Moomba to Wilton Pipeline – Modification 6

Preliminary Flood Assessment

APA Group

February 2024

Project name		Wilton Temporary Camps Modification Report					
Document title		Moomba to Wilton Pipeline – Modification 6 | Preliminary Flood Assessment					
Project number		12585734					
File name		12585734_REP_APA_Preliminary-Flood-Assessment_Rev0.docx					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
S3	0	M Zhang	R Berg		Aryel Pyliotis (delegate)		27/02/24

GHD Pty Ltd | ABN 39 008 488 373
133 Castlereagh Street, Level 15
Sydney, New South Wales 2000, Australia
T +61 2 9239 7100 | **F** +61 2 9239 7199 | **E** sydmail@ghd.com | **ghd.com**

Contents

1. Introduction **1**
- 1.1 Overview 1
- 1.2 The proposed modification 1
- 1.3 Purpose and scope of this report 5
- 1.4 Scope and limitations 5

2. Methodology **6**
- 2.1 Camp 1 6
- 2.2 Camp 3 11

3. Preliminary Flood Assessment Results **13**
- 3.1 Camp 1 13
- 3.2 Camp 3 13

4. Conclusions **16**

5. References **17**

Table index

Table 1.1 Camp key details 4
Table 1.2 Relevant recommended matters from DPE 5
Table 2.1 Validation of WBNM model 6
Table 2.2 Adopted 5%, 1% and 0.2% AEP flood peaks – Racecourse Creek 9

Figure index

Figure 1.1 Location of the modification 2
Figure 1.2 Indicative camp layout 3
Figure 2.1 Camp 1 site location 7
Figure 2.2 Racecourse Creek catchments 8
Figure 2.3 HECRAS 2D model domain 10
Figure 2.4 Camp 3 site location 12
Figure 2.5 Louth gauged flow March-April 2012 (MHL, 2023) 12
Figure 3.1 Camp 3 location with respect to surrounding lot 14
Figure 3.2 0.2% AEP flood at Camp 3 (MHL, 2023) 15

Appendices

Appendix A Flood Maps – Camp 1
Appendix B Flood Maps – Camp 3

1. Introduction

1.1 Overview

East Australian Pipeline Ltd, part of APA Group (APA), owns and operates the Moomba to Wilton Pipeline (the MWP). The MWP is an underground high-pressure natural gas transmission pipeline about 1,300 kilometres (km) long running between Moomba in South Australia to Wilton in New South Wales (NSW) (see Figure 1.1).

The MWP is the main line of the Moomba to Sydney Pipeline, part of the East Coast Grid of interconnected gas transmission pipelines.

The MWP is owned and operated subject to the conditions of Pipeline Licence No.16, issued under the *Pipelines Act 1967* (NSW) (the Pipelines Act) and the Project Approval (SSI-15548591).

The conditions of Pipeline Licence No.16 require regular integrity surveys to be undertaken on the MWP. The maintenance repair program has been ongoing since 2005, with the program requiring work crews to be mobilised into the field on a yearly basis to undertake repairs as required.

Two temporary accommodation camps are required to accommodate staff for the ongoing maintenance works:

– Camp 1 in the vicinity of Tibooburra.
– Camp 3 near Tilpa.

APA proposes to use the temporary accommodation camps on a recurring three yearly basis to house maintenance crews working on nearby sections of the MWP.

Accordingly, APA is proposing to modify the existing SSI-15548591 approval to construct and operate the temporary accommodation camps (the proposed modification) in accordance with section 5.25 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act).

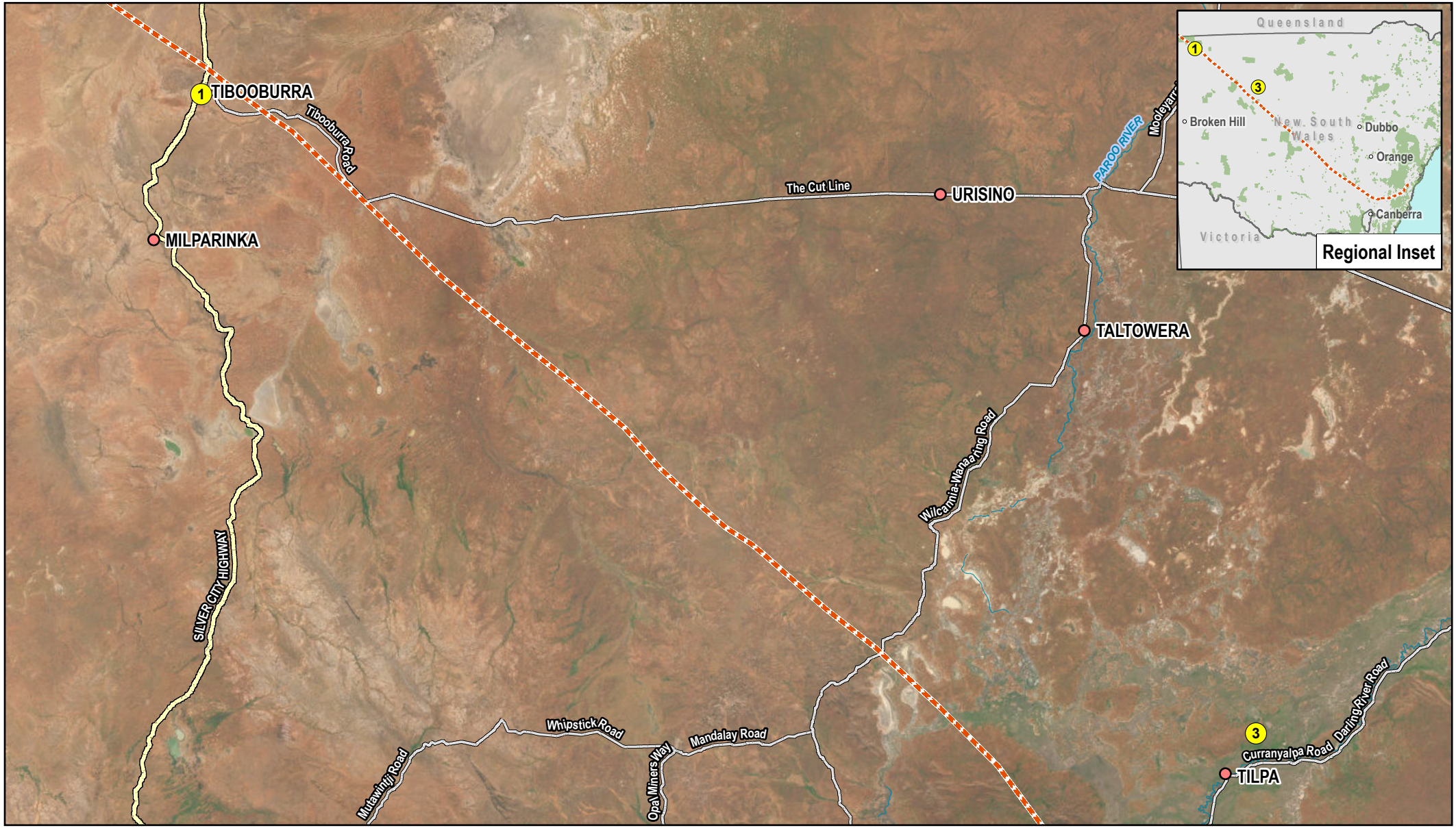
1.2 The proposed modification

1.2.1 Location

The two temporary accommodation camps which comprise the proposed modification are located across disparate areas of central and western NSW, as shown in Figure 1.1. For maintenance purposes the MWP is divided into a number of discrete sections. The temporary accommodation camps are located to support maintenance at section 2 and section 4 of the MWP.

A description of the site locations is provided below:

– Camp 1: Located approximately 200 metres (m) south-east of the town of Tibooburra. The Camp 1 site, which occupies an area of approximately 9.58 hectares (ha), is situated on Lot 24 of DP756228. The site is accessed via Burgess Street and an unsealed road off Burgess Street. Within the Camp 1 site, it is estimated that Camp 1 would occupy an area of approximately 3.85 ha (the Camp 1 footprint). The site is located in the Unincorporated Far West Region, and is not zoned under a local environmental plan.
– Camp 3: Located approximately 16 km north-east of the town of Tilpa in the Central Darling Shire LGA. The Camp 3 site, which occupies an area of approximately 28 ha, is situated on Lot 3 of DP 1092567. The site is accessed via Tilpa-Louth Road and an unsealed road off Tilpa-Louth Road. Within the Camp 3 site, it is estimated that Camp 3 would occupy an area of approximately 3.87 ha (the Camp 3 footprint).



LEGEND

- (1) Proposed temporary accommodation camp
- placepoint
- Moomba to Wilton Pipeline
- Highway
- Roads
- Watercourse

Paper Size ISO A4

0 9 18 27 36

Kilometers

Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA2020
Grid: GDA2020 NSW Lambert

N

GHD

APT Management Services Pty Ltd
Moomba to Wilton Pipeline – Mod 6
Preliminary Flood Assessment

Location of the proposed temporary accommodation camps

Project No. **12585734**
Revision No. **0**
Date **22/02/2024**

FIGURE 1.1

N:\AU\Sydney\Projects\21\12585734\GIS\Maps\MOD6_FloodAssess.aprx
Print date: 22 Feb 2024 - 15:37

Data source: World Imagery: Earthstar Geographics. Created by: tmorton

1.2.2 Key features of the modification

Each temporary accommodation camp would be serviced with power, communications, water, ablutions, and kitchen facilities.

Electricity for temporary accommodation camp operations would be supplied by diesel generators, with self bunded fuel tanks. A double wall, self bunded and containerised diesel storage tank of maximum 40,000 litre capacity would be strategically located on site. The camps would occupy a footprint of approximately 4 ha.

Each temporary camp would have approximately the same structure and function, including:

– demountable accommodation buildings
– demountable service buildings used for offices, kitchen, maintenance, and general housekeeping
– large and small vehicle parking
– construction laydown area

wastewater management system comprising a wastewater treatment plant and a designated area of approximately 1 ha for spray disposal of treated wastewater. An indicative temporary accommodation camp layout is shown in Figure 1.2.

