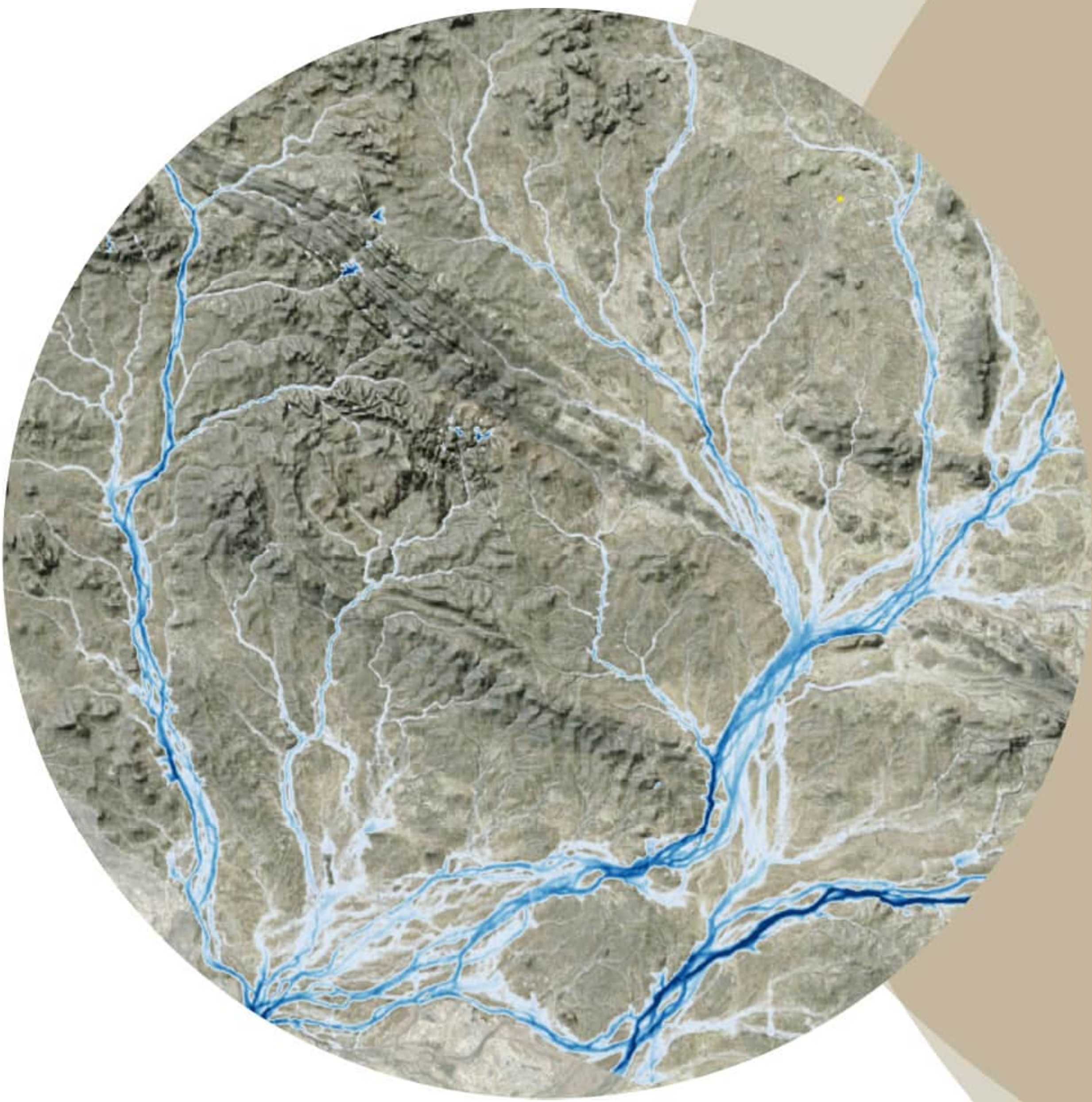

Yinnetharra Lithium Project

Baseline Hydrology Study

Electrostate Malinda Pty Ltd

04.10.2023

311012-01952

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PROJECT 311012-01952 - : Yinnetharra Lithium Project - Baseline Hydrology Study

Rev	Description	Author	Review	Advisian approval	Revision date	Client approval	Approval date
A	Internal review	D.Hortle	S.Atkinson	S.Atkinson	27.09.2023		
B	Client review	D.Hortle	S.Atkinson	S.Atkinson	28.09.2023		
0	Issued for use	Digitally signed by Damon Hortle DN: cn=Damon Hortle, ou=Users, email=Damon.Hortle@Advisian.com Date: 2023.10.04 16:03:13 +08'00' D.Hortle	S.Atkinson	S.Atkinson	04.10.2023		

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Executive summary

Advisian was engaged by Electrostate Malinda Pty Ltd (Electrostate) a wholly owned subsidiary of Delta Lithium Limited (Delta) to complete the baseline hydrology study for the Yinnetharra Lithium Project, located approximately 120km northeast of Gascoyne Junction in Western Australia (Figure 1-1). The current focus for Delta is development of the Malinda Lithium Prospect, in tenement E09- 2169 (Figure 1-1) which has been the focus of exploration activities to date.

This report presents the results of baseline hydrological and hydraulic modelling of the 1% AEP event for the Yinnetharra Project area, inclusive of the Malinda Lithium Prospect in tenement E09-2169, and other tenements shown in Figure 1-1. Flood maps showing maximum 1% AEP flood depths and peak velocities are presented in Appendix A and have been used to complete a preliminary flood risk assessment.

Key conclusions from the flood risk assessment include:

- A large creek flows through the north-western corner of the tenement E09-2169 with 1% AEP flood depths of up to 2.6m and peak velocities of up to 2.4 m/s,
- The 1% AEP flood depth map shows flooding of minor creeks at depths of 0.2 – 0.5m and sheetflow runoff at depths of <0.2m elsewhere within the E09-2169 tenement area. This runoff is unlikely to pose a significant risk to mine infrastructure,
- Mine infrastructure should be located outside the 1% AEP flood extents where possible to mitigate risk, and
- Haul and access road crossings of creeks should be designed to prevent ponding upstream and maintain flows downstream, thus minimising impacts to the environment.

It is recommended that proposed mine infrastructure layouts are included in the TUFLOW model, and the 1% AEP simulated. The results should then be used to develop surface water management measures to protect operations from flooding while also demonstrating the proposed development has negligible surface water related impacts to downstream environments. Probable maximum flood (PMF) modelling should also be completed to inform mine closure planning.

Acronyms and abbreviations

Acronym/abbreviation	Definition
2D	Two-dimensional
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
ARF	Areal Reduction Factor
ARI	Average Recurrence Interval
ARR2019	Australian Rainfall and Runoff (Ball *et al.*, 2019)
BoM	Bureau of Meteorology
DEM	Digital Elevation Model
DWER	Department of Water and Environmental Regulation
FFA	Flood Frequency Analysis
IFD	Intensity-frequency-duration
IL/CL	Initial Loss / Continuing Loss
RFFE	Regional Flood Frequency Estimation
RFFP	Regional Flood Frequency Procedure
SGS	Sub Grid Sampling
SRTM	Shuttle Radar Topography Mission

1 Introduction

1.1 Background

Electrostate Malinda Pty Ltd (Electrostate) a wholly owned subsidiary of Delta Lithium Limited (Delta) is looking to develop the Yinnetharra Lithium Project, located approximately 120km northeast of Gascoyne Junction in Western Australia. Figure 1-1 shows the Project located within a tenement package comprised of 7 tenements, 4 granted tenements and 3 pending tenement applications covering an area of 575km^2. The tenement package is located on a highly prospective Lithium Caesium Tantalum (LCT) bearing belt of metasediments forming a contact with a regional scale granite trending in a north westerly orientation for approximately 50km. The current focus for Delta is development of the Malinda Lithium Prospect, in tenement E09-2169 (Figure 1-1) which has been the focus of exploration activities to date. A baseline hydrology study is required by Delta to simulate and characterise flooding under existing conditions and use the results to inform mine planning and regulatory approvals for the Project.

