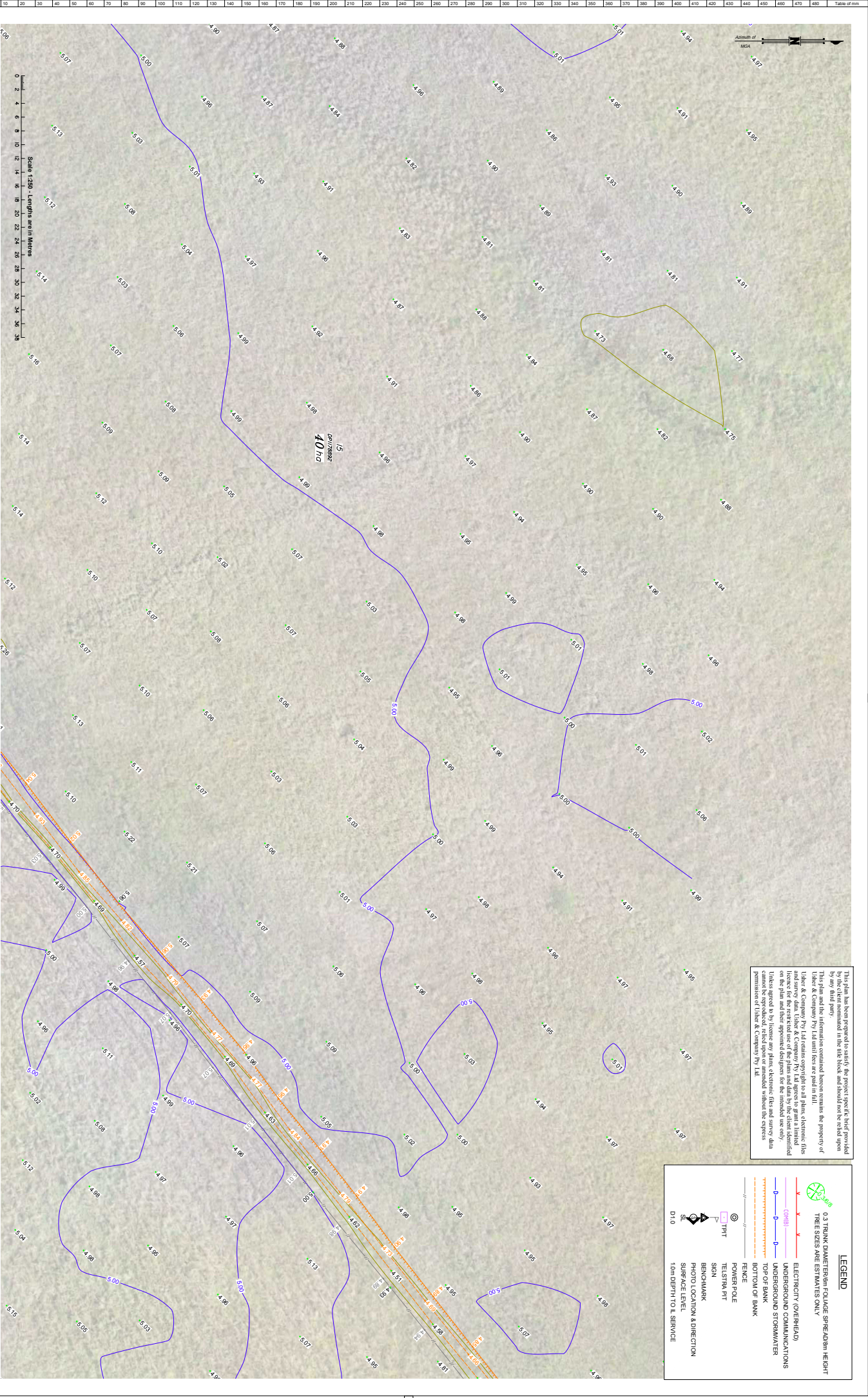
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Scale 1:250 Lengths are in Metres

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APPROVED

DATE	BY	REVISION
05/03/2020	DPH/MLH	1

TITLE

PLAN OF SITE DETAIL AND LEVELS  
AT DINGO LANE SOLAR FARM  
BINGO LOT 15 ON DP1778892  
SHEET 14 OF 29

LOC

BYRON

MYOCUM

SSM 62392

RL 30.917 AHD

CLASS LC, ORDER L3

REDUCTION RATIO

1:250 (A1)

DATE OF SURVEY

19-05-2020

SURVEYED BY

SD & TC

DRAWN BY

TM

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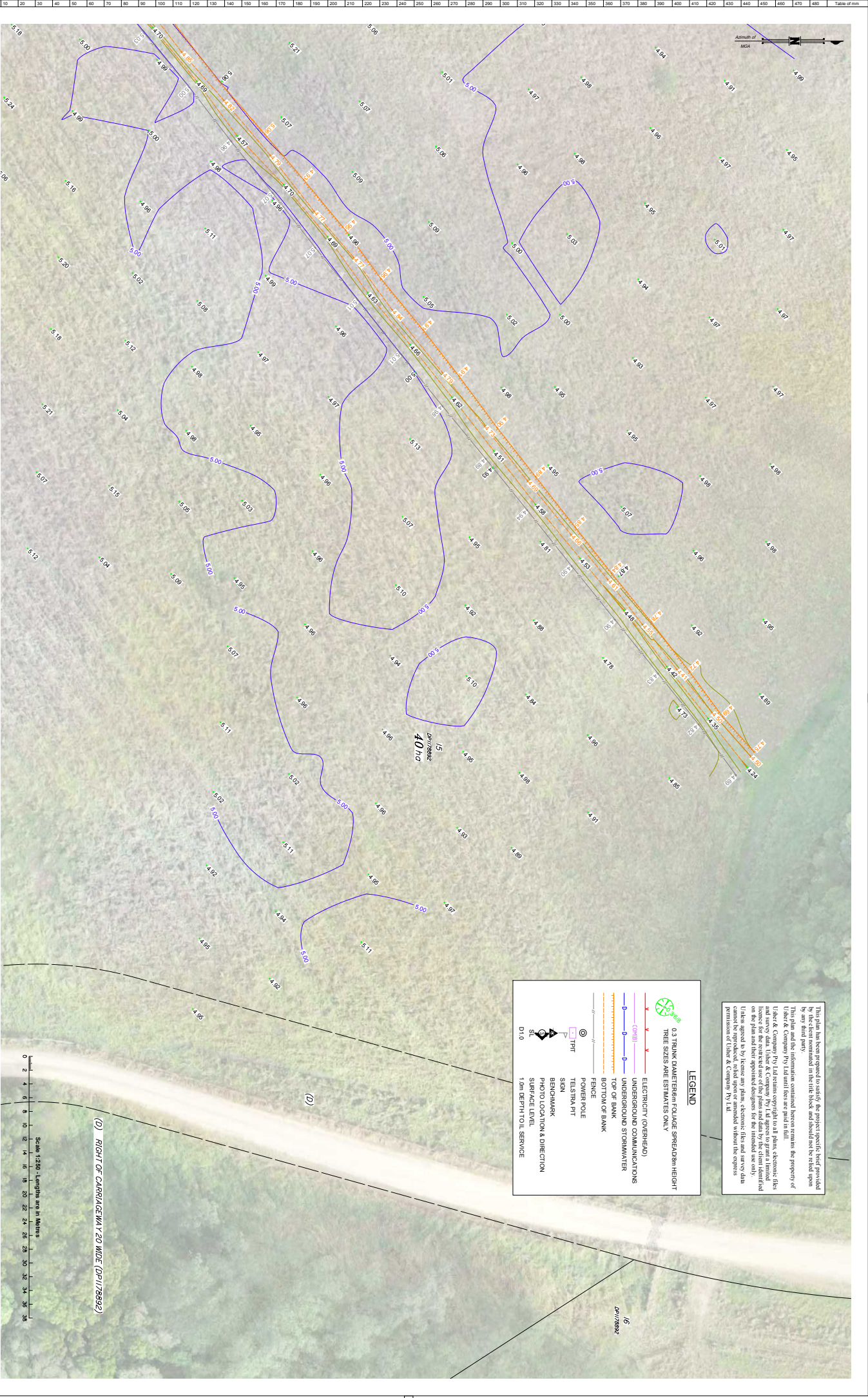
PLAN REFERENCE

10823

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**LEGEND**

0.3 TRUNK DIAMETER, FOLIAGE SPREAD, HEIGHT  
TREE SIZES ARE ESTIMATES ONLY

ELECTRICITY (OVERHEAD)

COMMUNICATIONS

UNDERGROUND STORMWATER

TOP OF BANK

BOTTOM OF BANK

FENCE

POWER POLE

TELSTRA PIT

SIGN

BENCHMARK

PHOTO LOCATION & DIRECTION

SURFACE LEVEL

D1.0  
1.0m DEPTH TOLL SERVICE

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APPROVED

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19-09-2020	SD & TC	268
19-09-2020	SD & TC	269
19-09-2020	SD & TC	270
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19-09-2020	SD & TC	272
19-09-2020	SD & TC	273
19-09-2020	SD & TC	274
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19-09-2020	SD & TC	284
19-09-2020	SD & TC	285
19-09-2020	SD & TC	286
19-09-2020	SD & TC	287
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19-09-2020	SD & TC	291
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19-09-2020	SD & TC	297
19-09-2020	SD & TC	298
19-09-2020	SD & TC	299
19-09-2020	SD & TC	300
19-09-2020	SD & TC	301
19-09-2020	SD & TC	302
19-09-2020	SD & TC	303
19-09-2020	SD & TC	304
19-09-2020	SD & TC	305
19-09-2020	SD & TC	306
19-09-2020	SD & TC	307
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19-09-2020	SD & TC	310
19-09-2020	SD & TC	311
19-09-2020	SD & TC	312
19-09-2020	SD & TC	313
19-09-2020	SD & TC	314
19-09-2020	SD & TC	



Surface

0.1 INCH DINTERFERED FLUOR SPREADDOWN HEIGHT  
THESE ARE ESTIMATES ONLY

ELECTRICITY (OVERHEAD)

UNDERGROUND COMMUNICATIONS

UNDERGROUND STORMWATER

TOP OF BANK

BOTTOM OF BANK

FENCE

POWER POLE

TPT

SIGN


BENCHMARK

PHOTO LOCATION & DIRECTION

SURFACE LEVEL

1m DEPTH TO SERVICE

Legend

 <b>USHER &amp; COMPANY</b> <i>Surveying &amp; Land Development</i> 1 Water Street, Burleigh Heads, QLD 4220 PO Box 7706, Burleigh Heads, QLD 4220 Phone: (07) 5526 8346 Fax: (07) 5525 8155 Email: admin@usherandcompany.com.au	TITLE:	
	PLAN OF SITE DETAIL AND LEVELS AT DINGO LANE SOLAR FARM BEIND LOT 15 ON DP1178892 SHEET 16 OF 29	
APPROVED	L.O.A. BYRON MPOCUM	REDUCTION RATIO: 1:250 (A1)
DATE: 16/04/2020 DRAWN BY:	DATE OF SURVEY: 19/05/2020 SURVEYED BY: SD & TC DRAWN BY: TM	THIS PLAN IS FOR THE EXCLUSIVE USE OF PLANT CONSULTING PTY LTD 10823 A



[illegible]

1.0A	BYRON	REDUCTION RATIO	1:250 (A1)
SUBJECT	MYOCIM	DATE	AHD
ORIGIN	SSM 62392 RL 30317 AHD CLASS I.C. ORDER I.3	DATE OF SURVEY	19-05-2020
		SUBMITTED BY	SD & TC
		DRAWN BY	TM

THIS PLAN IS FOR THE EXCLUSIVE USE OF PLANT CONSULTING PTY LTD	A1
PLAN REFERENCE 10823	ISSUE A

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The diagram illustrates a 0.3 Trunk Cable Tree structure. At the top, a green circle with a white 'X' and the word 'Cable' is shown. Below it, a horizontal line represents the '0.3 TRUNK CABLE TREE'. To the right of this line, a vertical line is labeled 'TREE SIZE BARE ESTIMATES ONLY'. Below the trunk cable, several horizontal lines represent different services, each with a corresponding symbol on the left:

- ELECTRICITY (OVERHEAD)**: Represented by a red line with 'X' symbols.
- UNDERGROUND COMMUNICATIONS**: Represented by a purple line with 'O' symbols.
- UNDERGROUND STORMWATER**: Represented by a blue line with 'O' symbols.
- TOP OF BANK**: Represented by an orange dashed line.
- BOTTOM OF BANK**: Represented by a yellow dashed line.
- FENCE**: Represented by a black line with 'X' symbols.
- POWER POLE**: Represented by a black circle with a cross inside.
- TELESTRUT PIT**: Represented by a black circle with a cross inside.
- SIGN**: Represented by a black circle with a cross inside.
- BENCHMARK**: Represented by a black circle with a cross inside.
- PHOTO LOCATION & DIRECTION**: Represented by a black circle with a cross inside.
- SURFACE LEVEL**: Represented by a black circle with a cross inside.
- D.I.O**: Represented by a black circle with a cross inside.