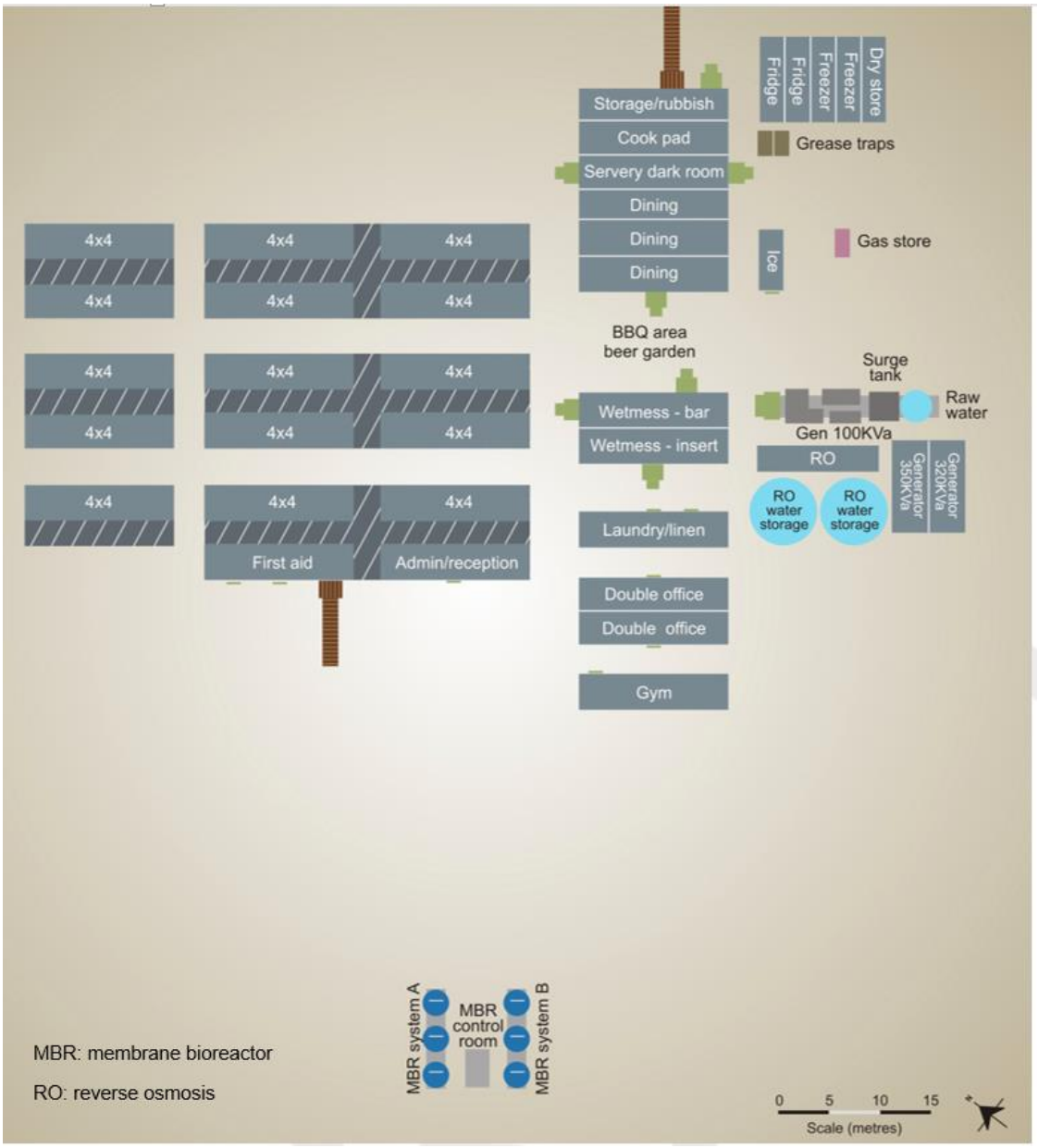


Figure 1.2 Indicative camp layout

Following construction, each temporary accommodation camp would have similar key structures and operational processes. The temporary accommodation camps would be established prior to commencement of works on the relevant section of the MWP. All accommodation structures are pre-fabricated and would be placed in position using a forklift or similar. Camp-specific details for each stage are provided in Table 1.1 and further detail is provided in Section 3 of the Modification Report.

Table 1.1 Camp key details

Camp	Site detail	Construction	Operation	Decommissioning and rehabilitation
Camp 1: Tibooburra	Camp 1 is located near the town of Tibooburra in an unincorporated area of NSW on freehold land (no zoning applies). The land parcel is located on Lot 24, DP756228. The landowner is Tibooburra Local Aboriginal Land Council (LALC). The proposed land use agreement would be via a lease. The camp is located to facilitate maintenance work on Section 2 of the MWP. The MWP is located around 5.4 km from Camp 1.	The proposed access route to Camp 1 to enable transport of construction materials and site infrastructure would be via the Silver City Highway, then Burgess Street, Tibooburra.	Potable water supply at Camp 1 would be established through a connection to the town water supply or trucked as required. Electricity supply would be via the use of two diesel generators, 350 kVa and 320 kVa, on site.	Following demobilisation, the hardstand, utility connections and some minor pipework including water lines may be left in-situ with agreement from the landholder.
Camp 3: North-east of Tilpa	Camp 3 is located about 16 km north-east of Tilpa along the Tilpa-Louth Road in the Central Darling Shire Council LGA on freehold land. The land zoning is RU1 – Primary Production under the Central Darling Local Environmental Plan 2012. The privately owned land parcel is located on Lot 3, DP1092567. Camp 3 has previously been used as a worker camp. It includes an existing laydown area which would be used under the modification. Camp 3 is located to facilitate maintenance work on Section 4 of the MWP, with the camp located around 46 km north-east of the MWP.	The proposed access route to Camp 3 to enable transport of construction materials and site infrastructure would be via Tilpa and Louth Roads, Tilpa.	Potable water supply at Camp 3 would be established through a connection to an existing standpipe/ surface water connection on site. Electricity supply would be via the use of two diesel generators, 350kVa and 320kVa, on site.	Following demobilisation, the hardstand, utility connections and some minor pipework, including water lines, may be left in-situ with agreement from the landholder.

1.2.3 Timing

Subject to receiving planning approval, it is expected that construction of the temporary accommodation camps would commence in mid to late-2024. The maintenance work is planned for low gas demand periods which are generally from October to December and February to April. Construction / installation may take four to six weeks with a similar time required for decommissioning work. Each temporary accommodation camp is expected to be operational for approximately three months. APA is seeking approval for use of the two temporary accommodation camp locations for up to 20 years. Each temporary accommodation camp is likely to be used approximately every three years, in line with the maintenance schedule for each section of the MWP.

1.2.4 Approval requirements

APA is seeking approval to modify SSI-15548591 under the provisions of Section 5.25 of the EP&A Act, which provides for modification of a SSI approval. The application is for Modification 6 to SSI-15548591.

Modification 6 was initiated through an initial scoping letter to the (then) NSW Department of Planning and Environment (DPE) (now Department of Planning, Housing and Infrastructure) in August 2023. DPE confirmed the appropriate approval pathway for the modification by letter dated 30 October 2023, and provided recommended matters to be addressed as part of the assessment process (see Table 1.2 of the Modification Report).

1.3 Purpose and scope of this report

The Modification Report has been prepared to support the application to modify the SSI-15548591 approval to construct and operate temporary accommodation Camps 1 and 3 in Tibooburra and Tilpa, respectively.

GHD Pty Ltd (GHD) has prepared this Preliminary Flood Assessment as a specialist input into the Modification Report. The report:

– addresses the relevant recommended matters listed in Table 1.2.
– provides a preliminary flooding assessment during a five per cent (%) Annual Exceedance Probability (AEP) flood event (i.e. 1 in 20 AEP), 1 % AEP flood event (i.e. 1 in 100 AEP) and 0.2% AEP flood event (i.e. 1 in 500 AEP) under existing conditions for Camps 1 and 3.

The methodology for the assessment is described in Section 2.

Table 1.2 Relevant recommended matters from DPE

DPE Recommendation	Where addressed
Flooding The Scoping Report indicates that the proposed Camp 1 site is located in close proximity to Racecourse Creek. The Modification Report should identify the proximity of both sites in relation to the floodplain and provide detailed assessment and justification for its use if they are located within the 1 in 100 flood planning level.	Key findings and recommendations for both camps based on this preliminary flood assessment is included in section 4. The preliminary assessment found that the majority of the Camp 1 site (3.85 ha) is outside of the 1% AEP floodplain. There is a small area (0.15 ha) in the north-eastern corner of the Camp 1 site that was modelled to experience flooding in this event. No infrastructure would be placed within this area. Camp 3 is located outside of the 1% AEP flood extent and detailed assessment for this site is therefore not required.

1.4 Scope and limitations

This report has been prepared by GHD for APA Group and may only be used and relied on by APA Group for the purpose agreed between GHD and APA Group. GHD otherwise disclaims responsibility to any person other than APA Group arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible. The report and mapping must not, without the prior written consent of GHD, be used or relied on by any other entity or person, except as permitted pursuant to the Special Conditions of Contract.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in this report. The opinions, conclusions and recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring after the date that the report was prepared.

The opinions, conclusions and recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

2. Methodology

2.1 Camp 1

2.1.1 Hydrology

Camp 1 is located between Racecourse Creek and south flowing ephemeral tributaries, south of the Tibooburra township (Figure 2.1). Local flooding of the site can occur due to surcharge from these tributaries.

The catchment draining to Racecourse Creek through Lot 24 was delineated as shown in Figure 2.2. It was originally proposed that flood peaks would be obtained using the regional flood frequency estimation model. However, due to the site being in a data-poor, arid region of Australia, regional flood frequency estimation data was not available for use in this assessment. Instead, a watershed bounded network model (WBNM) was compiled using Australian Rainfall and Runoff 2019 (ARR 2019, Ball et al., 2019) methodologies and 10 rainfall temporal distributions. Inputs to the WBNM were:

– ARR 2019 rainfall: Intensity Frequency Duration Design Rainfall Depth (mm) issued on 5 December 2023 for the requested coordinates: Latitude, -29.43057293, Longitude, 142.00695293.
– Catchment and impervious areas: The catchment area (894 ha with 0.54% slope) is mostly pervious. To account for buildings, roads, tracks, dams, quarries and other less pervious areas, an approximate 7.89% impervious fraction was adopted.
– Initial and continuing losses: Probability neutral initial losses were adopted in accordance with ARR 2019. Continuing losses were not available for this location amongst the ARR 2019 rainfall data. A continuing loss of 4mm/hr was therefore selected based on Table 3.2 in Book 2, Section 3 of the ARR 1987 guidelines (Pilgrim DH, 1987).
– A WBNM lag parameter of 1.6 was adopted.