Advisian was engaged by Delta to complete the baseline hydrology study and the results are presented in this report. While the focus of the baseline hydrology study is the Malinda Lithium Prospect in tenement E09-2169, the flood modelling completed also provides additional flood information for the other tenements shown in Figure 1-1.

1.2 Study objective

The objective of this Study is to complete baseline hydrological and hydraulic modelling under existing conditions and use the results to characterise flooding under existing conditions and use the results to inform mine planning and regulatory approvals.

1.3 Scope of work

The scope of work included the following tasks:

- Data collection and analysis,
- Characterise the topographic conditions, catchment characteristics, climate, and site hydrology,
- Produce a map showing catchment areas, drainage/creek flow paths and any significant receptors identified and provided by Delta,
- Complete Flood Frequency Analysis (FFA) using Gascoyne River streamflow data,
- Develop a RORB rainfall-runoff model for the Gascoyne River, including the catchments covering Delta tenement areas,
- Develop a coarse rain-on-grid TUFLOW model for the Gascoyne River catchment. Use representative rainfall events to model using both RORB and TUFLOW to select an appropriate Kc catchment storage parameter for the RORB model,
- Calibrate RORB model to FFA peak flow estimates by varying the loss parameters. Select appropriate loss parameters for design event modelling. Produce 1% AEP flood map for the Gascoyne River catchment area,
- Use the combination of LiDAR and LandGate data to develop a 2D hydraulic (flood) model for the Yinnetharra study area (Figure 1-1) and simulate flooding for the 1% AEP event,
- Produce peak flood depth and peak velocity maps for the 1% AEP event, and
- Preparation of this baseline hydrology study report (this report).

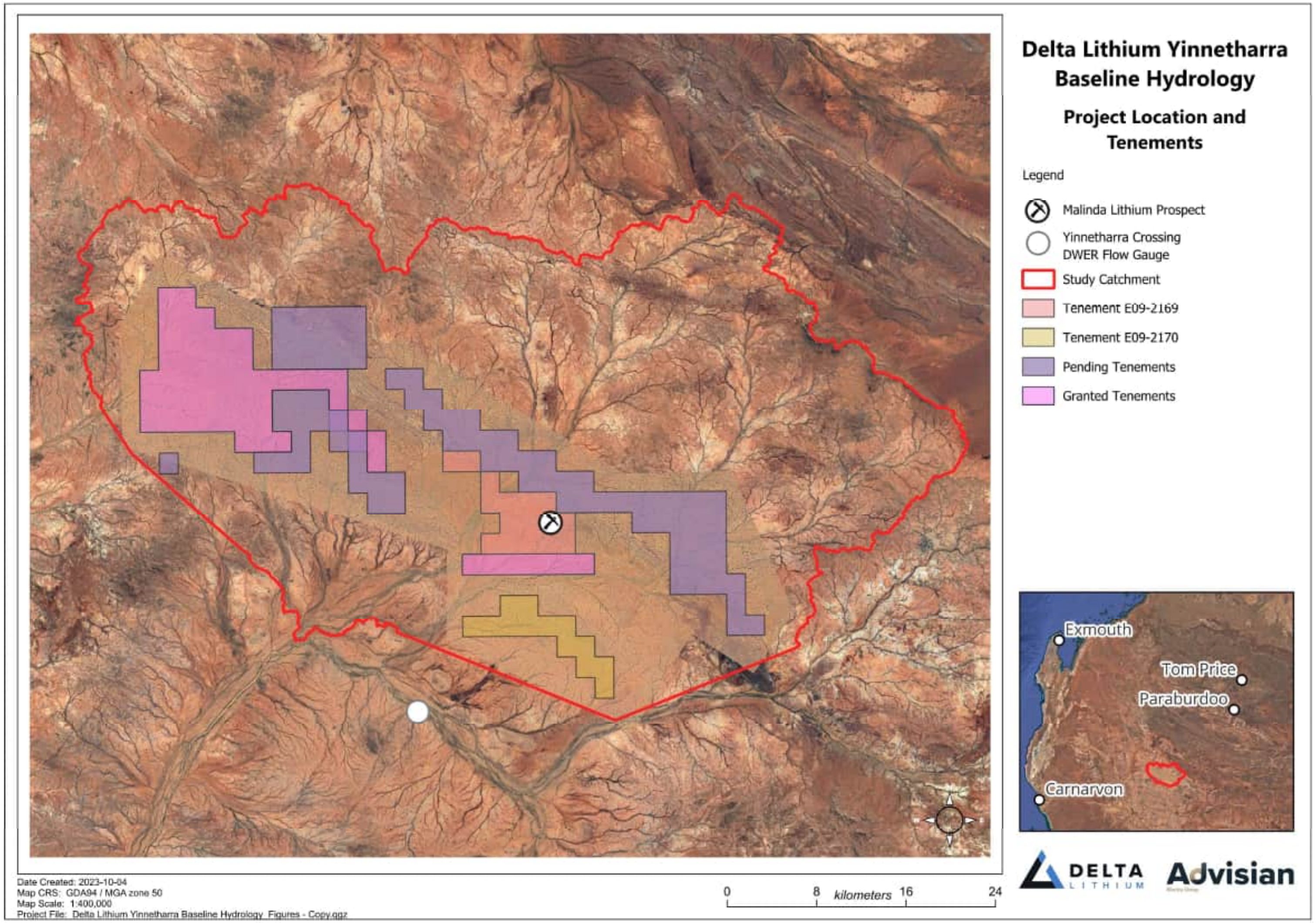


Figure 1-1. Yinnetharra Lithium Project location and tenements

2 Hydrology

2.1 Rainfall data

Gridded rainfall data was extracted for the study area using the Bureau of Meteorology (BoM) Design Rainfall Data System (BoM, 2016). A representative IFD extracted from the Yinnetharra Project area in Figure 2-1.

