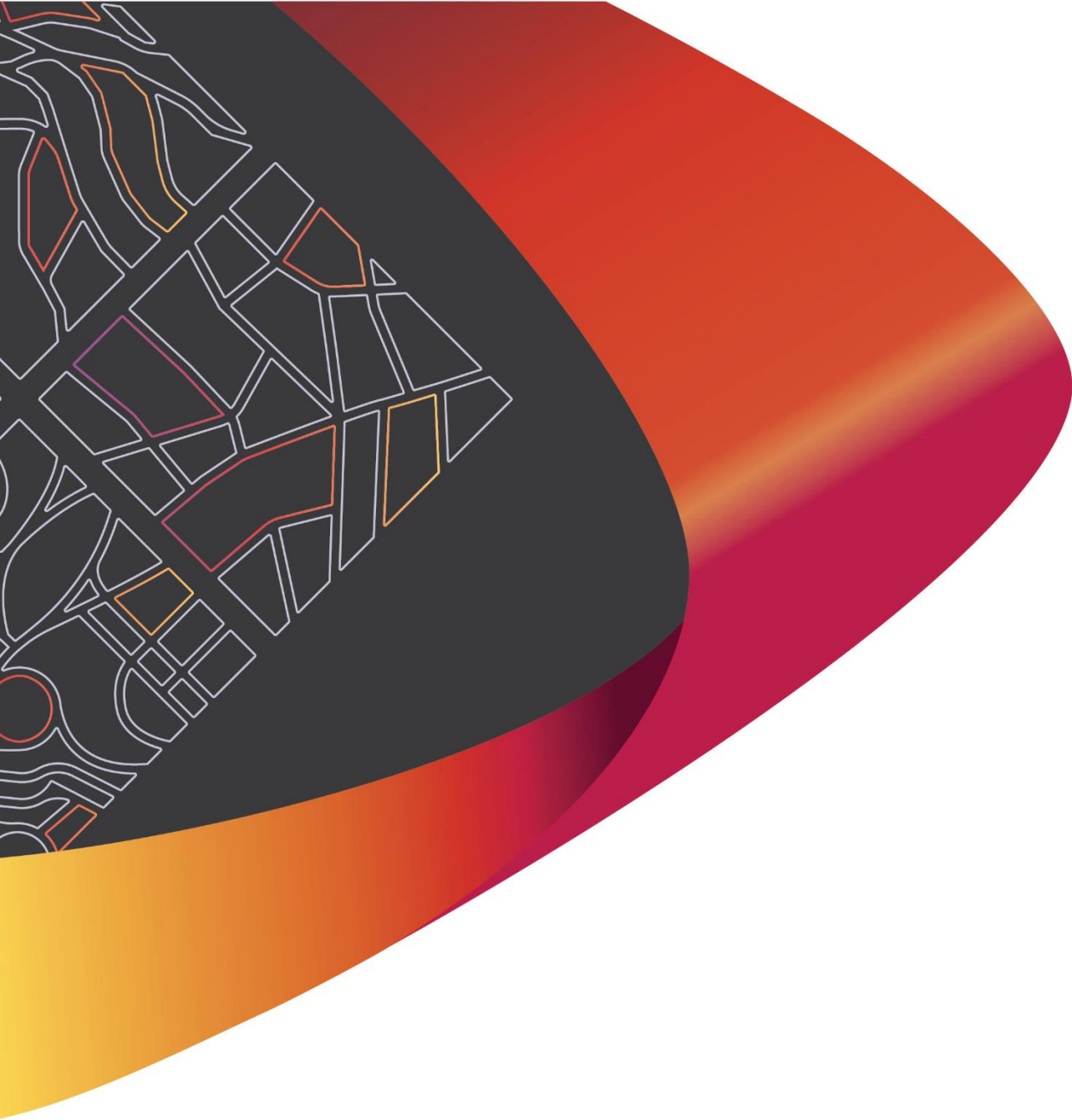




Flood Impact Assessment Finley BESS

BESS Pacific Pty Ltd

P001993 - FIA

Rev: A

5 February 2026



Premise

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ABBREVIATIONS

Abbreviation	Abbreviated term
ARF	Areal Reduction Factor
BESS	Battery Energy Storage System
BoM	Bureau of Meteorology
CEMP	Construction Environmental Management Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEM	Digital Elevation Model
EAf	elevation adjustment factor
EIS	Environmental Impact Statement
FIA	Flood Impact Assessment
GSDM	Generalised Short-Duration Method
IFD	Intensity–Frequency–Duration
MAF	moisture adjustment factor
OEMP	Operational Environmental Management Plan
PMF	Probable Maximum Flood
PMP	Probable Maximum Precipitation
SEARs	Secretary's Environmental Assessment Requirements
SES	State Emergency Services
TfNSW	Transport for NSW
WIA	Water Impact Assessment
WBNM	Watershed Bounded Network Model

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EXECUTIVE SUMMARY

Premise Australia Pty Ltd (Premise) has been engaged by BESS Pacific Pty Ltd to prepare a standalone Flood Impact Assessment (FIA) for the proposed Finley Battery Energy Storage System (BESS), located within Lot 3 DP740920 (private land under agreement by the proponent), Lot B DP961693 (Transgrid Finley substation) and associated road reserves at Canalla Road and Broockmanns Road, Finley, NSW.

This FIA has been prepared in response to comments received from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) on the Water Impact Assessment submitted as part of the exhibited Environmental Impact Statement (EIS) and has been undertaken in accordance with Flood Risk Management Guideline LU01 (NSW Government, 2023).

The proposed development comprises a 100 MW_{AC} / 200 MWh containerised lithium-ion battery energy storage facility, associated electrical infrastructure, underground cabling to the Transgrid Finley substation, internal access tracks and upgraded site access arrangements. A refinement to the development site was identified post-exhibition to accommodate intersection upgrade works at Riverina Highway / Canalla Road / Marantellis Road; however, no changes are proposed to the location or footprint of the BESS infrastructure itself.

A comprehensive flood assessment was undertaken using industry-standard hydrologic and hydraulic modelling tools. Catchment rainfall-runoff processes were simulated using the DRAINS modelling platform in accordance with Australian Rainfall and Runoff (ARR) 2019, while two-dimensional hydraulic modelling was undertaken using TUFLOW. Design flood events assessed include the 5%, 1%, 0.5% and 0.2% Annual Exceedance Probability (AEP) events, as well as the Probable Maximum Flood (PMF). Climate change sensitivity testing and cumulative impact scenarios incorporating nearby approved BESS developments were also assessed.

The modelling results indicate that the proposed Finley BESS will have negligible impacts on local and regional flood behaviour. Across all assessed design events, including the PMF, changes in maximum flood levels between pre- and post-development conditions are generally less than 10 mm, and changes in flood velocities are less than 0.1 m/s. Localised changes in flood behaviour are limited to the immediate vicinity of the raised BESS infrastructure platforms and internal drainage paths. These changes do not adversely affect flood conveyance, flood storage, or flood risk to surrounding land. Peak flow analysis confirms that flows within the broader catchment and along key overland flow paths remain effectively unchanged following development.

Flood function and flood hazard mapping demonstrates that the development site is predominantly located within the flood fringe, with low flood hazard classifications (generally H1) for the assessed AEP events. Higher hazard classifications identified during the PMF event are consistent with existing conditions and reflect the extreme nature of that event. The proposed development does not increase flood hazard categories on adjacent land.

Climate change assessments for future horizons under both RCP4.5 and RCP8.5 scenarios indicate only marginal increases in flood levels and velocities, with changes remaining negligible and not materially altering flood risk outcomes for the site or surrounding areas.

Cumulative impact modelling incorporating the adjacent Berrigan BESS and South Coree BESS developments demonstrates that combined impacts remain minor. Predicted increases in flood levels under cumulative post-development conditions are generally less than 0.2 m for extreme events and are not considered to result in unacceptable floodplain impacts.



Based on the outcomes of this assessment, the proposed Finley BESS is considered hydraulically feasible and acceptable from a flood risk perspective.

Recommendations

To ensure ongoing compliance with best-practice floodplain management, it is recommended that:

- > The BESS infrastructure platforms continue to be constructed at the modelled raised levels to maintain flood conveyance and minimise localised impacts.
- > Detailed civil and drainage design remains consistent with the modelled development layout and levels assessed in this report.
- > Finished surface levels and access routes are designed to maintain safe flood behaviour during major and extreme flood events, where practicable.
- > Any future changes to site layout, platform levels or surrounding land use are reviewed to confirm consistency with the flood modelling assumptions.
- > The CEMP and OEMP shall include procedures to incorporate flood risk awareness, evacuation protocols, and weather and flood warning monitoring into site inductions and relevant management plans, and to suspend site activities during forecast or active flood events in accordance with advice from the Bureau of Meteorology and NSW State Emergency Service.



1. INTRODUCTION

1.1 Background

Premise Australia Pty Ltd (Premise) was engaged by BESS Pacific Pty Ltd to prepare the Environmental Impact Statement (EIS) in accordance with the Planning Secretary's Environmental Assessment Requirements (SEARs) issued on 18 July 2024. As part of the EIS, a Water Impact Assessment (WIA) was prepared and submitted to the Department on 17 April 2025.

In June 2025, the Department of Climate Change, Energy, the Environment and Water (DCCEEW) and NSW State Emergency Services (SES) provided comments on the WIA. Following discussions with each agency regarding the flood assessment component, this standalone Flood Impact Assessment (FIA) report has been prepared to address the issues raised and to provide additional assessment of potential flood impacts associated with the proposed development, in accordance with Flood Risk Management Guideline LU01.

1.2 Project Area

BESS Pacific Pty Ltd seeks to develop a 100-Megawatt (MW_{AC}) / 200 Megawatt Hour (MWh) Battery Energy Storage System (BESS) impacting land within Lot 3 DP740920 (private land under agreement by the proponent), Lot B DP961693 (Transgrid Finley substation) and the road reserves of Canalla Road and Broockmanns Road, Finley. Collectively, this land was defined in the EIS as the 'development site' and comprised of an area of approximately 10.45 hectares (ha).

1.3 Proposed Development

The proposed Finley BESS, as assessed in the exhibited EIS, includes:

- > Installation of containerised lithium-ion phosphate batteries with a capacity of approximately 100 MW_{AC} / 200 MWh, with associated inverters, switchgear and a control building.
- > Underground transmission cable to connect the BESS to the Transgrid Finley substation approximately 480 metres in length;
- > Cabling and collector units, site office, storage area, internal access tracks, on-site parking, security fencing and temporary construction laydown area;
- > Construction of new heavy vehicle site access from Canalla Road and light vehicle accesses to Broockmanns Road; and
- > Intersection upgrades at Riverina Highway / Canalla Road / Marantellis Road intersection.

Following public exhibition of the EIS and subsequent engagement with Transport for NSW (TfNSW), a refinement to the proposal has been identified to accommodate intersection upgrade works at Riverina Highway / Canalla Road / Marantellis Road intersection, to ensure road safety and compliance with relevant Austroads design standards. This refinement is addressed in a separate Amendment Report outlining the proposed project amendment to be included within the development site. To facilitate the intersection upgrade works, the development site has been refined to include the additional area of approximately 1.83 ha of road and road reserve associated with the intersection upgrade. As refined, the development site now comprises approximately 12.28 ha.

Notably: No changes are proposed to the location, layout or extent of the BESS and substation infrastructure as assessed in the exhibited EIS; The additional land area relates solely to road intersection upgrade works in response to TfNSW; and the nature, scale and purpose of the Finley BESS remain unchanged.



- Legend**
- Development Site
 - Primary Site Access (Heavy Vehicle)
 - Lot
 - Road
 - Water Body
 - Watercourse
 - Existing Infrastructure**
 - Existing Substation
 - Existing Easement
 - Essential Energy OH
 - Essential Energy UG
 - Transgrid OH
 - Transgrid Optic Fibre
 - Essential Energy Pole
 - Transgrid Pit
 - Proposed Development**
 - Substation Switch Area
 - Internal Road
 - Temporary Facilities**
 - Car Parking
 - Laydown
 - Site Ofces
 - BESS Substation
 - BESS Buildings
 - Battery
 - Inverter
 - Gate
 - Fence
 - Screening Vegetation
 - Proposed UG Connection line
 - Watertank
 - CCTV Mast
 - BESS Lighting Mast



Finley BESS

Figure 1
Project Area Map

2. FLOOD IMPACT ASSESSMENT FRAMEWORK

2.1 Data Collection and Review

The following data and information were collected, reviewed, and used in the assessment:

- > Available site survey data
- > Hydrological data from Australian Rainfall and Runoff (ARR) data hub
- > Intensity–Frequency–Duration (IFD) design rainfall data from Bureau of Meteorology (BoM)
- > 5m Aerial LiDAR sourced from Geosciences Australia (Elvis Elevation and Depth Data)
- > Land use data from Department of Climate Change, Energy, the Environment and Water (DCCEEW) of New South Wales
- > Satellite images from Google Earth and aerial imagery by NSW Spatial Services Six Maps

2.2 Methodology

The key procedures adopted in the flood impact assessment are summarised below.

- > Collection and review of relevant hydrological data
- > Development of a 1 m resolution Digital Elevation Model (DEM) incorporating detailed site survey data
- > Delineation of the upstream catchment
- > Development of a hydrologic model using Drains software and conducting simulations to identify the critical storm durations and temporal patterns of design storm events
- > Preparation of design rainfall inputs for the 5% AEP, 1% AEP, 0.5% AEP, 0.2%AEP and PMF storm events, based on the identified critical duration and temporal patterns
- > Setup of a TUFLOW hydraulic model with an appropriately defined model domain
- > Simulation of flood characteristics for the design events under existing (pre-development) conditions using the hydraulic model
- > Updating the hydraulic model to reflect the proposed development (post-development) and conducting simulations for the design events; and
- > Preparation of flood maps for both pre- and post-development scenarios, and assessment of the potential impacts of the proposed development on flood behaviour.

2.3 Relevant Guidelines

Relevant guidelines and reference used in this assessment are:

- > Flood Impact and Risk Assessment: Flood Risk Management Guideline LU01 (DPE, 2022).
- > Flood Risk Management Manual: The policy and manual for the management of flood and liable land, (DPE, 2022).
- > The Estimation of Probable Maximum Precipitation in Australia: Generalised Short-Duration Method (GSDM), (BoM, 2003).

> Flood Function: Flood Risk Management Guideline FB02, (DPE, 2022).

The flood functions categories defined based on indicator techniques ($V \times D$ values) are shown in **Table 1**.

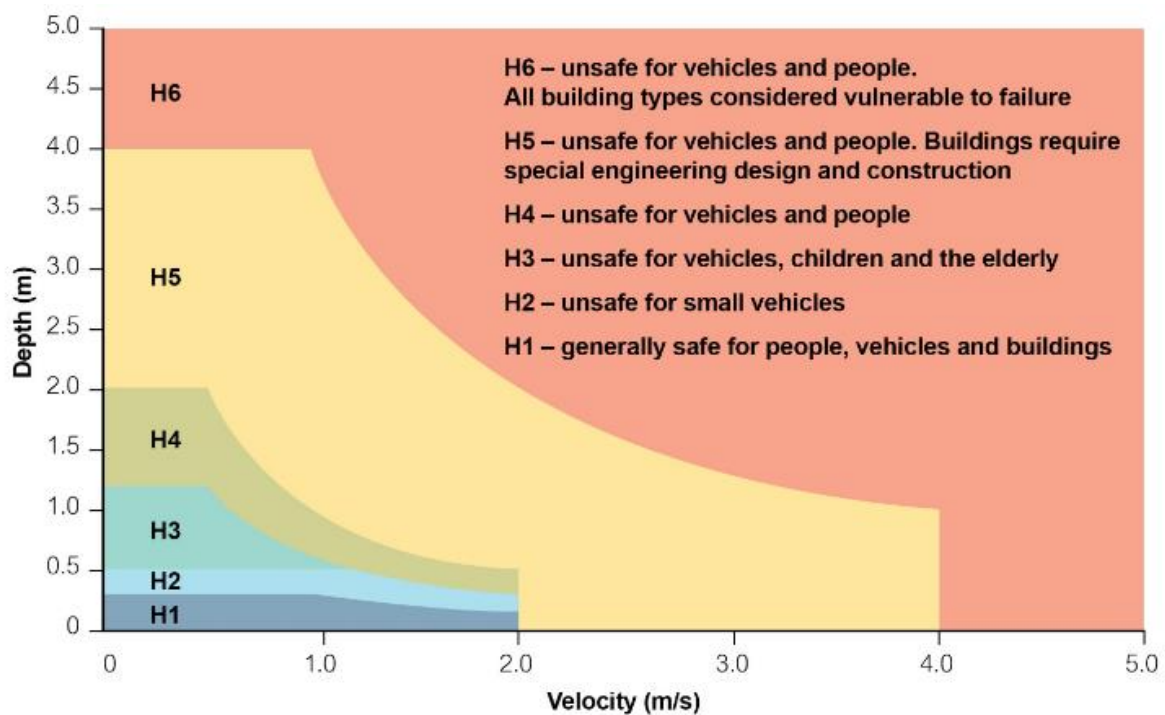
Table 1 – Flood Function Categories

Flood Function	Velocity x Depth
Flood Ways	0.0 – 0.2
Flood Storage Areas	0.2 – 0.5
Flood Fringe Areas	> 0.5

> Flood Hazard: Flood Risk Management Guideline FB03, (DPE, 2022).

Flood hazard categories defined in the guideline is provided in **Figure 2**

Figure 2 Flood Hazard Categories



3. HYDROLOGIC ASSESSMENT

3.1 Data from ARR Data Hub

Primary data and information obtained from the ARR Data Hub are provided in **Table 2 and Table 3**.