Simulations were undertaken for the 5%, 1% and 0.2% AEP storm events. In doing so, 10 storm rainfall patterns were simulated for a range of durations. For each duration the median flood peak was identified from the 10 storm patterns. This was adopted as the design flood peak for that duration, whereafter the design flood peaks were enveloped across all durations, to identify the critical duration and corresponding design flood peak. This is an approach acceptable under ARR 2019, however does not preclude a design flood peak greater than the critical flood peak adopted.

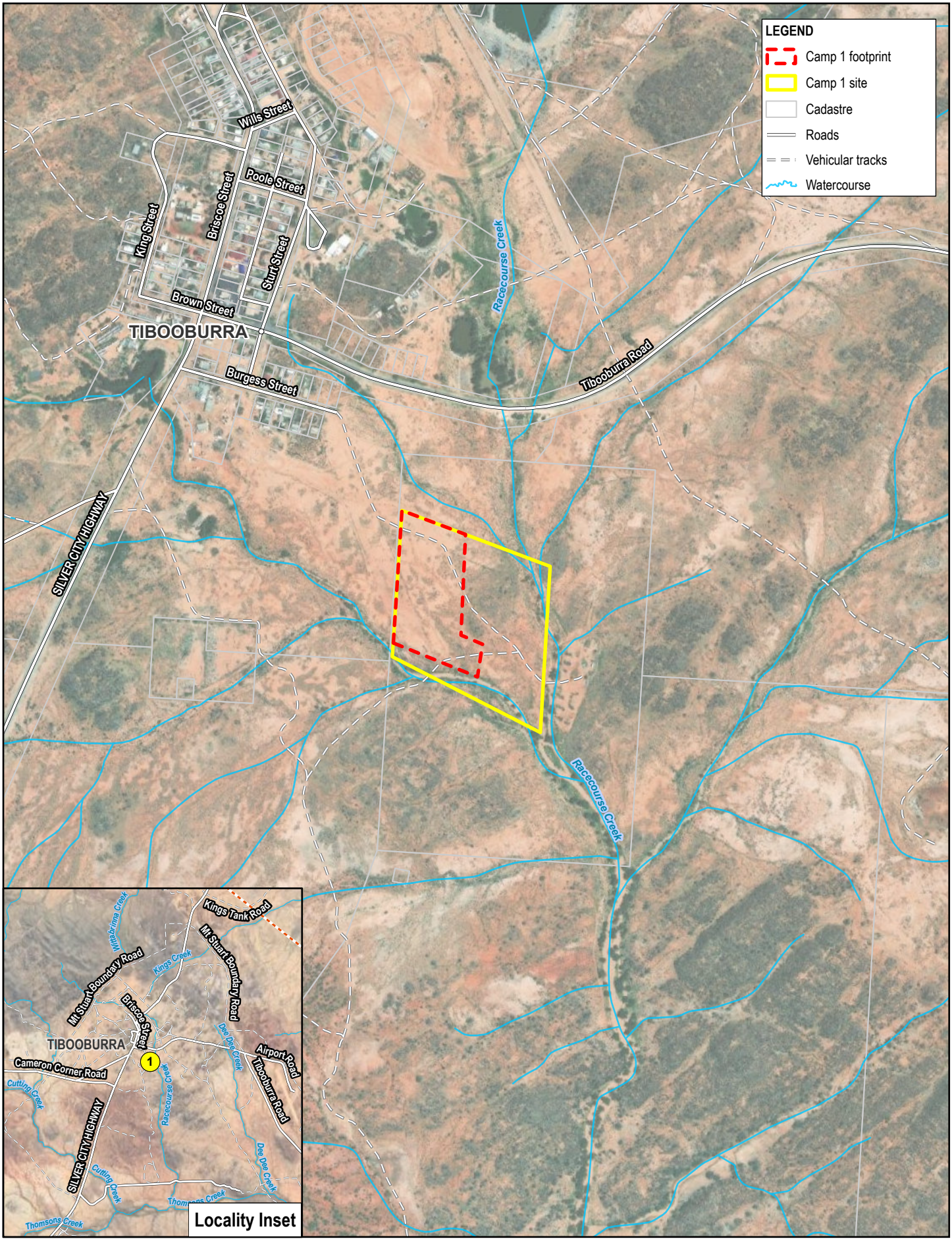
Since no concurrent pluviographic rainfall and runoff data was available, calibration of the model was not possible. Validation was thus undertaken using two separate methods, namely:

– a self-standing RORB model (which is an acceptable hydrological model under ARR 2019).
– an inhouse GHD flood peak relationship.

The results in Table 2.1 show favourable agreement between all three methods. Based on the above discussion, the WBNM simulations were adopted.

Table 2.1 Validation of WBNM model

Method	1% AEP Flood Peak (m^3/s)
WBNM	40 (3-hour duration)
RORB	36 (3-hour duration)
GHD Inhouse Graph	30-100



Paper Size ISO A4

0 100 200 300

Metres

Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA2020
Grid: GDA2020 NSW Lambert

N

GHD

APT Management Services Pty Ltd
Moomba to Wilton Pipeline – Mod 6
Preliminary Flood Assessment

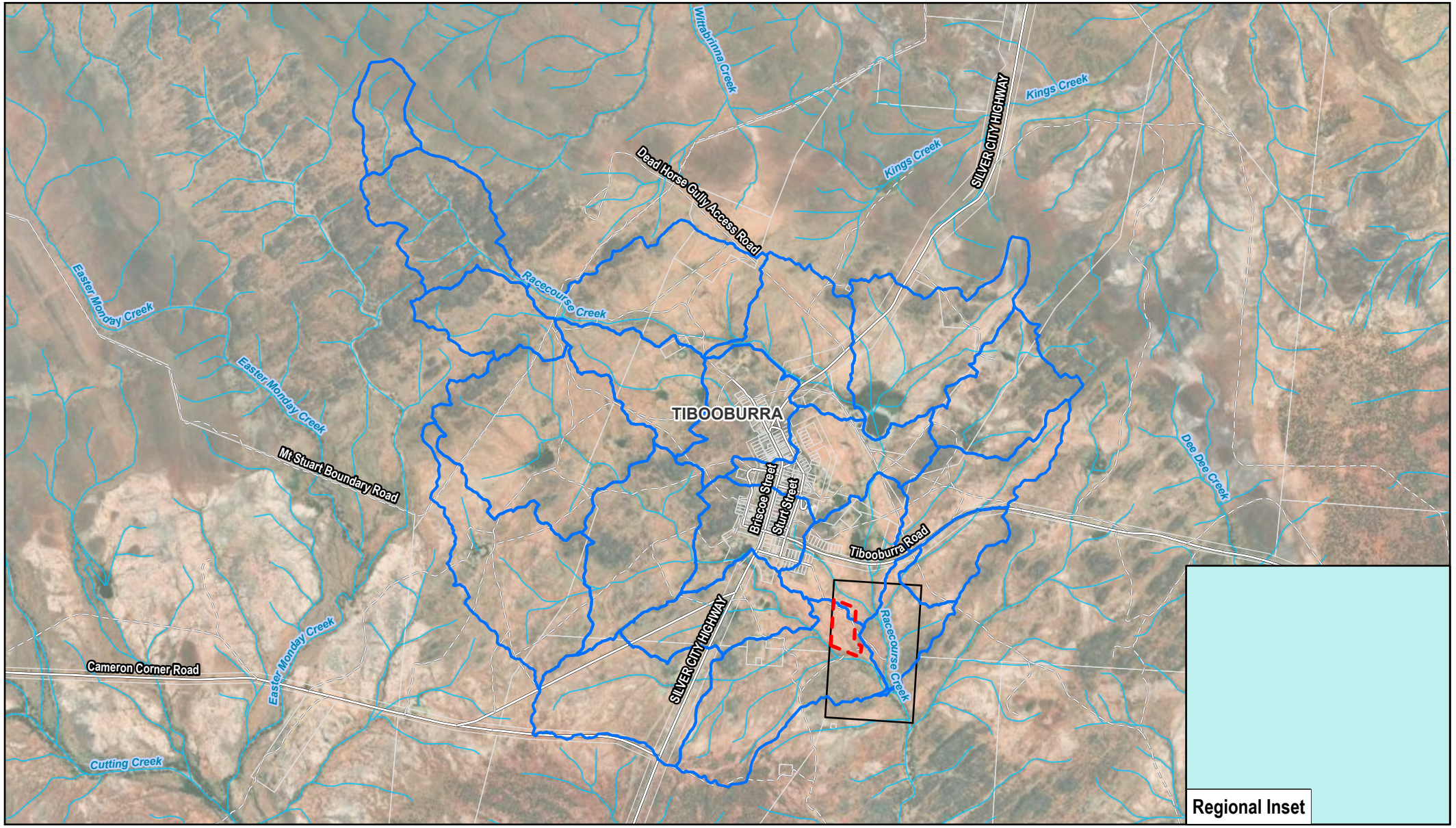
Camp 1 site location

Project No. **12585734**
Revision No. **0**
Date **22/02/2024**

FIGURE 2.1

N:\AU\Sydney\Projects\21\12585734\GIS\Maps\MOD6_FloodAssess.aprx - FA002_SiteLocation_MOD6_Camp1
Print date: 22 Feb 2024 - 14:04

Data source: Google Maps: Google
World Imagery: Maxar. DCS: DTDB/DCDB, 2021. DPIE: Land use zones, 2021. NSW EPI: Heritage data, 2022.
Created by: tmorton



LEGEND

- Camp 1 footprint
- Catchment boundary
- Lot 24 DP756228
- Cadastre
- Road
- Vehicular track
- Watercourse

Paper Size ISO A4

0 0.2 0.4 0.6 0.8 1

Kilometres

Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA2020
Grid: GDA2020 NSW Lambert

N

GHD

APT Management Services Pty Ltd
Moomba to Wilton Pipeline – Mod 6
Preliminary Flood Assessment

Racecourse Creek catchments
Camp 1

Project No. **12585734**
Revision No. **0**
Date **22/02/2024**

FIGURE 2.2

N:\AU\Sydney\Projects\21\12585734\GIS\Maps\MOD6_FloodAssess.aprx
Print date: 22 Feb 2024 - 14:04

Data source: World Imagery: Maxar. DCS: DTDB/DCDB, 2021. DPIE: Land use zones, 2021. NSW EPI: Heritage data, 2022.
Created by: tmorton

The WBNM model was simulated to determine the flood hydrographs draining to, and through, the Camp 1 site. The resultant 5%, 1% and 0.2% AEP flood peaks near the southern boundary of the site are listed in Table 2.2.