A legend on the right side of the diagram lists the following items:

- 0.3 TRUNK CABLE TREE**
- TREE SIZE BARE ESTIMATES ONLY**
- ELECTRICITY (OVERHEAD)**
- UNDERGROUND COMMUNICATIONS**
- UNDERGROUND STORMWATER**
- TOP OF BANK**
- BOTTOM OF BANK**
- FENCE**
- POWER POLE**
- TELESTRUT PIT**
- SIGN**
- BENCHMARK**
- PHOTO LOCATION & DIRECTION**
- SURFACE LEVEL**
- D.I.O**

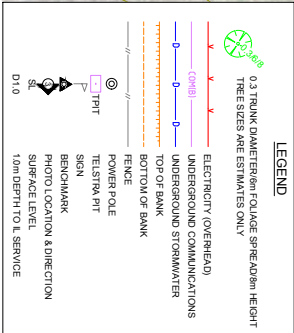


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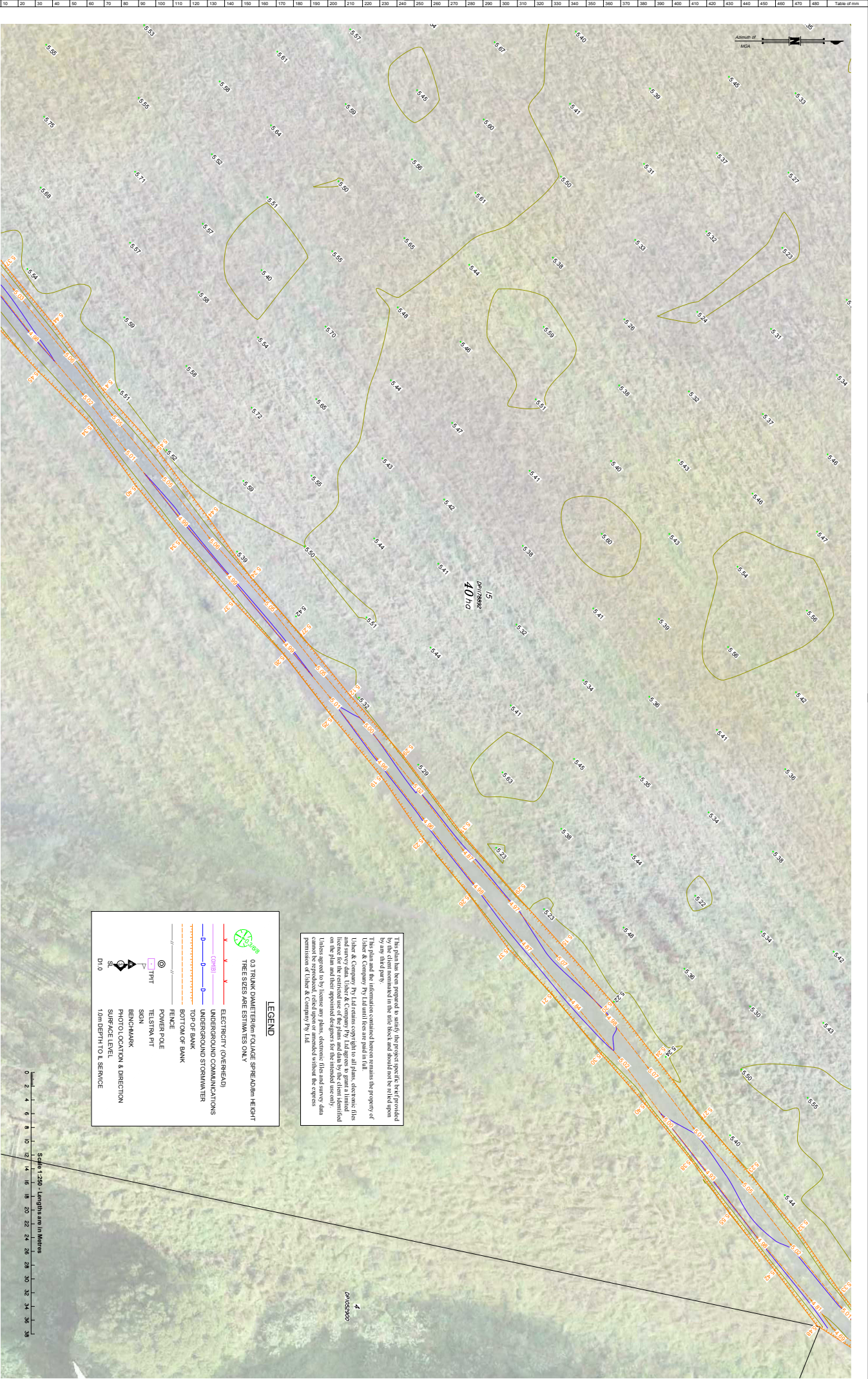
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**LEGEND**

0.3 TRUNK DIAMETER / FOLIAGE SPREAD / MIN. HEIGHT  
TREE SIZES ARE ESTIMATES ONLY

- ELECTRICITY (OVERHEAD)
- UNDERGROUND COMMUNICATIONS
- UNDERGROUND STORMWATER
- TOP OF BANK
- BOTTOM OF BANK
- POWER POLE
- TELSTRA PT
- SPON
- BENCHMARK
- PHOTO LOCATION & DIRECTION
- SURFACE LEVEL
- 1.0m DEPTH TO L. SERVICE

DT 1.0

Scale 1:250 - Lengths are in Metres

<b>USHER &amp; COMPANY</b> Surveying & Land Development Consultants 1 West Street, Bureigh Heads Q.L.D. 4220 PO Box 789 Bureigh Heads Q.L.D. 4220 Phone (07) 5535 6346 Fax (07) 5535 6347 Email admin@usherandcompany.com.au		APPROVED		TITLE		LOC.		REDUCTION RATIO:		THIS PLAN IS FOR THE EXCLUSIVE USE OF	
AMENDMENTS		DETAILS		PLAN OF SITE DETAIL AND LEVELS AT DINGO LANE SOLAR FARM BEING LOT 15 ON DP178892 SHEET 19 OF 29		BYRON		1:250 (A1)		PLANT CONSULTING PTY LTD	
DATE		DRAWN BY		DATE OF SURVEY		SURFACE		AHD		PLAN REFERENCE	
19-05-2020		SD & TC		19-05-2020		MYOCUM		AHD		10823	
19-05-2020		SD & TC		19-05-2020		SM 62392		AHD		A1	
19-05-2020		SD & TC		19-05-2020		RL 30317 AND		AHD		A	
19-05-2020		SD & TC		19-05-2020		CLASS LC, ORDER L3		AHD		A	



---

APPROVED

[illegible]

TITLE

PLAN OF SITE DETAIL AND LEVELS  
AT DINGO LANE SOLAR FARM  
BEING LOT 15 ON DP11 78992  
SHEET 20 OF 29

LOG:	BYRON	REDUCTION RATIO:	1:250 (A1)
SUBSTR:	MYOCUM	DATE:	AHD
ORIGIN:	S5M 62392 RL 30.917 AHD CLASS I.C. ORDER L3	DATE OF SURVEY:	19-05-2020
		SURVEYED BY:	SD & TC
		DRAWN BY:	TM

<p>THIS PLAN IS FOR THE EXCLUSIVE USE OF  <b>PLANT CONSULTING PTY          LTD</b></p>	<p>PLAN REFERENCE  <b>10823</b></p>
--	---





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0.3 TRUNK DIAMETER @ 1.3M FOLIAGE SPREAD @ 10M HEIGHT  
TREE SIZE'S ARE ESTIMATES ONLY

ELECTRICITY (OVERHEAD)

COMBI

UNDERGROUND COMMUNICATIONS

TOP OF BANK

BOTTOM OF BANK

FENCE

POWER POLE

TEST POINT

SIGN

BENCHMARK

PHOTO LOCATION & DIRECTION

SURFACE LEVEL

1.0m DEPTH TO TL SERVICE

Scale: 1:250 - Lengths are in Meters

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38

USHER & COMPANY

Surveying & Land Development Consultants

1 West Street, Buregh Heads Q.L.D. 4220

P.O. Box 789 Buregh Heads Q.L.D. 4220

Phone (07) 5535 6346

Fax (07) 5535 6345

Email admin@usherandcompany.com.au

ALN 10 58 41 602

APPROVED

DATE	BY
06/03/20	Usher & Company

Amendments

DETAILS

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TITLE

PLAN OF SITE DETAIL AND LEVELS  
AT DINGO LANE SOLAR FARM  
BEING LOT 15 ON DP1778892  
SHEET 21 OF 29

LOC.

BYRON

SHIRE

MYOCUM

CRMN

SSM 62392  
RL 30.917 AND  
CLASS LC, ORDER L3

REDUCTION RATIO:

1:250 (A1)

DATE:

AHD

DATE OF SURVEY:

19-05-2020

SURVEYED BY:

SD & TC

DRAWN BY:

TM

THIS PLAN IS FOR THE EXCLUSIVE USE OF

PLANT CONSULTING PTY LTD

PLAN REFERENCE

10823

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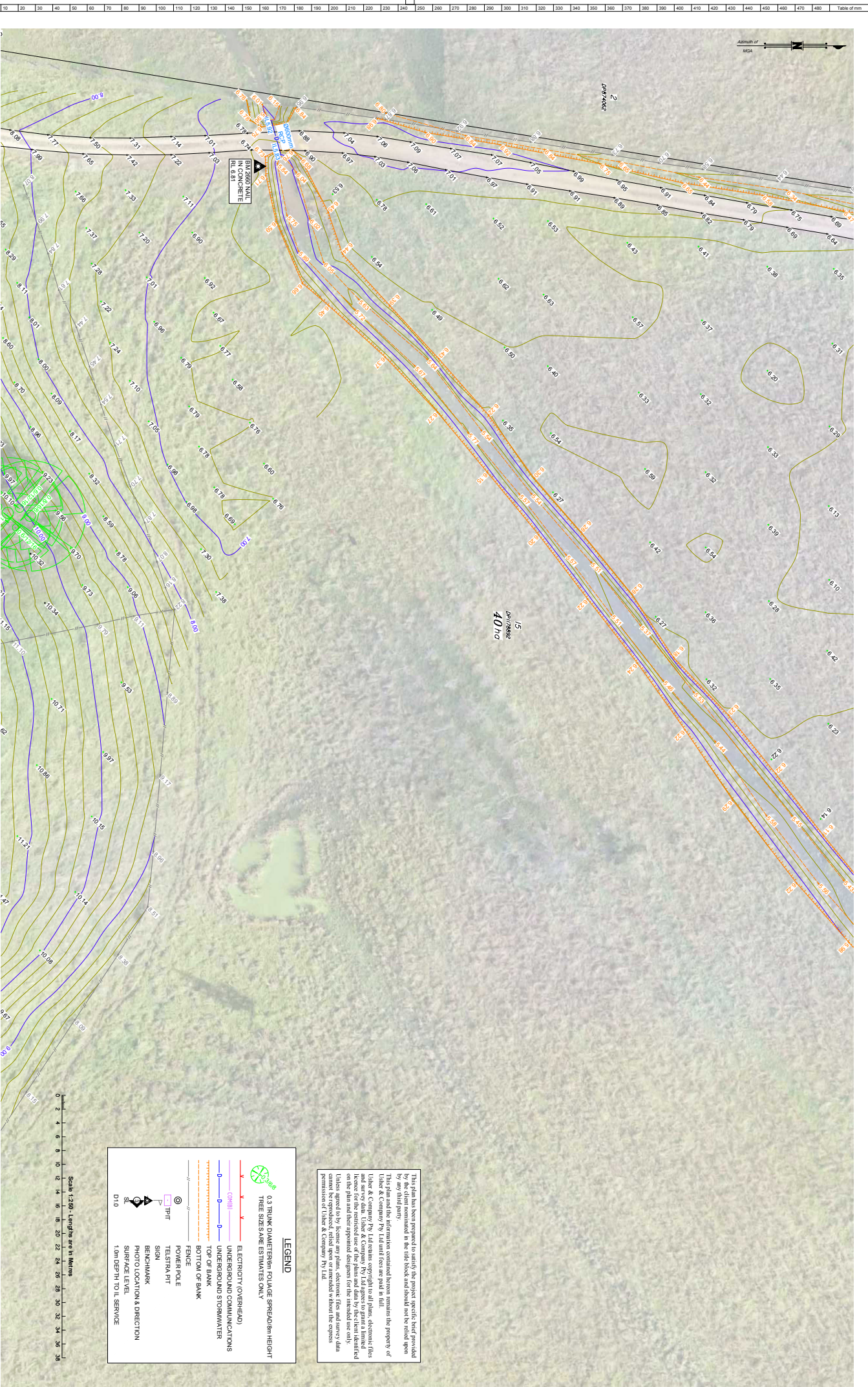
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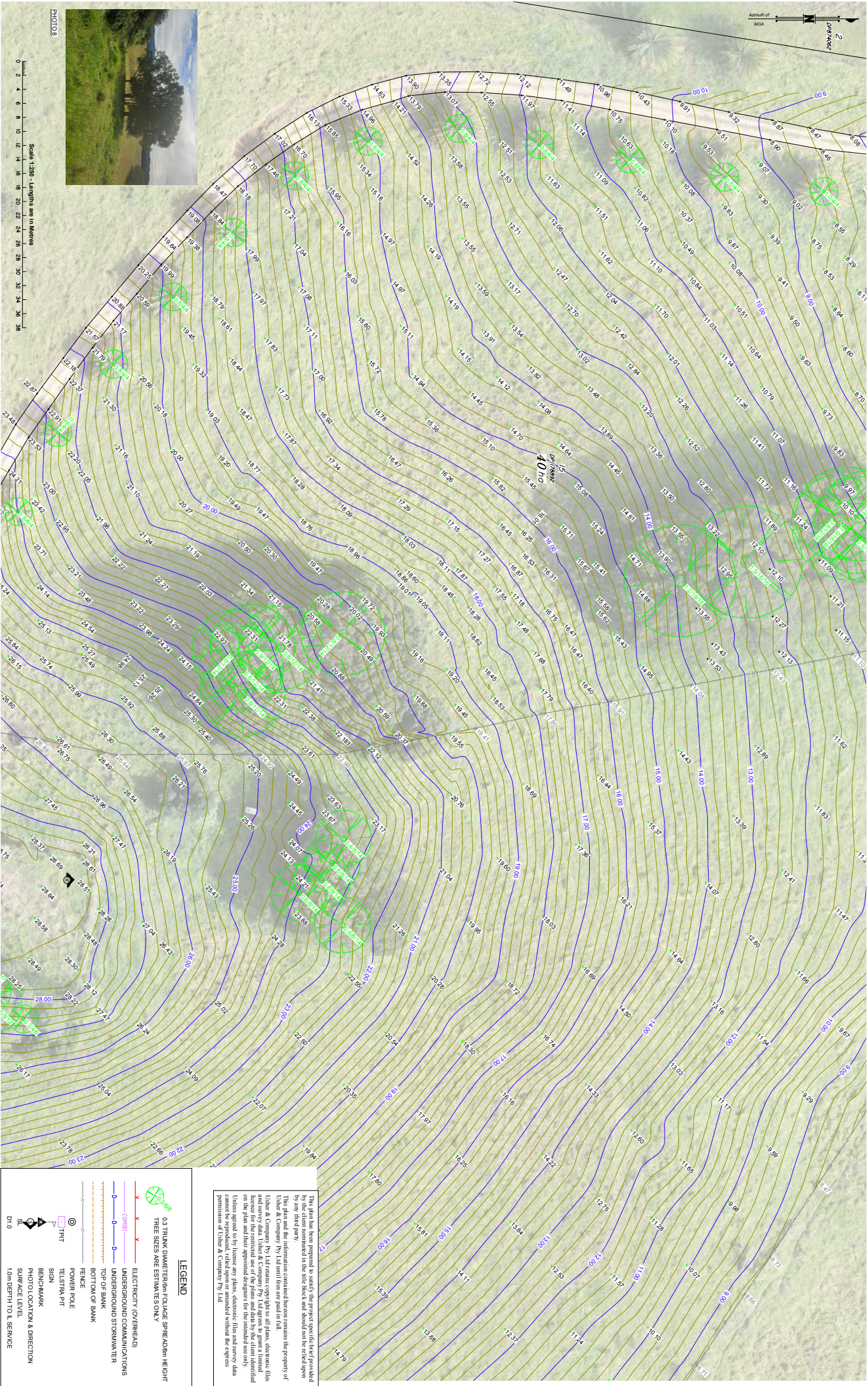
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<div><div><div><div></div><div>USHER &amp; COMPANY</div><div>Surveying &amp; Land Development Consultants ALN 90 8744400</div></div><div><div>1 MHA Street, Balaclava House, CLD 4220 PO Box 758, Bulwer Heights QLD 4220 Phone (07) 5635 0346 Fax (07) 5635 8155 Email: admin@usherandcompany.com.au</div></div></div></div>																			
APPROVED																			
										TITLE									
										PLAN OF SITE DETAIL AND LEVELS AT DINGO LANE SOLAR FARM BEING LOT 15 ON DP-1178892 SHEET 22 OF 29									
										L.O.A.									
										BYRON									
										SUBJECT:									
										MYOCUM									
										CREW:									
										SSM 62392 RL 30.917/AHD CLASS LC, ORDER L3									
										REDUCTION RATIO:									
										1:250 (A1)									
										DATE:									
										AHD									
										DATE OF SURVEY:									
										19-06-2020									
										SURVEITED BY:									
										SD & TC									
										DRAWN BY:									
										TM									
										THIS PLAN IS FOR THE EXCLUSIVE USE OF PLANT CONSULTING PTY LTD									
										PLAN REFERENCE									
										10823									
										ISSUE									
										A1									
										A									