Table 2 - Summary of Data obtained from ARR Data Hub

Data	Value
Latitude &	-35.637872
Longitude	145.514056
River Region	Murray-Darling Basin
River Name	Murray Riverina
Initial Losses (IL)	24.0 mm
Temporal Patterns	Murray Basin (MB)
Preburst Depths and Ratios	Median

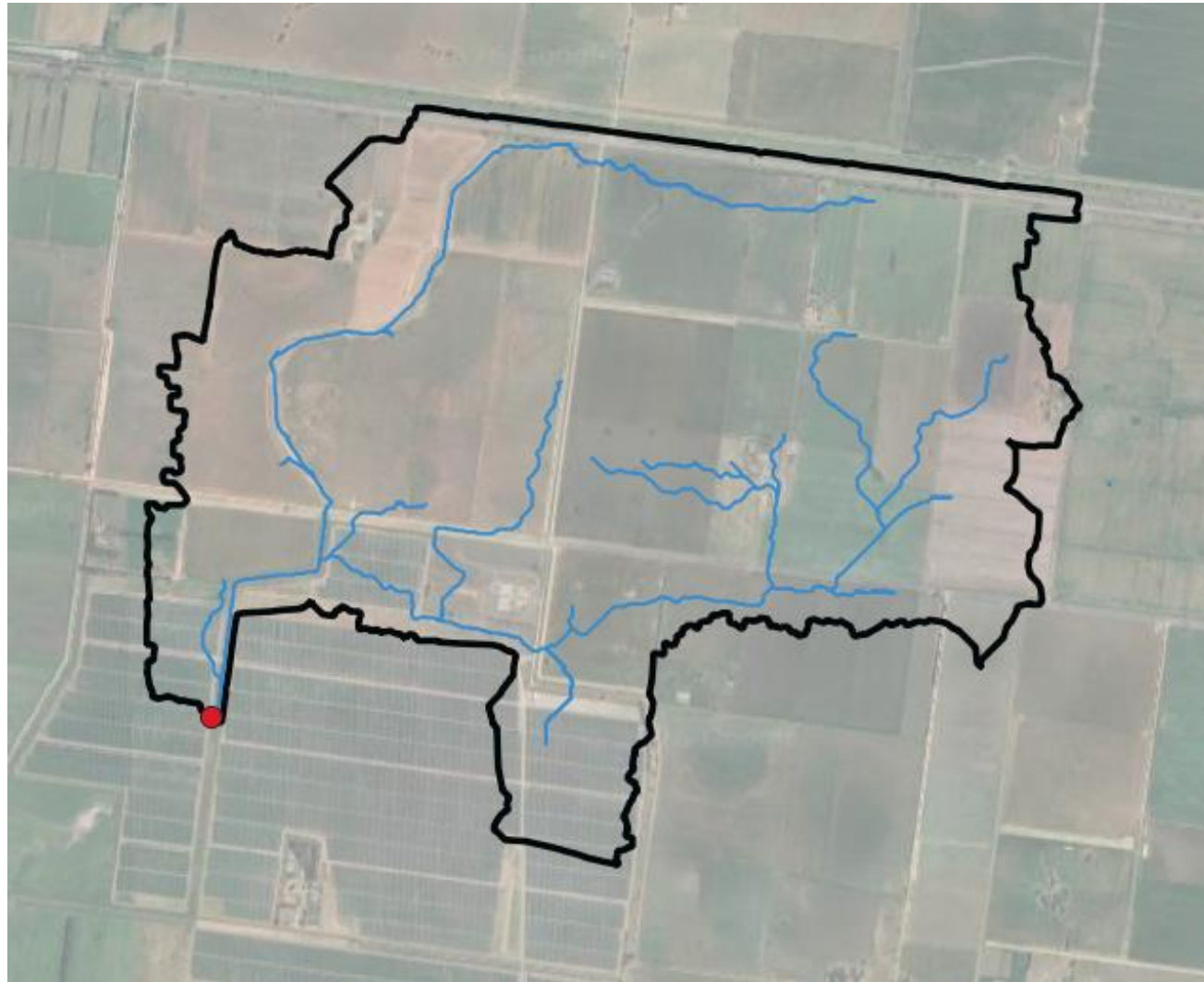
Table 3 – Areal Reduction Factors (ARF)

Parameter	Value
Zone	Southern Semi-arid
a	0.254
b	0.247
c	0.403
d	0.351
e	0.0013
f	0.302
g	0.058
h	0.0
i	0.00

3.2 Catchment Delineation

The relatively flat topography within and surrounding the project area limits the reliability of conventional terrain-based catchment delineation. Accordingly, an approximate catchment boundary was defined using the HEC-HMS software package, with the model outlet specified at the Goolam Road bridge. The study area is fully contained within the adopted catchment, which has an approximate area of 200 hectares (**Figure 3**).

Figure 3 Catchment Area



3.3 Hydrological Modelling

3.3.1 AEP DESIGN EVENTS

The following steps were undertaken as part of the hydrological modelling process to estimate the design rainfall distribution for the selected design events (5%, 1%, 0.5% and 0.2%). The results are summarised in **Table 4**.

- > A storage–routing hydrological model was developed for the delineated catchment using the WBNM (Watershed Bounded Network Model) approach within the DRAINS modelling package, in accordance with ARR 2019 recommendations.
- > The model was simulated for all AEP events to determine the critical storm duration and temporal pattern for each event.
- > The IFD burst depth corresponding to the critical duration was identified from the BoM design rainfall data.
- > The Event ID associated with the critical duration and temporal pattern of each event was identified.
- > The areal reduction factor (ARF) for each event and its critical duration was calculated following ARR 2019 guidelines and applied to derive the final design rainfall depth.
- > The final rainfall depth was distributed according to the selected Event ID to develop the design rainfall hyetograph.
- > The probability-neutral initial loss for each event and its corresponding critical duration was identified from ARR data.

Table 4 – Hydrological Modelling Results

Parameter	5% AEP Event	1% AEP Event	0.5% AEP Event	0.2% AEP Event
Critical Duration (hr)	3	6	3	3
Temporal Pattern	Storm 4	Storm 2	Storm 9	Storm 9
IFD Burst Depth (mm)	52.4	86.6	80.2	91.3
Event ID	3983	4031	3966	3966
ARF	0.9550	0.9659	0.9349	0.9249
Probability Neutral Burst Initial Loss (mm)	11.1	7.2	7.2	7.2

3.3.2 PMF EVENT

Based on the methods recommended by the Bureau of Meteorology (BoM) in Design Rainfalls: Water Information, the Generalised Short-Duration Method (GSDM) was adopted to estimate the Probable Maximum Precipitation (PMP) for the catchment at the Goolma Road bridge. The catchment lies within the intermediate zone, and the PMP duration limit was interpolated to be 3 hours.

The GSDM estimation, as outlined in Appendix 1 (GSDM Calculation Sheet) of the BoM guideline, is presented in **Table 5**. The following parameters and assumptions were applied in accordance with the BoM methodology:

- > Based on catchment topography, 100% of the area was classified as smooth (S) and 0% as rough (R).

- > As the maximum elevation of the catchment is below 1500 m AHD, the elevation adjustment factor (EAF) was taken as 1.0.
- > From Figure 3 of the guideline, the moisture adjustment factor (MAF) was estimated to be 0.65.
- > From Figure 4 of the guideline, the initial depths for both the smooth (D_s) and rough (D_R) categories were obtained for a catchment area of 5.678km² for durations up to 3 hours.
- > The PMP depths for each duration were then calculated using the PMP estimation equation.
- > The estimated PMP values were rounded to the nearest 10 mm.
- > For this study, the 3-hour PMP depth was adopted and temporally distributed as per Figure 5 of the guideline to develop the hyetograph for the PMP event.

Table 5 - GSDM Calculation

Location Information				
Catchment Area: 5.67 km ²				
Duration Limit: 3 hrs				
Latitude: -35.637872				
Longitude: 145.514056				
Portion of Area Considered: Smooth, S = 1.0 (0.0 - 1.0) Rough, R = 0.0 (0.0 - 1.0)				
Elevation Adjustment Factor (EAF)				
Mean Elevation: 160.00 m				
Adjustment for Elevation (-0.05 per 300m above 1500m): NA				
EAF = 1.00 (0.85 - 1.00)				
Moisture Adjustment Factor (MAF)				
MAF = 0.65 (0.40 - 1.00)				
PMP Values (mm)				
Duration (hours)	Initial Depth - Smooth (DS)	Initial Depth - Rough (DR)	PMP Estimate = (DS x S + DR x R) x MAF x EAF	Rounded PMP Estimate (nearest 10 mm)
0.25	225	225	146.3	150
0.5	325	255	211.3	210
0.75	410	320	266.5	270
1.0	480	390	312.0	310
1.5	545	615	354.3	350
2.0	610	720	396.5	400
2.5	650	795	422.5	420
3.0	680	870	442.0	440

4. FLOOD MODELLING

4.1 Model Development

A rain-on-grid TUFLOW hydraulic model was developed for the entire catchment using a 2 m grid resolution. The following input files were prepared for model simulations:

- > Geometry control file;
- > Boundary control file; and
- > Time control file.

These files were supported by sub-files containing topographic data (DEM), rainfall inputs and land use. For each design storm event, probability-neutral burst initial losses and continuing losses were applied. Land use information was defined through material ID files, and the corresponding Manning's roughness coefficients were assigned based on the land use classification. The adopted roughness values used in the hydraulic model are presented in **Table 6**.

Table 6 - Manning's n Values

Land Use	Values
Residential Areas (Low Density)	0.100
Roads	0.022
Water Sources	0.030
Pasture/Farms	0.040
Open pervious areas, minimal vegetation (Grassed)	0.045
Open pervious areas, moderate vegetation (Shrubs)	0.060
Open pervious areas, thick vegetation (Trees)	0.090

4.2 Model Simulation Scenarios

Flood modelling was undertaken for three scenarios. The representation of each scenario and the design events modelled under each are summarised in **Table 7**.

Table 7 – Model Simulation Scenarios

Scenario	Description	Simulated Events
Pre-Development	> Represents the existing site condition via the developed DEM	5%, 1%, 0.5%, 0.2% AEP Events and PMF
Post-Development	> The DEM was modified to represent the development footprints of the batteries, inverters, BESS building, and switch area. > It was assumed that these development footprints would be raised by 3 m, and the DEM ground levels within the identified areas were adjusted accordingly	5%, 1%, 0.5%, 0.2% AEP Events and PMF

Scenario	Description	Simulated Events
	> Development footprint modified for Finley BESS is shown in Figure 4	
Cumulative Post-Development	> The post-development DEM was modified to incorporate the footprints of the two adjacent developments, the Berrigan BESS and the South Coree BESS. The adjacent BESS footprints were assumed to be raised by 3 m, and the post-development DEM was adjusted accordingly. > Development footprint modified for adjacent projects are shown in Figure 4	5%, 1%, AEP Events and PMF

Figure 4 Post Development Modifications



5. MODEL RESULTS AND ASSESSMENT

5.1 Pre-Development Scenario Results

Pre-development simulation results for maximum flood depth and flood level for the modelled design events are provided in the **Appendix A**. Flood depths less than 10 mm were considered negligible for flood mapping. Key observations of each design event are summarised in **Table 8**.

Table 8 – Maximum Flood Depth and Flood Level (Pre Development)

Design Event	Flood Depth	Flood Level
5% AEP Event	> Flood depths across the development site range from 10 mm to 500 mm, with approximately 20% of the proposed BESS area experiencing flood depths between 200 mm and 500 mm > Maximum flood depths of approximately 500 mm are predicted along Brookmanns Road and Canalla Road near their intersection	> Flood level across the development site range from 107.0 m AHD 109.5 m AHD, with the entire proposed development area experiencing maximum flood level up to 108.0 m AHD
1% AEP Event	> Flood depths across the development site range from 10 mm to 500 mm, with approximately more than 90% of the proposed BESS area experiencing flood depths between 200 mm and 500 mm > Maximum flood depths of approximately 500 mm are predicted along Brookmanns Road and Canalla Road near their intersection	> Flood level across the development site range from 107.0 m AHD 109.5 m AHD, with the entire proposed development area experiencing maximum flood level up to 108.0 m AHD
0.5% AEP Event	> Flood depths across the development site range from 10 mm to 500 mm, with approximately more than 90% of the proposed BESS area experiencing flood depths between 200 mm and 500 mm > Maximum flood depths of approximately 500 mm are predicted along Brookmanns Road and Canalla Road near their intersection	> Flood level across the development site range from 107.0 m AHD 109.5 m AHD, with the entire proposed development area experiencing maximum flood level up to 108.0 m AHD
0.2% AEP Event	> Flood depths across the development site range from 10 mm to 500 mm, with approximately more than 90% of the proposed BESS area experiencing flood depths between 200 mm and 500 mm > Maximum flood depths of approximately 500 mm are predicted along Brookmanns Road and Canalla Road near their intersection	> Flood level across the development site range from 107.0 m AHD 109.5 m AHD, with the entire proposed development area experiencing maximum flood level up to 108.0 m AHD
PMF	> Flood depths across the development site range from 10 mm to 100 cm (1m), with approximately more than 90% of the proposed BESS area	> Flood level across the development site range from 107.0 m AHD 109.5 m AHD, with the

Design Event	Flood Depth	Flood Level
	experiencing flood depths between 50 cm and 100 cm > Maximum flood depths of approximately 100 cm are predicted along Brookmanns Road and Canalla Road near their intersection	entire proposed development area experiencing maximum flood level up to 108.5 m AHD

Pre-development simulation results for maximum flood velocity, flood function and flood hazard for the modelled design events are provided in the **Appendix A**. Key observations of each design event are summarised in **Table 9**.

Table 9 – Maximum Flood Velocity, Flood Function and Flood Hazard (Pre Development)

Design Event	Flood Velocity	Flood Function	Flood Hazard
5% AEP Event	> The maximum flood velocity across the development site is generally less than 0.1 m/s.	> The entire development site is categorised as being within the flood fringe area	> In general, the flood hazard category across the development site is H1
1% AEP Event	> The maximum flood velocity across the development site is generally less than 0.1 m/s.	> The entire development site is categorised as being within the flood fringe area	> In general, the flood hazard category across the development site is H1
PMF	> The maximum flood velocity across the development site is generally less than 0.25 m/s.	> The entire development site is categorised as being within the flood fringe area	> the flood hazard category across the development site ranges from H1 – H3.

5.2 Post-Development Scenario Results

Post-development model results showing maximum flood depth and flood level for the simulated design events are presented in **Appendix B**. Flood depths less than 10 mm were considered negligible for flood mapping. Flood depths and levels within the post-development BESS area were not defined, as mapping these areas would not be representative of actual flood behaviour due to the assumed raising of the post-development BESS area.

Key observations of each design event are summarised in **Table 10**.

Table 10 – Maximum Flood Depth and Flood Level (Pre Development)

Design Event	Flood Depth	Flood Level
5% AEP Event	> Flood depths across the development site range from 10 mm to 500 mm, with approximately 20% of the proposed BESS area experiencing flood depths between 200 mm and 500 mm > Maximum flood depths of approximately 500 mm are predicted along Brookmanns Road and Canalla Road near their intersection	> Flood level across the development site range from 107.0 m AHD 109.5 m AHD, with the entire proposed development area experiencing maximum flood level up to 108.0 m AHD
1% AEP Event	> Flood depths across the development site range from 10 mm to 500 mm, with approximately more than 90% of the proposed BESS area experiencing flood depths between 200 mm and 500 mm > Maximum flood depths of approximately 500 mm are predicted along Brookmanns Road and Canalla Road near their intersection	> Flood level across the development site range from 107.0 m AHD 109.5 m AHD, with the entire proposed development area experiencing maximum flood level up to 108.0 m AHD
0.5% AEP Event	> Flood depths across the development site range from 10 mm to 500 mm, with approximately more than 90% of the proposed BESS area experiencing flood depths between 200 mm and 500 mm > Maximum flood depths of approximately 500 mm are predicted along Brookmanns Road and Canalla Road near their intersection	> Flood level across the development site range from 107.0 m AHD 109.5 m AHD, with the entire proposed development area experiencing maximum flood level up to 108.0 m AHD
0.2% AEP Event	> Flood depths across the development site range from 10 mm to 500 mm, with approximately more than 90% of the proposed BESS area experiencing flood depths between 200 mm and 500 mm > Maximum flood depths of approximately 500 mm are predicted along Brookmanns Road and Canalla Road near their intersection	> Flood level across the development site range from 107.0 m AHD 109.5 m AHD, with the entire proposed development area experiencing maximum flood level up to 108.0 m AHD
PMF	> Flood depths across the development site range from 10 mm to 100 cm (1m), with approximately more than 90% of the proposed BESS area experiencing flood depths between 50 cm and 100 cm > Maximum flood depths of approximately 100 cm are predicted along Brookmanns Road and Canalla Road near their intersection	> Flood level across the development site range from 107.0 m AHD 109.5 m AHD, with the entire proposed development area experiencing maximum flood level up to 108.0 m AHD

*Flood depth and levels within the proposed development BESS area were not considered in the assessment

Post-development simulation results for maximum flood velocity, flood function and flood hazard for the modelled design events are provided in the **Appendix B**. Key observations of each design event are summarised in **Table 11**.