Table 2.2 Adopted 5%, 1% and 0.2% AEP flood peaks – Racecourse Creek

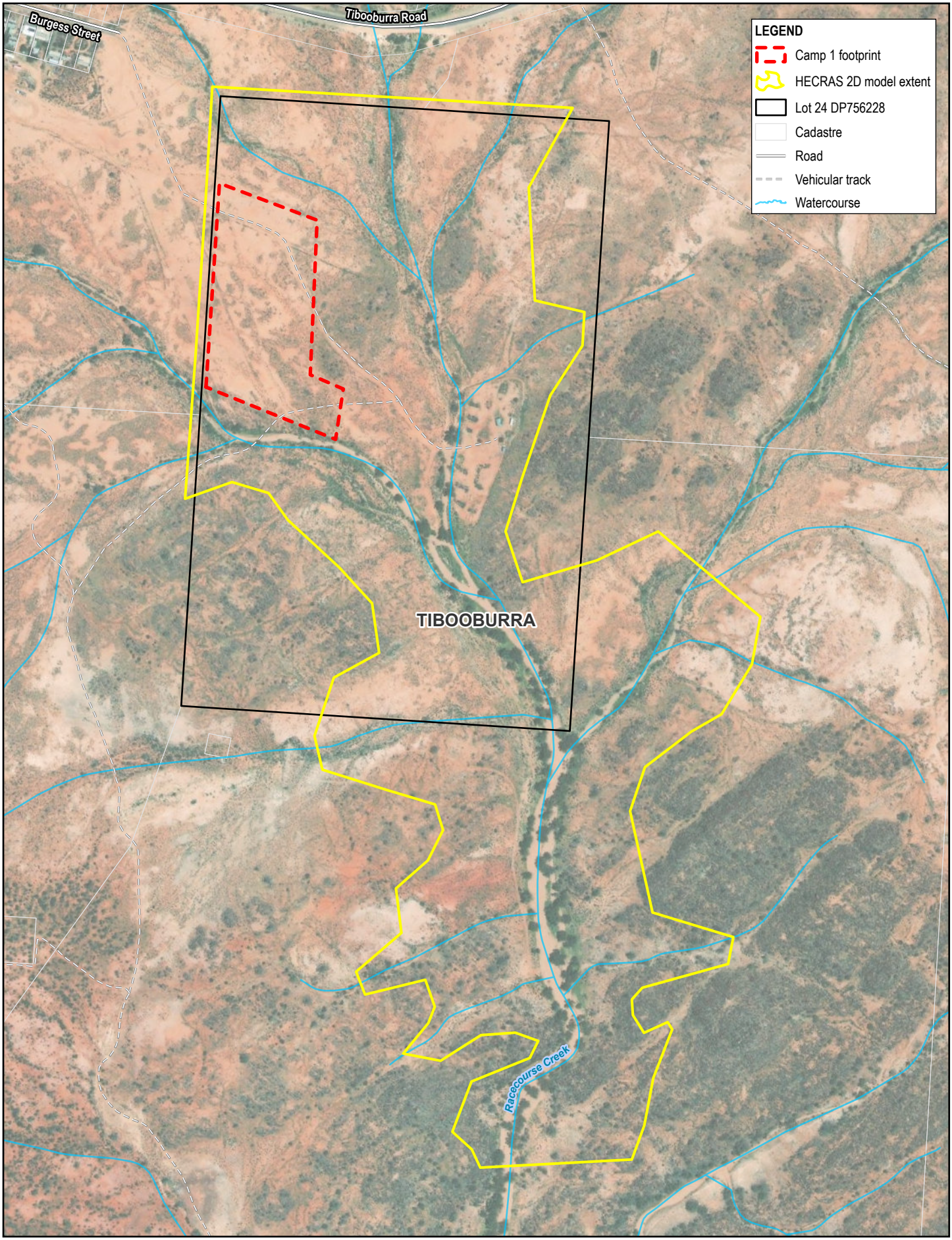
Event (AEP)	Critical Duration	Median Flood Peak (m^3/s)	Temporal Pattern (TP)
5%	4.5 hour	13	TP2
1%	3 hour	40	TP5
0.2%	2 hour	74	TP8

2.1.2 Flood modelling

A 2D HECRAS hydraulic model was compiled for the purpose of calculating the flood inundation from the Racecourse Creek tributaries at Camp 1, as follows:

– The model extended from the northern boundary of Lot 24 to approximately 0.8 km downstream of the confluence of the two Racecourse Creek tributaries.
– Topographic data was sourced from LiDAR data (5 m grids) obtained from the ICSM data portal.
– A generally regular interval 2 m spacing mesh was adopted for most of the model domain. Adjustment of the mesh was achieved using breaklines in some locations, to better represent the creek.
– A Manning's "n" roughness value of 0.1 was adopted for the creek channel and overbank areas, given the nature of the catchment and preliminary nature of the assessment.
– The Racecourse Creek inflow hydrographs were adopted as boundary inflows and normal depth was assumed as downstream boundary.

The extents of the local hydraulic model are shown in Figure 2.3. The model was simulated for the 5%, 1% and 0.2% AEP flood events and the flood data was enveloped to produce a series of flood maps provided in Appendix A.



Paper Size ISO A4

0 50 100 150 200 250

Metres

Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA2020
Grid: GDA2020 NSW Lambert

N

GHD

APT Management Services Pty Ltd
Moomba to Wilton Pipeline – Mod 6
Preliminary Flood Assessment

HECRAS 2D Model extents Camp 1

Project No. **12585734**
Revision No. **0**
Date **22/02/2024**

FIGURE 2.3

N:\AU\Sydney\Projects\21\12585734\GIS\Maps\MOD6_FloodAssess.aprx - FA004_HECRAS_MOD6_Camp1
Print date: 22 Feb 2024 - 14:04

Data source: World Imagery: Maxar. DCS: DTDB/DCDB, 2021. DPIE: Land use zones, 2021. NSW EPI: Heritage data, 2022. Created by: tmorton

2.2 Camp 3

2.2.1 Darling River Flood Mapping Study Final Report (MHL 2023)

Manly Hydraulic Laboratory (MHL) and Public Works Advisory (PWA) were engaged by Central Darling Shire Council to undertake the Darling River Flood Mapping Study (MHL, 2023). The objective was to improve understanding of flood behaviour and impacts, and better inform management of flood risk in the study area. Camp 3 (shown in Figure 2.4) is located within the extents of this study.

The floodplain in the study area is confined mainly to the Darling River from Bourke to Tilpa and downstream of Tilpa. The Darling River flows into the Wilcannia main channel and Talyawalka Creek and this becomes a complex system connecting with a series of small and big lakes. Flow between the rivers and some of the lakes are controlled by hydraulic structures. The general topography of the catchment is flat, with elevations less than 100 m across most of the floodplain. The low gradient of the land to the north of Menindee means that flood peaks may take a long time to reach the townships. There is a very small amount of run-off within this catchment and nearly all the water flowing through the Central Darling comes from the rivers of southern Queensland and northern New South Wales through the Barwon–Darling River system.

The Darling River Flood Mapping Study (MHL, 2023) developed a TUFLOW hydraulic model to simulate flood behaviour within the study area. To define the topography of the floodplain areas within the model domain, a grid resolution of 80 m x 80 m was adopted. A finer resolution grid of 20 m x 20 m was used to define the main channel of the Darling River and critical topography around inlet channels, key structures, and levees. Flood frequency analyses were conducted for the Louth and Willara gauging stations to determine design floods. The March-April 2012 historic flood event (Figure 2.5) was adopted as a validation event. The figure shows the slow rise in flood waters over a period of approximately 14 days. At the site this would translate to approximately 0.85 m rise over 24 hours (approximately 35 mm per hour).

The study found that several main roads and railways, including the Barrier Highway, Wilcannia-Menindee Road, East and West Tilpa Road, and Orange Broken Hill Railway, are cut off at various locations during all modelled flood events. Therefore, the connectivity between townships, including Tilpa, Wilcannia, and Menindee, can be significantly impacted during a major flood event. In Tilpa, the levee appears to generally protect the township from a 5% AEP flood event but is overtopped during a 1% AEP or larger event.

Figure provided in PDF version of this report

Figure 2.4 Camp 3 site location

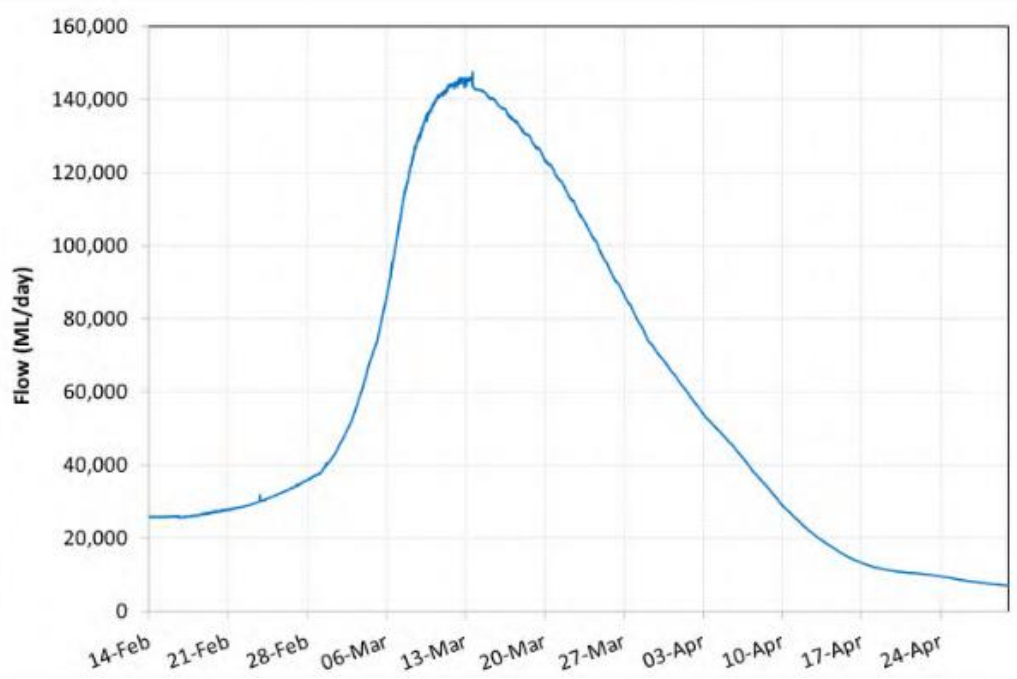


Figure 2.5 Louth gauged flow March-April 2012 (MHL, 2023)

2.2.2 Flood data interpretation

For the preliminary assessment, a flood model was not compiled. Instead, information was extracted from the flood mapping study undertaken by MHL (MHL, 2023). The flood mapping from this study was superimposed onto the Camp 3 site and, together with publicly available LiDAR data (ICSM Elvis Data Hub), was used to interpret flood data. The MHL flood mapping study provided the following flood mapping in the study report:

– peak flood depth and water levels for the 5%, 1% and 0.2% AEP design flood events
– peak flow velocity for the 5%, 1% and 0.2% AEP design flood events
– yydraulic hazard for the 5%, 1% and 0.2% AEP design flood events.