**LEGEND**

0.3 TRUNK DIAMETER FOLIAGE SPREAD/SHRUB HEIGHT  
TREE SIZES ARE ESTIMATES ONLY

— ELECTRICITY (OVERHEAD)  
— UNDERGROUND COMMUNICATIONS  
— UNDERGROUND STORMWATER  
— TOP OF BANK  
— BOTTOM OF BANK  
— FENCE  
— POWER POLE  
— TELSTRA PIT  
— SIGN  
— BENCHMARK  
— PHOTO LOCATION & DIRECTION  
— SURFACE LEVEL  
— 10m DEPTH TO L SERVICE

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Phone (07) 5535 6246  
Fax (07) 5535 6245  
Email [admin@usherandcompany.com.au](mailto:admin@usherandcompany.com.au)

AS/NZS 1546:2002

APPROVED

DATE	BY	REVISION
05/03/2020	DPH/DAW	

**TITLE**  
PLAN OF SITE DETAIL AND LEVELS  
AT DINGO LAKE SOLAR FARM  
BEING LOT 15 ON DP178892  
SHEET 23 OF 29

DATE	BY	REVISION
19-05-2020	SD & TC	

**PLANT CONSULTING PTY LTD**  
10823  
A







Amendments		
Issue	Date	US FMS
A	07/24/2007	Original issue

TITLE:

PLAN OF SITE DETAIL AND LEVELS  
AT DINGO LANE SOLAR FARM  
BEING LOT 15 ON DP1178892  
SHEET 25 OF 29

LOC:	BYRON
SUBURB:	MYOCUM
ORIGIN:	SSM 62392 RL 30.917 AHD CLASS LC, ORDER L3

REDUCTION RATIO:	1:250 (A1)
DATAID:	AHD
DATE OF SURVEY:	19-05-2020
SURVEYED BY:	SD & TC
DRAWN BY:	TM

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A1	ISSUE A
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26  
DPR44850

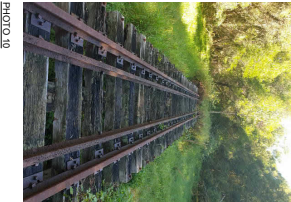


PHOTO 10

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**LEGEND**

0.3 TRUNK DIAMETER FOLIAGE SPREAD-ARM HEIGHT  
THE SIZES ARE ESTIMATES ONLY

ELECTRICITY (OVERHEAD)  
UNDERGROUND COMMUNICATIONS  
UNDERGROUND STORMWATER  
TOP OF BANK  
BOTTOM OF BANK  
FENCE  
POWER POLE  
TELSTRA PIT  
SIGN  
BENCHMARK  
PHOTO LOCATION & DIRECTION  
SURFACE LEVEL  
1.0m DEPTH TO L SERVICE

Scale 1:250 - Lengths are in Metres

**USHER & COMPANY**  
Surveying & Land Development Consultants  
1 West Street, Buregh Heads Q.L.D. 4220  
PO Box 726 Buregh Heads Q.L.D. 4220  
Phone (07) 5535 6246  
Fax (07) 5535 6247  
Email admin@usherandcompany.com.au

Amendments			
NO.	DATE	DESCRIPTION	BY
1	07/02/2020	Original Issue	

TITLE	
PLAN OF SITE DETAIL AND LEVELS AT DINGO LANE SOLAR FARM BEING LOT 15 ON DP1178892 SHEET 26 OF 29	
LOC:	BYRON
SUBURB:	MYOCUM
SECTION:	SSM 62392 RL 30.917 AND CLASS LC, ORDER L3

REDUCTION RATIO:	1:250 (A1)
DATE:	AHD
DATE OF SURVEY:	19-05-2020
SURVEYED BY:	SD & TC
DRAWN BY:	TM

THIS PLAN IS FOR THE EXCLUSIVE USE OF	
PLANT CONSULTING PTY LTD	
PLAN REFERENCE	10823

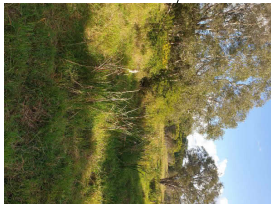
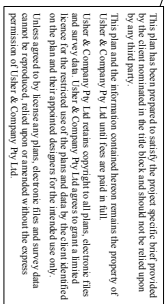



PHOTO 12



 <b>USHER &amp; COMPANY</b> Surveying & Land Development Consultants 11 West Street, Rushleigh Heads QLD 4220 PO Box 100, Rushleigh QLD 4220 Phone (07) 5535 6046 Fax: (07) 5535 6155 Email: admin@usherandcompany.com.au											
	Amendments			TITLE		L.O.A.		REDUCTION RATIO		THIS PLAN IS FOR THE EXCLUSIVE USE OF PLANT CONSULTING PTY LTD	
	ISSUE	DATE	DESCRIPTION	BY	DATE	BY	DATE	BY	DATE	BY	
	1		Original issue	BYRON		1:250 (A1)					
				SUBMITTER							
				MYOCUM							
				ORIGIN							
				SSM 62392							
				RL 30.917 AND							
				CLASS I.C. ORDER L3							
			DATE OF SURVEY								
			19-06-2020								
			DRAWN BY:								
			TM								
			PLAN REFERENCE								
			10823								
			ISSUE								
			A								





16  
DP1178892

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DP628810

26  
DP628824



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0.3 TRUNK DIMENSION FOLiage SPREAD/8m HEIGHT

TREE SPREADS ARE ESTIMATED ONLY

ELECTRICITY (OVERHEAD)

COMBI

UNDERGROUND COMMUNICATIONS

UNDERGROUND STORMWATER

TOP OF BANK

BOTTOM OF BANK

FENCE

POWER POLE

TELEPHONE

SIGN

BENCHMARK

PHOTO LOCATION & DIRECTION

SURFACE LEVEL

1.0m DEPTH TO L SERVICE

D/I/O

LEGEND

Scale 1:250 - Lengths are in Metres

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40

**USHER & COMPANY**  
Surveying & Land Development Consultants  
ALN 10 584 1402

1 West Street, Buregh Heads Q.L.D. 4220  
PO Box 788 Buregh Heads Q.L.D. 4220  
Phone (07) 5535 6246  
Fax (07) 5535 6247  
Email admin@usherandcompany.com.au

APPROVED

Amendments		
NO.	DATE	DESCRIPTION
1	05/02/20	Original

TITLE

PLAN OF SITE DETAIL AND LEVELS  
AT DINGO LANE SOLAR FARM  
BEING LOT 15 ON DP1178892  
SHEET 28 OF 29

LOC.	BYRON
SUBURB	MYOCUM
COUNCIL	SSM 62392 RL 30.917 AND CLASS LC, ORDER L3

REDUCTION RATIO	1:250 (A1)
DATE	AHD
DATE OF SURVEY	19-05-2020
SUPERVISOR	SD & TC
DRAWN BY	TM

THIS PLAN IS FOR THE EXCLUSIVE USE OF

PLANT CONSULTING PTY LTD

PLAN REFERENCE

10823

10823

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10823

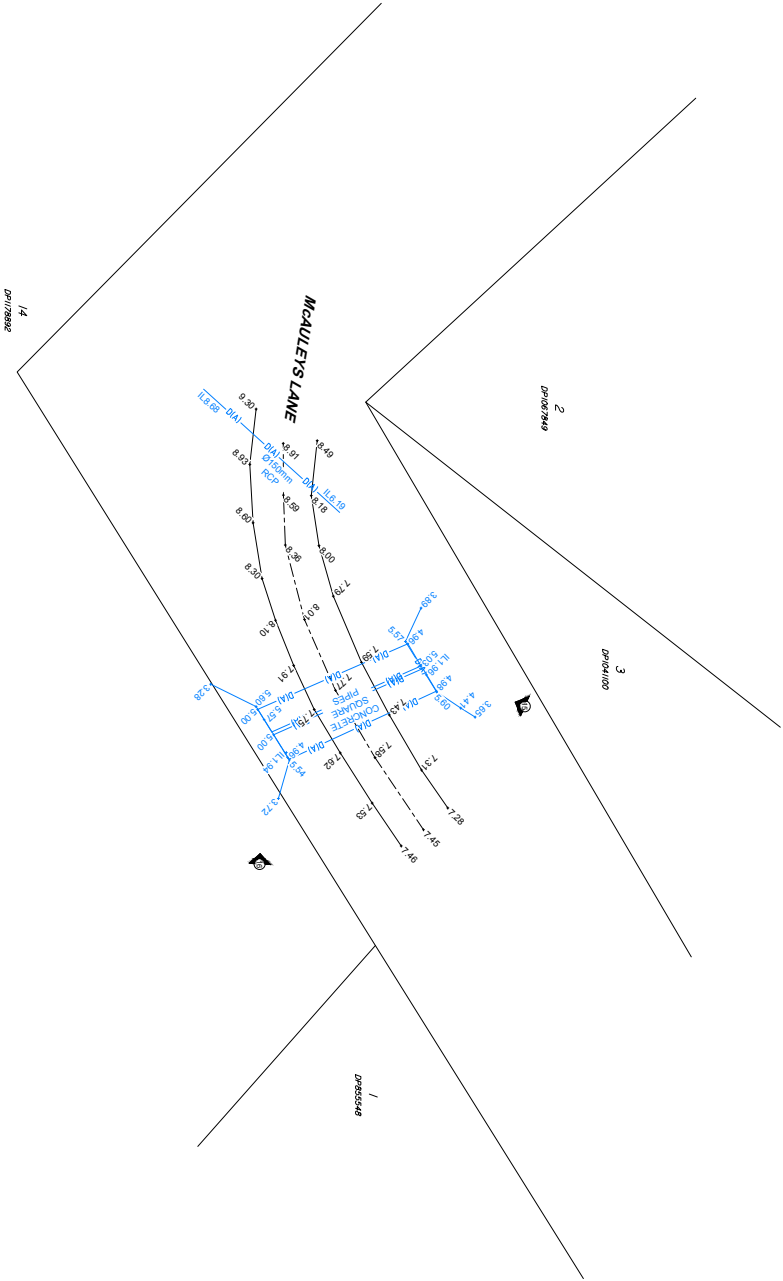
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PHOTO 15



PHOTO 16



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0.3 TRUNK DIAMETER FOLIAGE SPREAD/10m HEIGHT  
TREE SIZE/ARE ESTIMATES ONLY

ELECTRICITY (OVERHEAD)

COMB

UNDERGROUND COMMUNICATIONS

TOP OF BANK

UNDERGROUND STORMWATER

BOTTOM OF BANK

FENCE

POWER POLE

TELSTRA PIT

SIGN

BENCHMARK

PHOTO LOCATION & DIRECTION

SURFACE LEVEL

1.0m DEPTH TO L SERVICE

LEGEND

Scale 1:250 - Lengths are in Metres

**USHER & COMPANY**  
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Phone (07) 5535 6246  
Fax (07) 5535 6247  
Email admin@usherandcompany.com.au

Amendments			
NO.	DATE	DESCRIPTION	BY
1	05/02/20	Original	
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Amendments			
NO.	DATE	DESCRIPTION	BY
1	05/02/20	Original	
2			
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TITLE			
PLAN OF SITE DETAIL AND LEVELS AT DINGO LANE SOLAR FARM BEING LOT 15 ON DP/178892 SHEET 29 OF 29			

LOC.		REDUCTION RATIO	
BYRON	BYRON	1:250 (A1)	
MYOQUIM	MYOQUIM		
SSM 62392	SSM 62392		
PL 303917 AND	PL 303917 AND		
CLASS LC, ORDER L3	CLASS LC, ORDER L3		

DATE OF SURVEY		DATE OF SURVEY	
19-05-2020	19-05-2020	19-05-2020	19-05-2020
SUPERVISOR BY	SD & TC	SUPERVISOR BY	SD & TC
DRAWN BY	TM	DRAWN BY	TM

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PLANT CONSULTING PTY LTD		10823	

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## Appendix B

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Dial Before You Dig (DBYD)



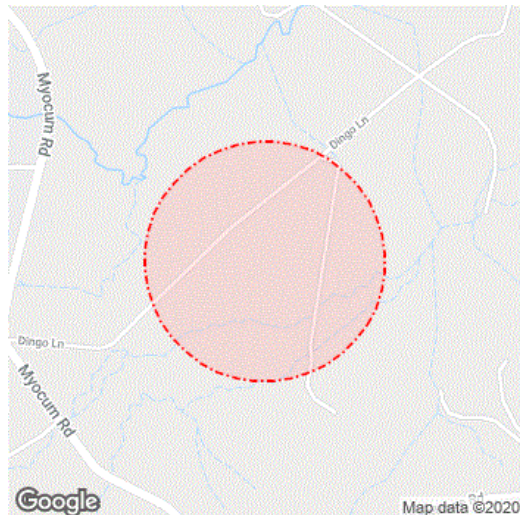
## Caller Details

**Contact:** Mr Jake Bentley  
**Company:** PlanIt  
**Address:** 9A, 80-84 Ballina Street  
Lennox Head NSW 2478

**Caller Id:** 1860742  
**Mobile:** 0455911994  
**Email:** jakeb@planitconsulting.com.au  
**Phone:** 0455911994  
**Fax:** Not Supplied

## Dig Site and Enquiry Details

**WARNING:** The map below only displays the location of the proposed dig site and does not display any asset owners' pipe or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.