Table 11 – Maximum Flood Velocity, Flood Function and Flood Hazard (Pre Development)

Design Event	Maximum Flood Velocity	Flood Function	Flood Hazard
5% AEP Event	> The maximum flood velocity across the development site is generally less than 0.1 m/s. > Localised increases in velocity are observed around the BESS area; however, these are minor and are not expected to cause erosion on the site or on adjacent properties	> The entire development site is categorised as being within the flood fringe area	> In general, the flood hazard category across the development site is H1
1% AEP Event	> The maximum flood velocity across the development site is generally less than 0.1 m/s. > Localised increases in velocity are observed around the BESS area; however, these are minor and are not expected to cause erosion on the site or on adjacent properties	> The entire development site is categorised as being within the flood fringe area	> In general, the flood hazard category across the development site is H1
PMF	> The maximum flood velocity across the development site is generally less than 0.25 m/s. > Localised increases in velocity are observed around the BESS area; however, these are minor and are not expected to cause erosion on the site or on adjacent properties	> The entire development site is categorised as being within the flood fringe area	> the flood hazard category across the development site ranges from H1 – H3.

5.3 Impact Assessment

5.3.1 CHANGES IN FLOOD LEVEL

Changes in maximum flood levels between the pre-development and post-development conditions for the 5% AEP, 1% AEP and PMF events are presented in **Figure 5**, **Figure 6** and **Figure 7** respectively. The results indicate that flood level changes across all scenarios are less than 10 mm, which is considered minimal and negligible.

5.3.2 CHANGES IN FLOOD VELOCITY

Changes in maximum flood velocities between the pre-development and post-development conditions for the 5% AEP, 1% AEP and PMF events are presented in **Figure 8**, **Figure 9** and **Figure 10** respectively. The results indicate that flood velocity changes across all scenarios are less than 0.1 m/s, which is considered minimal and negligible.

5.3.3 CLIMATE CHANGE IMPACTS

In accordance with the Flood Risk Management Guideline, the 0.5% and 0.2% AEP events are adopted as reasonable proxies for the projected change in the 1% AEP event under future flood-producing rainfall conditions associated with RCP4.5 and RCP8.5 scenarios in 2090, respectively. Accordingly, climate change impacts have been assessed using these post development proxy events.

Changes in flood level due to climate change under RCP4.5 and RCP8.5 at 2090 are provided in **Figure 11** and **Figure 12** respectively. The results indicate that flood level changes across all scenarios are less than 10 mm, which is considered minimal and negligible.

Changes in flood velocity due to climate change under RCP4.5 and RCP8.5 at 2090 are provided in **Figure 13** and **Figure 14** respectively. The results indicate that flood velocity changes across all scenarios are less than 0.1 m/s, which is considered minimal and negligible.

5.3.4 CUMULATIVE IMPACTS

Changes in maximum flood levels between the pre-development and cumulative post-development conditions for the 5% AEP, 1% AEP and PMF events are presented in **Figure 15**, **Figure 16** and **Figure 17** respectively.

The results indicate that cumulative post-development flood level increases in the surrounding areas are generally less than 0.20 m. This suggests that appropriate mitigation measures should be implemented to manage potential flood impacts on adjacent areas, such as revegetation. The extent of impacted areas increases with the severity of the design event, from the 5% AEP through to the PMF. In addition, the Brookmanns Road and Canalla Road intersection is predicted to experience flood level increases of up to 0.20 m. Similarly, flood impacts on local roads increase with increasing design event severity.



Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESRN 2025
File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 23/01/2026

- Legend**
-  Development Site
 -  Lot
 -  Road
 -  Named Watercourse
 -  Natural Contours (0.25 m Intervals)

 **Premise**
Finley BESS

Figure 5
Pre-Post Development
5% AEP Flood Level Change



Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025

File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 23/01/2026

Legend

-  Development Site
-  Lot
-  Road
-  Named Watercourse
-  Natural Contours (0.25 m Intervals)

1% AEP Flood Level Change (m)

 0.01 - 0.02



Premise

Finley BESS

Figure 6
Pre-Post Development
1% AEP Flood Level Change



Figure 7
Pre-Post Development
PMF Flood Level Change



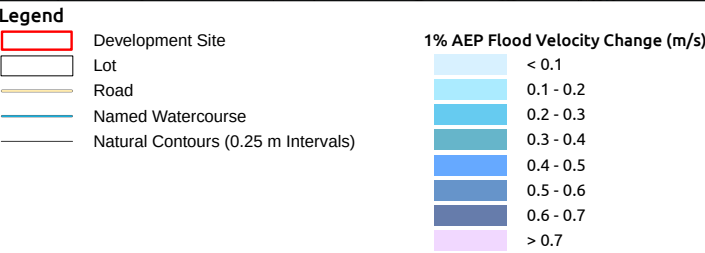
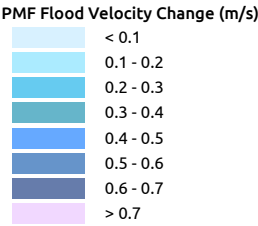


Figure 9
Pre-Post Development
1% AEP Flood Velocity Change



- Legend**
- Development Site
 - Lot
 - Road
 - Named Watercourse
 - Natural Contours (0.25 m Intervals)



 **Premise**
Finley BESS

Figure 10
Pre-Post Development
PMF Flood Velocity Change



Legend

-  Development Site
-  Lot
-  Road
-  Named Watercourse
-  Natural Contours (0.25 m Intervals)

0.5% - 1% AEP Flood Level Change (m)

-  < 0.01
-  0.01 - 0.05

 **Premise**
Finley BESS

Figure 11
Post-Development
0.5% - 1% AEP Flood Level Change
Climate Change Impacts on Flood Level under RCP4.5 in 2090



Legend

-  Development Site
-  Lot
-  Road
-  Named Watercourse
-  Natural Contours (0.25 m Intervals)

0.2% - 1% AEP Flood Level Change (m)

-  < 0.01
-  0.01 - 0.05

 **Premise**
Finley BESS

Figure 12
Post-Development
0.2% - 1% AEP Flood Level Change
Climate Change Impacts on Flood Level under RCP8.5 in 2090



Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025
File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 30/01/2026

Legend

-  Development Site
-  Lot
-  Road
-  Named Watercourse
-  Natural Contours (0.25 m Intervals)

0.5% - 1% AEP Flood Velocity Change (m/s)

	< 0.1
	0.1 - 0.2
	0.2 - 0.3
	0.3 - 0.4
	0.4 - 0.5
	0.5 - 0.6

 **Premise**
Finley BESS

Figure 13
Post-Development
0.5% - 1% AEP Flood Velocity Change
Climate Change Impacts on Flood Velocity under RCP4.5 in 2090

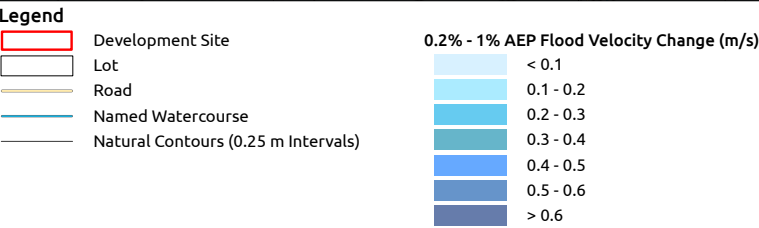


Figure 14
Post-Development
0.2% - 1% AEP Flood Velocity Change
Climate Change Impacts on Flood Velocity under RCP8.5 in 2090



Legend

-  Development Footprint
-  Lot
-  Road
-  Named Watercourse
-  Natural Contours (0.25 m Intervals)

5% AEP Flood Level Change (m)

-  0.01 - 0.1
-  0.1 - 0.2

 **Premise**
Finley BESS

Figure 15
Pre-Development-Cumulative Impacts
5% AEP Flood Level Change
Cumulative Impacts on Flood Level (5% AEP Event)



- Legend**
-  Development Footprint
 -  Lot
 -  Road
 -  Named Watercourse
 -  Natural Contours (0.25 m Intervals)

1% AEP Flood Level Change (m)	
	0.01 - 0.1
	0.1 - 0.2

 **Premise**
Finley BESS

Figure 16
Pre-Development-Cumulative Impacts
1% AEP Flood Level Change
Cumulative Impacts on Flood Level (1% AEP Event)



- Legend**
-  Development Footprint
 -  Lot
 -  Road
 -  Named Watercourse
 -  Natural Contours (0.25 m Intervals)

PMF Flood Level Change (m)	
	0.01 - 0.1
	0.1 - 0.2

 **Premise**
Finley BESS

Figure 17
Pre-Development-Cumulative Impacts
PMF Flood Level Change
Cumulative Impacts on Flood Level (PMF Event)

6. CONCLUSION AND RECOMMENDATIONS

The assessment was prepared in response to agency feedback on the previously exhibited EIS and provides a detailed, standalone evaluation of flood impacts under existing, post-development and cumulative development conditions. A combination of hydrologic modelling (DRAINS) and two-dimensional hydraulic modelling (TUFLOW) was undertaken for the 5%, 1%, 0.5% and 0.2% AEP events, as well as the PMF. Climate change sensitivity testing and cumulative impact scenarios incorporating adjacent approved BESS developments were also assessed.

The modelling results indicate that the proposed development will have negligible impacts on flood behaviour across the study area. Changes in maximum flood levels between pre- and post-development conditions are generally less than 10 mm, and changes in flood velocities are less than 0.1 m/s for all assessed design events, including the PMF. These changes are considered minor and well within the tolerances adopted under LU01 for acceptable floodplain development.

Localised variations in flood behaviour are confined to the immediate vicinity of the raised BESS infrastructure footprints and internal drainage paths; however, these changes do not result in adverse impacts on flood conveyance, flood storage, or flood risk to surrounding land. Peak flow analysis confirms that flows within the broader catchment and along key overland flow paths remain effectively unchanged under post-development conditions.

Flood function and flood hazard mapping demonstrates that the development site remains predominantly within the flood fringe, with low flood hazard classifications (generally H1) for the modelled design events. For the PMF, limited areas of higher hazard are predicted, consistent with existing conditions and reflective of the extreme nature of the event. Importantly, the proposed development does not increase flood hazard categories on adjacent land.

Climate change assessments for under RCP4.5 and RCP8.5 scenarios indicate only marginal increases in flood levels and velocities, with changes remaining negligible and not materially altering flood risk outcomes for the site or surrounding areas. Cumulative impact modelling incorporating the adjacent Berrigan BESS and South Coree BESS developments demonstrates that combined effects remain minor. Predicted increases in flood levels under cumulative post-development conditions are generally less than 0.2 m for extreme events and are not considered to result in unacceptable floodplain impacts.

Based on the outcomes of the assessment, the proposed Finley BESS is considered hydraulically acceptable and consistent with NSW floodplain management objectives, provided the development proceeds in accordance with the assumptions adopted in this assessment.

Recommendations

To ensure ongoing compliance with best-practice floodplain management, it is recommended that:

- > The BESS infrastructure platforms continue to be constructed at the modelled raised levels to maintain flood conveyance and minimise localised impacts.
- > Detailed civil and drainage design remains consistent with the modelled development layout and levels assessed in this report.
- > Finished surface levels and access routes are designed to maintain safe flood behaviour during major and extreme flood events, where practicable.
- > Any future changes to site layout, platform levels or surrounding land use are reviewed to confirm consistency with the flood modelling assumptions.



- > The CEMP and OEMP shall include procedures to incorporate flood risk awareness, evacuation protocols, and weather and flood warning monitoring into site inductions and relevant management plans, and to suspend site activities during forecast or active flood events in accordance with advice from the Bureau of Meteorology and NSW State Emergency Service.

Subject to the above, the proposed development is not expected to result in adverse flood impacts and is considered suitable to proceed from a flood risk perspective.



APPENDIX A

PRE-DEVELOPMENT SCENARIO RESULTS

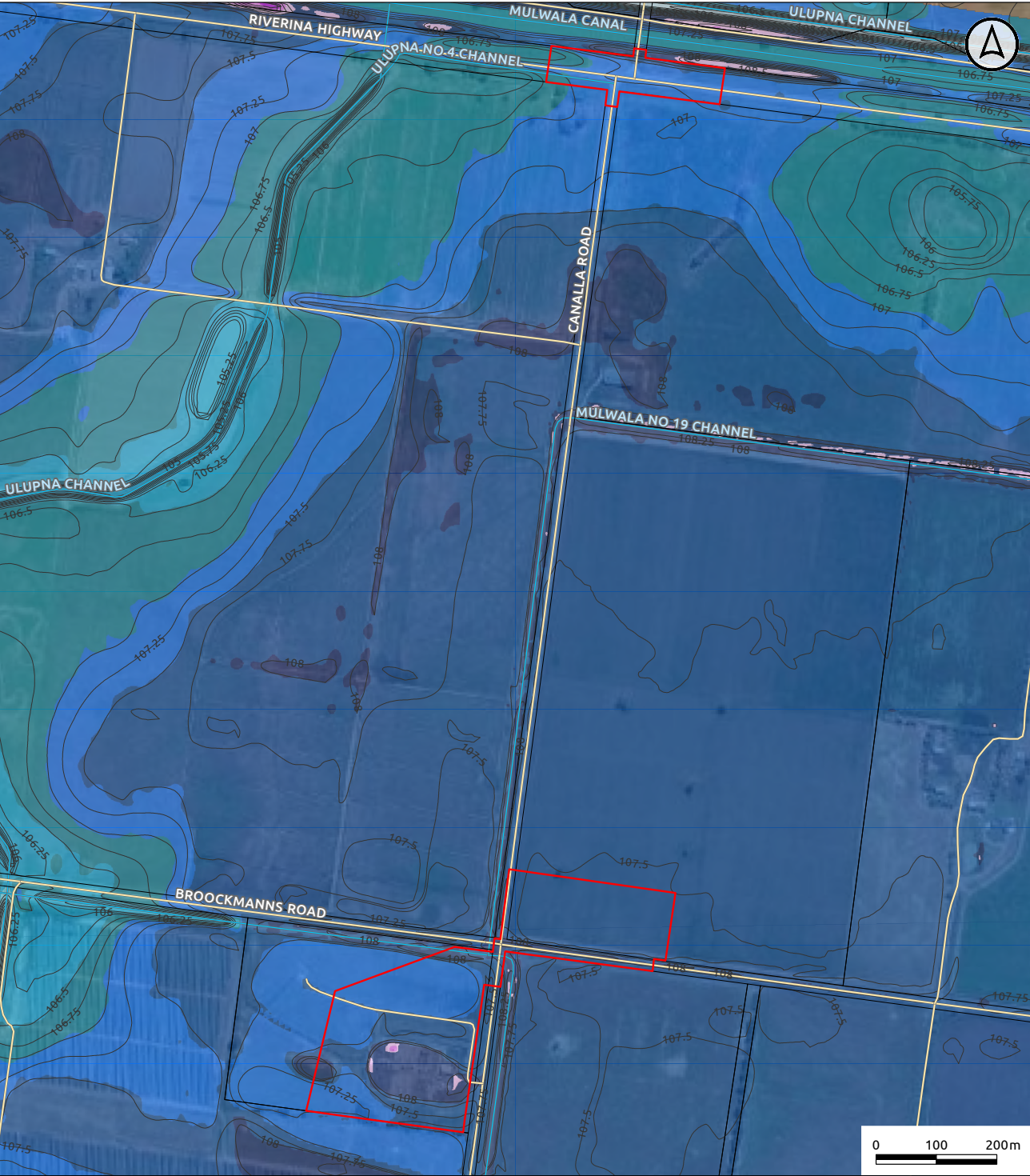


- Legend**
-  Development Site
 -  Lot
 -  Road
 -  Named Watercourse
 -  Natural Contours (0.25 m Intervals)

5% AEP Flood Depth (m)	
	0.01 - 0.05
	0.05 - 0.1
	0.1 - 0.2
	0.2 - 0.5
	0.5 - 1
	> 1

 **Premise**
Finley BESS

Figure 18
Pre-Development
5% AEP Flood Depth



Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025
File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 22/01/2026