No model results data was available.

3. Preliminary Flood Assessment Results

This section describes the results of the preliminary flood assessment. Please refer to the flood maps in Appendix A (for Camp 1) and Appendix B (for Camp 3), respectively.

3.1 Camp 1

The 2D HECRAS flood simulations (described in Section 2) showed:

– The Camp 1 footprint is outside of the 5% AEP flood extent.
– In the 1% AEP event, the majority of the camp remains flood free, with only a small area (0.15 ha) on the north-eastern corner of the footprint experiencing flooding due being located on the outer edges of the Racecourse Creek floodplain. This equates to approximately 4 % of the overall Camp 1 footprint area (3.85 ha), however, no site infrastructure or facilities would be located in this area. Flood depths and velocities in this area reach a maximum of 0.3 m and 0.16 m/s respectively. The combination of relatively shallow, slow-moving flood waters result in generally safe hazard conditions (H1 – Generally safe for vehicles, people and buildings, AIDR 2017).
– In the 0.2% AEP event, a tributary of Racecourse Creek near the northern site boundary was simulated to surcharge, conveying floodwater southwards across most of the Camp 1 site. However, flood depths within the site are typically under 0.5 m in this event, and flood velocities are mostly in the range of 0.05 – 0.4 m/s. The combination of these flood depths and velocities maintain the generally safe hazard conditions (H1 – Generally safe for vehicles, people and buildings, AIDR 2017).

This assessment has not considered future climate flood levels, which were beyond the scope of the assessment. However, the 0.2% AEP flood event is at times used as a proxy for the future climate 1% AEP event. It is therefore important to note, that under future climate conditions floodwaters could discharge through the site, albeit with generally safe hazard conditions.

3.2 Camp 3

Camp 3 only occupies a small, approximately 4-ha area of the overall lot (Figure 3.1). It is located on an elevated portion of the lot with the lowest portion of the Camp 3 boundary being located at approximately 89.7 m Australian Height Datum (AHD).

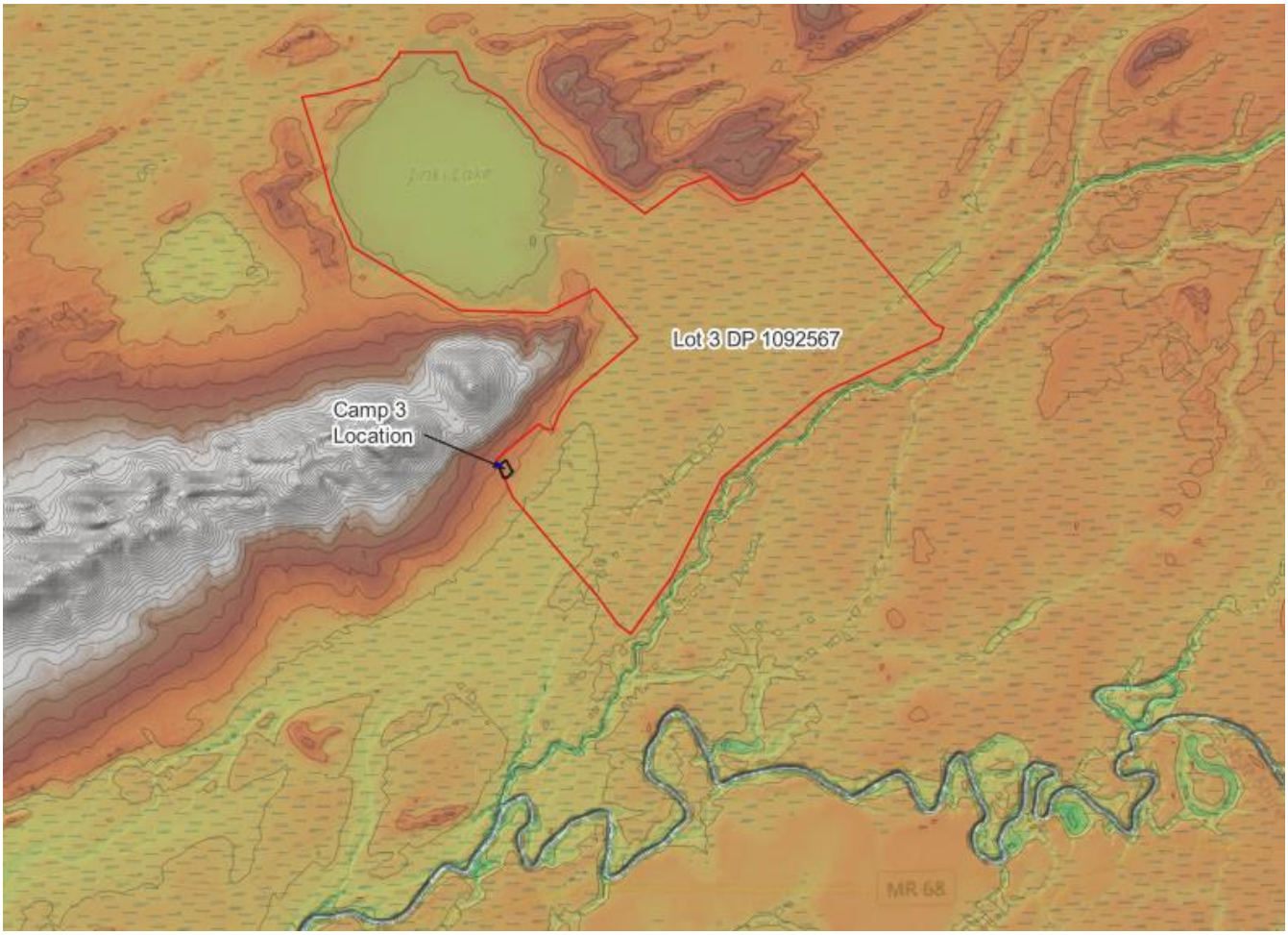


Figure 3.1 Camp 3 location with respect to surrounding lot

A review of the MHL 2023 flood study shows the proposed location of Camp 3 is above the 0.2% AEP flood extent as per Figure 3.2 and Appendix B. The site is therefore assessed to be flood free up to this flood event. The proximity of the site to the 1% AEP floodplain was measured to be approximately 135 m.

It is noted however that Camp 3 will be accessed off the Tilpa Louth Road. This road crosses the Darling River floodplain which is at a high risk of flooding and is shown to be flooded in a 5% AEP event. Evacuation from the site will be important if flooding is predicted and is considered achievable as flood levels rise slowly providing opportunity to demobilise if required and evacuate the site. It will be important to be vigilant at times of flooding and monitor/heed advice from the SES and BOM, evacuating the site before evacuation routes are cut.

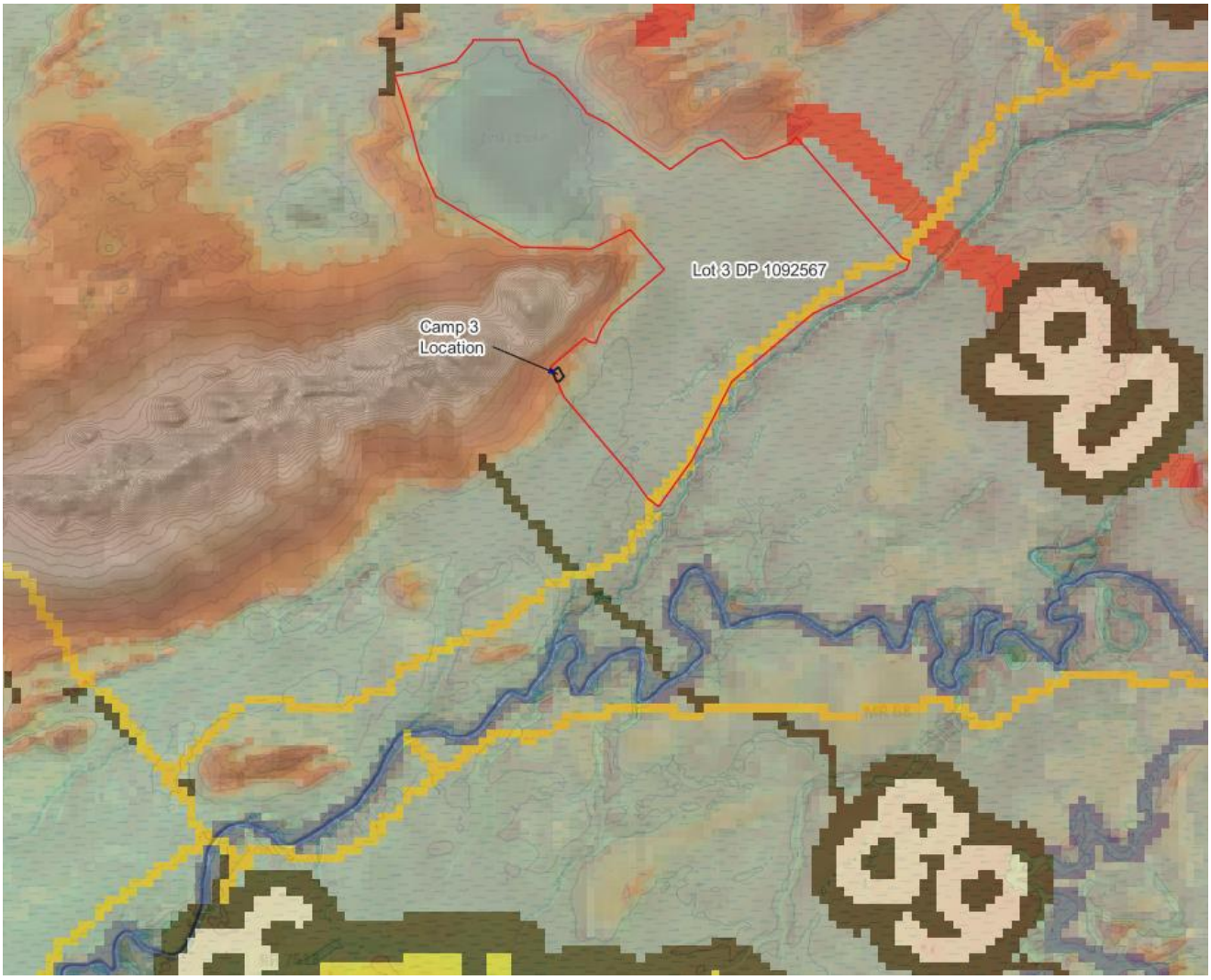


Figure 3.2 0.2% AEP flood at Camp 3 (MHL, 2023)

4. Conclusions

This report provides a preliminary flood assessment of the 5% Annual Exceedance Probability (AEP, i.e. 1 in 20 AEP), 1% AEP (i.e. 1 in 100 AEP) and 0.2% AEP (i.e. 1 in 500 AEP) flood events for temporary accommodation Camps 1 and 3 in Tibooburra and Tilpa, respectively.