**User Reference:** Dingo Ln  
**Working on Behalf of:** Private  
**Enquiry Date:** 25/08/2020  
**Start Date:** 31/08/2020  
**End Date:** 23/09/2020

**Address:**  
Dingo Ln  
Myocum NSW 2481

**Job Purpose:**  
Excavation

**Location of Workplace:**  
Both

**Onsite Activity:**  
Mechanical Excavation  
**Location in Road:**  
CarriageWay, Footpath, Nature Strip

- Check the location of the dig site is correct. If not submit a new enquiry.
- If the scope of works change, or plan validity dates expire, resubmit your enquiry.
- Do NOT dig without plans. Safe excavation is your responsibility. If you do not understand the plans or how to proceed safely, please contact the relevant asset owners.

### Notes/Description of Works:

## Your Responsibilities and Duty of Care

- The lodgement of an enquiry does not authorise the project to commence. You must obtain all necessary information from any and all likely impacted asset owners prior to excavation.
- If plans are not received within 2 working days, contact the asset owners directly & quote their Sequence No.
- ALWAYS perform an onsite inspection for the presence of assets. Should you require an onsite location, contact the asset owners directly. Please remember, plans do not detail the exact location of assets.
- Pothole to establish the exact location of all underground assets using a hand shovel, before using heavy machinery.
- Ensure you adhere to any State legislative requirements regarding Duty of Care and safe digging requirements.
- If you damage an underground asset you MUST advise the asset owner immediately.
- By using this service, you agree to Privacy Policy and the terms and disclaimers set out at [www.1100.com.au](http://www.1100.com.au)
- For more information on safe excavation practices, visit [www.1100.com.au](http://www.1100.com.au)

## Asset Owner Details

The assets owners listed below have been requested to contact you with information about their asset locations within 2 working days. Additional time should be allowed for information issued by post. It is **your responsibility** to identify the presence of any underground assets in and around your proposed dig site. Please be aware, that not all asset owners are registered with the Dial Before You Dig service, so it is **your responsibility** to identify and contact any asset owners not listed here directly.

\*\* Asset owners highlighted by asterisks \*\* require that you visit their offices to collect plans.

# Asset owners highlighted with a hash require that you call them to discuss your enquiry or to obtain plans.

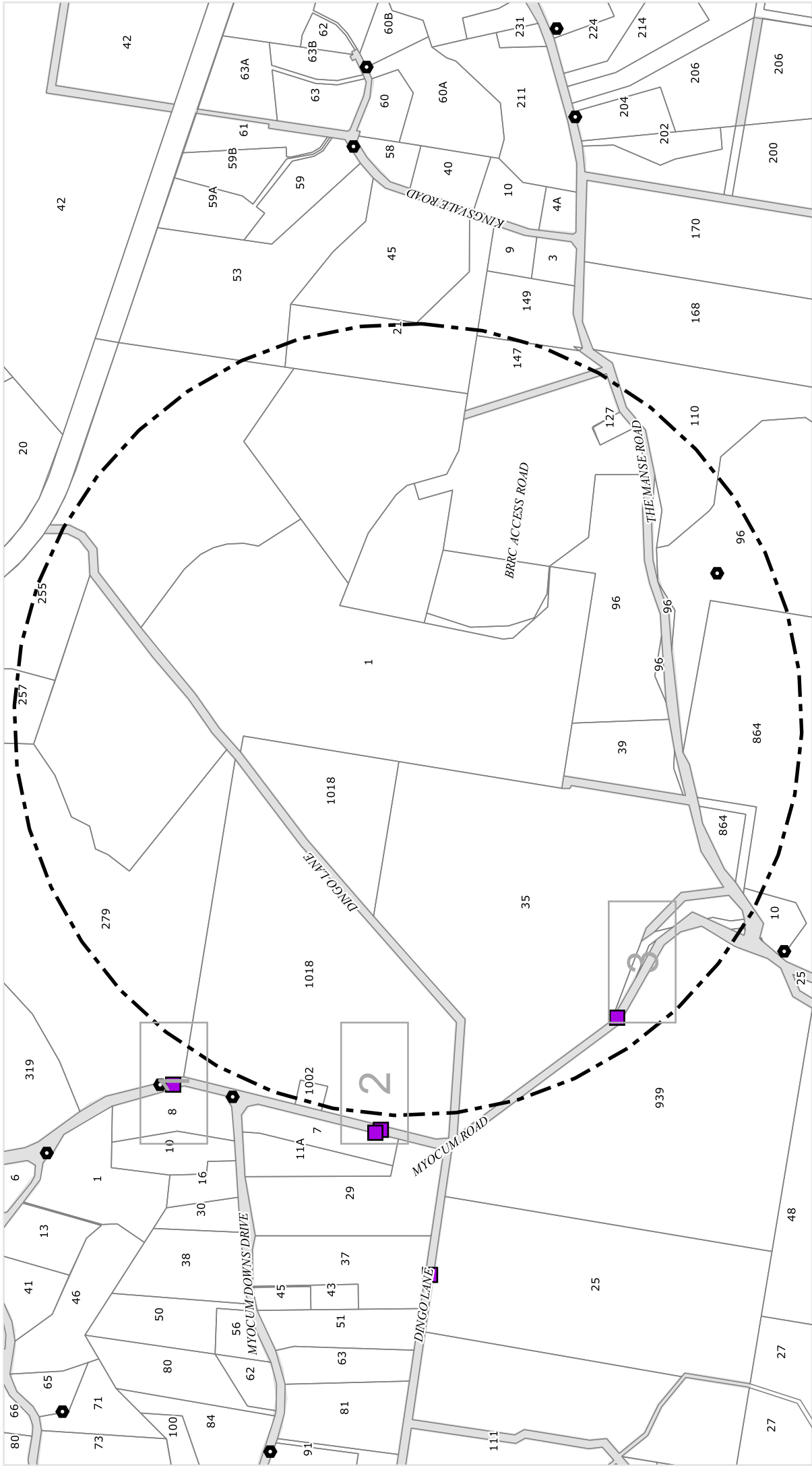
Seq. No.	Authority Name	Phone	Status
101078667	Byron Shire Council	0266267000	NOTIFIED
101078668	Essential Energy	132391	NOTIFIED
101078669	Telstra NSW, North	1800653935	NOTIFIED

END OF UTILITIES LIST



Sequence No: 98170359  
Job No: 19620284  
Location: Dingo Ln, Myocum, NSW 2481

Scale: 1:12061 (A4)



- Water Main Drinking
- Water Main Abandoned
- Water Meter Pipe
- Water Valves
- Water Hydrants
- Water Main Recycled
- Water Valves Recycled
- Wastewater Gravity Main
- Wastewater Manhole
- Wastewater Rising Main
- Wastewater Valve
- Wastewater Vacuum Main
- Wastewater Vacuum Valves
- Wastewater Vacuum Pods
- Wastewater Pressure Main
- Wastewater Pressure Valve
- Stormwater Main
- Stormwater Pit
- Stormwater Culvert
- SCIMS Survey Control Point
- Incomplete Data
- Property Boundary
- Road Reserve
- Rivers
- No Digging Permitted

**DISCLAIMER:** While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither Byron Shire Council or PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.





Overhead wires not shown  
LOOK UP & LIVE!

LEGEND

- LV Underground Cable
- HV Underground Cable
- Underground Pipe
- Underground Earth or Wires
- Ground Substation
- Pole
- Cubicle
- Pit
- Area of Interest

Critical Assets

Contact Essential Energy  
on 13 23 91

- Zone Substation
- Underground Cable
- Underground Fibre

Proposed Works

Area of proposed works  
Proposed assets are shown as orange symbols

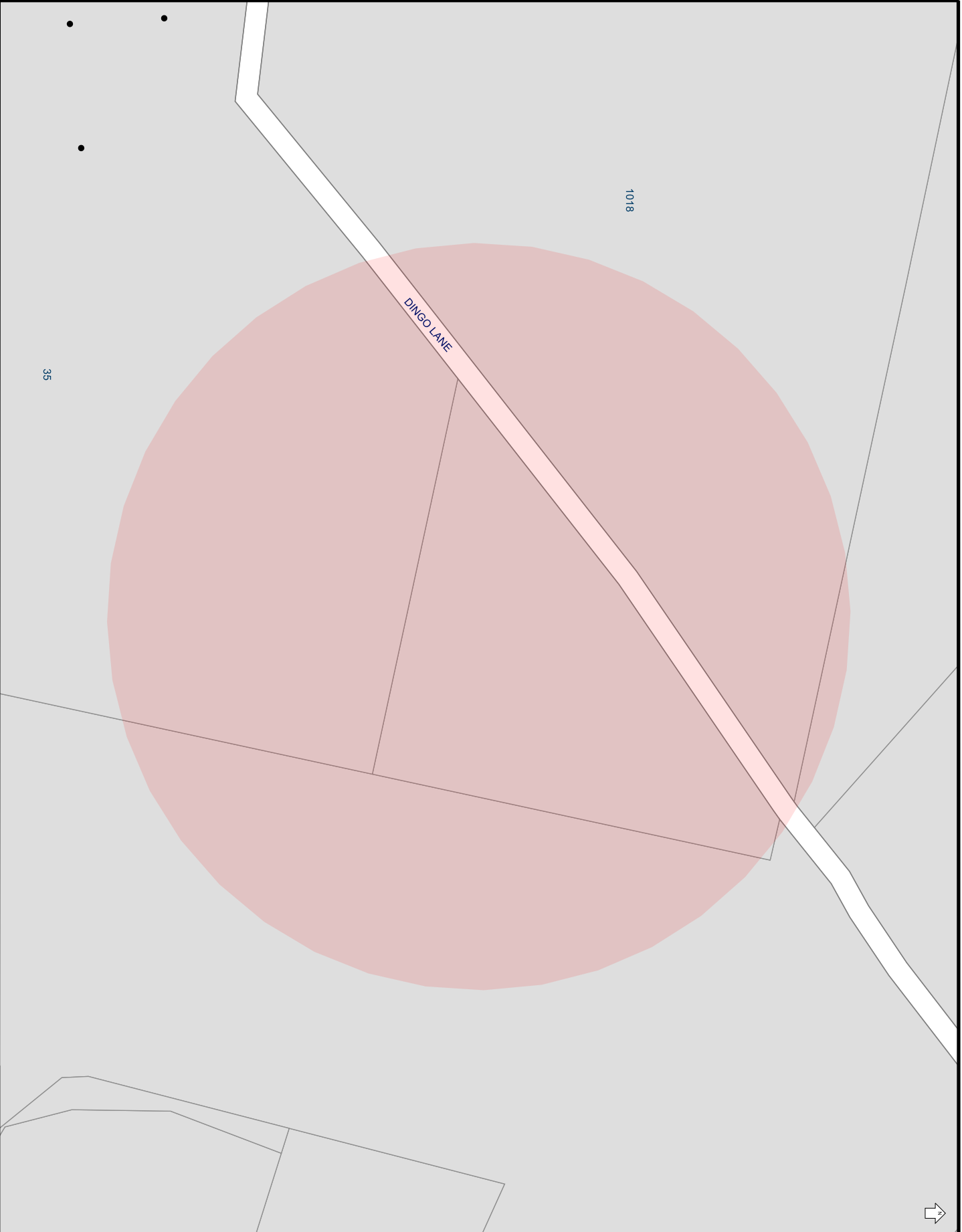
THE INFORMATION ON THIS MAP MAY NOT BE ACCURATE.