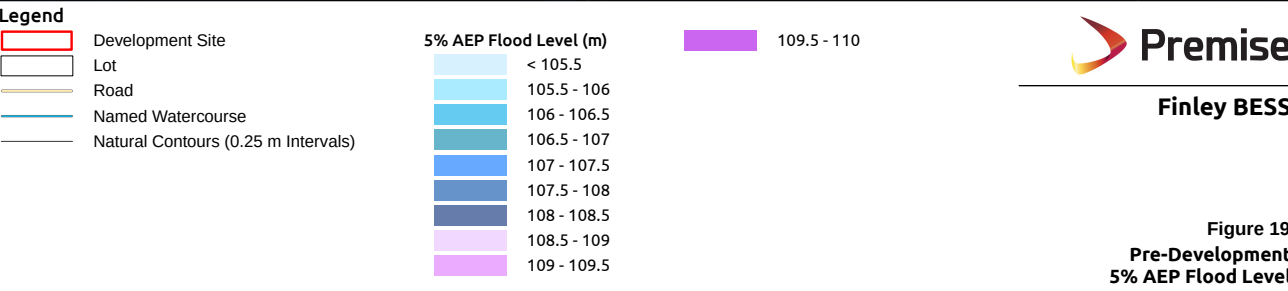




Figure 20
Pre-Development
5% AEP Flood Velocity

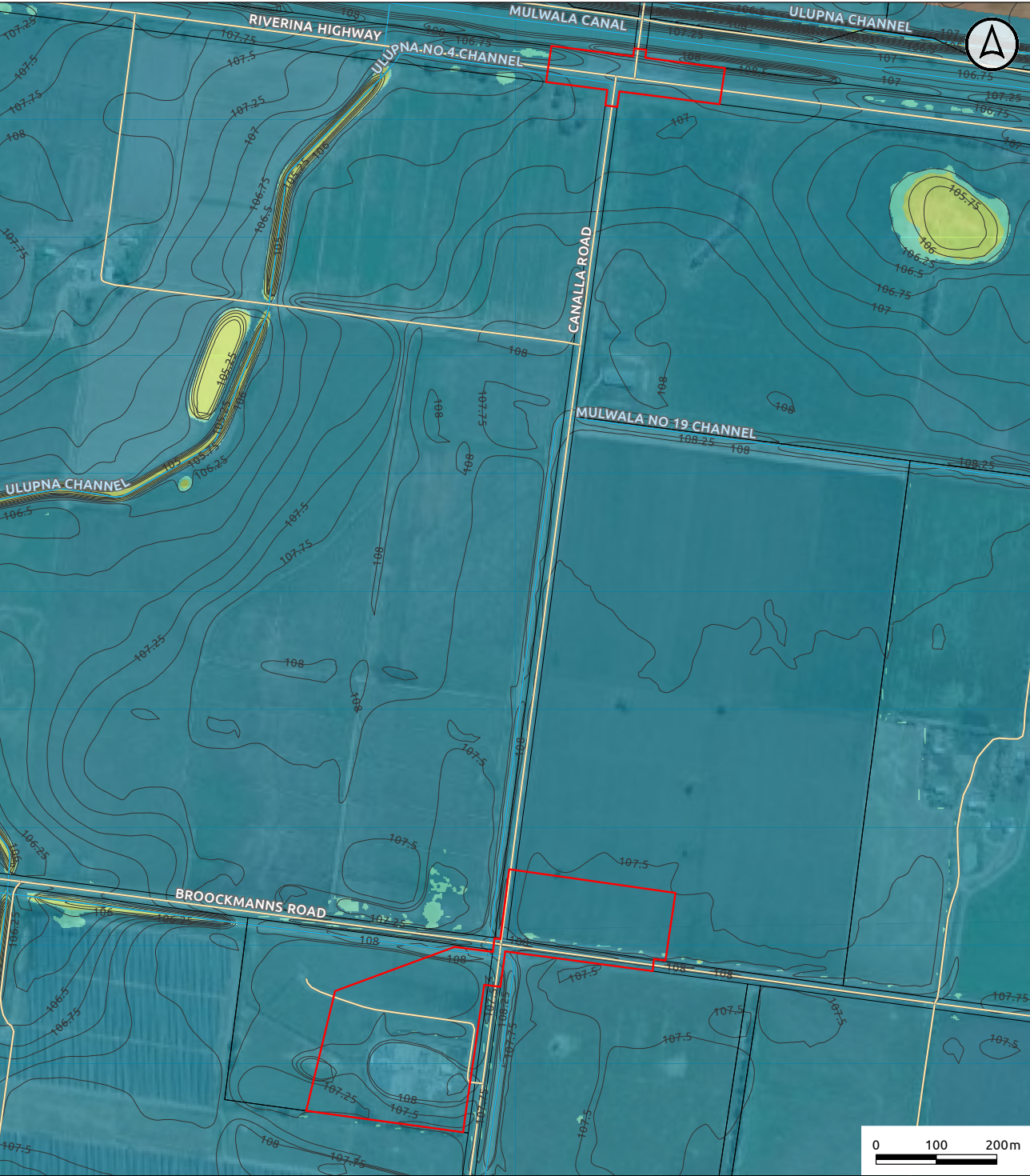


- Legend**
- Development Site
 - Lot
 - Road
 - Named Watercourse
 - Natural Contours (0.25 m Intervals)

5% AEP VxD (m2/s)	
	< 0.1
	0.1 - 0.2
	0.2 - 0.3
	0.3 - 0.4
	0.4 - 0.5
	0.5 - 0.6
	> 0.6

 **Premise**
Finley BESS

Figure 21
Pre-Development
5% AEP Flood Function



Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025

File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 23/01/2026

Figure 22
Pre-Development
5% AEP Flood Hazard

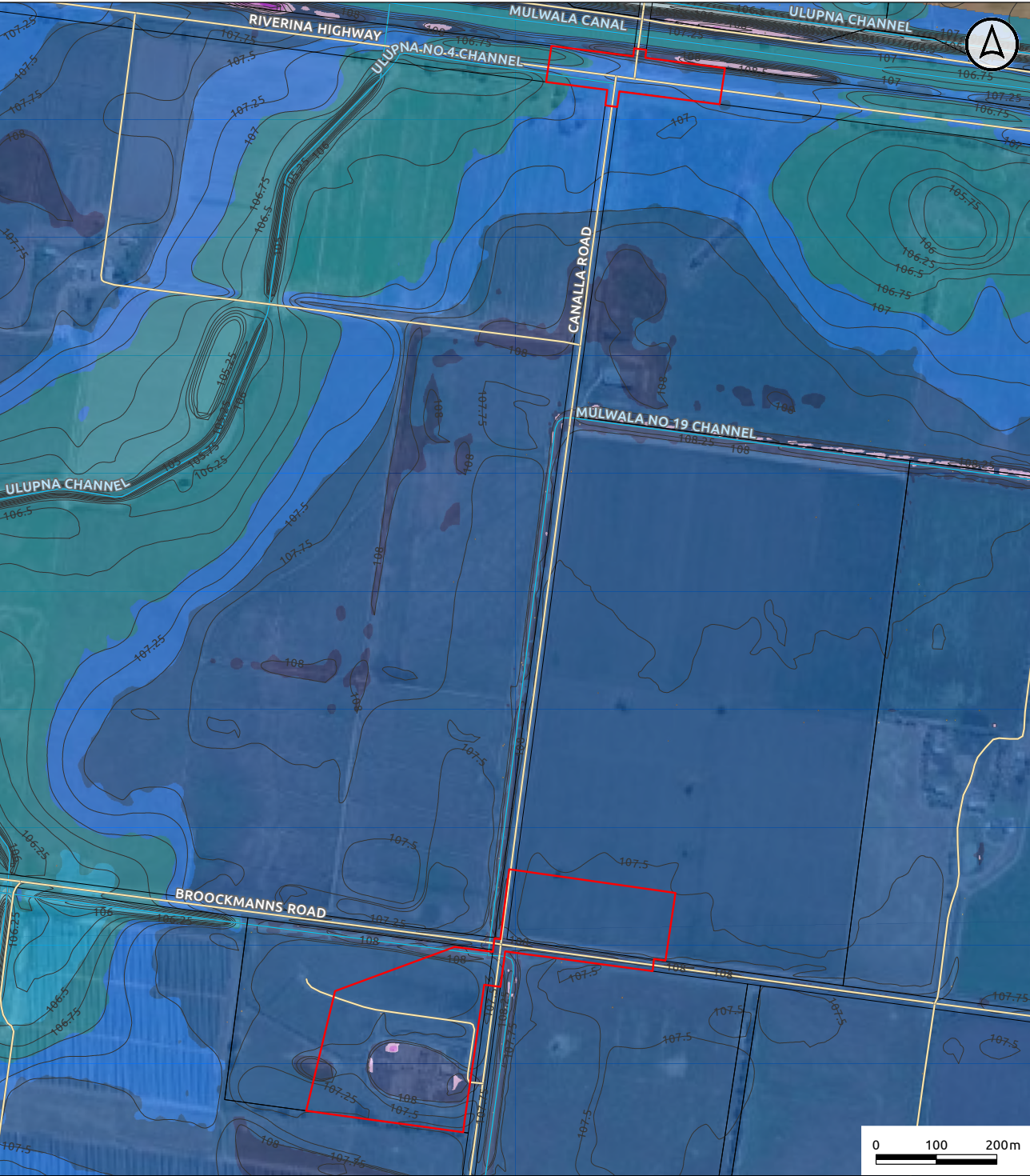


- Legend**
-  Development Site
 -  Lot
 -  Road
 -  Named Watercourse
 -  Natural Contours (0.25 m Intervals)

1% AEP Flood Depth (m)	
	0.01 - 0.05
	0.05 - 0.1
	0.1 - 0.2
	0.2 - 0.5
	0.5 - 1
	> 1

 **Premise**
Finley BESS

Figure 23
Pre-Development
1% AEP Flood Depth



Legend

-  Development Site
-  Lot
-  Road
-  Named Watercourse
-  Natural Contours (0.25 m Intervals)

1% AEP Flood Level (m)	
	< 105.5
	105.5 - 106
	106 - 106.5
	106.5 - 107
	107 - 107.5
	107.5 - 108
	108 - 108.5
	108.5 - 109
	109 - 109.5

 109.5 - 110

 **Premise**
Finley BESS

Figure 24
Pre-Development
1% AEP Flood Level



Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025

File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 22/01/2026

- Legend**
-  Development Site
 -  Lot
 -  Road
 -  Named Watercourse
 -  Natural Contours (0.25 m Intervals)

1% AEP Flood Velocity (m/s)	
	< 0.1
	0.1 - 0.25
	0.25 - 0.5
	0.5 - 1
	> 1

 **Premise**
Finley BESS

Figure 25
Pre-Development
1% AEP Flood Velocity



- Legend**
-  Development Site
 -  Lot
 -  Road
 -  Named Watercourse
 -  Natural Contours (0.25 m Intervals)

1% AEP VxD (m2/s)	
	< 0.1
	0.1 - 0.2
	0.2 - 0.3
	0.3 - 0.4
	0.4 - 0.5
	0.5 - 0.6
	0.6 - 0.7

 **Premise**
Finley BESS

Figure 26
Pre-Development
1% AEP Flood Function

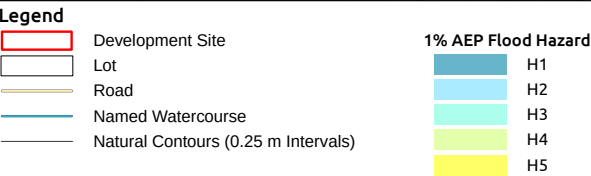
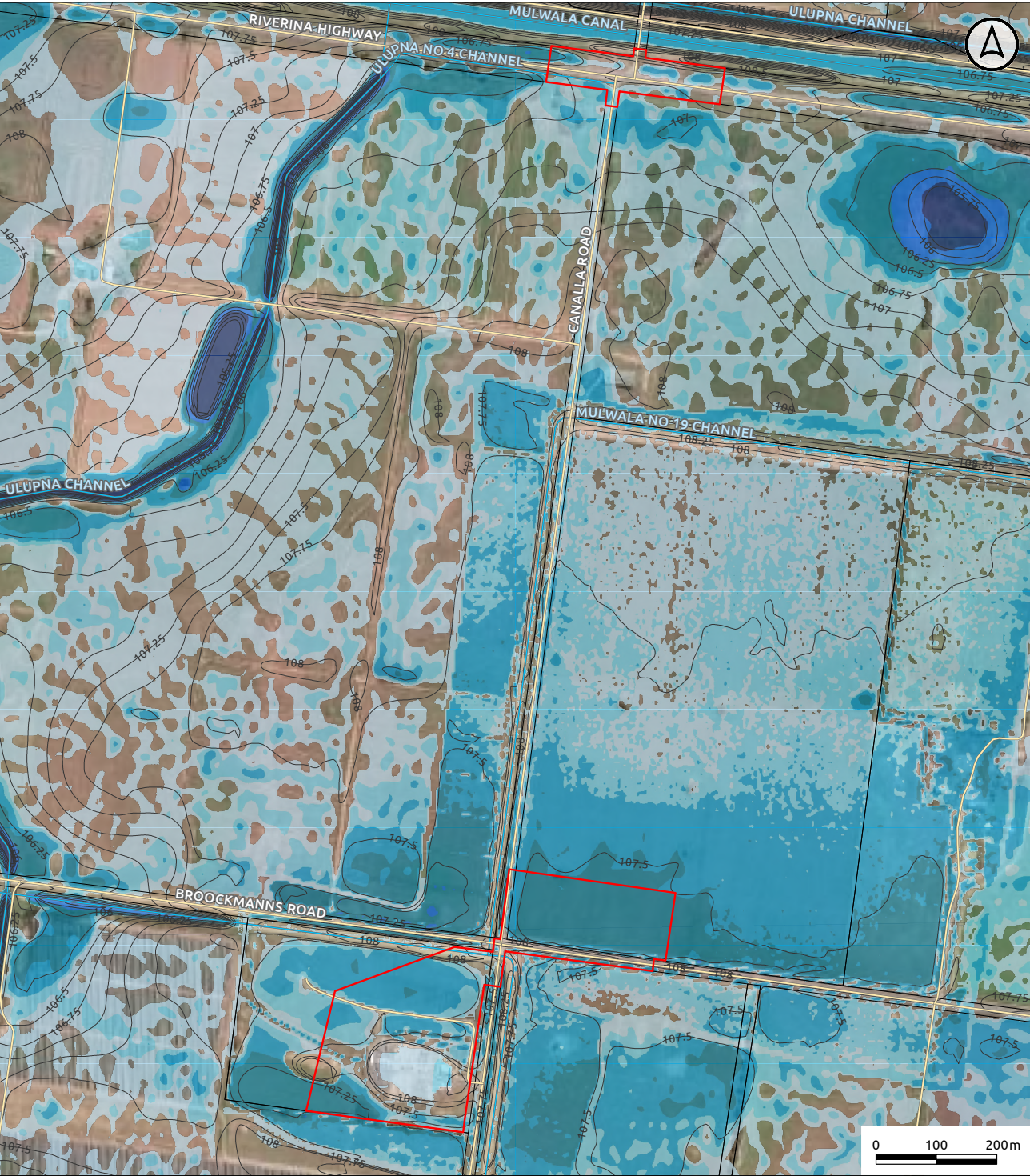


Figure 27
Pre-Development
1% AEP Flood Hazard

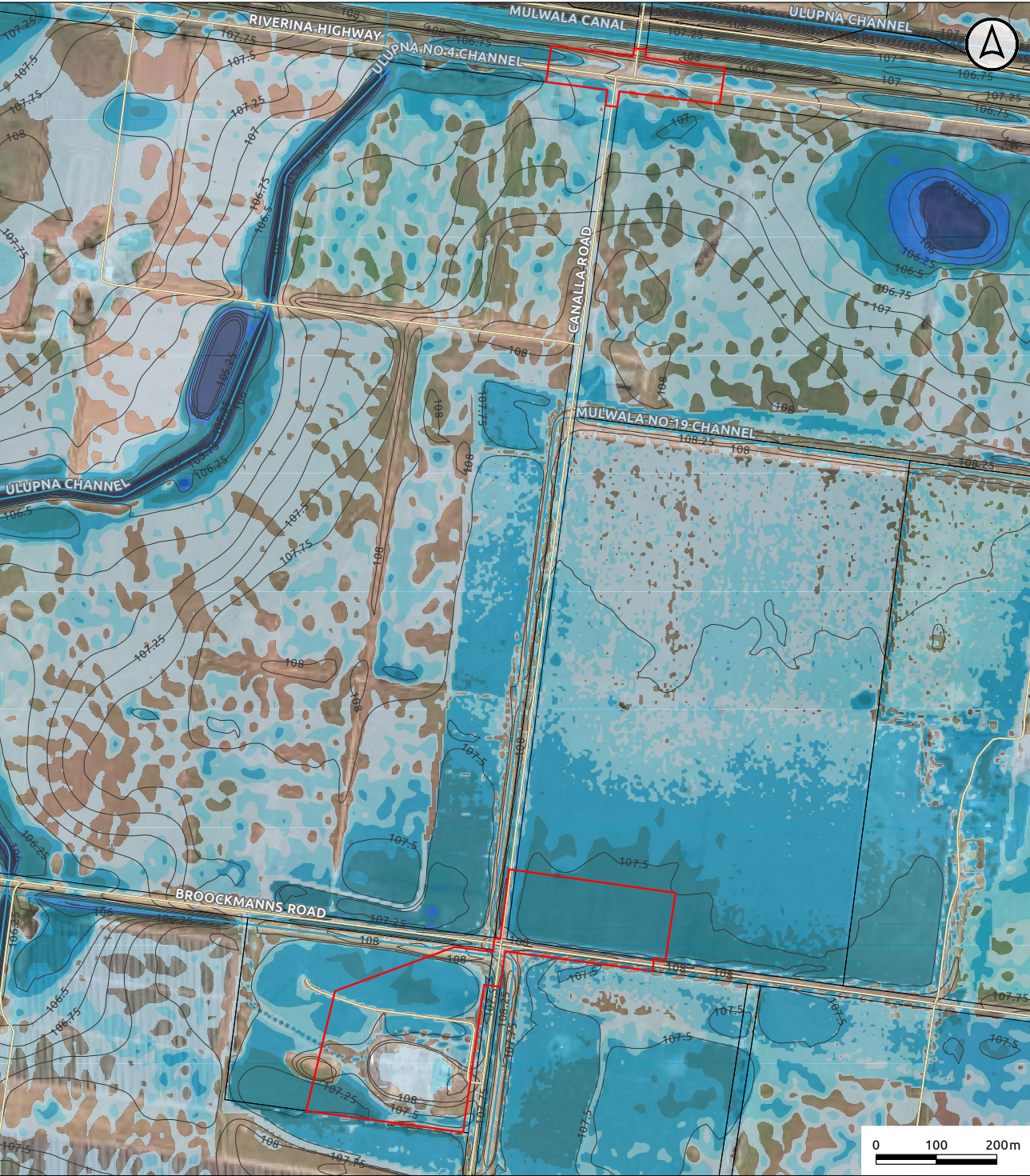


- Legend**
- Development Site
 - Lot
 - Road
 - Named Watercourse
 - Natural Contours (0.25 m Intervals)