Due to the Camp 1 site being located in a data-poor, arid region of Australia, regional flood frequency estimation data was not available for use in this assessment as previously intended. Instead, a WBNM hydrological model was compiled. A preliminary HECRAS 2D hydraulic model was compiled for the purpose of calculating the flood inundation from the Racecourse Creek tributaries at the Camp 1 site. The model was simulated for the 5%, 1% and 0.2% AEP flood events and the flood data was enveloped to produce a series of flood maps.

A flood model was not compiled for the preliminary assessment for Camp 3. Instead, information was extracted from the Darling River Flood Mapping Study (MHL, 2023). The flood mapping from this study was superimposed onto the site and, together with publicly available LiDAR data (ICSM Elvis Data Hub), was used to interpret flood data.

Key findings and recommendations are as follows:

– A small portion on the north-eastern corner of Camp 1 (approx. 0.15 ha) was simulated to be within the Racecourse Creek floodplain in the 1% (1 in 100) AEP flood extent (refer to Figure A02 in Appendix A). This area, located on the outer edge of the floodplain, occupies only approximately 4% of the overall Camp 1 footprint and no site infrastructure or facilities would be located in this area. The combination of slow flowing floodwaters and shallow flood depths result in generally safe hazard conditions (H1 – Generally safe for vehicles, people and buildings, AIDR 2017).
– The flood maps from the Darling River Flood Mapping Study (MHL, 2023) showed that proposed location of Camp 3 would not be inundated in the 1% AEP event, being located above even the 0.2% AEP flood extent. The proximity of the site to the 1% AEP floodplain was measured to be approximately 135 m.
– The CEMP for Camp 3 should include evacuation procedures to vacate the site where flooding of the Darling River floodplain could affect access along Tilpa-Louth Road during occupation periods. The procedure should include monitoring of the flood situation in the event of predicted flooding of the Darling River floodplain, flood evacuation routes and emergency contact information. In the event of predicted flooding of Tilpa-Louth Road the site operator should evacuate the Camp 3 site in accordance with the procedure and any advice from the NSW State Emergency Service.

This preliminary assessment has not considered future climate explicitly since this was beyond the scope of the study. However, the 0.2% AEP flooding is often used as a proxy for the 1% AEP flood event under future climate conditions. For Camp 1 floodwaters could discharge through the site under future climate, albeit with generally safe hazard conditions. Camp 3 is expected to be located above the future climate 1% AEP flood levels.

5. References

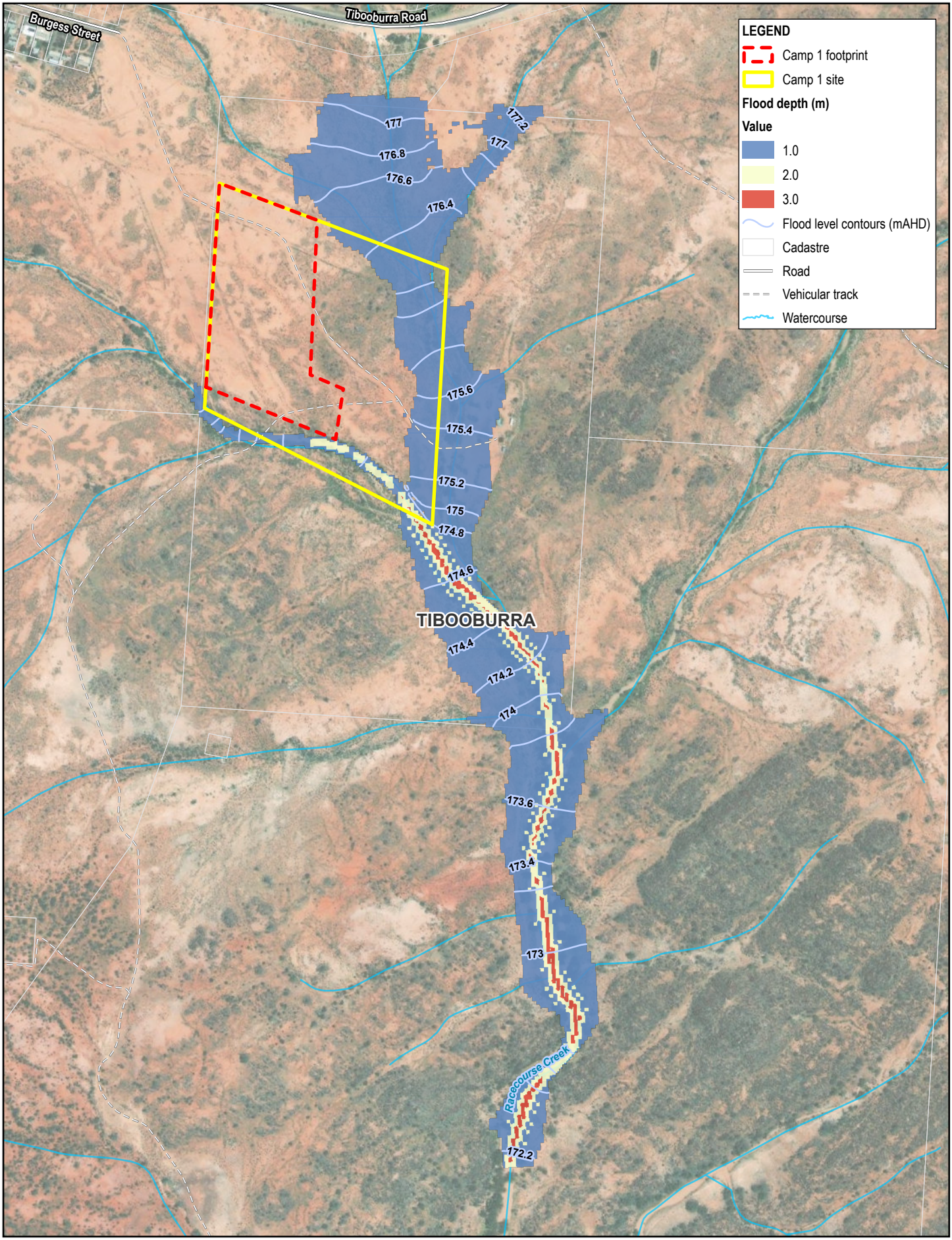
Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors) (2019 Australian Rainfall and Runoff: A Guide to Flood Estimation, © Commonwealth of Australia (Geoscience Australia)

Pilgrim DH (editor) (1987), Australian Rainfall and Runoff: A Guide to Flood Estimation, Institution of Engineers, Australia

AIDR (2017), Australian Disaster Resilience Handbook Collection Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia, AIDR

Appendix A

Flood Maps – Camp 1



Paper Size ISO A4

0 50 100 150 200 250

Metres

Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA2020
Grid: GDA2020 NSW Lambert

N

GHD

APA Group
Moomba to Wilton Pipeline
Temporary Accommodation Camps 1 and 3 Modification Report

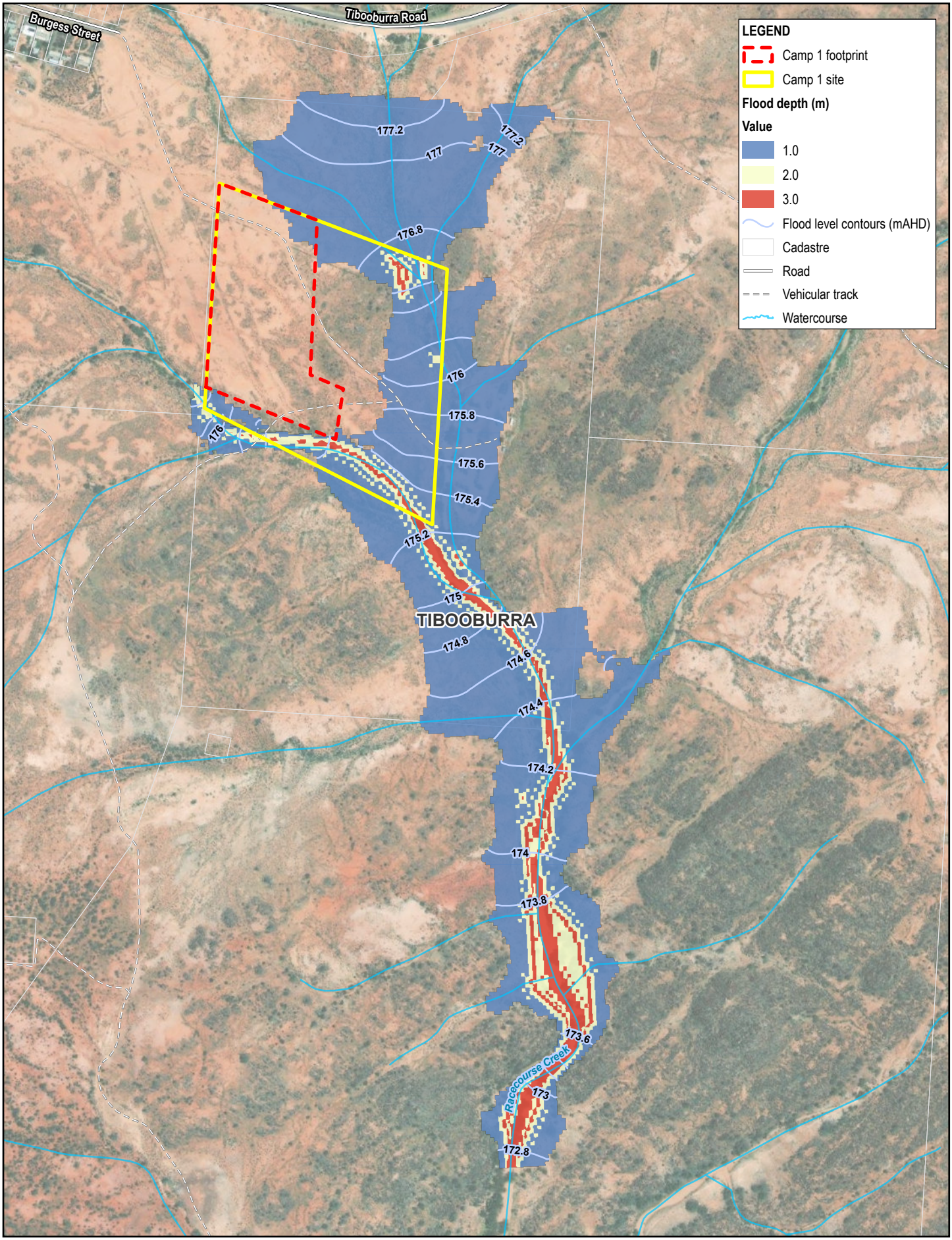
Camp 1 site location of the 5% AEP flood extents