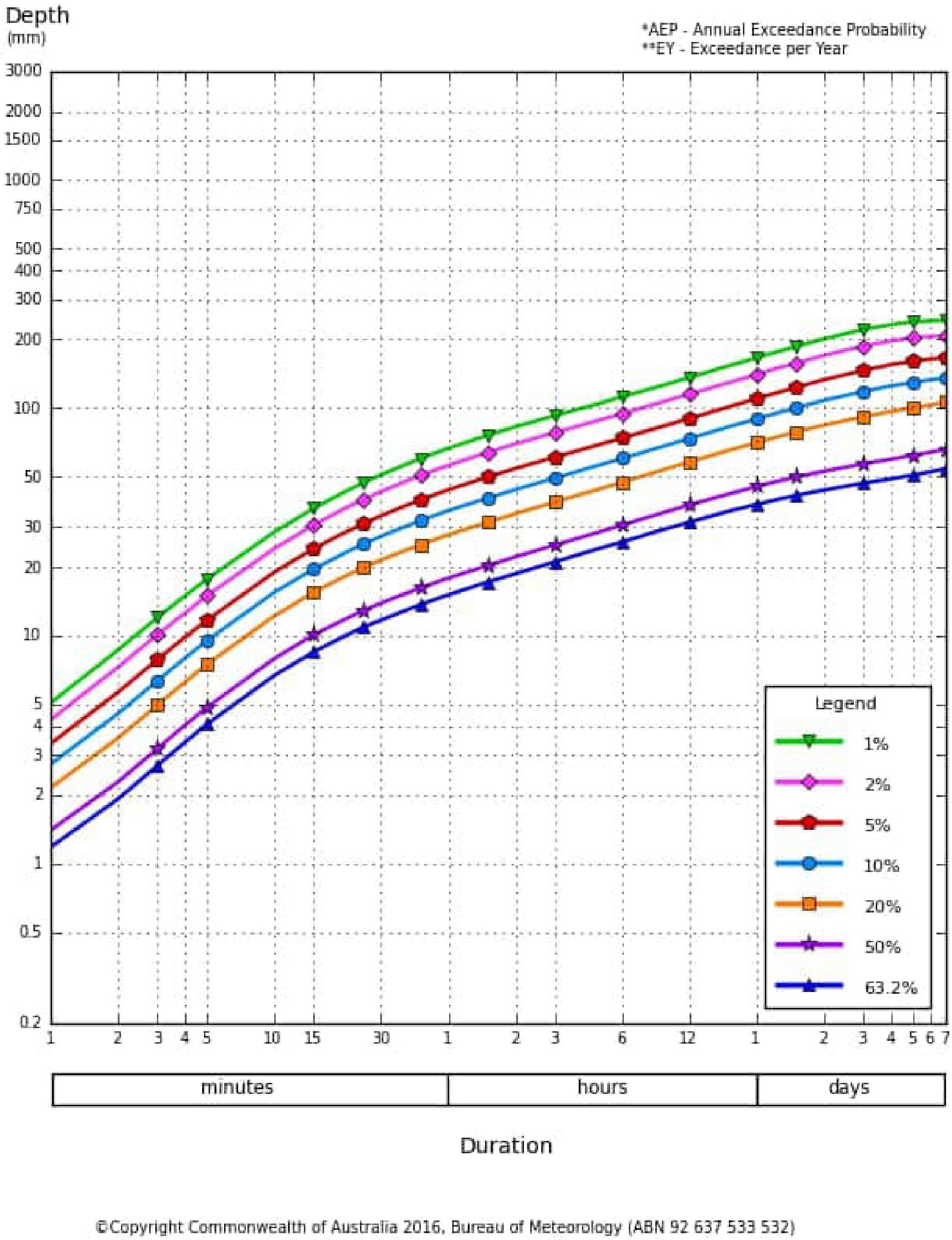


Figure 2-1. Yinnetharra IFD (BoM, 2023)

2.2 Catchment analysis

Advisian purchased a 10m Digital Elevation Model (DEM) from Landgate for the Yinnetharra Study Area. This DEM was developed by Landgate using photogrammetry analysis of 80cm high resolution scanned aerial photography. This dataset was used to delineate the Yinnetharra catchment areas upstream of the areas of interest, as shown in Figure 2-2. The total delineated catchment area (including all sub-catchments) is 2,461 km^2. The topographic elevations in the study area range from 750 mAHD in the northeast to 240 mAHD in the southwest with an average slope of 0.2%.

Publicly available SRTM (USGS, 2023) topographic survey data was then used to delineate the Gascoyne River catchment area upstream of the Yinnetharra Crossing gauging station (#705195) and shown in Figure 2-3. The catchment area upstream of the gauge is 36,700 km^2. Analysis of the topographic survey data suggests there are two distinct catchment areas; the lower catchment which has steep rocky terrain and an upper catchment area with lower gradients and broad floodplains. These two sub-catchment areas are shown in Figure 2-3 and discussed further in Section 3.1.2.2.