 **Premise**
Finley BESS

Figure 28
Pre-Development
0.5% AEP Flood Depth

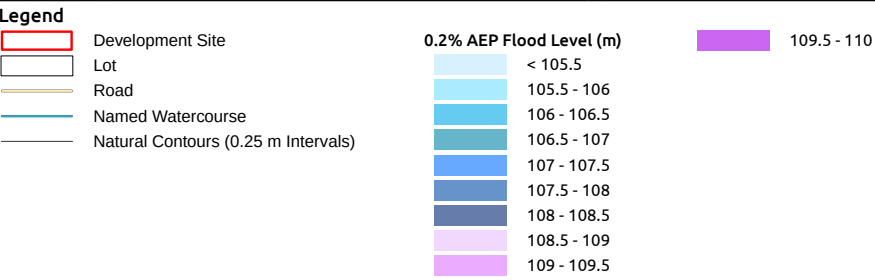
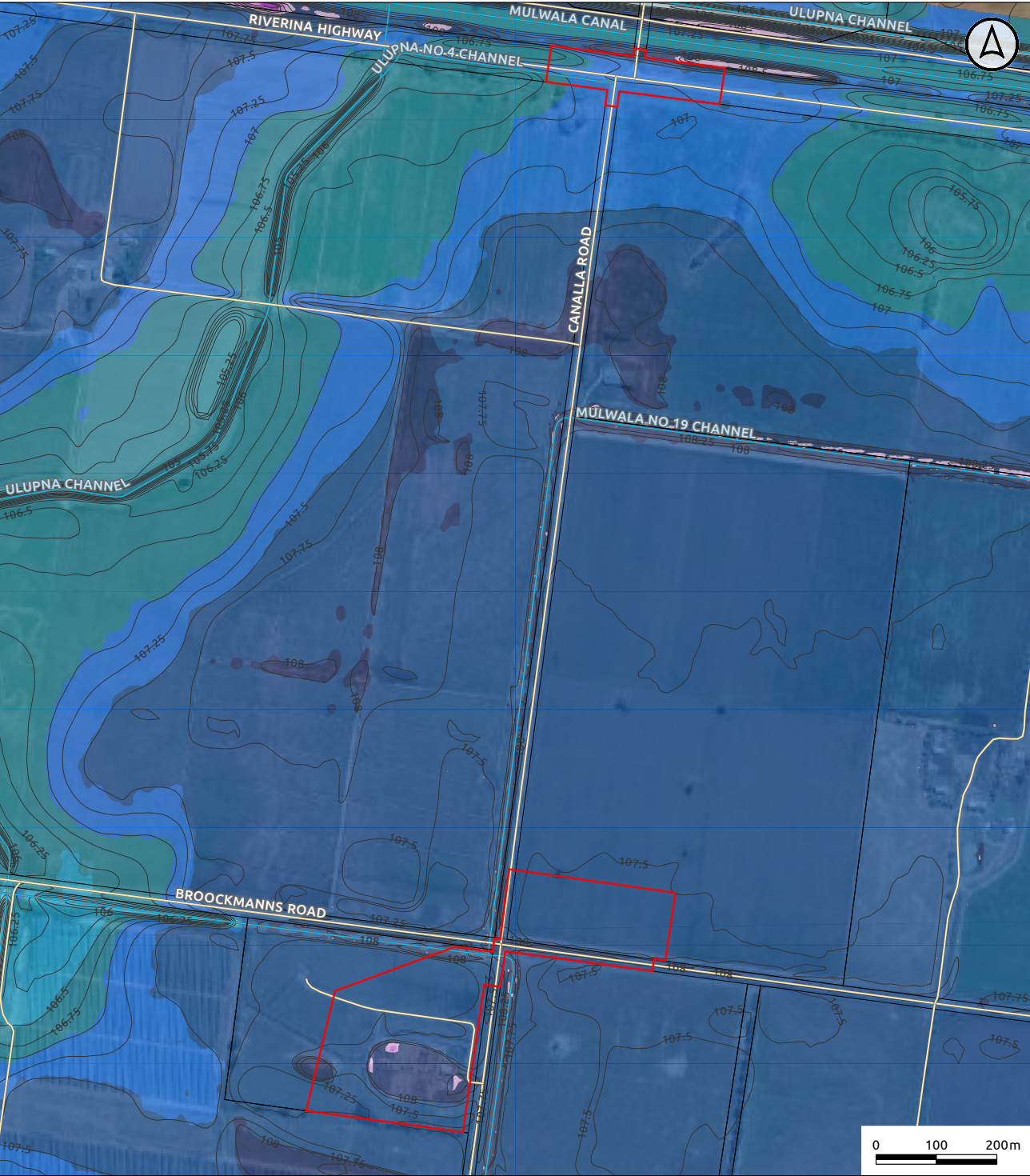




Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025
File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 22/01/2026

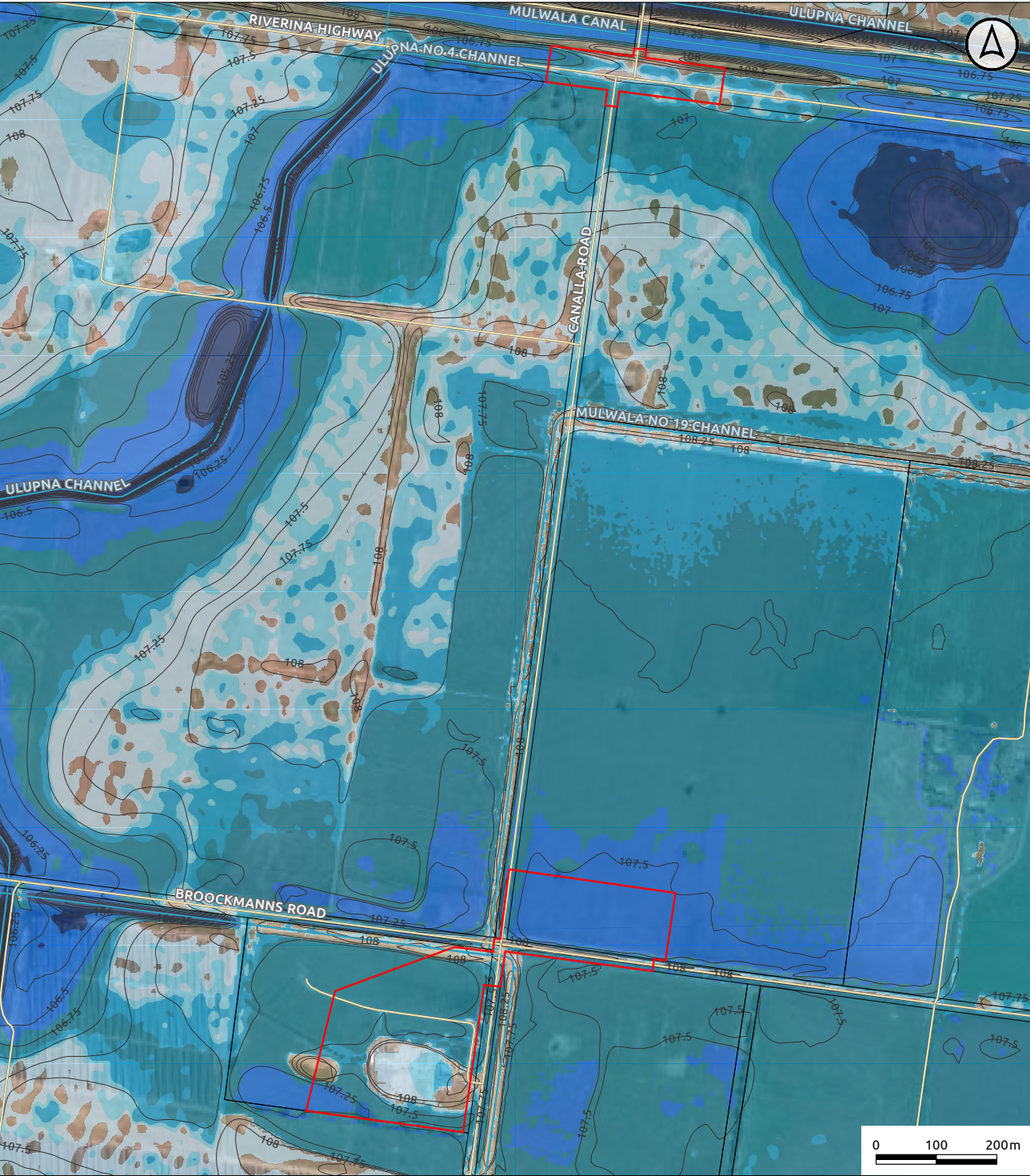
 **Premise**
Finley BESS

Figure 30
Pre-Development
0.2% AEP Flood Depth



 **Premise**
Finley BESS

Figure 31
Pre-Development
0.2% AEP Flood Level



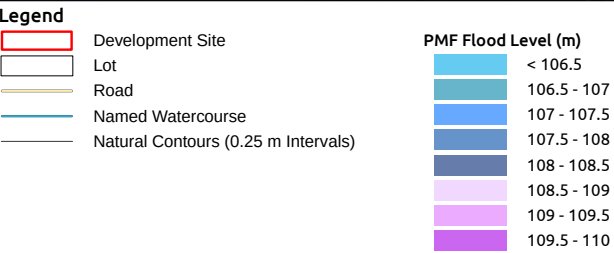
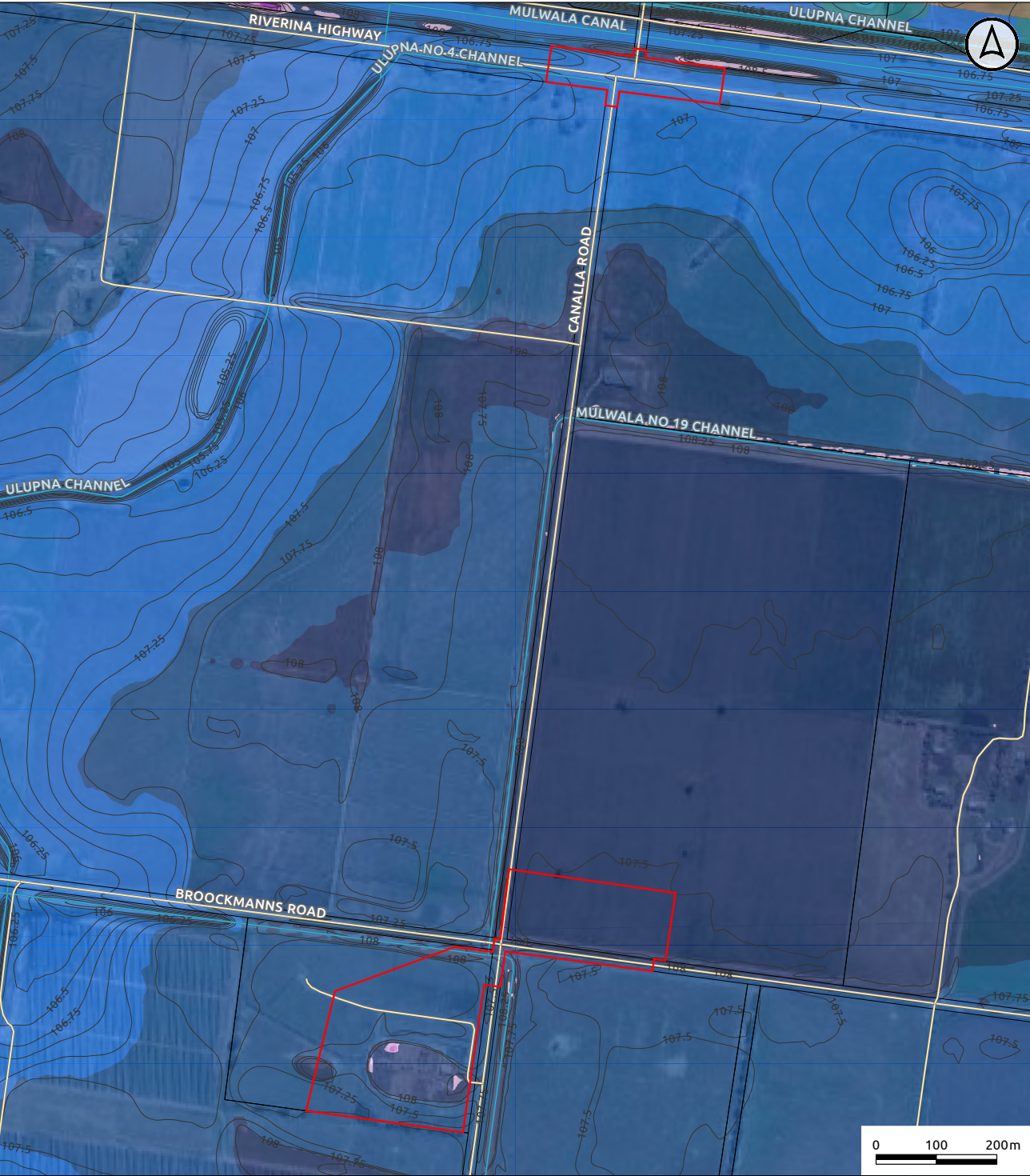
Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025
File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 22/01/2026

- Legend**
-  Development Site
 -  Lot
 -  Road
 -  Named Watercourse
 -  Natural Contours (0.25 m Intervals)

PMF Flood Depth (m)	
	0.01 - 0.05
	0.05 - 0.1
	0.1 - 0.2
	0.2 - 0.5
	0.5 - 1
	> 1

 **Premise**
Finley BESS

Figure 32
Pre-Development
PMF Flood Depth

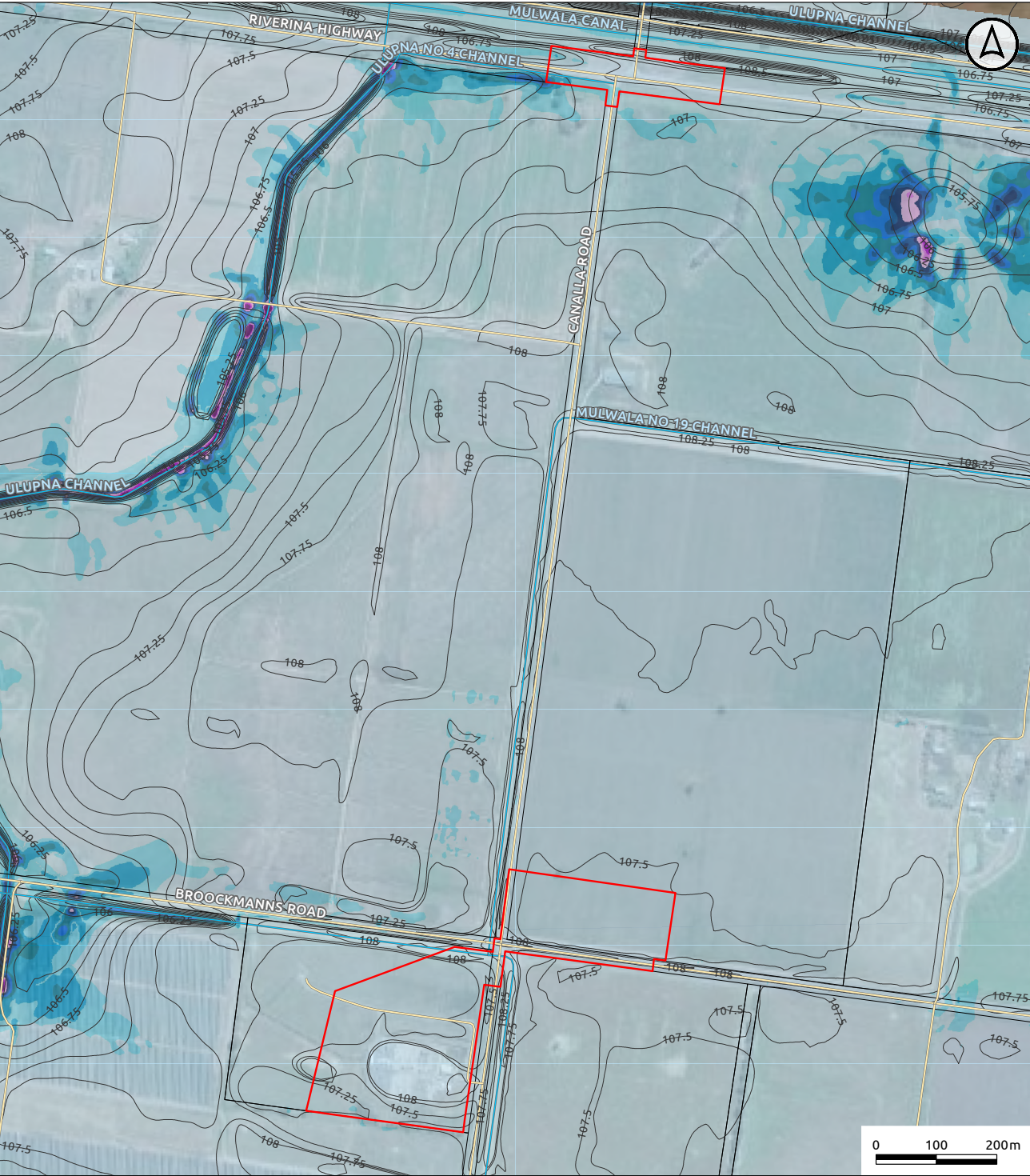


 **Premise**
Finley BESS

Figure 33
Pre-Development
PMF Flood Level



Figure 34
Pre-Development
PMF Flood Velocity



Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025

File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 23/01/2026

Legend

-  Development Site
-  Lot
-  Road
-  Named Watercourse
-  Natural Contours (0.25 m Intervals)

PMF VxD (m2/s)

	< 0.1
	0.1 - 0.2
	0.2 - 0.3
	0.3 - 0.4
	0.4 - 0.5
	0.5 - 0.6
	0.6 - 0.7
	0.7 - 0.8
	0.8 - 0.9