If details are incorrect, please notify  
Essential Energy on  
13 23 91  
(or fax 1800 354 636)

ISSUE DATE: 25/08/2020

You must resubmit your request if you have not started work within 4 weeks of the 'Issue Date' above

A4 SCALE: 1:4663



Job Number: 20122249    Sequence number: 101078668    Job location: Dinggo Ln, Myocum

Map Centre: 153° 30' 15.7", -28° 35' 14.6"

## Appendix C

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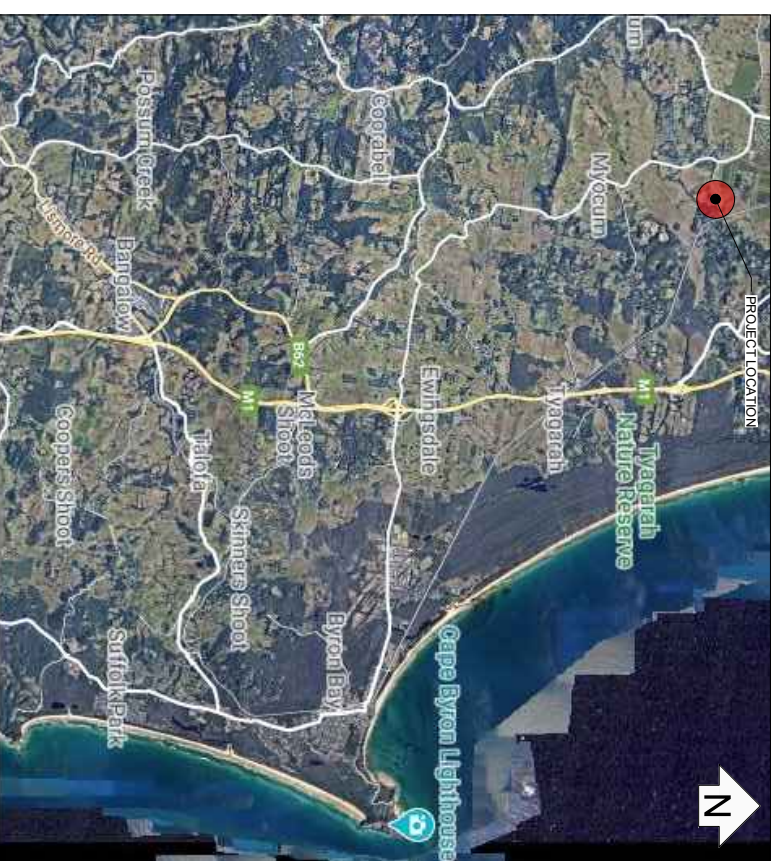
### Civil Plans



BYRON SHIRE COUNCIL  
DINGO LANE SOLAR FARM  
BYRON BAY, NSW



DRAWING REGISTER		
DRAWING NUMBER	TITLE	DRAWING REVISION
0001	COVER SHEET AND DRAWING REGISTER	B
0020	GENERAL ARRANGMENT PLAN	B
0100	EROSION AND SEDIMENT CONTROL PLAN	B
0110	EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	B
0301	MOCUM ROAD & DINOGO LANE INTERSECTION	B
0310	SITE ACCESS ARRANGEMENT	B

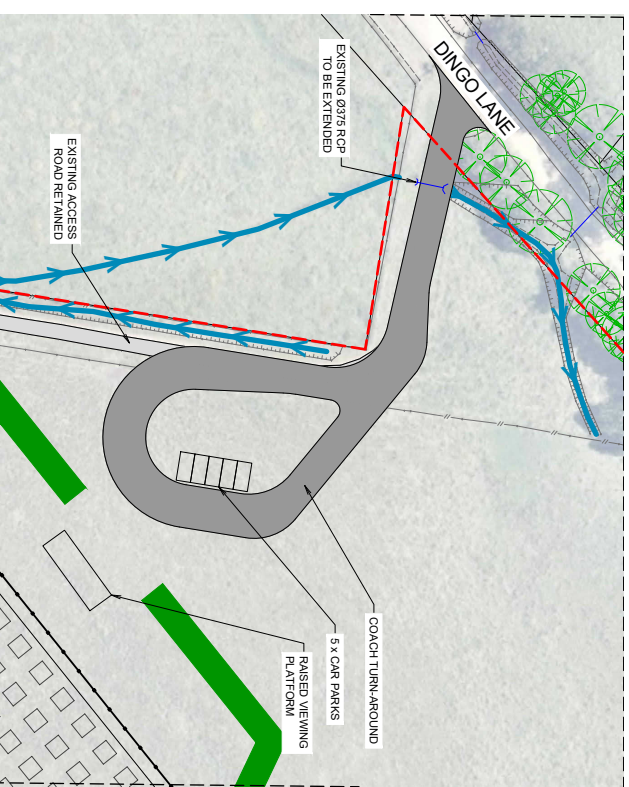
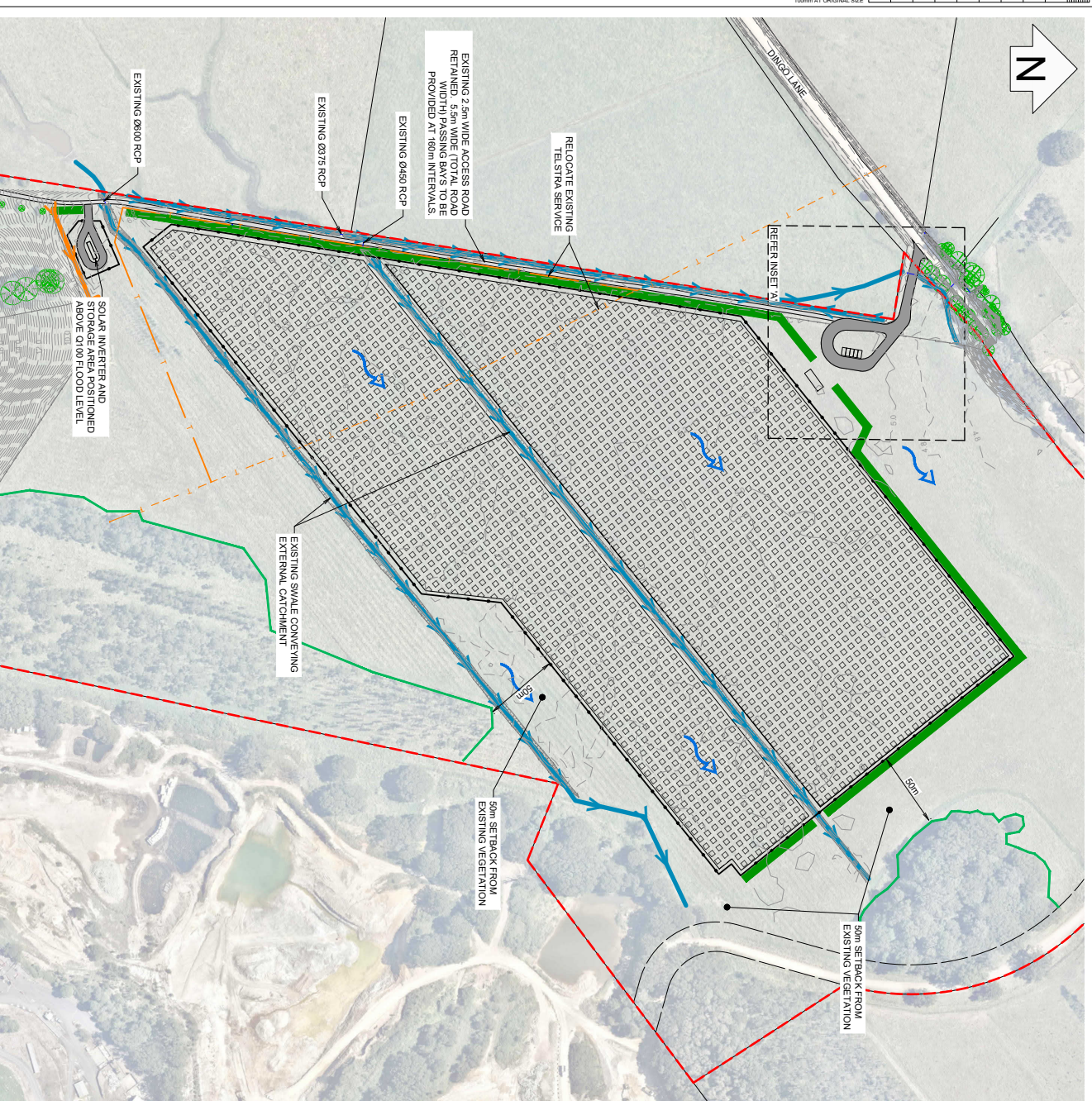
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**LOCALITY PLAN**  
NOT TO SCALE

SOURCE: NEARMAP

**NOT FOR CONSTRUCTION**





- LEGEND**
- SITE BOUNDARY
  - PROPERTY BOUNDARY
  - EXISTING SWALE
  - PROPOSED DRAIN
  - OVERLAND FLOW PATH
  - EXISTING UNSEALED ROAD
  - SOLAR ARRAY AREA (1 ha)
  - PROPOSED SEALED ROAD
  - SECURITY FENCE
  - LANDSCAPE SCREENING
  - EXISTING TELSTRA SERVICE
  - TELSTRA SERVICE DIVERSION

**NOTES:**

SOLAR ARRAY AREA ASSUMPTIONS:

- 5m SPACING BETWEEN PANEL ROWS
- SURFACE TO BE NAVIGABLE BY LIGHT VEHICLE FOR MAINTENANCE

THIS PLAN SHOULD BE READ IN CONJUNCTION WITH PLANT'S ENGINEERING ASSESSMENT (06586\_DINGO\_LANE) AND PLANT'S TRAFFIC IMPACT STATEMENT (06586DINGO\_LANE1500)

**NOT FOR CONSTRUCTION**

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	PRELIMINARY ISSUE	28/03/20	RD	BT	JT	JT
B	ISSUED FOR APPROVAL	11/01/22	RD	BT	NWO	NWO

SCALE: 1:2,000

0 20 40 80 120

Full Size: 1:2000 Half Size: 1:4000

Scale (m)

0 5 10 20 30

Full Size: 1:500 Half Size: 1:1000

Scale (m)

DO NOT SCALE FROM DRAWINGS

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DATE: \_\_\_\_\_

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PLANT CONSULTING

SUITE 9A, 80-84 BALLINA STREET

LEWIS HEAD NSW 2478

TELEPHONE: 02 6687 4666

EMAIL: [info@plantconsulting.com.au](mailto:info@plantconsulting.com.au)

CLIENT:

BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY:

BYRON SHIRE COUNCIL

PROJECT:

DINGO LANE SOLAR FARM

DRAWING TITLE:

GENERAL ARRANGEMENT PLAN

ORIGINAL SIZE: PLANT JOB No. J6558 DRAWING No. 0020 REV: B





**NOT FOR CONSTRUCTION**

[illegible]





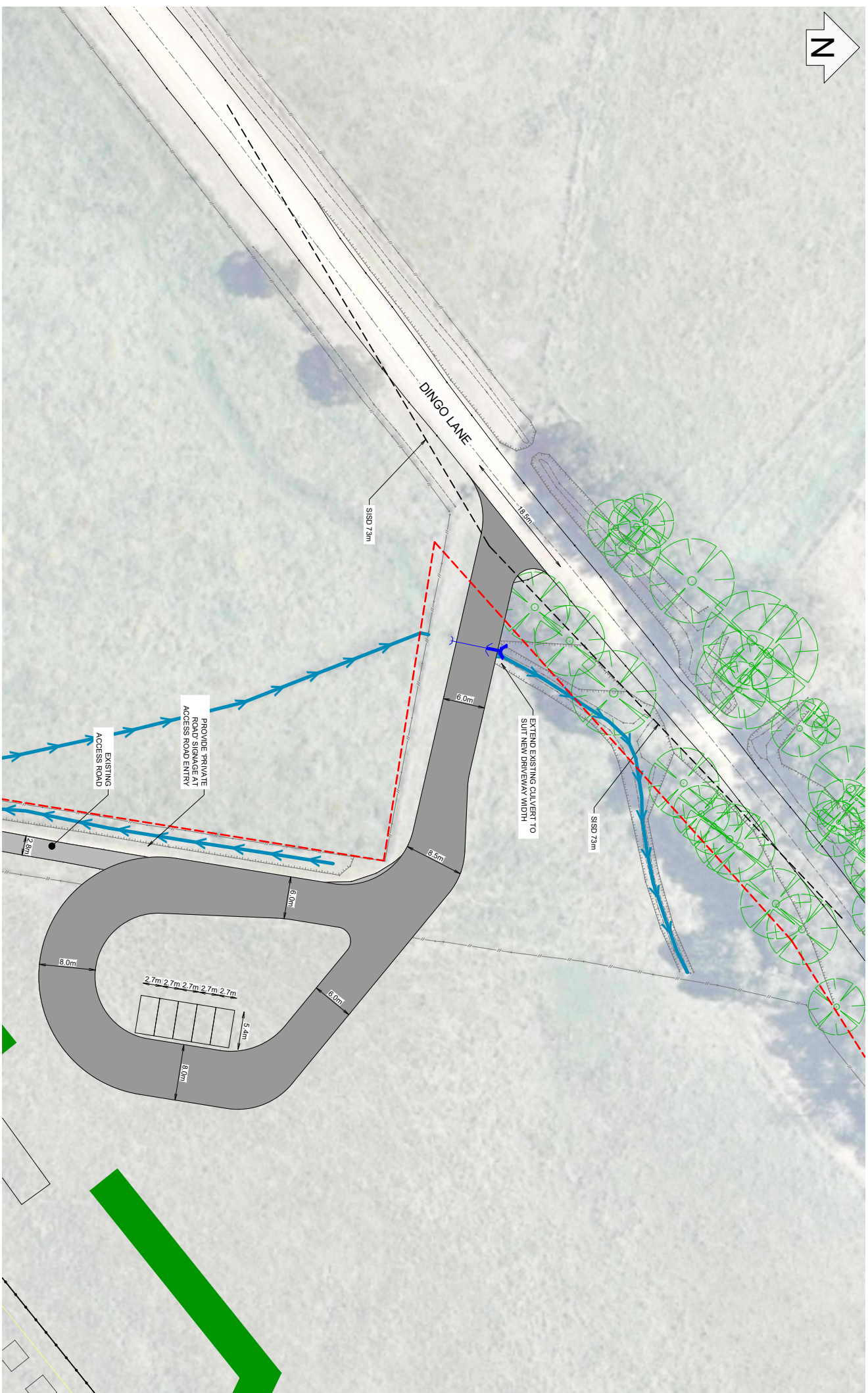




**NOT FOR CONSTRUCTION**

[illegible]





**NOT FOR CONSTRUCTION**

[illegible]



## Appendix D

---

### Acid Sulfate Soil Investigation



PO Box 5120  
Ballina Mail Centre, Ballina NSW 2478  
17 De-Havilland Crescent, Ballina NSW 2478

Telephone: (02) 6681 1516  
Mob: 0402 876 868  
A.B.N. 92 602 346 127

**Acid Sulfate Soil Investigation**  
**For**  
**Proposed Solar Farm Development**  
**At**  
**Dingo Lane, Myocum, NSW 2483**

Prepared For  
  
Byron Shire Council  
Station Street,  
Mullumbimby NSW 2481

Reference Number: H19-1331-ASS-R

10<sup>th</sup> January 2020



10<sup>th</sup> January 2020

## Reference No: H19-1331-ASS

Byron Shire Council  
Station Street,  
Mullumbimby NSW 2481

### Acid Sulfate Soil Report For: Proposed Solar Farm Development At: Dingo Lane, Myocum, NSW 2481.

#### Introduction

Australian Soil and Concrete Testing (ASCT) have undertaken an acid sulfate soil (ASS) investigation for a proposed solar farm development at Dingo Lane, Myocum, NSW.