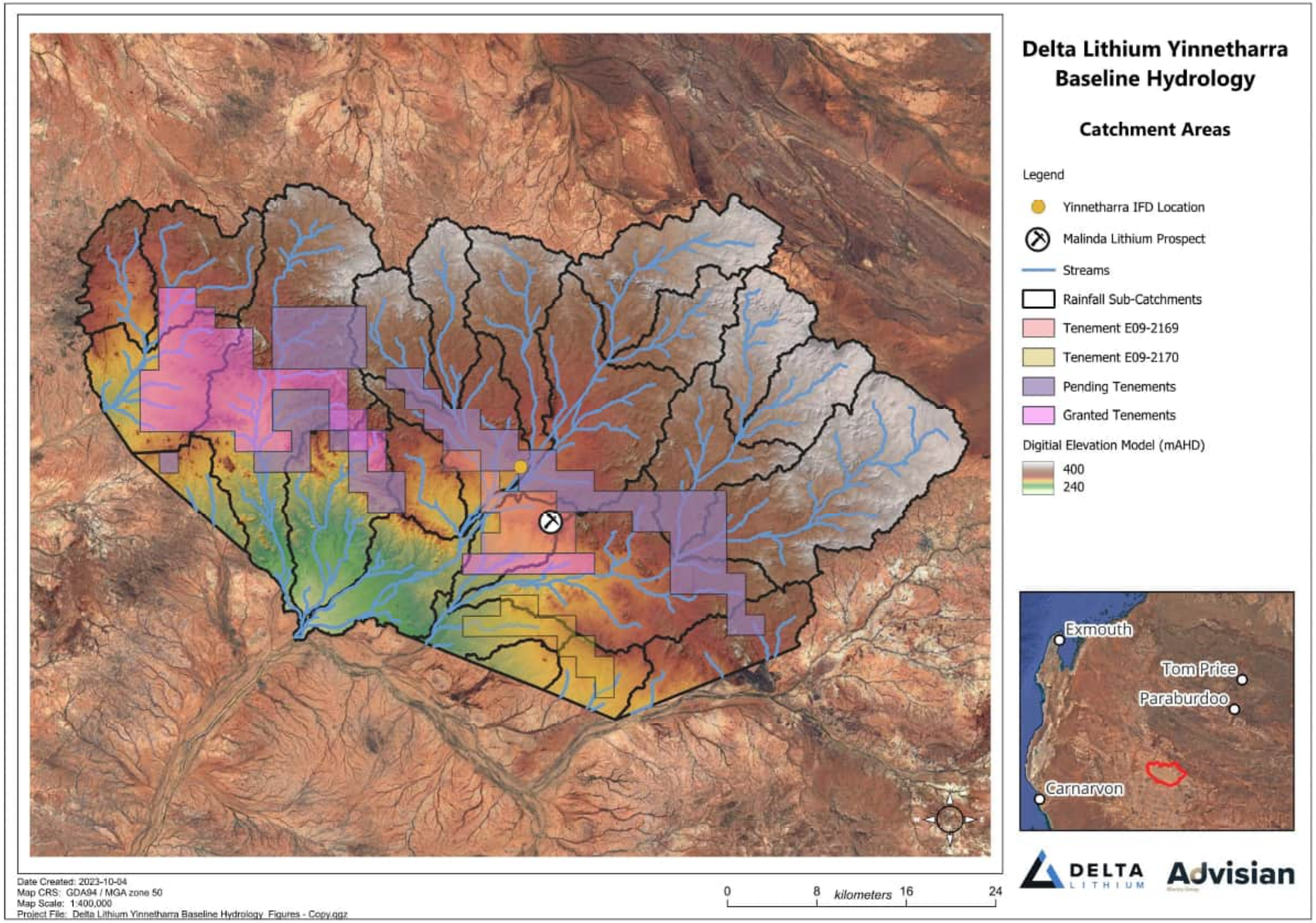


Figure 2-2. Yinnetharra catchments

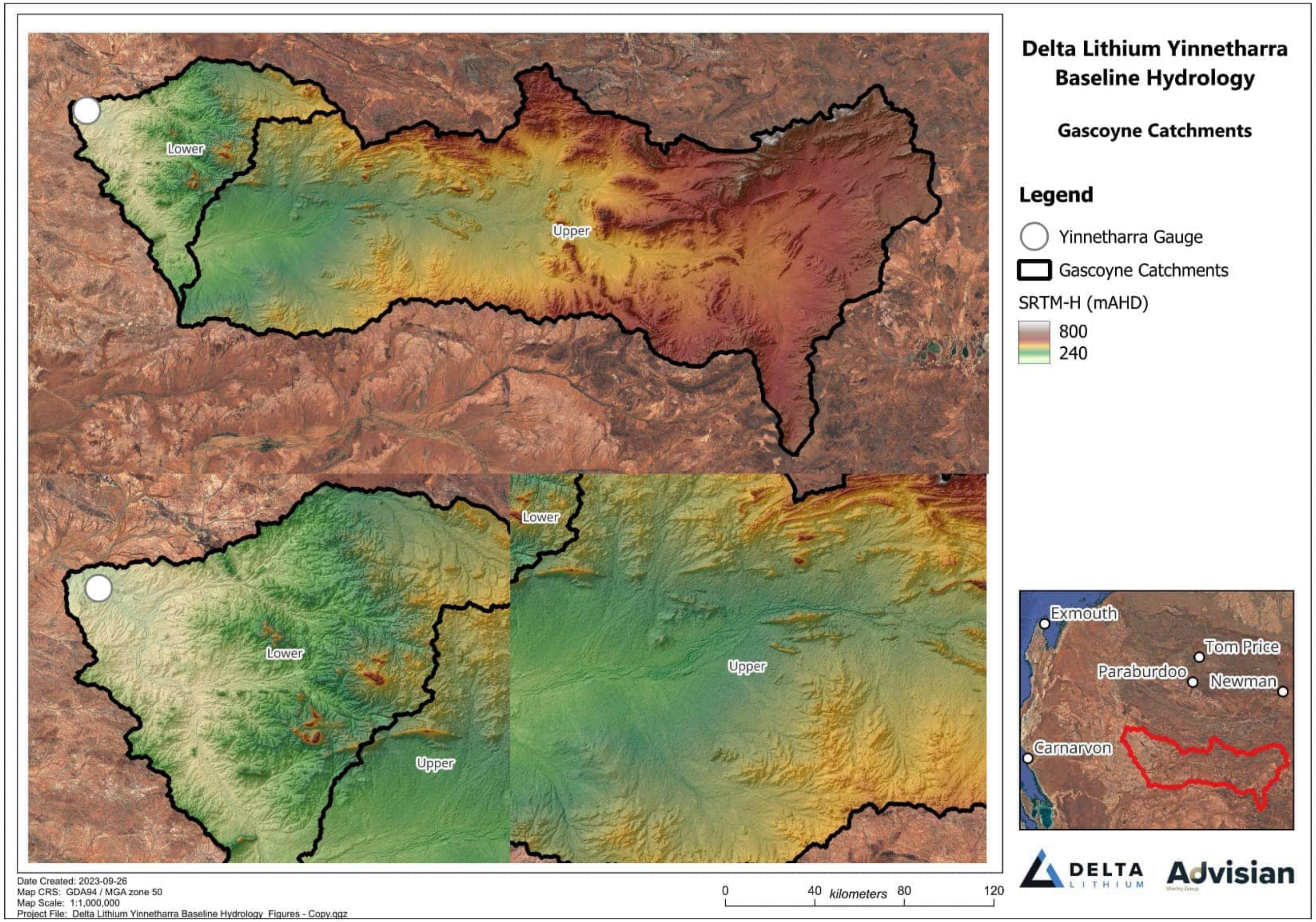


Figure 2-3. Gascoyne River catchments

2.3 Peak flow estimation

2.3.1 Flood Frequency Analysis (FFA)

Streamflow data recorded at the Yinnetharra Crossing gauging station (#705195) on the Gascoyne River was obtained from the Department of Water and Environmental Regulation (DWER, 2023) website. Monthly maxima flows were obtained and assigned to relevant water years (October to September) and an Annual Maxima (AM) streamflow dataset derived. Incomplete years were excluded from the analysis (1998, 2023). This resulted in 24 years of data available for the analysis. A Log Pearson III probability model with Bayesian inference method was shown to provide the best fit to the data using TUFLOW FLIKE FFA toolkit. The resulting FFA peak flow estimates are presented in Table 2-1.

Table 2-1. FFA peak flow estimates (m^3/s) for the Gascoyne River at Yinnetharra Crossing (DWER #705195)

Streamflow Gauging Station	50% AEP	20% AEP	10% AEP	5% AEP	2% AEP	1% AEP
Yinnetharra Crossing	529	1,403	2,129	2,878	3,868	4,600

2.3.2 Regional methods

Two regional peak flow estimation methods were considered:

- Flavell (2012) developed the Regional Flood Frequency Procedure (RFFP) for the Pilbara, Wheatbelt, Kimberly and Goldfields regions. It does not cover the Gascoyne area where the Project is located.
- The Regional Flood Frequency Estimation Model (RFFE) was developed to provide an Australia-wide flood estimation method (ARR, 2019). The RFFE model states the following for the study area, so is not considered a reliable method for peak flow estimation:

  "The catchment is outside the recommended catchment size of 0.5 to 1,000 km^2. Results have lower accuracy and may not be directly applicable in practice. The catchment has unusual shape. Results have lower accuracy and may not be directly applicable in practice."

Therefore, the results suggest that there are no reliable regional methods for peak flow estimation in the study area. The peak flow estimates using FFA (Table 2-1) were adopted for model calibration.

3 Hydrologic and hydraulic modelling

3.1 Gascoyne River modelling

3.1.1 Modelling approach

The Gascoyne River catchment is extremely large with a catchment area of 36,700 km^2. Therefore, combination of RORB rainfall-runoff and rain-on-grid TUFLOW modelling was adopted for model calibration to reduce simulation times and ensure compliance with Australian Rainfall and Runoff (Ball *et al.*, 2019).

RORB and TUFLOW models were developed for the Gascoyne River catchment area upstream of the Yinnetharra Crossing gauging station (# 705195) and used to calibrate model parameters to the 1% AEP peak flow estimate in Table 2-1. The following model parameters were calibrated to the 1% AEP FFA estimate:

1. RORB's Kc (catchment storage) parameter, and
2. Initial loss / Continuing loss *(IL/CL)* parameters in both the RORB and TUFLOW model.

Catchment analysis and TUFLOW model evaluation found that the peak flows recorded at the Yinnetharra gauge were governed by the steeper local reaches of the Gascoyne catchment, rather than the broader reaches upstream. This delineation is visualised in Figure 2-3, showing the steeper, rocky terrain in the lower catchment, when compared to the flatter and broader reaches in the upper catchment.

3.1.2 Model setup

3.1.2.1 TUFLOW

A coarse grid TUFLOW model was developed for the Gascoyne catchment using the following input parameters summarised in Table 3-1. The TUFLOW model setup is presented in Figure 3-1.