	0.9 - 1
	1 - 2
	> 2

 **Premise**
Finley BESS

Figure 35
Pre-Development
PMF Flood Function

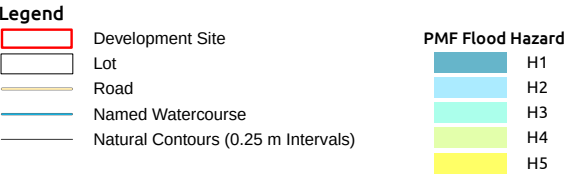
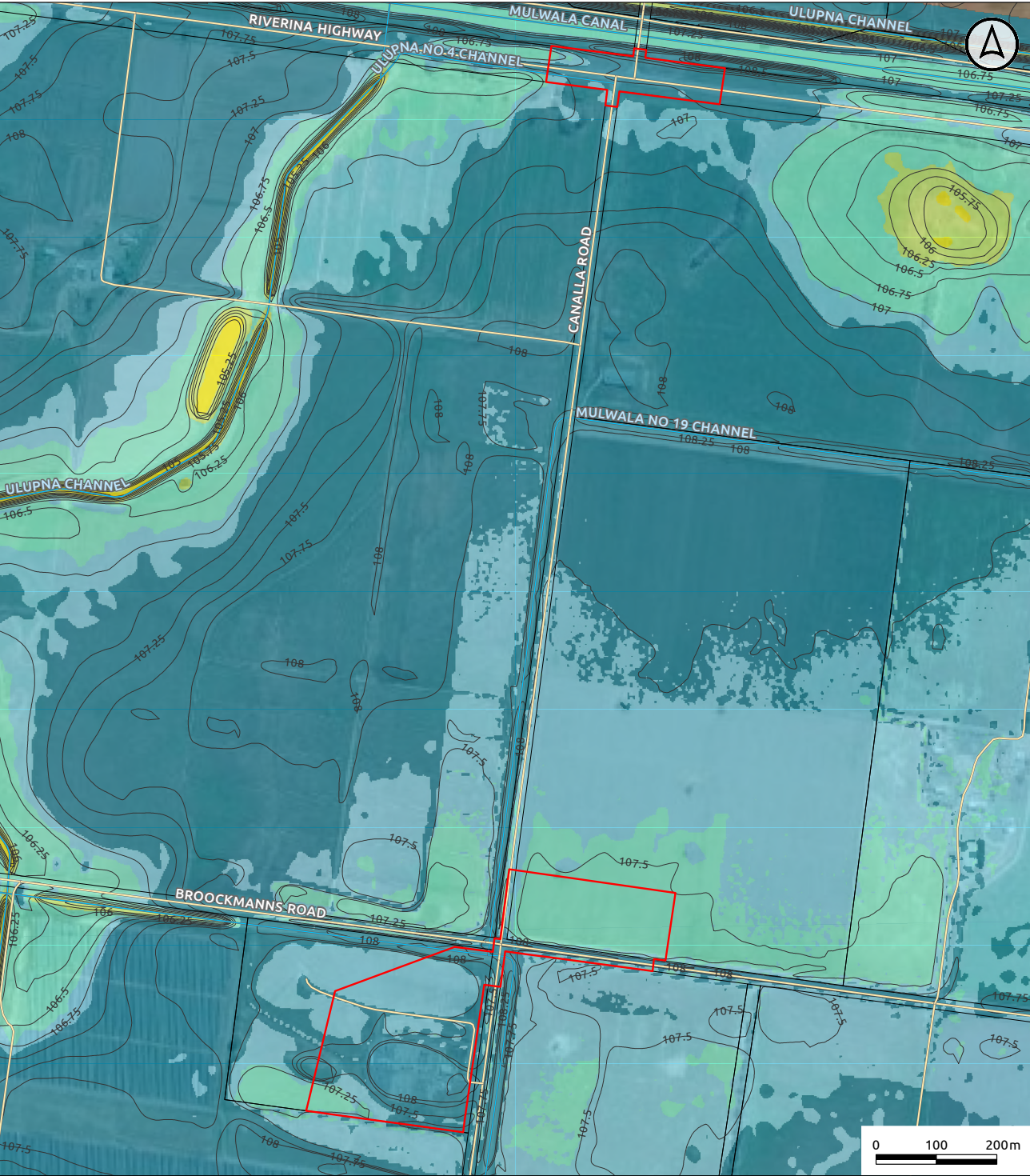


Figure 36
Pre-Development
PMF Flood Hazard

APPENDIX B

POST-DEVELOPMENT SCNEARIO RESULTS

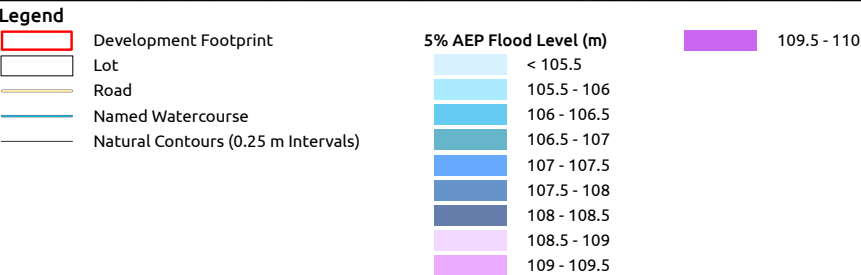
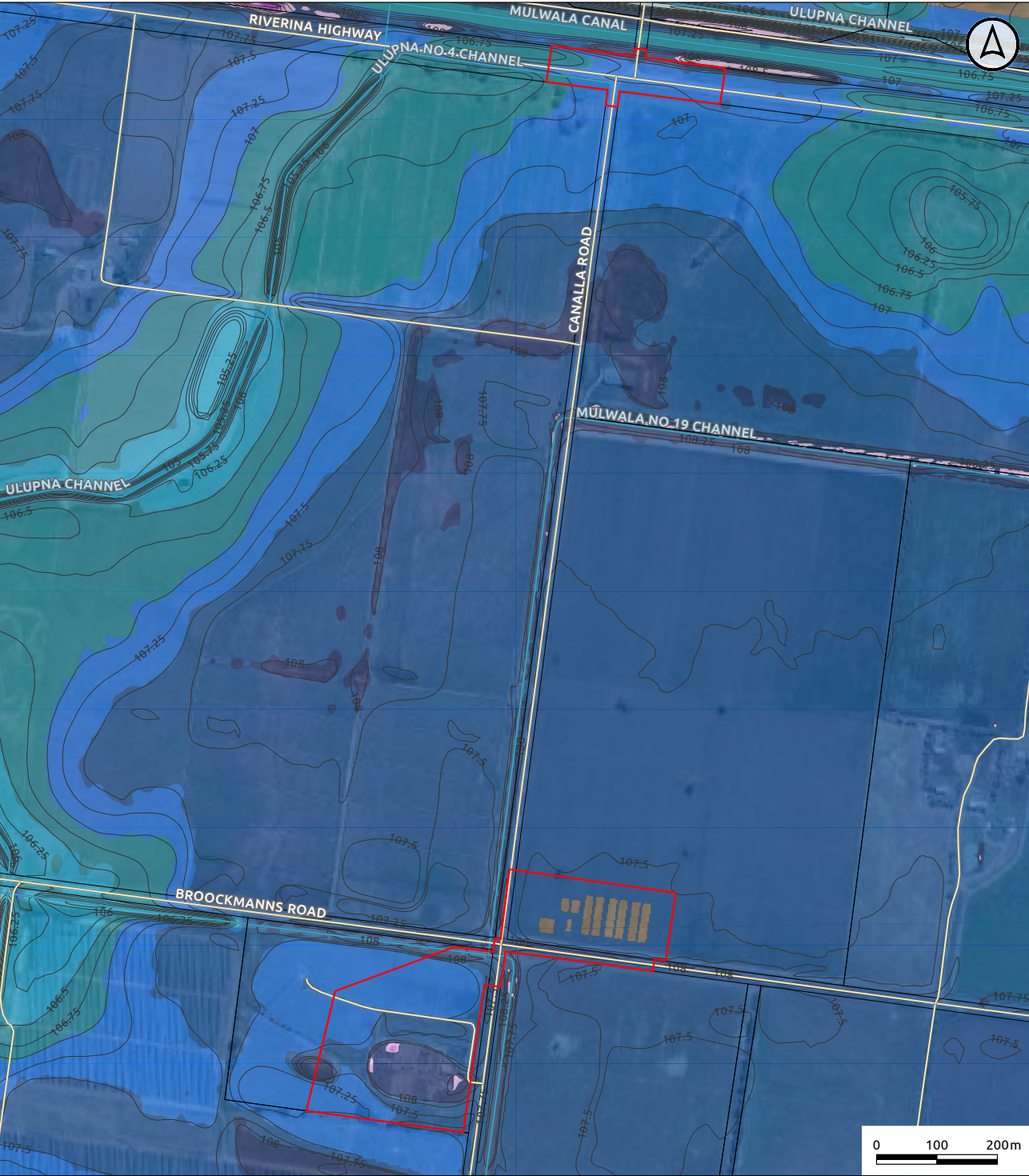


- Legend**
-  Development Site
 -  Lot
 -  Road
 -  Named Watercourse
 -  Natural Contours (0.25 m Intervals)

5% AEP Flood Depth (m)	
	0.01 - 0.05
	0.05 - 0.1
	0.1 - 0.2
	0.2 - 0.5
	0.5 - 1
	> 1

 **Premise**
Finley BESS

Figure 37
Post-Development
5% AEP Flood Depth



 **Premise**
Finley BESS

Figure 38
Post-Development
5% AEP Flood Level



- Legend**
-  Development Site
 -  Lot
 -  Road
 -  Named Watercourse
 -  Natural Contours (0.25 m Intervals)

5% AEP Flood Velocity (m/s)	
	< 0.1
	0.1 - 0.25
	0.25 - 0.5
	0.5 - 1
	> 1

 **Premise**
Finley BESS

Figure 39
Post-Development
5% AEP Flood Velocity



Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025

File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 23/01/2026

Legend

- Development Site
- Lot
- Road
- Named Watercourse
- Natural Contours (0.25 m Intervals)

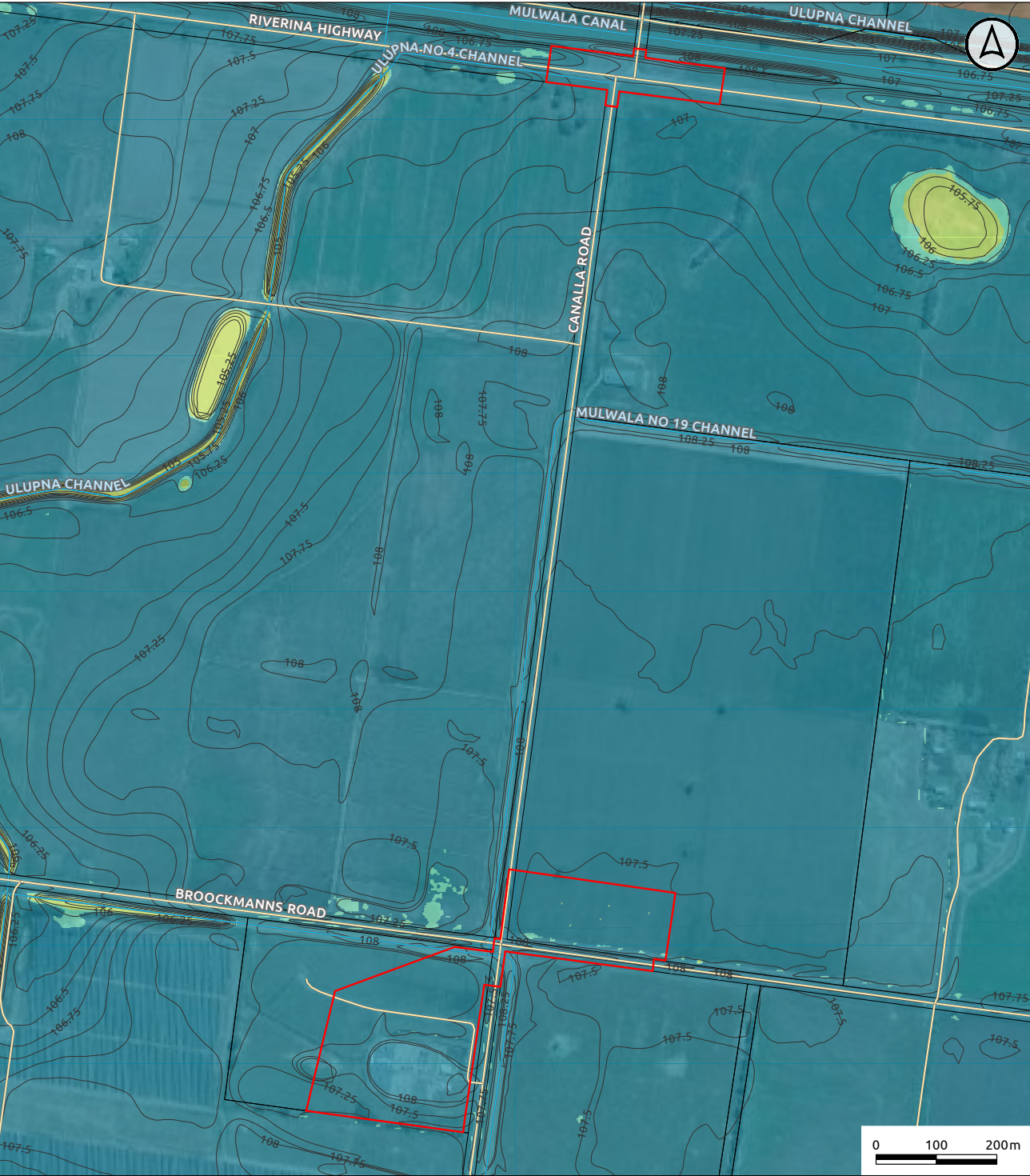
5% AEP VxD (m²/s)

- < 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9

- 0.9 - 1
- > 1

 **Premise**
Finley BESS

Figure 40
Post-Development
5% AEP Flood Function



Legend

-  Development Site
-  Lot
-  Road
-  Named Watercourse
-  Natural Contours (0.25 m Intervals)

5% AEP Flood Hazard

-  H1
-  H3
-  H4

Figure 41
Post-Development
5% AEP Flood Hazard

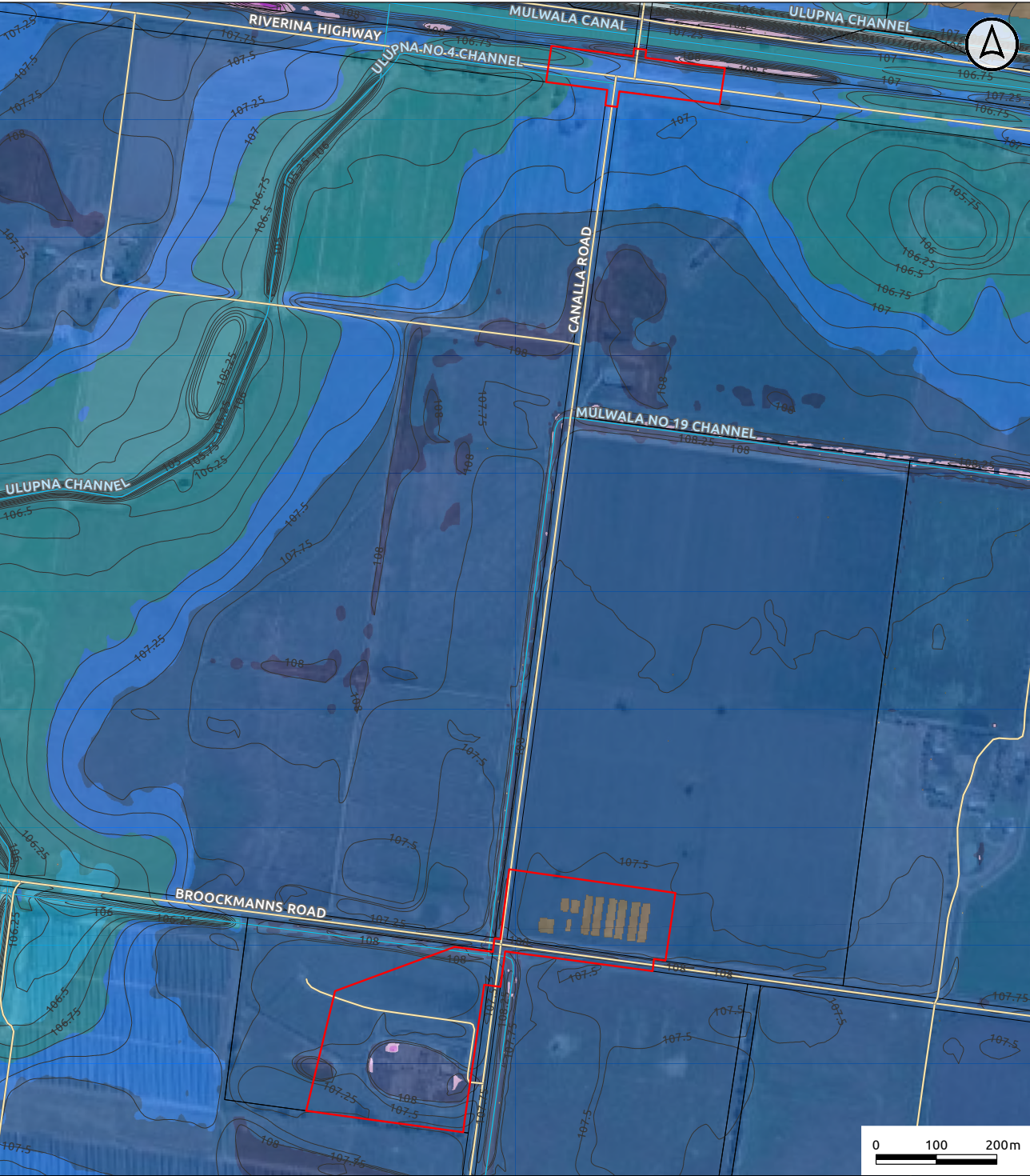


- Legend**
- Development Site
 - Lot
 - Road
 - Named Watercourse
 - Natural Contours (0.25 m Intervals)