The work has been executed under the guidance provided in;

*National Acid Sulfate Soils Sampling and Identification Methods Manual* (NASS SIMM), and  
*National Acid Sulfate Soils Identification and Laboratory Methods Manual* (NASS ILMM).

This report presents the results of the acid sulfate soil investigation.

#### Desktop Assessment

A desktop assessment was undertaken to determine the likelihood of ASS materials being present at the site. This assessment included a review of available ASS risk mapping, aerial photography, topographic mapping, geological mapping and ASCT experience.

<i>Element</i>	<i>Reference</i>	<i>Descriptor / Indicator / Trigger</i>
ASS Risk Mapping	Byron Shire Council NSW SEED Mapping	Zone 4 (Planning Instrument). Low Probability.
Photography	Google Earth	Flood Plains
Topography	Google Earth	>6m AHD
Geological	NSW – Tweed Heads 1:250k	Qa - Alluvium
ASCT Experience	H19-1331	ASS very likely

#### Site Inspection

With knowledge of the desktop assessment results, a site inspection was conducted. The site inspection provided further ASS/PASS indicators, as listed below.

<i>Characteristics</i>	<i>Indicators (if any)</i>	<i>Inspection Result</i>
Soil	Dark grey silty sands. Sulphurous smell.	Not Observed
Water	Iron staining of surface drainage.	Not Observed
Vegetation	Salt/acid tolerant vegetation (paperbarks).	Not Observed
Infrastructure	Corrosion of concrete pipe outlets.	Not Observed

This information is also useful in selecting the location of investigation boreholes.

#### Soil Sampling, Field Testing and Collection

Three (3) boreholes were drilled and two (2) test pits conducted in the proposed solar farm location at the site on the 18<sup>th</sup> December 2019, the location of the boreholes and test pits are displayed in Figure 1. The field logs for the boreholes are attached in Appendix B.

As no groundwater alteration is expected, the boreholes were extended to a depth of 2.0m (i.e.: 1m below the maximum depth of proposed disturbance).

### Sampling

Starting from the existing ground surface, soil samples were representatively collected within vertical intervals not exceeding 0.5m. All collected samples were handled, transported and stored to preserve their condition.

### Field Testing

All field samples (above) were tested for field pH ( $pH_F$ ) and field pH peroxide ( $pH_{FOX}$ ) in accordance with *National acid sulfate soils sampling and identification methods manual*. The results of field testing are contained within the attached Lab Reports (Appendix A).

### Collection

The proposed site works equate to a 'Small-scale disturbance'.

In accordance with the provisions of NASS SIM clause 6.7.4 a limited number of samples were collected, based on their likelihood to have the highest potential of an acidity hazard. These samples were collected from the 'pool' of field samples (above).

The resultant soil sample collection was detailed in a *Chain of Custody* (CoC) and forwarded to the laboratory for quantitative analysis.

### **Laboratory Analysis**

The collection of soil samples (detailed above) was submitted to the Environmental Analysis Laboratory (EAL, Lismore). The requested analysis included;

Moisture Content,

Potential Sulfidic Acidity - Chromium Reducible Sulfur (CRS),

Actual Acidity – Titratable Actual Acidity (TAA),

Net acidity and Liming rate.

A summary of the laboratory results is provided below, with the actual test Certificates included in Appendix A.

Summary of laboratory test results.

<b>Field Sample Number</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Sample Location</b>	BH1	BH2	BH3
<b>Depth (m)</b>	0.5	2.0	1.5
<b>Potential Sulfidic Acidity (mol H<sup>+</sup>/t)</b>	0	0	0
<b>Actual Acidity (mol H<sup>+</sup>/t)</b>	54	107	154
<b>Retained Acidity (mol H<sup>+</sup>/t)</b>	-	-	-
<b>Net Acidity (mol H<sup>+</sup>/t)</b>	54	107	154
<b>Texture</b>	Medium	Fine	Medium
<b>NASS ILMM Action Criteria<sup>1</sup> (mole H<sup>+</sup>/t)</b>	≥ 36	≥ 62	≥ 36
<b>ASS Management Plan Triggered</b>	Yes	Yes	Yes
<b>Liming Rate (kg CaCO<sub>3</sub>/t DW<sup>2</sup>)</b>	4	8	12

1. Action criteria taken from the National Acid Sulfate Soils Identification and Laboratory Methods Manual (NASS ILMM) Table 1.1, based on less than 1000 tonnes of soil to be disturbed and dependent on soil texture.

2. DW – Dry Weight.



## **Conclusions**

The laboratory analysis indicates that one or more of the soil materials has triggered the NASS ILMM action criteria based on their Net Acidity. As such, these soil materials are either;

- Actual ASS (AASS: ASS materials that have been oxidised and are severely acidic), or
- Potential ASS (PASS: ASS materials that would become severely acidic if allowed to oxidise completely).

These soils materials pose an environmental hazard and require management.

The laboratory analysis has determined a liming application rate (with a safety factor of 1.5) based on the results of testing. The recommended liming rate is up to 12 kg CaCo3 (lime)/t of soil which is based on the treatment of the 'worst case' acidic soil detected in the investigation.

**The lime neutralising agent shall be applied to the soil at the site at the calculated rate immediately upon excavation.**

## **Limitations**

This report relies on information supplied by the client and the results of investigations conducted in accordance with accepted practices and standards. The report is intended to represent a reasonable interpretation of the appropriate legislation and the condition of the site at the time of the investigation. However, due to these elements being subject to change over time the report under no circumstances can be considered to represent the definitive state of the site at all times.

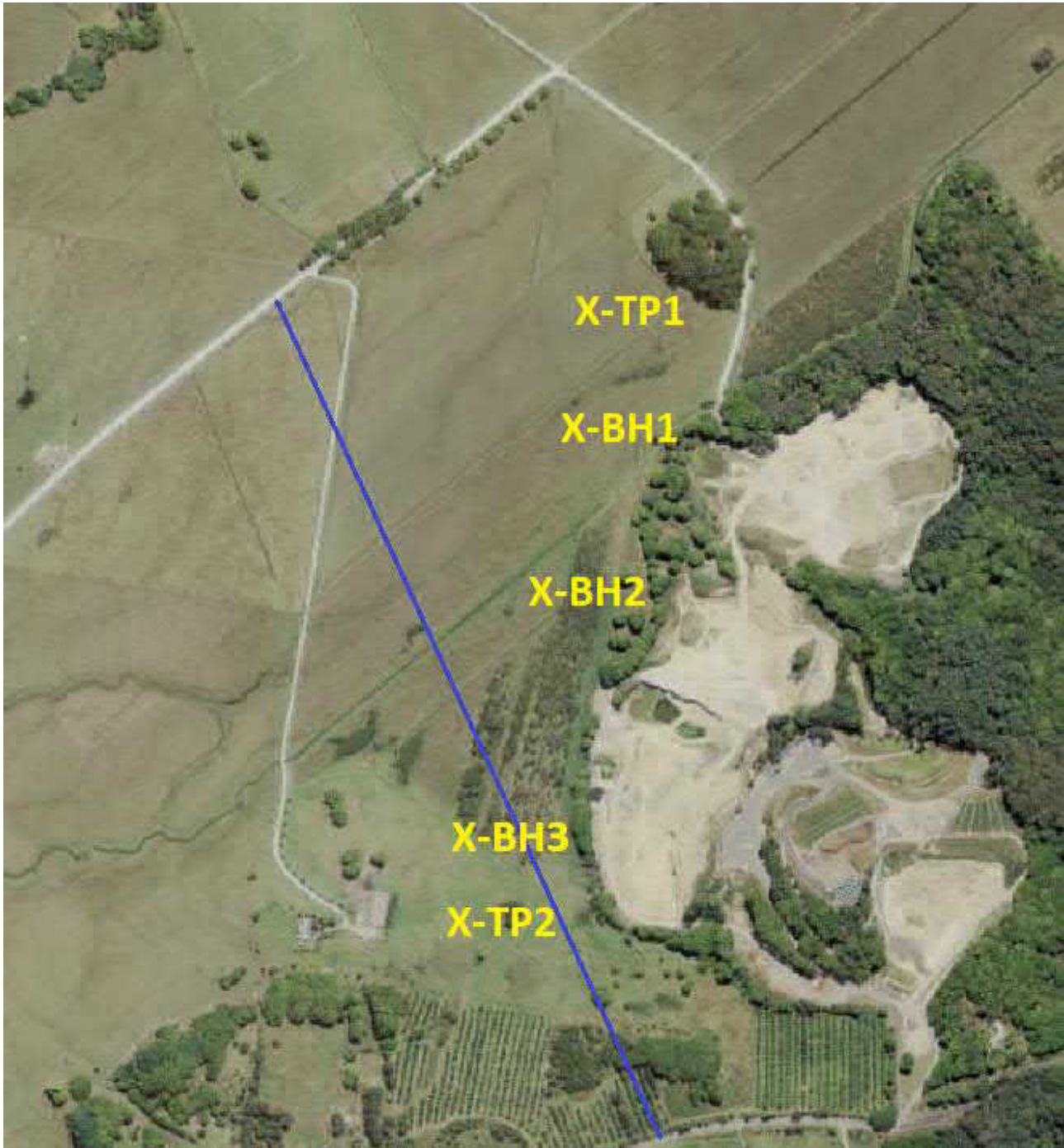
Finally, should you require any further assistance, please do not hesitate to contact our office.

Yours Faithfully,

**Australian Soil and Concrete Testing**



Darran Kennedy  
**Laboratory Manager**



**X – ASS Investigation sampling points.**

**Figure 1:** Dingo Lane, Myocum, NSW 2481, showing the location of the acid sulfate soil sampling points (Boreholes).



**APPENDIX A – Results of Laboratory Soil Analysis**

## RESULTS OF ACID SULFATE SOIL ANALYSIS

3 samples supplied by Australian Soil & Concrete Testing on 7th January, 2020. Lab Job No.9324  
Analysis requested by Daran Kennedy. Your Job: 1804

17 De Havilland Crescent BALLINA NSW 2478											Non-treated soil				Non-treated soil	
Sample Identification	Depth	EAL Lab Code	Texture	Moisture Content		Potential Sulfidic Acidity (Chromium Reducible Sulfur - CRS)		Actual Acidity (Titratable Actual Acidity - TAA)	Retained Acidity		Acid Neutralising Capacity (ANC <sub>sp</sub> )		Net Acidity	Lime Calculation		
	(m)			(% moisture of total wet weight)	(g moisture / g of oven dry soil)	(% S <sub>CRS</sub> )	(mol H <sup>+</sup> /t)	pH <sub>CaCl2</sub>	(% S <sub>RA</sub> )	(mol H <sup>+</sup> /t)	(% CaCO <sub>3</sub> )	(mol H <sup>+</sup> /t)	(mol H <sup>+</sup> /t)	(kg CaCO <sub>3</sub> /t DW)		
Method Info						(In-house method 6b)		(In-house method 16)				(In-house method 14)				
9303 BH1	0.0	/9324/1	Medium	24.0	0.32	< 0.005	0	4.62	54	..	..	..	..	4		
9309 BH2	0.5	/9324/2	Fine	29.4	0.42	< 0.005	0	4.02	107	..	..	..	..	8		
9315 BH3	1.0	/9324/3	Medium	27.2	0.37	< 0.005	0	4.11	154	..	..	..	..	12		

### NOTES:

- All analysis is reported on a dry weight (DW) basis, unless wet weight (WW) is specified.
- Samples are dried and ground immediately upon arrival (unless supplied dried and ground).
- Analytical procedures are sourced from Sullivan L, Ward N, Toppler N and Lancaster G. 2018. National acid sulfate soils guidance: national acid sulfate soils identification and laboratory methods manual, Department of Agriculture and Water Resources, Canberra, ACT. CC BY 4.0.
- The Acid Base Accounting Equation, where Acid Neutralising Capacity has not been corroborated by other data, is **Net Acidity = Potential Acidity + Actual Acidity + Retained Acidity** (Eq. 3.2; Sullivan et al. 2018 - full reference above).
- The Acid Base Accounting Equation for post-limed soil materials is **Net Acidity = Potential Acidity + Actual Acidity + Retained Acidity - (post treatment Acid Neutralising Capacity - Initial Acid Neutralising Capacity)** (Eq. 3.3; Sullivan et al. 2018 - full reference above). While the Acid Neutralising Capacity of a soil material may not be included in the Net Acidity calculation (Note 4), it must be measured to give an Initial Acid Neutralising Capacity if verification testing is planned post-liming. **The Initial Acid Neutralising Capacity must be provided by the client to enable EAL to produce Verification Net Acidity and Liming calculations for post-limed soil materials.**
- The Acid Base Accounting Equation, where Acid Neutralising Capacity has been corroborated by other data, is **Net Acidity = Potential Acidity + Actual Acidity + Retained Acidity - Acid Neutralising Capacity** (Eq. 3.1; Sullivan et al. 2018 - full reference above).
- The lime calculation includes a Safety Factor of 1.5 as a safety margin for acid neutralisation (Sullivan et al. 2018). This is only applied to positive values. An increased Safety Factor may be required in some cases.
- Retained Acidity is required when the pH<sub>CaCl2</sub> < 4.5 or where jarosite has been visually observed.
- A negative Net Acidity result indicates an excess acid neutralising capacity.
- If insufficient mixing occurs during initial sampling, or during post-liming, or both, the Potential Sulfidic Acidity may be greater in the post-limed sample than in the initial sample; the post-liming Acid Neutralising Capacity may be lower in the post-limed sample than in the initial sample.
- An acid sulfate soil management plan is triggered by Net Acidity results greater than the texture dependent criterion: coarse texture ≥ 0.03% S or 18 mol H<sup>+</sup>/t; medium texture ≥ 0.06% S or 36 mol H<sup>+</sup>/t; fine texture ≥ 0.1% S or 62 mol H<sup>+</sup>/t** (Table 1.1; Sullivan et al. 2018 - full reference above).
- For projects that disturb > 1000 t of soil material, the coarse trigger of ≥ 0.03% S or ≥ 18 mol H<sup>+</sup>/t must be applied in accordance with Sullivan et al. (2018) (full reference above).
- Acid sulfate soil texture triggers can be related to NCST (2009) textures: coarse and peats = sands to loamy sands; medium = clayey sand to light clays; fine = light medium to heavy clays (Sullivan et al. 2018 - full reference above).
- Bulk density is required to convert liming rates to soil volume based results. Field bulk density rings can be submitted to EAL for bulk density determination.
- A negative Net Acidity result indicates an excess acid neutralising capacity.
- '...' is reported where a test is either not requested or not required. Where pH<sub>CaCl2</sub> is < 4.5 or > 6.5, zero is reported for S<sub>RA</sub> and ANC in Net Acidity calculations, respectively.
- Results refer to samples as received at the laboratory. This report is not to be reproduced except in full.
- \*\* NATA accreditation does not cover the performance of this service.
- Analysis conducted between sample arrival date and reporting date.
- All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal or on request).
- Results relate to the samples tested.
- This report was issued on 09/01/2020.