Project No. **12585734**
Revision No. **0**
Date **22/02/2024**

APPENDIX A01

\\ghdnet\ghd\AU\Sydney\Projects\21\12585734\GIS\Maps\MOD6_FloodAssess_Appendicies.aprx - MRA01_MOD6_5Perc_AEP_Camp1
Print date: 22 Feb 2024 - 14:25

Data source: World Imagery: Maxar. DCS: DTDB/DCDB, 2021.
Created by: tmorton



Paper Size ISO A4

0 50 100 150 200 250

Metres

Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA2020
Grid: GDA2020 NSW Lambert

N

GHD

APA Group
Moomba to Wilton Pipeline
Temporary Accommodation Camps 1 and 3 Modification Report

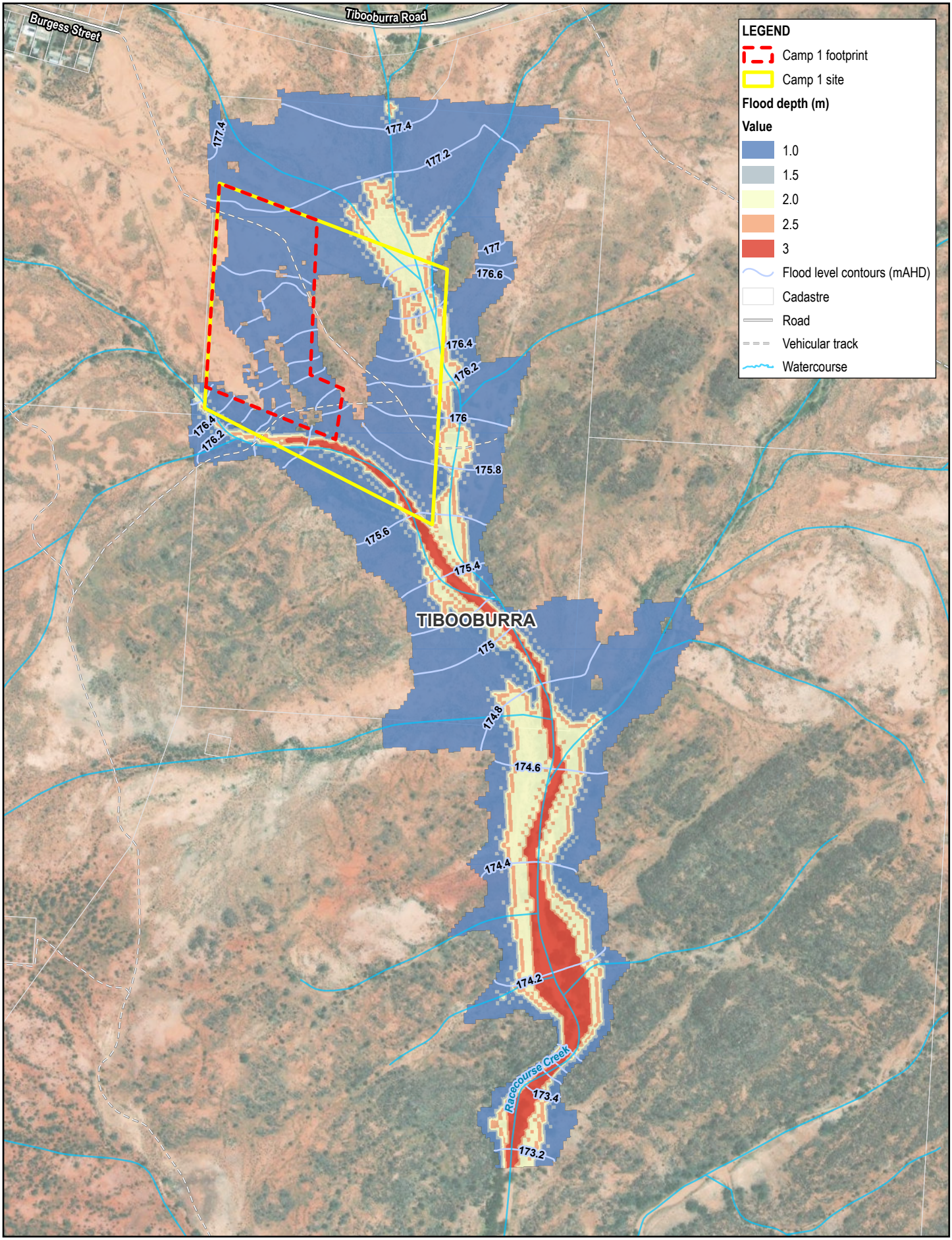
Camp 1 site location of the 1% AEP flood extents

Project No. **12585734**
Revision No. **0**
Date **22/02/2024**

APPENDIX A02

\\ghdnet\ghd\AU\Sydney\Projects\21\12585734\GIS\Maps\MOD6_FloodAssess_Appendicies.aprx - MRA02_MOD6_1Perc_AEP_Camp1
Print date: 22 Feb 2024 - 14:25

Data source: World Imagery: Maxar. DCS: DTDB/DCDB, 2021.
Created by: tmorton



Paper Size ISO A4

0 50 100 150 200 250

Metres

Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA2020
Grid: GDA2020 NSW Lambert

N

GHD

APA Group
Moomba to Wilton Pipeline
Temporary Accommodation Camps 1 and 3
Modification Report

Camp 1 site location of the 0.2% AEP flood extents

Project No. **12585734**
Revision No. **0**
Date **22/02/2024**

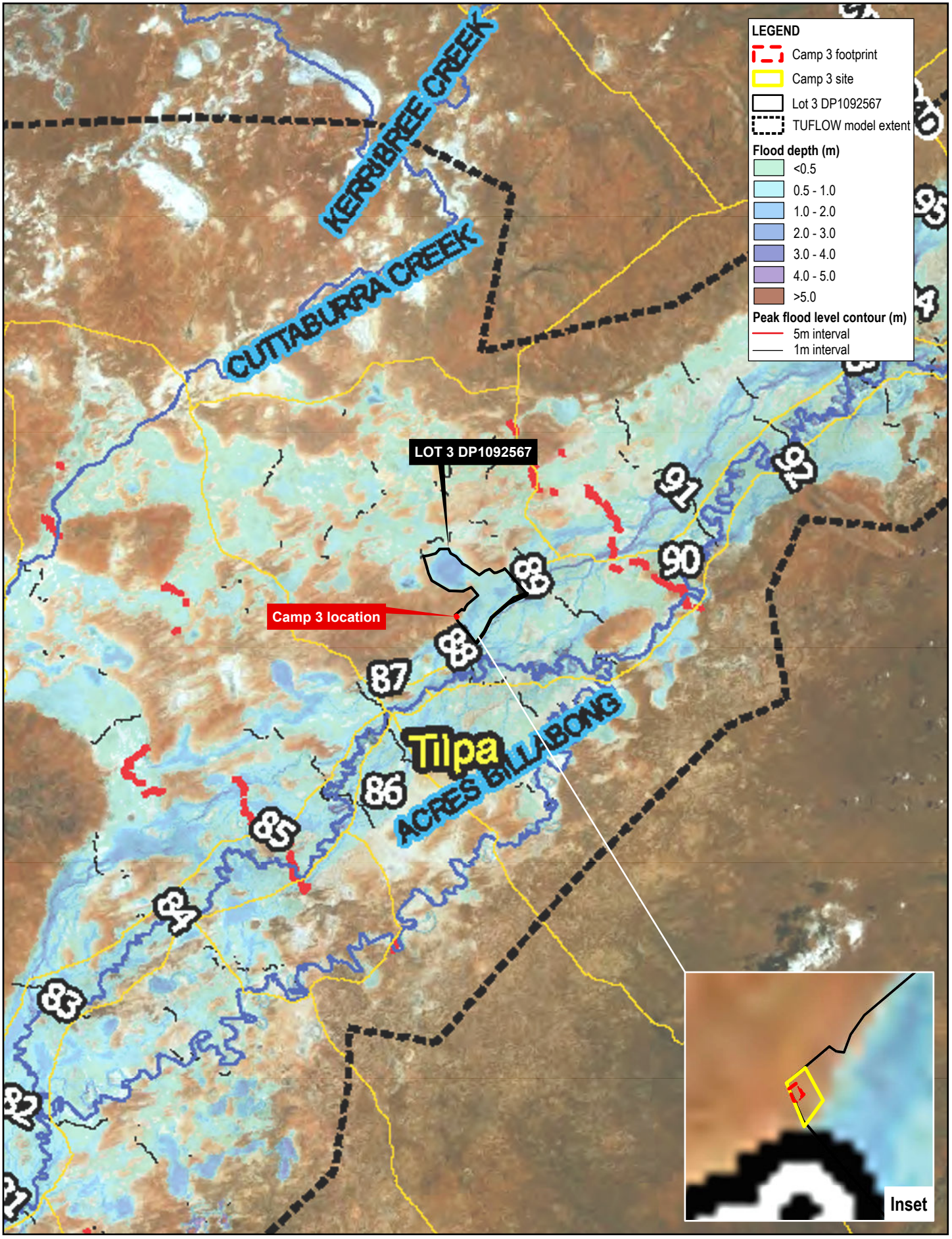
APPENDIX A03

\\ghdnet\ghd\AU\Sydney\Projects\21\12585734\GIS\Maps\MOD6_FloodAssess_Appendicies.aprx - MRA03_MOD6_02Perc_AEP_Camp1
Print date: 22 Feb 2024 - 14:25