Table 3-1. Gascoyne River catchment: TUFLOW model inputs and parameters

Parameter	Adopted values
Rainfall	
Rainfall depths for direct rainfall boundary condition	Extracted from BoM Design Rainfall Data System (BoM, 2016) using TUFLOW ARR2016 QGIS plugin.
Rainfall Event	1% AEP
Losses	*IL* = 40mm, *CL* = 4mm/hr - Initially assumed for calibration
Temporal patterns	Areal Temporal patterns for the Rangelands West Region
Terrain	
Terrain	30 m resolution SRTM – Hydrologically Enforced

Parameter	Adopted values
Total model area	36,700 km^2
Base grid size (SGS sample distance)	120 m (30 m)
Manning's '*n*' value	Depth varying with 0.1: <0.1m, interpolated 0.1m – 0.2m, 0.04: >0.2m
Boundary conditions	
Outflow boundary	Automated stage-discharge curve (HQ) with calculated stream bed slope of 0.2%. Located sufficient distance downstream as to not potentially impact Study Area.

3.1.2.2 RORB

RORB (version 6.45) is a general runoff and streamflow routing program used to calculate flood hydrographs from rainfall and other channel inputs. It subtracts losses from rainfall to produce rainfall-excess and routes this through catchment storage to produce the hydrograph. RORB is characterised by two key parameters to enable calculation of its storage-discharge relationship. These are the exponent m, often referred to as the non-linearity parameter and the coefficient K_c, often referred to as the reach storage parameter. The standard m value of 0.8 was adopted in the RORB models.

The steeper, rocky terrain in the lower catchment, means less storage, rapid catchment streamflow response to rainfall events and limited attenuation of peak flows. The lower gradients and broad reaches upstream, means high storage, slower catchment streamflow response to rainfall events and attenuated peak flows. The difference in catchment characteristics and streamflow response to rainfall required the adoption of a varied K_c parameter approach when developing the RORB model, with different K_c values applied to the lower and upper portions of the catchment. The K_c values were determined by simulating a nominally selected 1% AEP rainfall event in TUFLOW, then adjusting the K_c values in RORB until the hydrograph shapes in the upper and lower catchments were similar.

RORB model was built with a high level of detail, containing 69 reaches and 37 subareas as displayed in Figure 3-2.