1% AEP Flood Depth (m)	
0.01 - 0.05	
0.05 - 0.1	
0.1 - 0.2	
0.2 - 0.5	
0.5 - 1	
> 1	

 **Premise**
Finley BESS

Figure 42
Post-Development
1% AEP Flood Depth



Legend

-  Development Footprint
-  Lot
-  Road
-  Named Watercourse
-  Natural Contours (0.25 m Intervals)

1% AEP Flood Level (m)

-  < 105.5
-  105.5 - 106
-  106 - 106.5
-  106.5 - 107
-  107 - 107.5
-  107.5 - 108
-  108 - 108.5
-  108.5 - 109
-  109 - 109.5

-  109.5 - 110

 **Premise**
Finley BESS

Figure 43
Post-Development
1% AEP Flood Level



- Legend**
-  Development Site
 -  Lot
 -  Road
 -  Named Watercourse
 -  Natural Contours (0.25 m Intervals)

1% AEP Flood Velocity (m/s)	
	< 0.1
	0.1 - 0.25
	0.25 - 0.5
	0.5 - 1
	> 1

 **Premise**
Finley BESS

Figure 44
Post-Development
1% AEP Flood Velocity



Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025

File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 23/01/2026

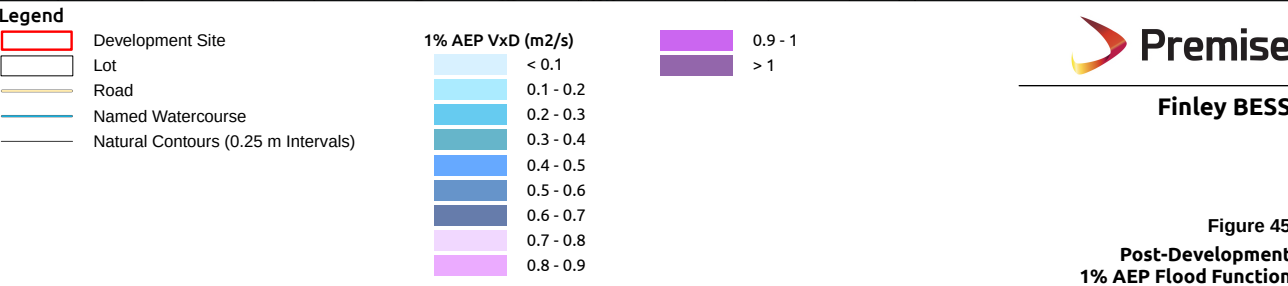


Figure 45
Post-Development
1% AEP Flood Function



Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025

File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 23/01/2026

Legend

-  Development Site
-  Lot
-  Road
-  Named Watercourse
-  Natural Contours (0.25 m Intervals)

1% AEP Flood Hazard

-  H1
-  H2
-  H3
-  H4
-  H5

 **Premise**
Finley BESS

Figure 46
Post-Development
1% AEP Flood Hazard



Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025
File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 22/01/2026

Legend

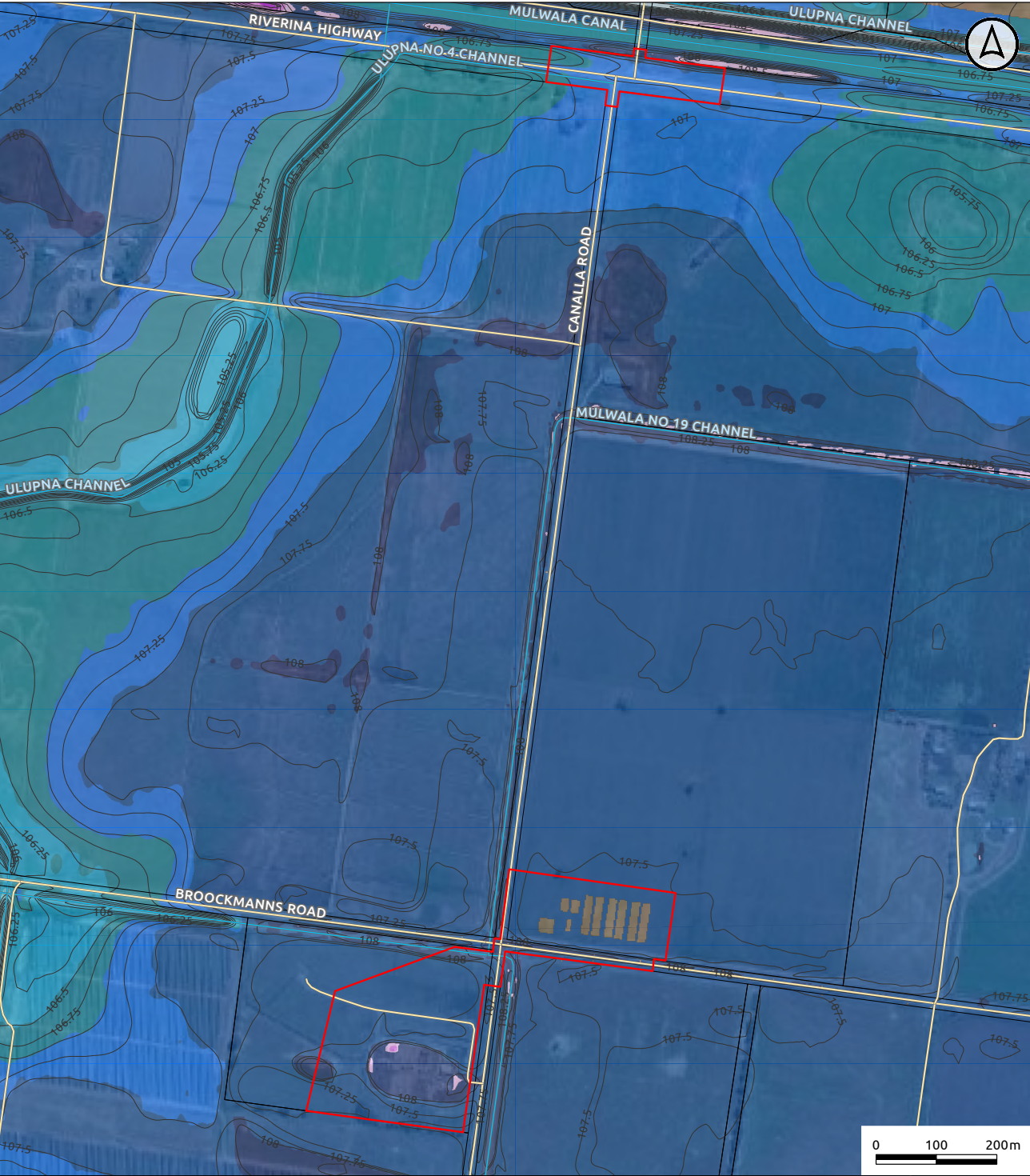
-  Development Site
-  Lot
-  Road
-  Named Watercourse
-  Natural Contours (0.25 m Intervals)

0.5% AEP Flood Depth (m)

-  0.01 - 0.05
-  0.05 - 0.1
-  0.1 - 0.2
-  0.2 - 0.5
-  0.5 - 1
-  > 1

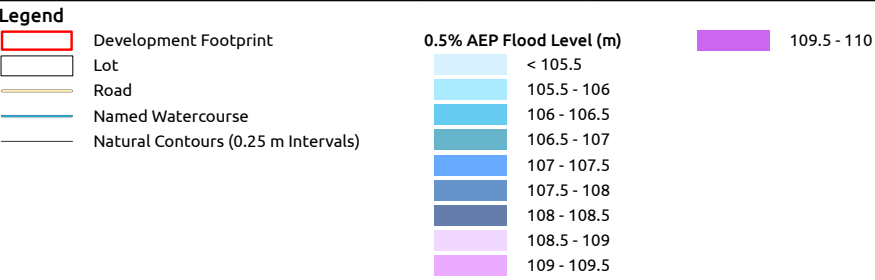
 **Premise**
Finley BESS

Figure 47
Post-Development
0.5% AEP Flood Depth



Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025

File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 6/02/2026



 **Premise**
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Figure 48
Post-Development
0.5% AEP Flood Level

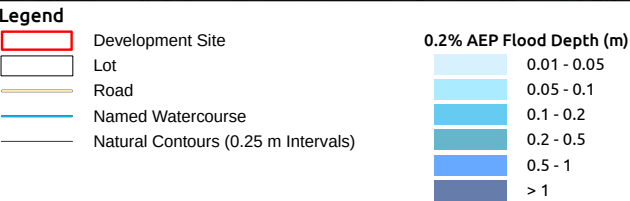
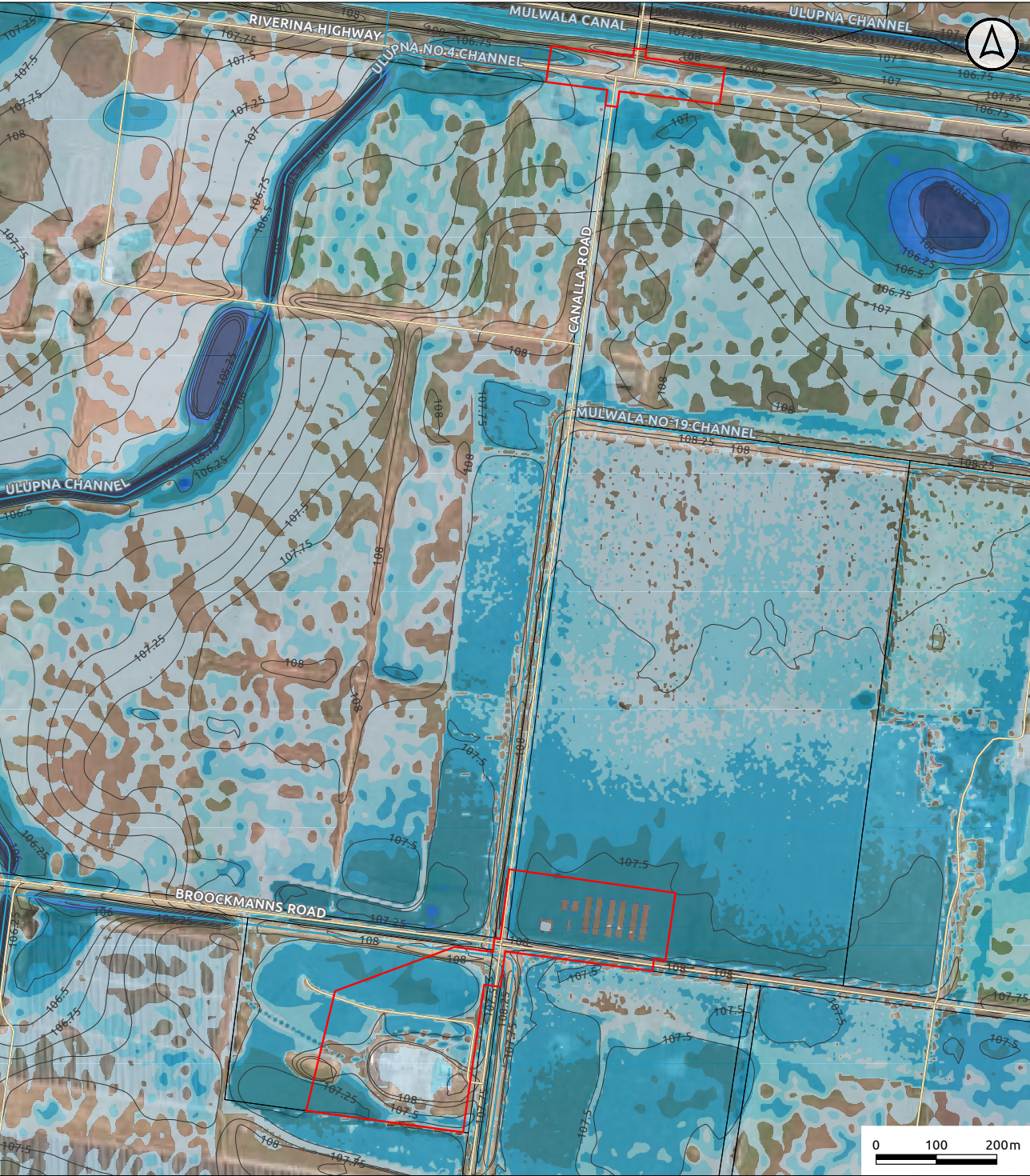
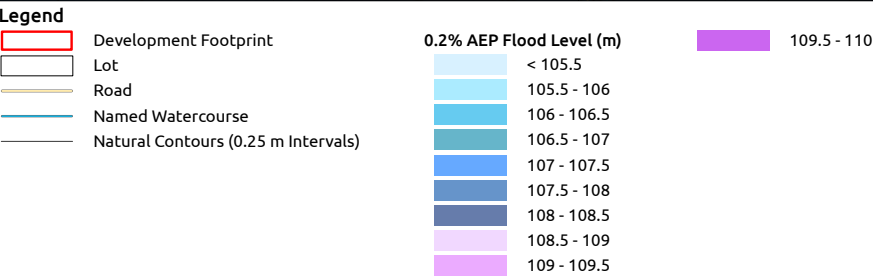
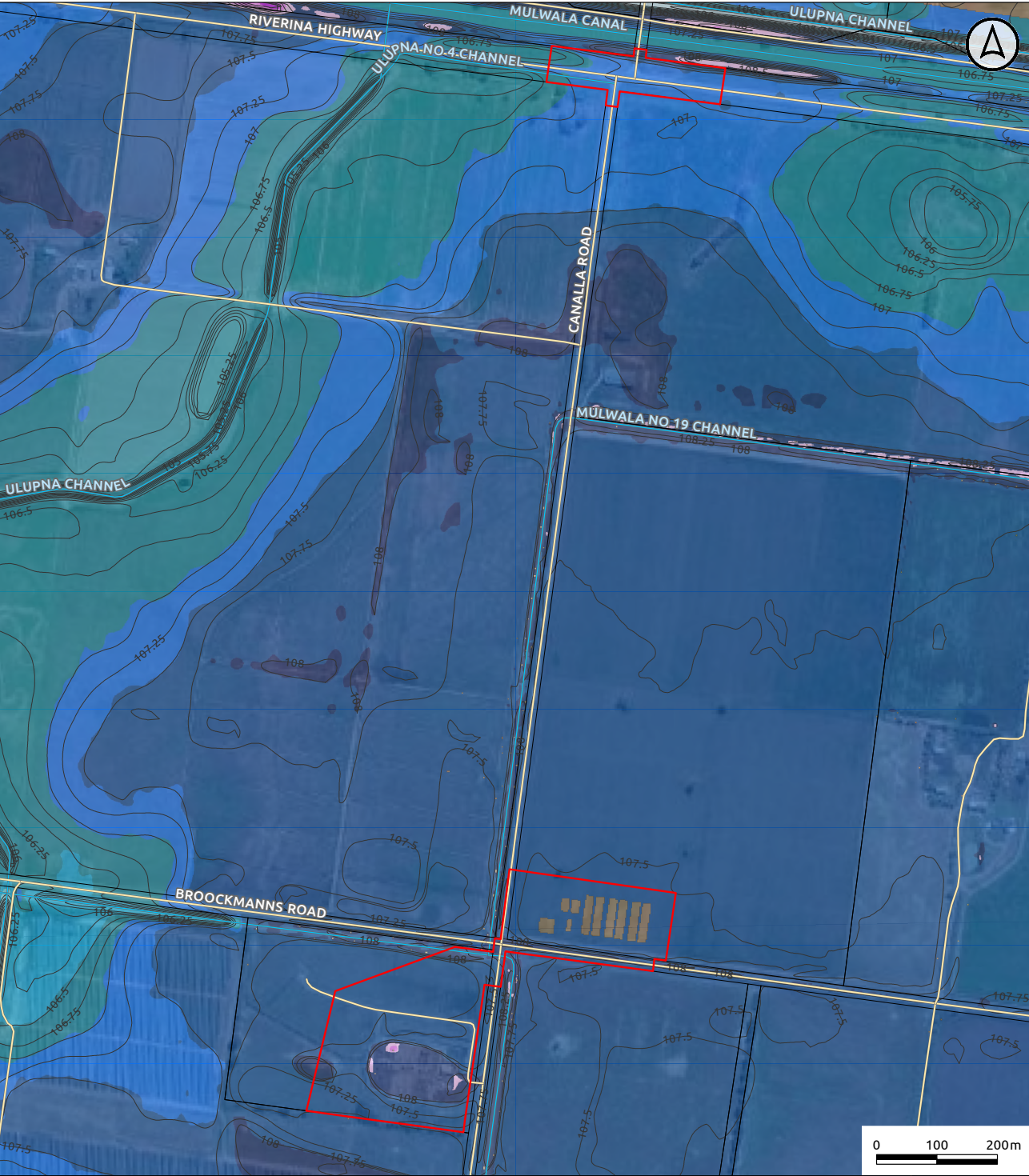