Data source: World Imagery: Maxar. DCS: DTDB/DCDB, 2021.
Created by: tmorton

Appendix B

Flood Maps – Camp 3



Paper Size ISO A4

0 5 10 15 20

Kilometres

Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA2020
Grid: GDA2020 NSW Lambert

N

GHD

APA Group
Moomba to Wilton Pipeline
Temporary Accommodation Camps 1 and 3 Modification Report

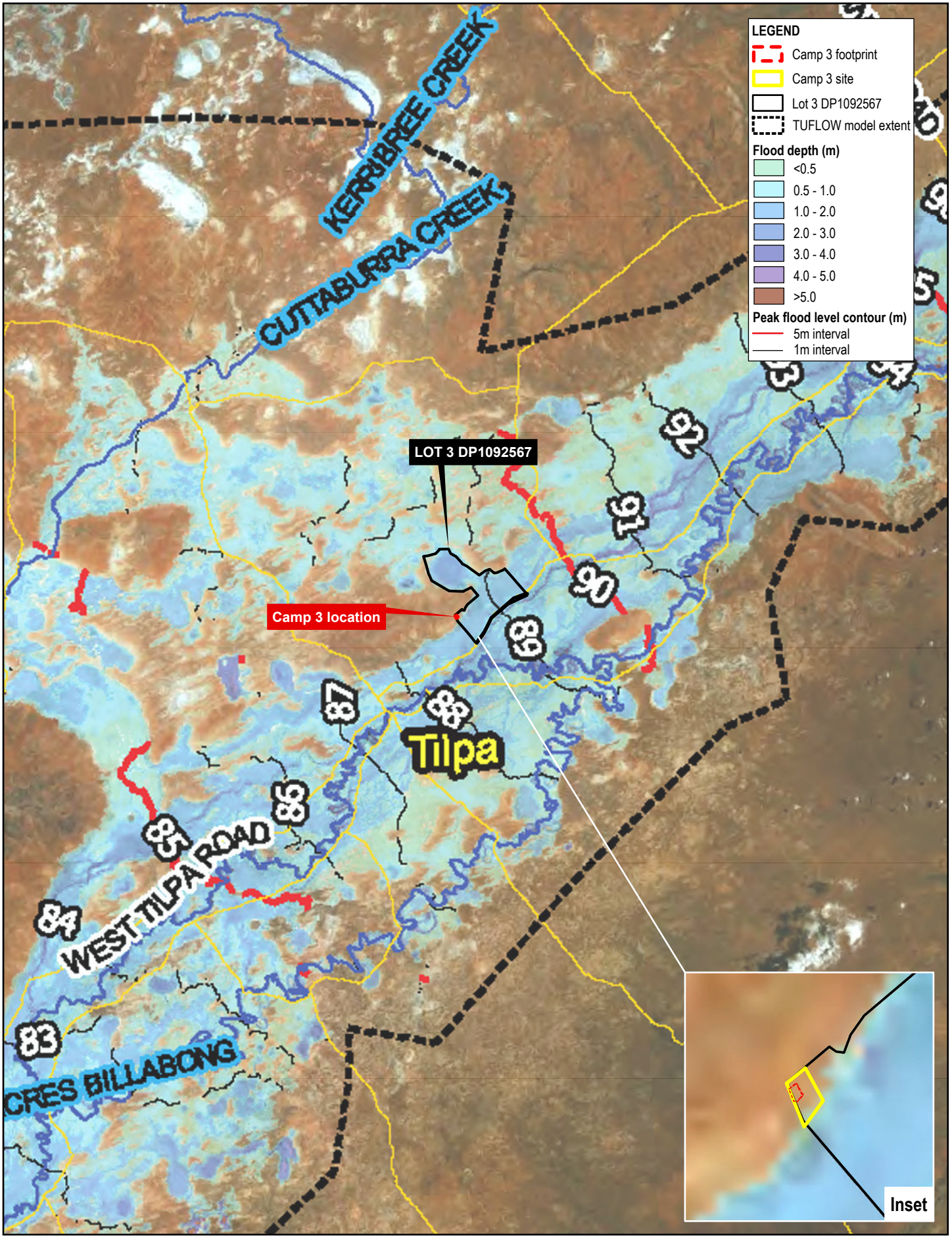
Camp 3 site location of the 5% AEP flood extents

Project No. **12585734**
Revision No. **0**
Date **22/02/2024**

APPENDIX B01

\\ghdnet\ghd\AU\Sydney\Projects\21\12585734\GIS\Maps\MOD6_FloodAssess_Appendicies.aprx - MRB01_MOD6_5Perc_AEP_Camp3
Print date: 22 Feb 2024 - 14:24

Data source: World Imagery: Earthstar Geographics
World Imagery: Maxar. DCS: DTDB/DCDB, 2021.
Created by: tmorton



Paper Size ISO A4

0 5 10 15 20

Kilometres

Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA2020
Grid: GDA2020 NSW Lambert

N

GHD

APA Group
Moomba to Wilton Pipeline
Temporary Accommodation Camps 1 and 3 Modification Report

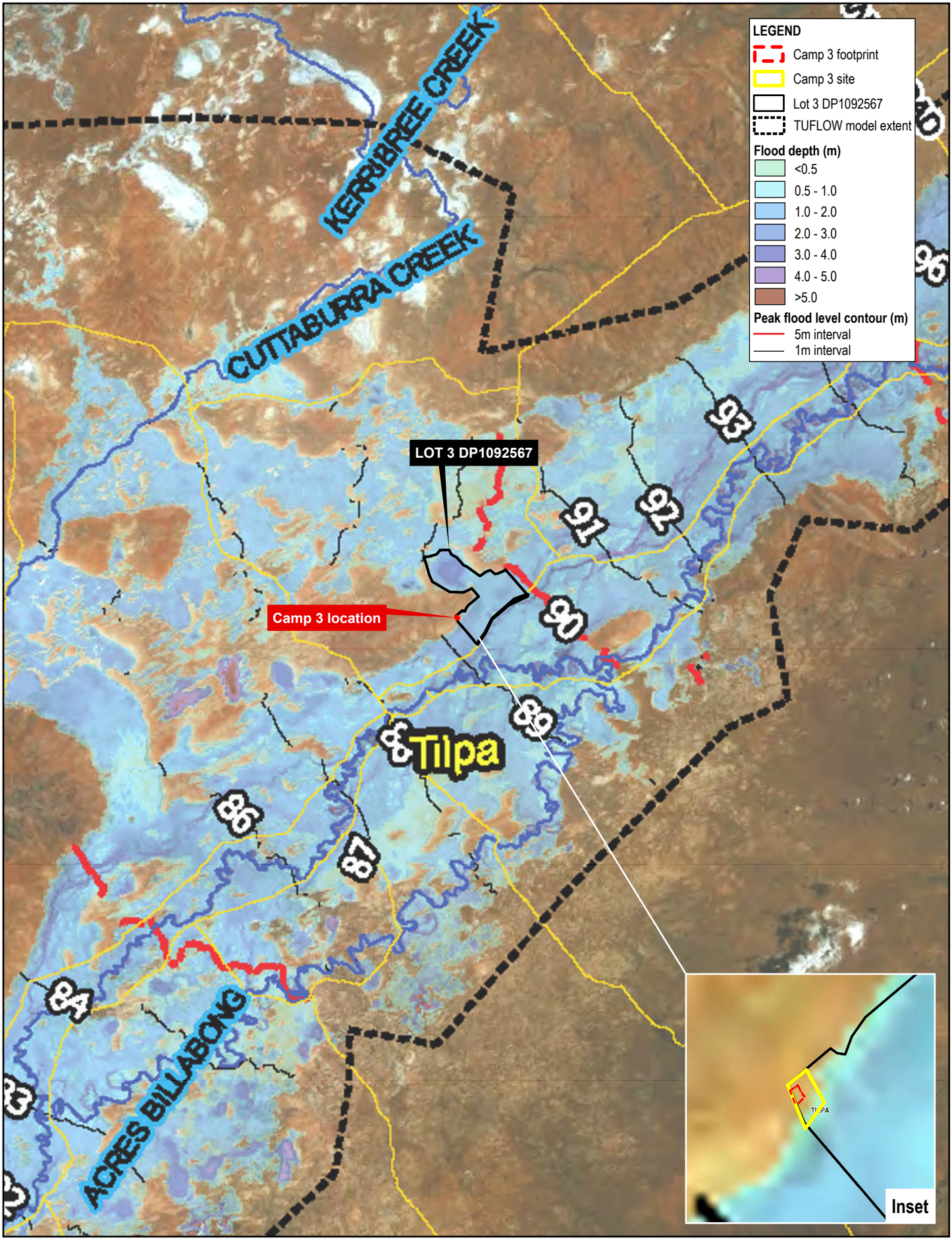
Camp 3 site location of the 1% AEP flood extents

Project No. **12585734**
Revision No. **0**
Date **22/02/2024**

APPENDIX B02

\\ghdnet\ghd\AU\Sydney\Projects\21\12585734\GIS\Maps\MOD6_FloodAssess_Appendicies.aprx - MRB02_MOD6_1Perc_AEP_Camp3
Print date: 22 Feb 2024 - 14:25

Data source: World Imagery: Earthstar Geographics
World Imagery: Maxar. DCS: DTDB/DCDB, 2021.
Created by: tmorton



Paper Size ISO A4

0 5 10 15 20

Kilometres

Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA2020
Grid: GDA2020 NSW Lambert

N

GHD

APA Group
Moomba to Wilton Pipeline
Temporary Accommodation Camps 1 and 3 Modification Report

Camp 3 site location of the 0.2% AEP flood extents

Project No. **12585734**
Revision No. **0**
Date **22/02/2024**

APPENDIX B03

\\ghdnet\ghd\AU\Sydney\Projects\21\12585734\GIS\Maps\MOD6_FloodAssess_Appendicies.aprx - MRB03_MOD6_02Perc_AEP_Camp3
Print date: 22 Feb 2024 - 14:25

Data source: World Imagery: Earthstar Geographics
World Imagery: Maxar. DCS: DTDB/DCDB, 2021.
Created by: tmorton

ghd.com

The Power of Commitment