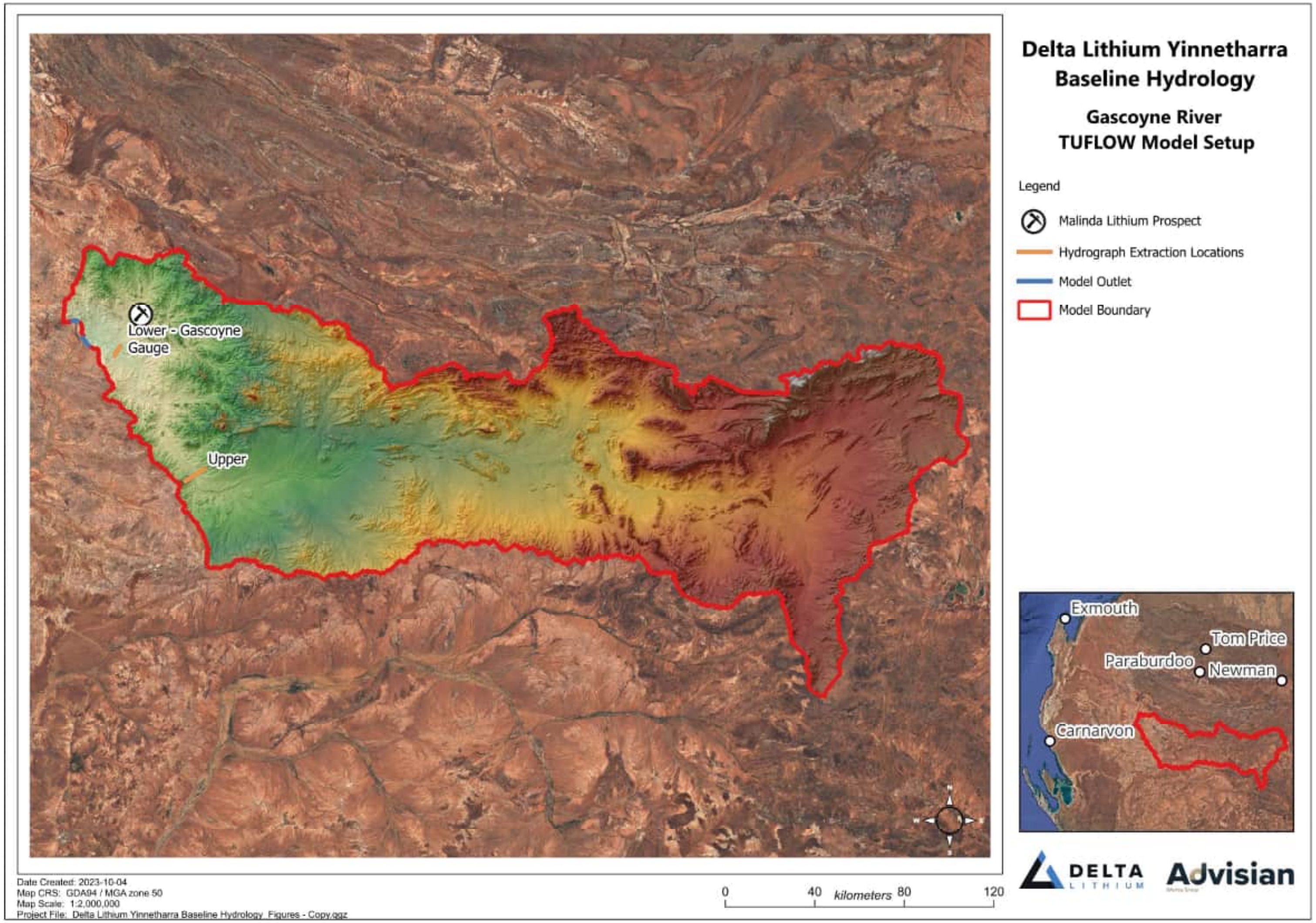


Figure 3-1. Gascoyne River TUFLOW model setup

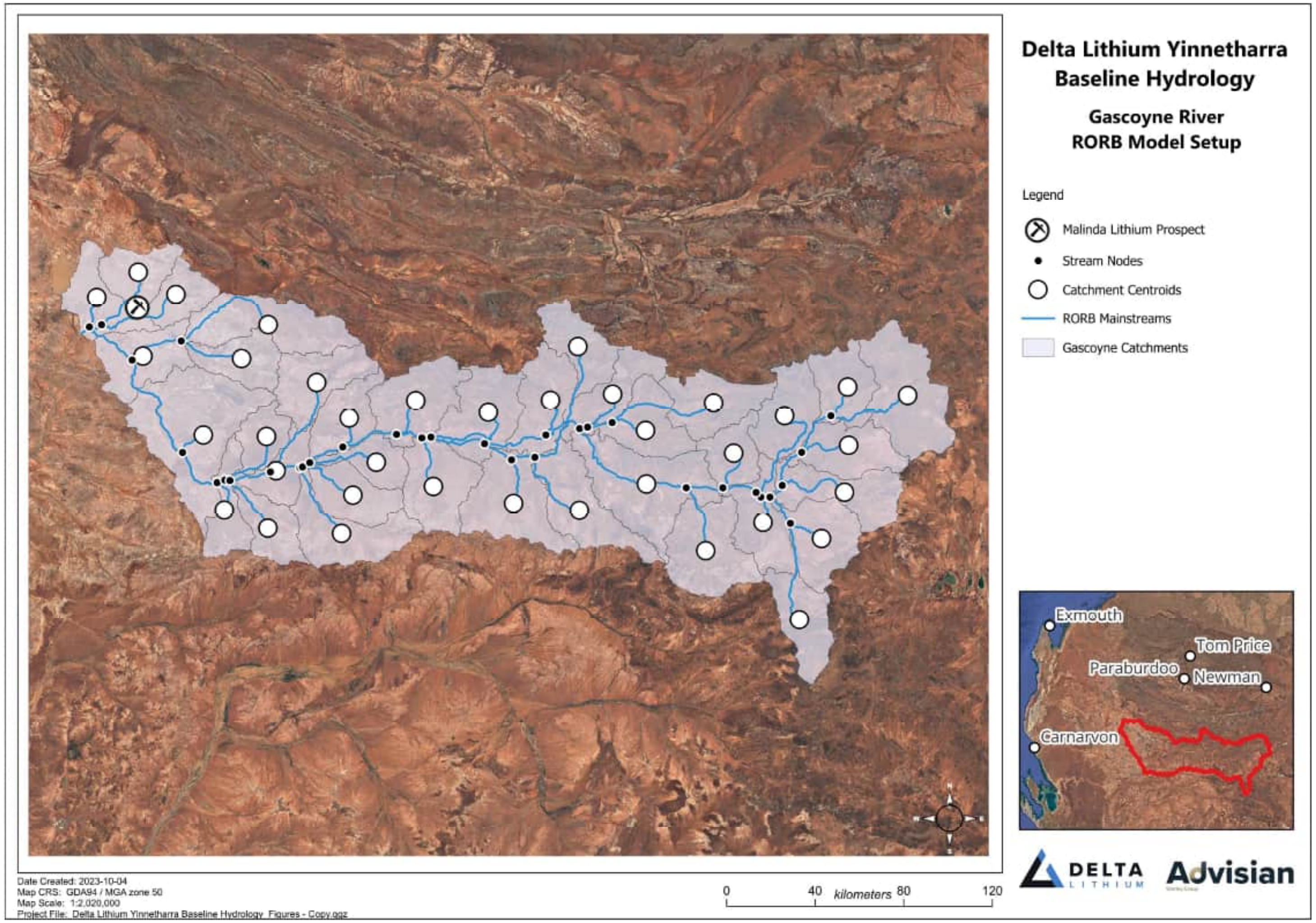


Figure 3-2. Gascoyne River RORB model setup

3.1.3 Calibration

3.1.3.1 Catchment reach storage parameter (K_c)

The RORB and TUFLOW rainfall event and loss models were matched to allow a relative comparison of hydrograph outputs and selection of K_c values for both the upper and lower Gascoyne catchments. A 24-hour rainfall event was selected as nominal design storm for input into both the RORB and TUFLOW model. A representative set of Initial Loss and Continuing Loss values (40/4) were initially applied in both models to ensure K_c values were not calibrated to artificially high or low peak flow rates. The models were set up with identical hydrograph extraction locations:

- Lower Catchment: The Gascoyne River streamflow gauge site and,
- Upper Catchment: A delineated location dividing the steeper, rougher terrain in the lower catchment and the flatter and broader reaches in the upper catchment.

These hydrograph extraction locations are displayed in Figure 3-1.

K_c values were varied in RORB until a reasonable fit was achieved for the lower and upper catchments. The resulting K_c values were 100 and 800 for the lower and upper catchments, respectively. A comparison of the RORB and TUFLOW hydrographs are shown in Figure 3-3 and Figure 3-4.