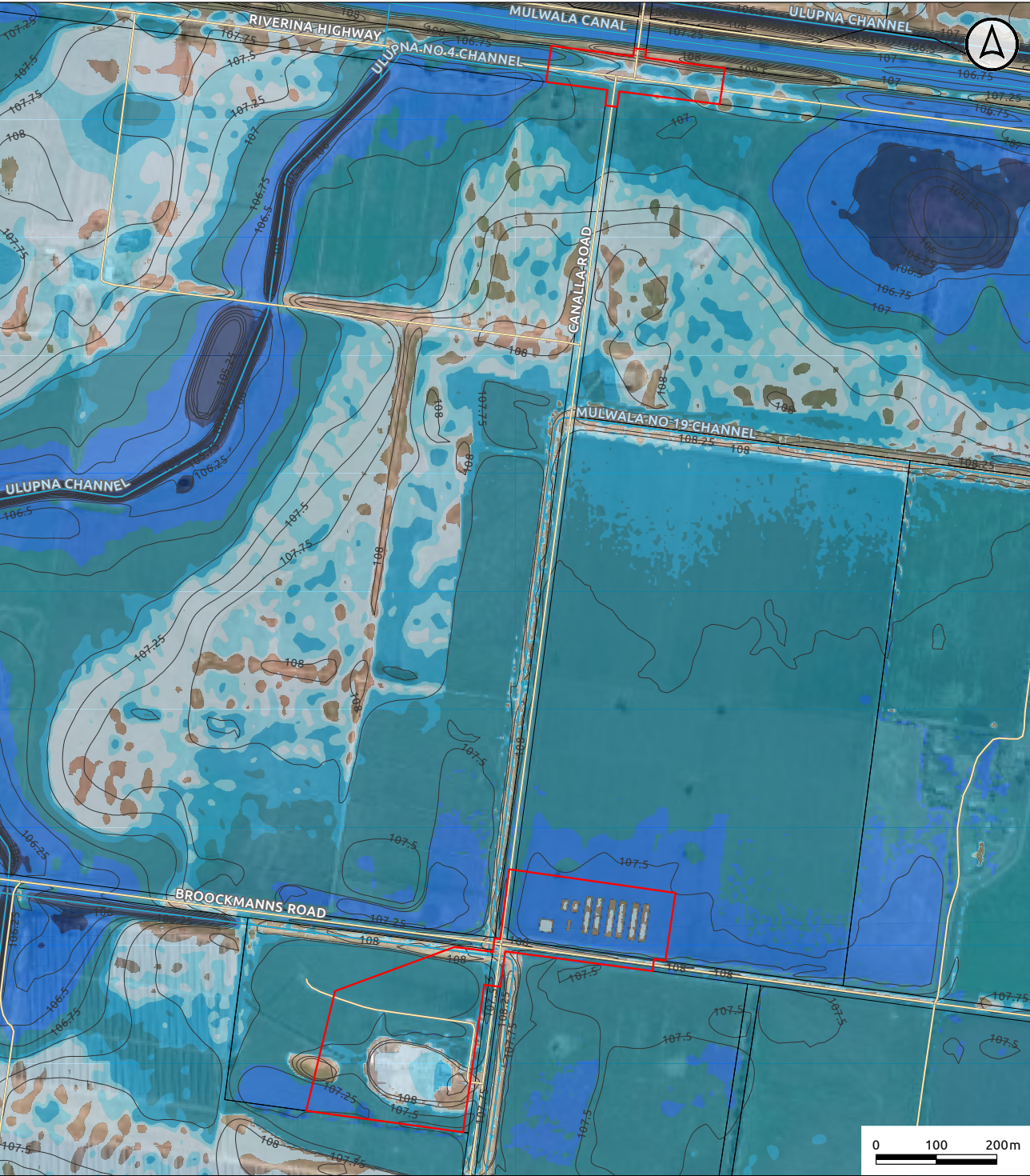
Figure 49
Post-Development
0.2% AEP Flood Depth



 **Premise**
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Figure 50
Post-Development
0.2% AEP Flood Level

Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025
File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 6/02/2026



- Legend**
- Development Site
 - Lot
 - Road
 - Named Watercourse
 - Natural Contours (0.25 m Intervals)

PMF Flood Depth (m)	
	0.01 - 0.05
	0.05 - 0.1
	0.1 - 0.2
	0.2 - 0.5
	0.5 - 1
	> 1

 **Premise**
Finley BESS

Figure 51
Post-Development
PMF Flood Depth

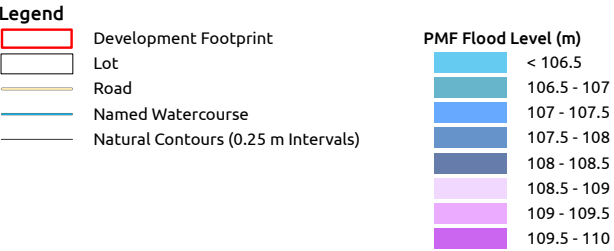
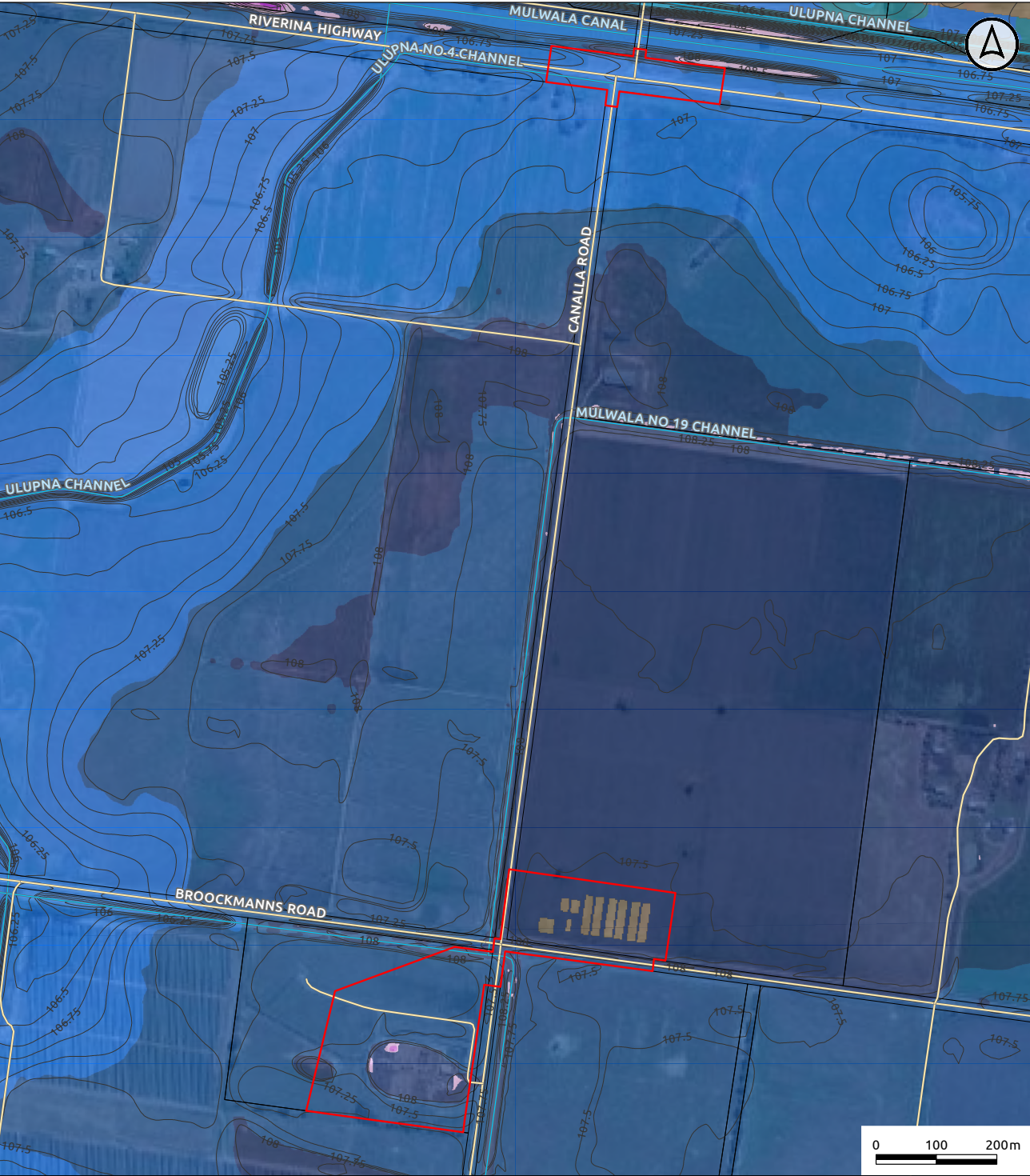
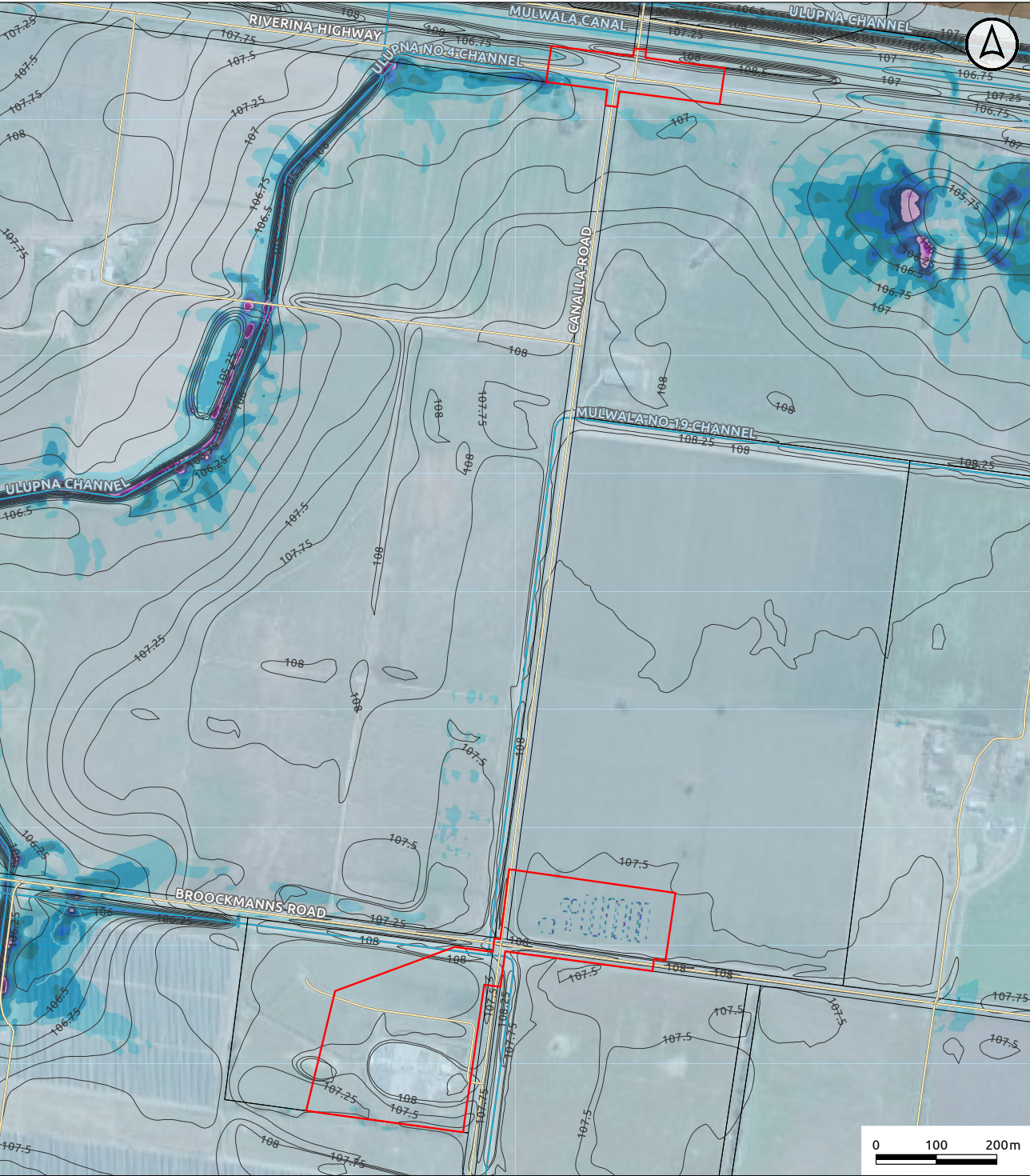


Figure 52
Post-Development
PMF Flood Level

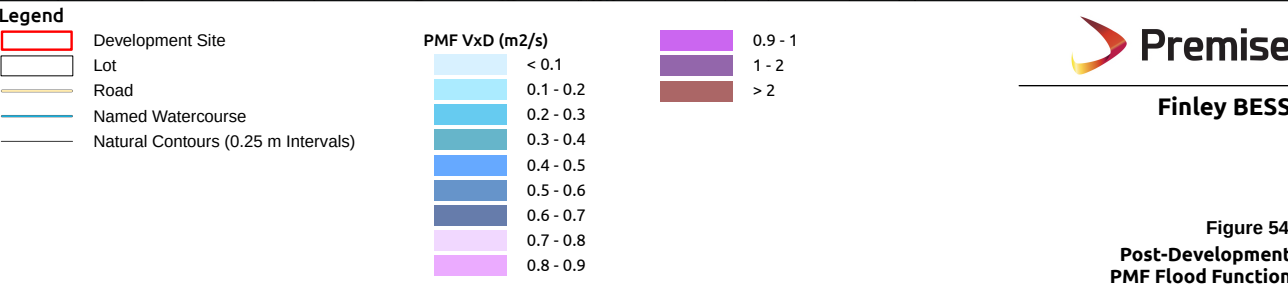


Figure 53
Post-Development
PMF Flood Velocity



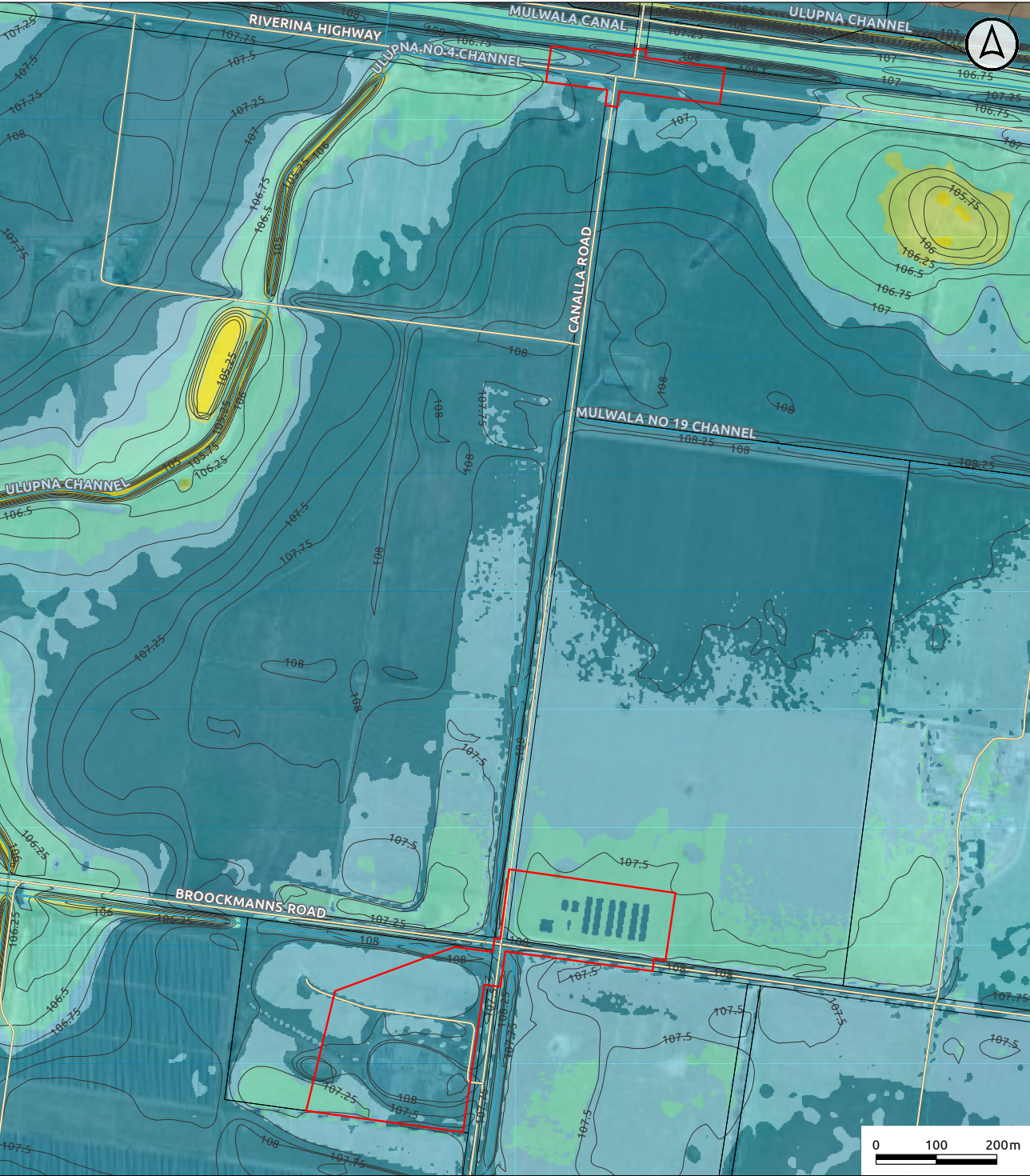
Sources: © State of NSW, Department of Customer Services, Spatial Services 2025
Gransolar Development 2025, ESR 2025

File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 23/01/2026



 **Premise**
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Figure 54
Post-Development
PMF Flood Function



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Gransolar Development 2025, ESR 2025
File: P001993_01_MASTER.aprx Prepared by: adam.davis Date: 23/01/2026

Legend

-  Development Site
-  Lot
-  Road
-  Named Watercourse
-  Natural Contours (0.25 m Intervals)

PMF Flood Hazard

-  H1
-  H2
-  H3
-  H4
-  H5

Figure 55
Post-Development
PMF Flood Hazard