Environmental Analysis Laboratory, Southern Cross University,  
Tel. 02 6620 3678, website: scu.edu.au/eal

checked: .....  
Graham Lancaster  
Laboratory Manager







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**A.B.N.** 92 602 346 127

## Report on Moisture Content, Emerson Class, Soil pH, and PASS/AASS

Client:	Byron Shire Council	Report No:	1
Client Address:	70-90 Station Street Mullumbimby	Report Date:	7/01/2020
Project:	Dingo Lane, Myocum	Report Page:	Page 1 of 1
Works Component:	Material Assessment	Project No:	1804
Material Used:	Existing	Test Request/Order:	Email
Material Description:	Silty Silty	Lot Number:	NA
Lot Boundaries:	Chainage NA to NA. Offsets NA to NA.	ITP/PCP Number:	-
Lot Comments:	-	Control Line:	NA

Sample Number:	9303	9304	9305	9306	9307
Field Sample/Test Date:	18/12/2019	18/12/2019	18/12/2019	18/12/2019	18/12/2019
Lab Test Date (Moisture):	-	-	-	-	-
Chainage / Location: (m)	BH-1	BH-1	BH-1	BH-1	BH-1
Offset from control line: (m)	NA	NA	NA	NA	NA
Level of Test: (m)	Subgrade	Subgrade	Subgrade	Subgrade	Subgrade
Test Depth: (mm)	0.0m	0.5m	1.0m	1.5m	2.0m
Moisture Content: (%)	-	-	-	-	-
Test Water Used:	-	-	-	-	-
Temperature of Water: (°C)	-	-	-	-	-
Soil Description:	-	-	-	-	-
Emerson Class Number:	-	-	-	-	-
Soil-suspension made of 30g soil & :	-	-	-	-	-
pH Value of Soil-suspension: (pH)	-	-	-	-	-
Field pH: (pH <sub>f</sub> )	6.4	5.0	4.8	5.3	6.6
Field pH Oxidised: (pH <sub>f(ox)</sub> )	4.2	3.1	3.3	4.0	6.4
Acid Sulfate Soil Indication:	PASS Very Likely	PASS Very Likely	PASS Possible	PASS Possible	Non-AASS

Sample Number:	9308	9309	9310	9311	9312
Field Sample/Test Date:	18/12/2019	18/12/2019	18/12/2019	18/12/2019	18/12/2019
Lab Test Date (Moisture):	-	-	-	-	-
Chainage / Location: (m)	BH-2	BH-2	BH-2	BH-2	BH-2
Offset from control line: (m)	NA	NA	NA	NA	NA
Level of Test: (m)	Subgrade	Subgrade	Subgrade	Subgrade	Subgrade
Test Depth: (mm)	0.0m	0.5m	1.0m	1.5m	2.0m
Moisture Content: (%)	-	-	-	-	-
Test Water Used:	-	-	-	-	-
Temperature of Water: (°C)	-	-	-	-	-
Soil Description:	-	-	-	-	-
Emerson Class Number:	-	-	-	-	-
Soil-suspension made of 30g soil & :	-	-	-	-	-
pH Value of Soil-suspension: (pH)	-	-	-	-	-
Field pH: (pH <sub>f</sub> )	5.4	4.9	4.6	4.7	5.5
Field pH Oxidised: (pH <sub>f(ox)</sub> )	3.3	3.2	3.3	3.6	4.9
Acid Sulfate Soil Indication:	PASS Very Likely	PASS Very Likely	PASS Possible	PASS Possible	PASS Possible

Sampling & Test Methods (Results relate only to the items sampled/tested)	Report Remarks & Endorsement
AS 1289.1.2.1, Cl 6.5.3: Disturbed Soil Sampling - Powered - Auger AS 1289.1.1: Preparation of disturbed soil samples AS 1289.4.3.1: pH value of a soil (Electrometric method)	 Always Test With The Best. Issued By:  D. Kennedy Approved Signatory

ASCT Doc # WB57 - Rev 8, 15/05/2019





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## Report on Moisture Content, Emerson Class, Soil pH, and PASS/AASS

Client:	Byron Shire Council	Report No:	1
Client Address:	70-90 Station Street Mullumbimby	Report Date:	7/01/2020
Project:	Dingo Lane, Myocum	Report Page:	Page 1 of 1
Works Component:	Material Assessment	Project No:	1804
Material Used:	Existing	Test Request/Order:	Email
Material Description:	Silty Silty	Lot Number:	NA
Lot Boundaries:	Chainage NA to NA. Offsets NA to NA.	ITP/PCP Number:	-
Lot Comments:	-	Control Line:	NA

Sample Number:	9313	9314	9315	9316	9317
Field Sample/Test Date:	18/12/2019	18/12/2019	18/12/2019	18/12/2019	18/12/2019
Lab Test Date (Moisture):	-	-	-	-	-
Chainage / Location:	(m) BH-3	(m) BH-3	(m) BH-3	(m) BH-3	(m) BH-3
Offset from control line:	(m) NA	(m) NA	(m) NA	(m) NA	(m) NA
Level of Test:	(m) Subgrade	(m) Subgrade	(m) Subgrade	(m) Subgrade	(m) Subgrade
Test Depth:	(mm) 0.0m	(mm) 0.5m	(mm) 1.0m	(mm) 1.5m	(mm) 2.0m
Moisture Content:	(%) -	(%) -	(%) -	(%) -	(%) -
Test Water Used:	-	-	-	-	-
Temperature of Water:	(°C) -	(°C) -	(°C) -	(°C) -	(°C) -
Soil Description:	-	-	-	-	-
Emerson Class Number:	-	-	-	-	-
Soil-suspension made of 30g soil & :	-	-	-	-	-
pH Value of Soil-suspension:	(pH) -	(pH) -	(pH) -	(pH) -	(pH) -
Field pH:	(pH <sub>f</sub> ) 5.7	(pH <sub>f</sub> ) 5.2	(pH <sub>f</sub> ) 5.1	(pH <sub>f</sub> ) 4.9	(pH <sub>f</sub> ) 5.0
Field pH Oxidised:	(pH <sub>f-ox</sub> ) 3.5	(pH <sub>f-ox</sub> ) 3.6	(pH <sub>f-ox</sub> ) 3.8	(pH <sub>f-ox</sub> ) 4.0	(pH <sub>f-ox</sub> ) 4.0
Acid Sulfate Soil Indication:	PASS Very Likely	PASS Very Likely	PASS Possible	PASS Possible	PASS Possible

Sample Number:	-	-	-	-	-
Field Sample/Test Date:	-	-	-	-	-
Lab Test Date (Moisture):	-	-	-	-	-
Chainage / Location:	(m) -	(m) -	(m) -	(m) -	(m) -
Offset from control line:	(m) -	(m) -	(m) -	(m) -	(m) -
Level of Test:	(m) -	(m) -	(m) -	(m) -	(m) -
Test Depth:	(mm) -	(mm) -	(mm) -	(mm) -	(mm) -
Moisture Content:	(%) -	(%) -	(%) -	(%) -	(%) -
Test Water Used:	-	-	-	-	-
Temperature of Water:	(°C) -	(°C) -	(°C) -	(°C) -	(°C) -
Soil Description:	-	-	-	-	-
Emerson Class Number:	-	-	-	-	-
Soil-suspension made of 30g soil & :	-	-	-	-	-
pH Value of Soil-suspension:	(pH) -	(pH) -	(pH) -	(pH) -	(pH) -
Field pH:	(pH <sub>f</sub> ) -	(pH <sub>f</sub> ) -	(pH <sub>f</sub> ) -	(pH <sub>f</sub> ) -	(pH <sub>f</sub> ) -
Field pH Oxidised:	(pH <sub>f-ox</sub> ) -	(pH <sub>f-ox</sub> ) -	(pH <sub>f-ox</sub> ) -	(pH <sub>f-ox</sub> ) -	(pH <sub>f-ox</sub> ) -
Acid Sulfate Soil Indication:	-	-	-	-	-

Sampling & Test Methods (Results relate only to the items sampled/tested)	Report Remarks & Endorsement
AS 1289.1.2.1, Cl 6.5.3: Disturbed Soil Sampling - Powered - Auger AS 1289.1.1: Preparation of disturbed soil samples NASS SIMM: NASS - Sampling & Identification Methods Manual (Jun 2018)	 Always Test With The Best. Issued By:  D. Kennedy Approved Signatory


ASCT Doc # WB57 - Rev 8, 15/05/2019



**APPENDIX B – ASS Test Hole Logs**

## BOREHOLE LOG SHEET - 1


<b>Client:</b> Byron Shire Council	<b>ASCT Ref No:</b> H19-1331
<b>Project:</b> - Dingo Lane, Myocum	<b>Client Ref No:</b> NA
<b>Borehole Position:</b> See Site Sketch	<b>Drilling Method:</b> Power Auger
<b>Surface Elevation:</b> Existing Surface Level	<b>Drill Bit:</b> 100mm Ø TC

Depth (m)	Graphic Symbol	Group Symbol	Soil Description (AS 1726)	Consistency / Relative Density / Rock Strength	DCP Blows / 100mm	Test Sample		
Cone Tip								
0.0		CH	Silty CLAY, NATURAL: (topsoil) black, high plasticity, medium dry strength, dry to moist.	Soft	1	Disturbed		
0.1					1			
0.2		CH		Silty CLAY, NATURAL: mottled black/brown high plasticity, high dry strength, moist.	Soft	1		
0.3					to	1		
0.4					Firm	1		
0.5						2		Disturbed
0.6						2		
0.7						2		
0.8						2		
0.9						1		Disturbed
1.0					1			
1.1		CH	Silty CLAY, NATURAL: ('pug') black, high plasticity, high dry strength, moist.	Soft	1			
1.2				to	1			
1.3				Stiff	1			
1.4					1	Disturbed		
1.5					1			
1.6					2			
1.7					3			
1.8					3	Disturbed		
1.9					3			
2.0					3			
2.1					4			
2.2					Stopped			
2.3								
2.4								
2.5			DRILLING TERMINATED: target depth reached.					
2.6								
2.7								
2.8								
2.9								
3.0								
3.1								
3.2								
3.3								
3.4								
3.5								
3.6								
3.7								
3.8								
3.9								
4.0								
4.1								
4.2								
4.3								
4.4								
4.5								
4.6								
4.7								
4.8								
4.9								
5.0								





## BOREHOLE LOG SHEET - 2

<b>Client:</b> Byron Shire Council	<b>ASCT Ref No:</b> H19-1331
<b>Project:</b> - Dingo Lane, Myocum	<b>Client Ref No:</b> NA
<b>Borehole Position:</b> See Site Sketch	<b>Drilling Method:</b> Power Auger
<b>Surface Elevation:</b> Existing Surface Level	<b>Drill Bit:</b> 100mm Ø TC

Depth (m)	Graphic Symbol	Group Symbol	Soil Description (AS 1726)	Consistency / Relative Density / Rock Strength	DCP Blows / 100mm	Test Sample	
Cone Tip							
0.0		CH	Silty CLAY, NATURAL: (topsoil) black, high plasticity, medium dry strength, dry to moist.	Stiff	3	Disturbed	
0.1					2		
0.2		CH		Silty CLAY, NATURAL: mottled black/brown high plasticity, high dry strength, moist.	Firm to Soft	2	
0.3					1		
0.4					2		
0.5					2	U50 Tube	
0.6					1		
0.7					1		
0.8					2		
0.9					2		
1.0			1		Disturbed		
1.1		CH	Silty CLAY, NATURAL ('pug'): black, high plasticity, high dry strength, moist.		Soft to Stiff	1	
1.2				1			
1.3				1			
1.4				1			
1.5				1	Disturbed		
1.6				1			
1.7				1			
1.8				2			
1.9				2			
2.0				3	Disturbed		
2.1			3				
2.2			4				
2.3			Stopped				
2.4							
2.5		DRILLING TERMINATED: target depth reached.			Disturbed		
2.6							
2.7							
2.8							
2.9							
3.0							
3.1							
3.2							
3.3							
3.4							
3.5							
3.6							
3.7							
3.8							
3.9							
4.0							
4.1							
4.2							
4.3							
4.4							
4.5							
4.6							
4.7							
4.8							
4.9							
5.0							

## BOREHOLE LOG SHEET - 3

<b>Client:</b> Byron Shire Council	<b>ASCT Ref No:</b> H19-1331
<b>Project:</b> - Dingo Lane, Myocum	<b>Client Ref No:</b> NA
<b>Borehole Position:</b> See Site Sketch	<b>Drilling Method:</b> Power Auger
<b>Surface Elevation:</b> Existing Surface Level	<b>Drill Bit:</b> 100mm Ø TC