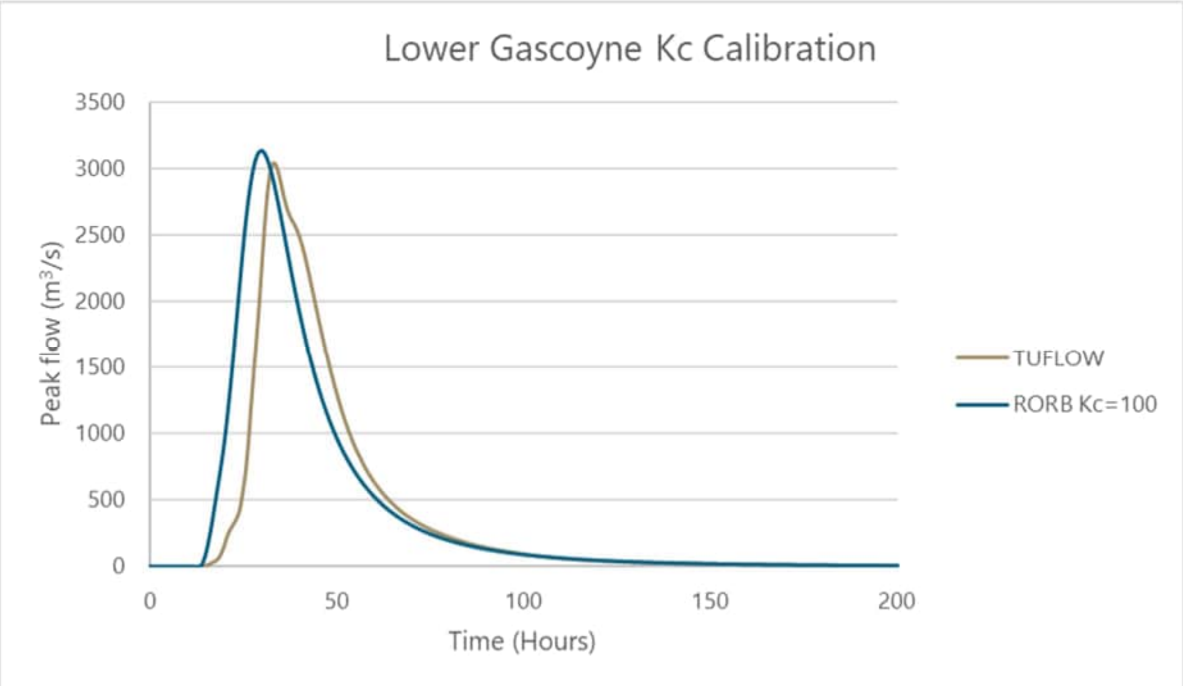


Figure 3-3. Lower Gascoyne Kc calibration

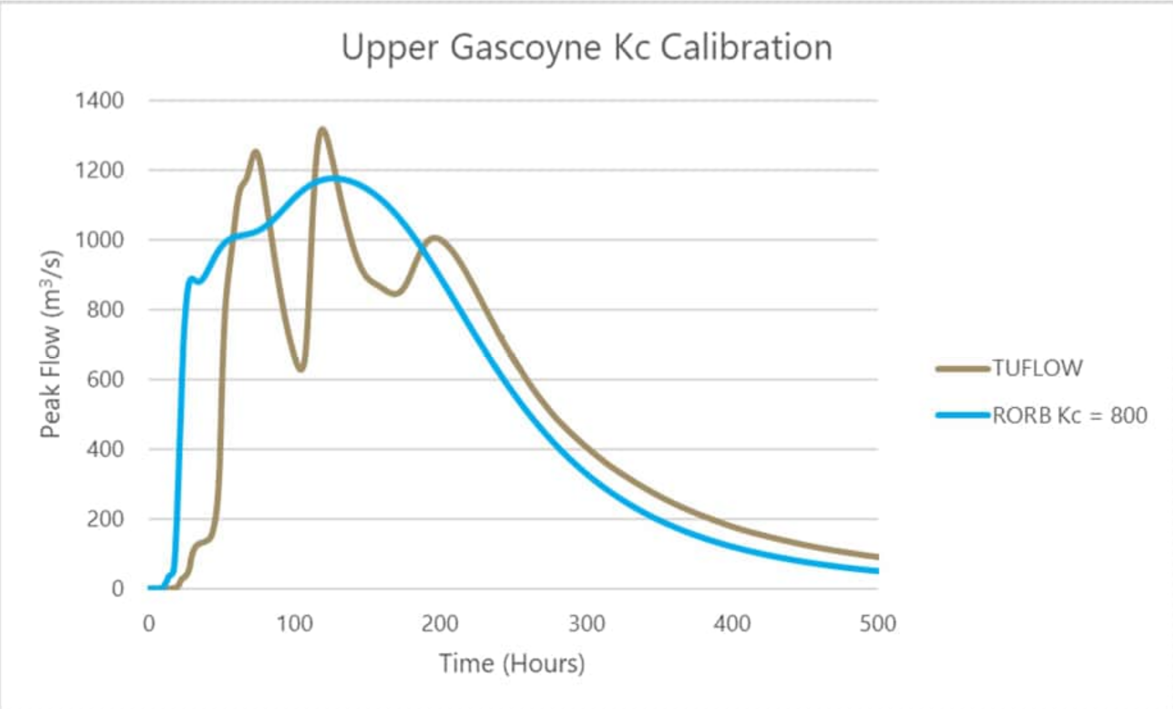


Figure 3-4. Upper Gascoyne Kc calibration

3.1.3.2 Catchment losses

An Initial/Continuing Loss (*IL/CL*) empirical loss model was adopted for this study. With the adopted K_c values for the lower and upper catchments, a range of Initial Loss (*IL*) and Continuing Loss (*CL*) values were tested in the RORB model using the "Ensemble" modelling approach described in ARR2019 (Ball, et al., 2019). The critical storm duration event was selected and the losses producing the closest fit to the FFA peak flow estimates determined.

The results suggest that the 20mm IL and 1 mm/hr CL produced the closest fit to the FFA peak flow estimates (Table 3-2). The adopted losses are consistent with the design flood loss parameters adopted in the Lower Gascoyne River Carnarvon Floodplain Management Study (SKM, 2002). A comparison of the RORB and FFA peak flows is provided in Table 3-3. The results demonstrate that the adopted losses are suitable for 1% AEP flood modelling and also provide a reasonable representation of the more frequent AEP events.

Table 3-2. Initial Loss/Continuing Loss values

Parameter	Value
Initial Loss *(IL)*	20 mm
Continuing Loss *(CL)*	1 mm/hr

Table 3-3. Comparison of FFA and RORB peak flow estimates (m^3/s) at Yinnetharra Crossing (DWER #705195)

Estimation Method	50% AEP	20% AEP	10% AEP	5% AEP	2% AEP	1% AEP
FFA	529	1,403	2,129	2,878	3,868	4,600
RORB Model	400	1,268	1,961	2,753	3,752	4,540

3.1.4 Application to the Yinnetharra catchments

The topography, rainfall, and soil conditions of the Yinnetharra study area (Figure 2-2) were compared with the lower Gascoyne River catchment to assess the suitability of adopting the same losses for TUFLOW modelling of the Yinnetharra study area. The comparison suggests that both catchments have similar:

- Topographic conditions: with steep rocky upper catchment conditions and well-defined creek lines,
- Rainfall: analysis of the IFD grids in each catchment returns similar average values to the study catchment, and
- Soil types: defined by DPIRD (2019) as predominantly red shallow sandy duplex / loamy duplex soils.

Therefore, the losses from the calibrated Gascoyne River RORB model (20mm IL and 1 mm/hr CL) are considered suitable for use in the Yinnetharra study area and were adopted in the TUFLOW modelling presented in Section 3.2.

3.2 Yinnetharra catchment modelling

3.2.1 Model setup

The Yinnetharra TUFLOW model was characterised by several input parameters which are summarised in Table 3-4. Areal reduction factors, grid size and losses are discussed further in the following sections. Figure 3-5 also shows the TUFLOW model setup.

Table 3-4. Yinnetharra TUFLOW model inputs and parameters

Parameter	Adopted values
Rainfall	
Rainfall depths for direct rainfall boundary condition	Spatially distributed based on sub-catchments: Extracted from BoM Design Rainfall Data System (BoM, 2016) using TUFLOW ARR2016 QGIS plugin.
Rainfall Events	1% AEP
Pre-burst	Median pre-burst rainfall depths extracted from ARR Datahub (Babister et al., 2016).
Losses	IL = 20mm, CL = 1mm/hr – refer Section 3.1.3.2
Temporal patterns	Areal TPs – Rangelands West region
ARF	Determined with parameters extracted from the ARR Datahub (Babister et al., 2016) for the Northern Coastal region and based on sub-catchment areas within model domain.
Terrain	
Terrain	10 m resolution Landgate DEM (4/11/2009)

Parameter	Adopted values
Total model area	2,461 km²
Base grid size (SGS sample distance)	40 m - refer Section - 3.2.2 (10 m)
Manning's '*n*' value	Depth varying: 0.1: <0.1m, interpolated 0.1m – 0.2m, 0.04: >0.2m
Boundary conditions	
Outflow boundary	Automated stage-discharge curve (HQ) with calculated stream bed slope of 0.2%. Located sufficient distance downstream as to not potentially impact Study Area.

3.2.2 Grid size

2D TUFLOW simulation run times are dependent on the size of the model domain and adopted grid/cell size. Since the model domain is large (2,461 km^2), the cell size is the key parameter to optimise to ensure run times are manageable.

Sub Grid Sampling (SGS) is a recent addition to TUFLOW software, which allows high accuracy hydrologic routing performance to be achieved in areas of interest, while adopting a larger base model resolution. A 40 m model resolution using 10 m SGS was found to accurately represent catchment runoff routing performance and cross catchment interactions while maintaining manageable simulation run times.

3.2.3 Areal reduction factor

Given the large size of the study catchment, it is unlikely that the spatial coverage of a high intensity storm burst will be consistent across the entire catchment area. To address this issue, it is typical to apply an Areal Reduction Factor (ARF) to the point IFD estimates to ensure the preservation of a probability neutral transition between the design rainfall and the design flood characteristics (Ball et al., 2019). An ARF was applied to the model domain based on the catchment area upstream of the Project area of interest. Figure 3-6 shows the ARF sub-catchment of interest upstream of the Project site.

3.2.4 Rainfall data

Rainfall data was extracted from the BoM Design Rainfall Data System (BoM, 2016) using the TUFLOW ARR2016 QGIS plugin to spatially distribute rainfall values based on the 28 sub-catchments displayed in Figure 3-5. The ARF described in Section 3.2.3 was applied to the rainfall estimates.