Depth (m)	Graphic Symbol	Group Symbol	Soil Description (AS 1726)	Consistency / Relative Density / Rock Strength	DCP Blows / 100mm	Test Sample			
Cone Tip									
0.0			<b>Silty CLAY, NATURAL: (topsoil)</b> dark brown, high plasticity, high dry strength, moist	Stiff	1	Disturbed			
0.1					2				
0.2					4				
0.3					4				
0.4					XW	<b>Silty CLAY, NATURAL:</b> brown, high plasticity, high dry strength, moist	Very Stiff	5	Disturbed
0.5								4	
0.6								4	
0.7								5	
0.8							5	Disturbed	
0.9							5		
1.0							6		
1.1							5		
1.2							5		
1.3							6		
1.4	XW	<b>Silty CLAY, NATURAL: (extremely weathered rock),</b> mottled orange brown/grey, medium plasticity, medium dry strength, trace sand, moist.	Very Stiff	5	Disturbed				
1.5				5					
1.6				4					
1.7				4					
1.8			Stiff to Very Stiff	6	Disturbed				
1.9				6					
2.0				Stopped					
2.1									
2.2									
2.3									
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
3.0									
3.1									
3.2									
3.3									
3.4									
3.5									
3.6									
3.7									
3.8									
3.9									
4.0									
4.1									
4.2									
4.3									
4.4									
4.5									
4.6									
4.7									
4.8									
4.9									
5.0									

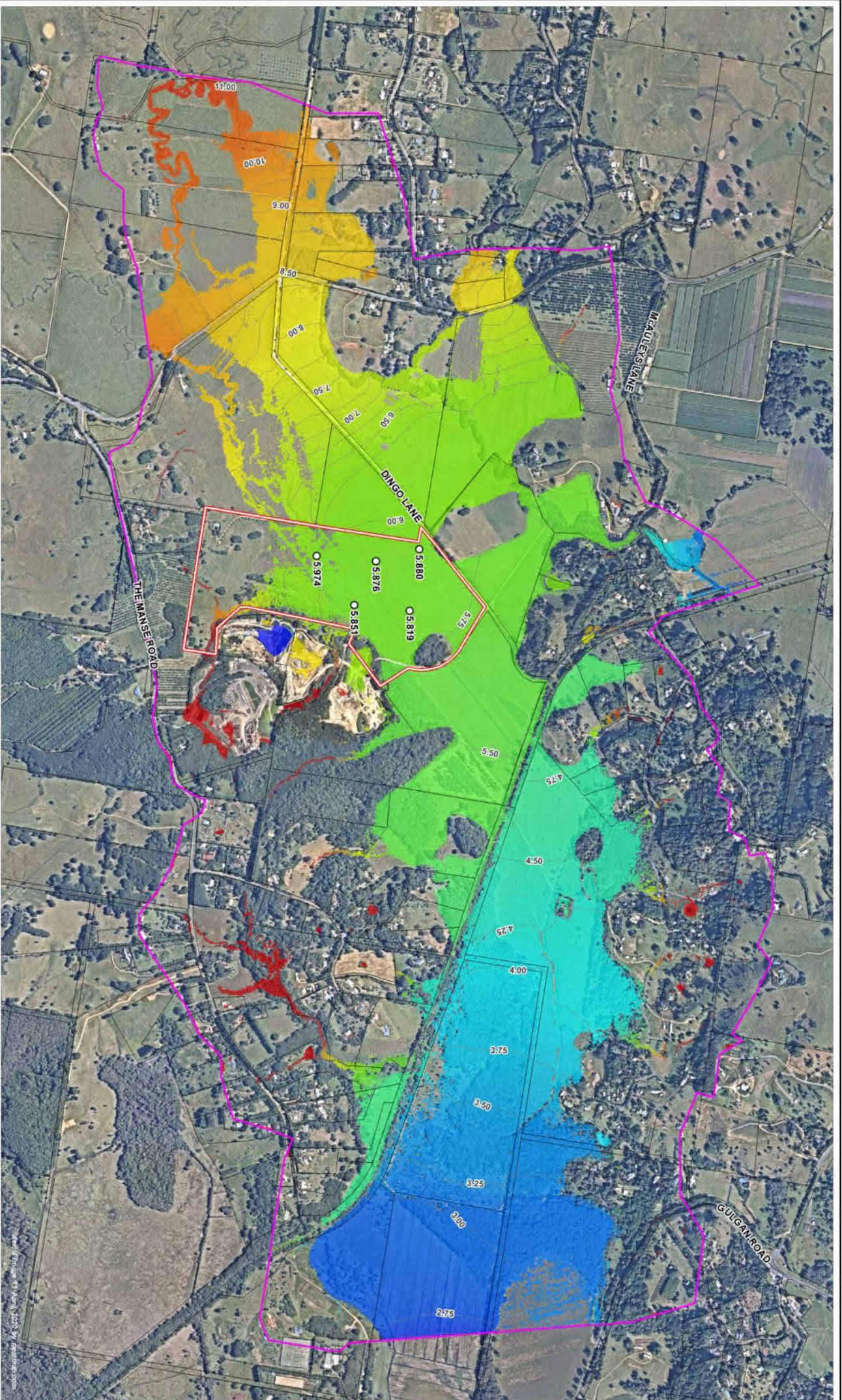


## Appendix E

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### BMT 1% AEP Flood Mapping





# LEGEND

- Project Site
- Reporting Points (Level mAHd)
- Model Extent
- Cadastral Boundaries
- Flood Level Contours (0.25m intervals)
- Flood Level (mAHd)

Title: 1 in 100 AEP Water Level

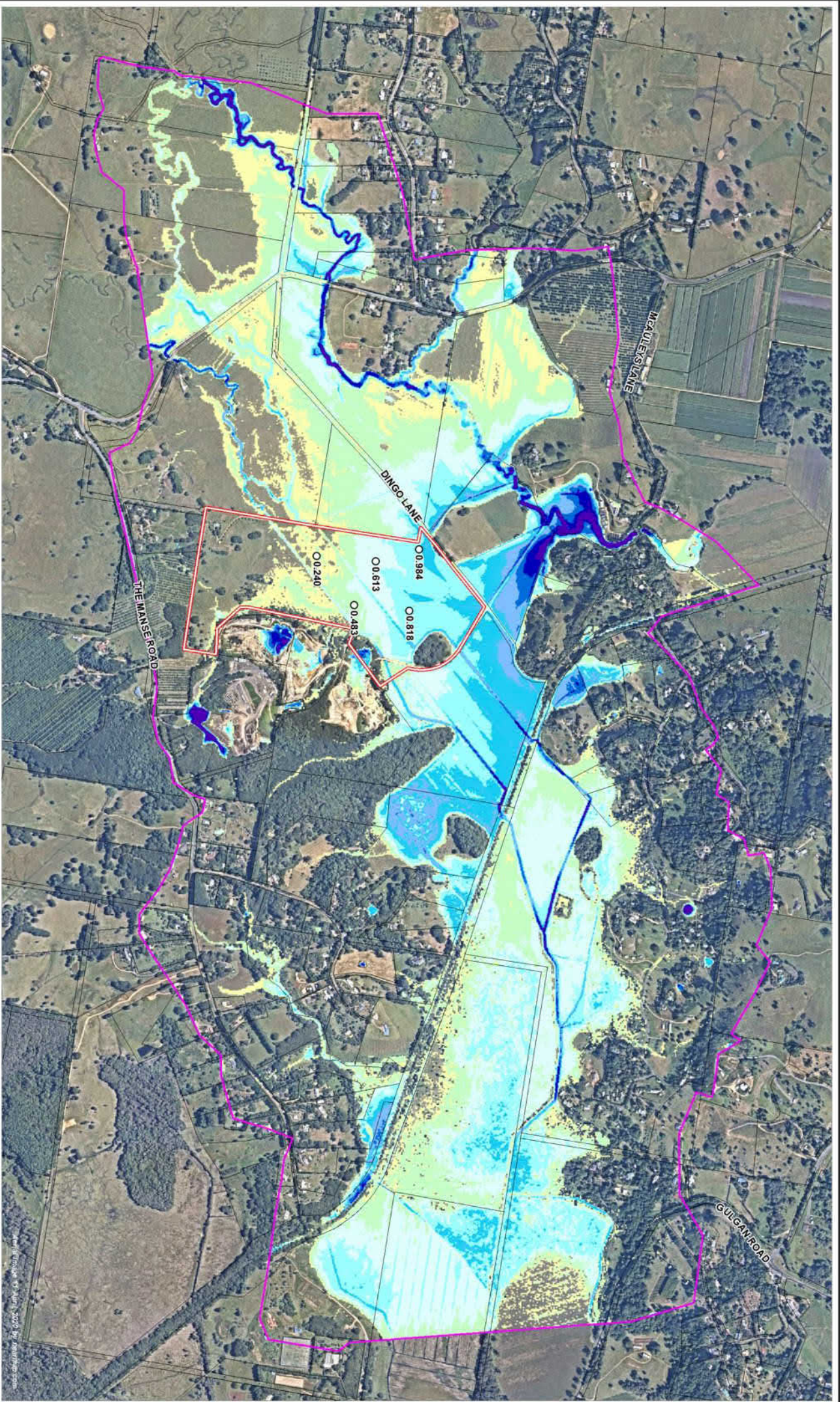
Figure: C-1 Rev: A

BMF endeavours to ensure that the information provided in this map is correct at the time of publication. BMF does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

Filepath: H:\B240851\ref\_Dingo\_SolarFarm\B240851\_001\_200706\_WaterLevel\_100AEP.MXD







# LEGEND

- Project Site
  - Reporting Points (Depth m/s)
  - Model Extent
  - Cadastral Boundaries
- Peak Flood Depth (m)
- |              |              |
|--------------|--------------|
| 0.00 to 0.25 | 1.25 to 1.50 |
| 0.25 to 0.50 | 1.50 to 1.75 |
| 0.50 to 0.75 | 1.75 to 2.00 |
| 0.75 to 1.00 | 2.00 to 5.00 |
| 1.00 to 1.25 | > 5.00       |

Title: 1 in 100 AEP Depth

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Filepath: I:\B240851\ref\_Dingo\_SolarFarm\BRC\FLD\_002\_200706\_WaterDepth\_100AEP.WOR

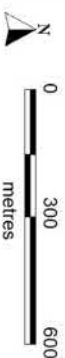
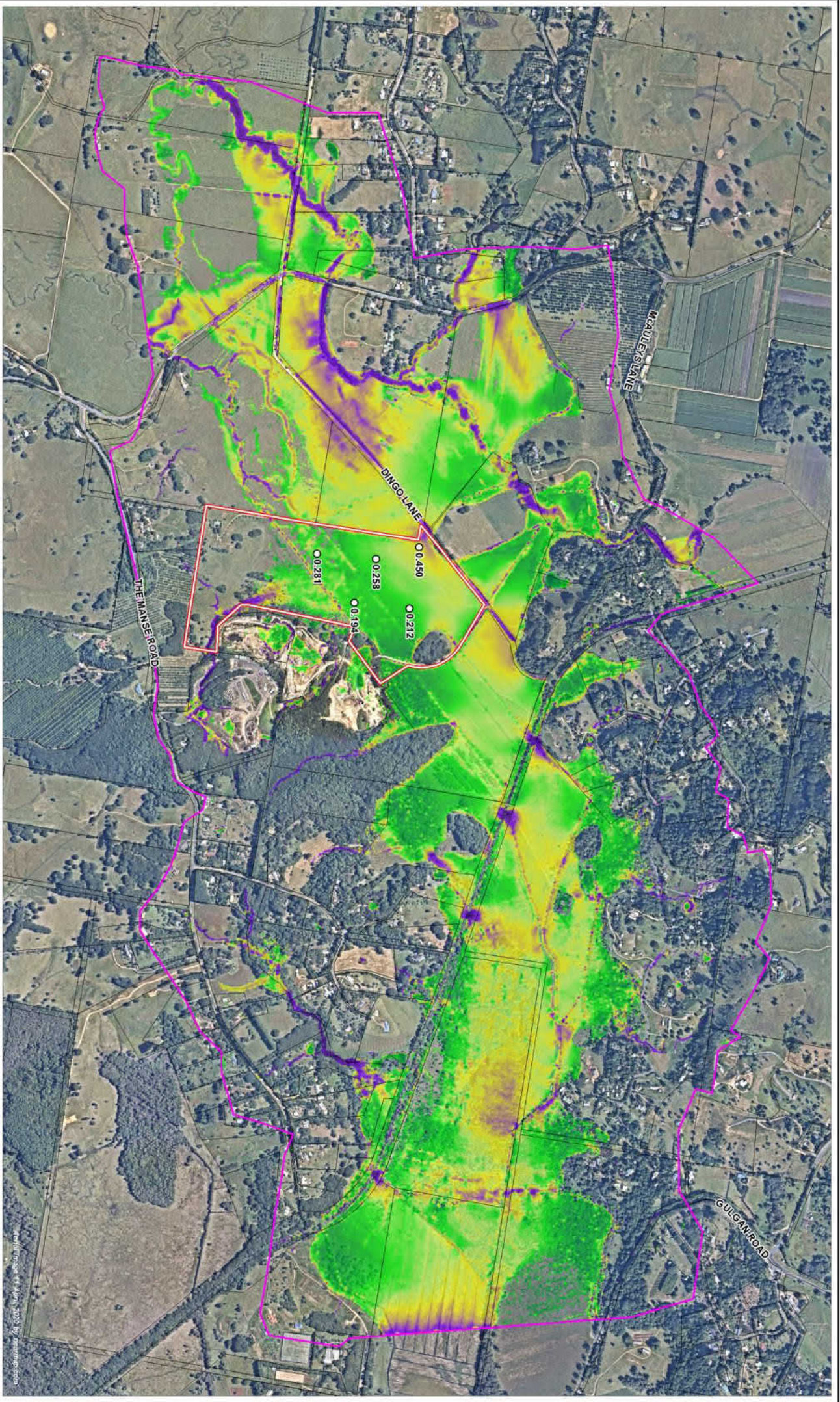


Figure: C-2 Rev: A

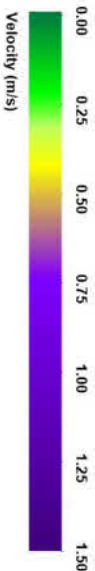






# LEGEND

- Project Site
- Reporting Points (Velocity m/s)
- Model Extent
- Cadastral Boundaries



Title:  
**1 in 100 AEP Velocity**

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Filepath: I:\B240851\rel\_Dingo\_SolarFarm\DRG\FLD\_003\_200706\_Velocity\_100AEP.WOR

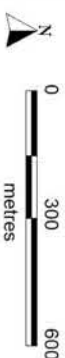


Figure:  
**C-3**

Rev:  
**A**