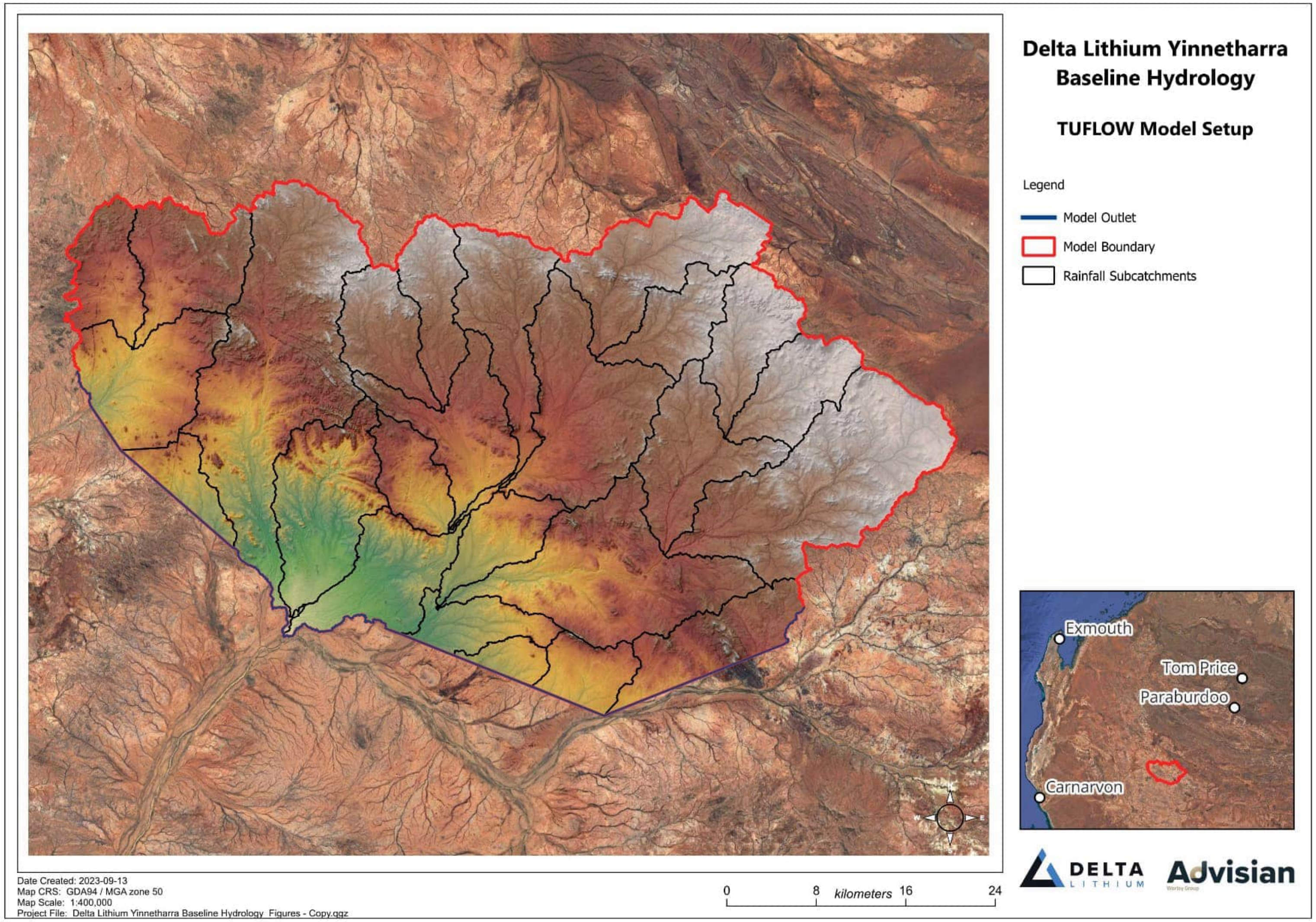


Figure 3-5. Yinnetharra TUFLOW model setup

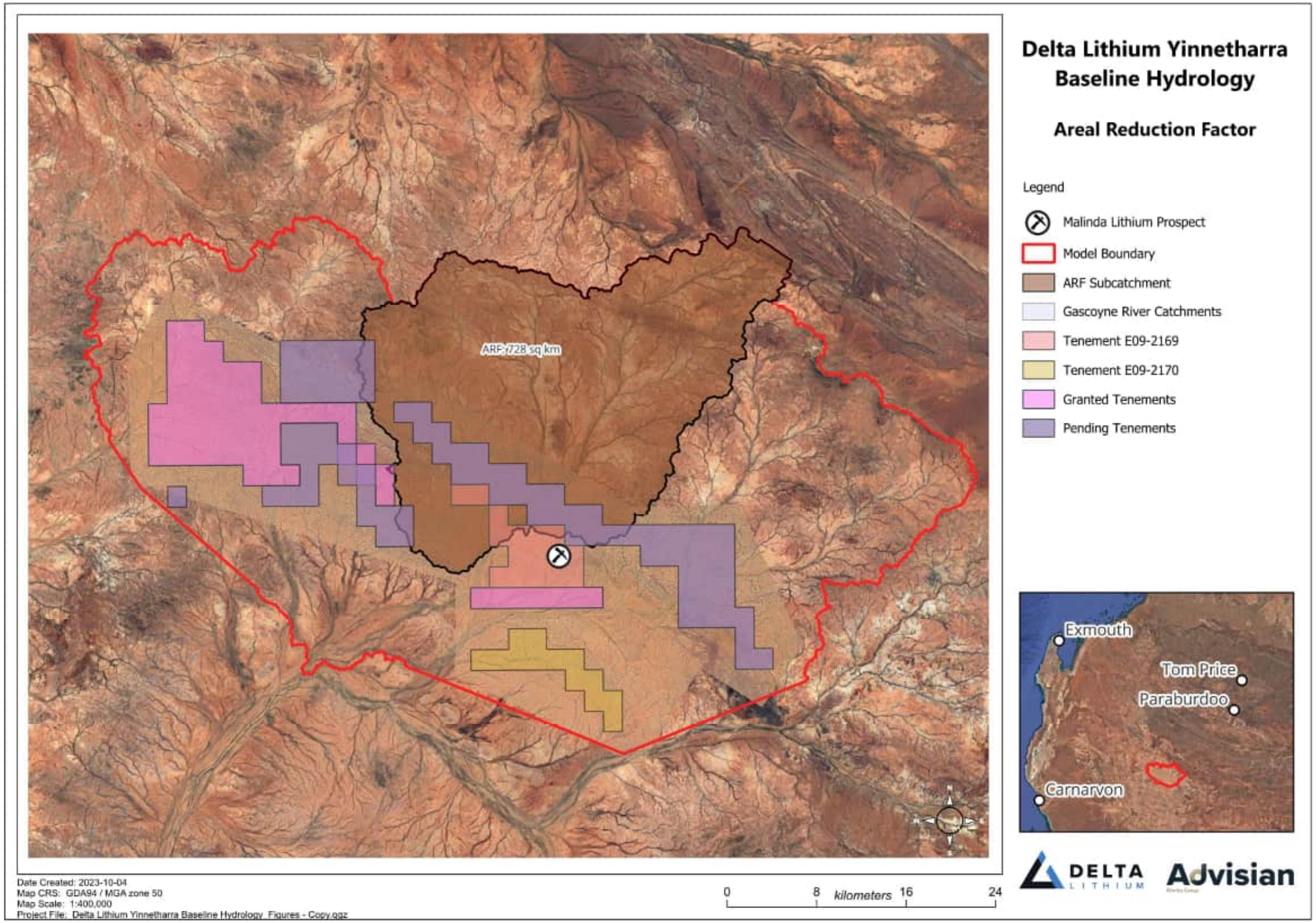


Figure 3-6. Areal reduction factor (ARF) sub-catchment

3.2.5 Modelling approach

As the locations of interest are spread over the study area, the Yinnetharra TUFLOW flood model used an ensemble approach to capture the maximum flood depth at each model cell. Flood magnitudes are generally very sensitive to temporal patterns and storm duration and thus the ensemble approach provides a straightforward means of avoiding the introduction of bias due to this source of variability (Ball et al., 2019). A range of design storm durations were simulated in the TUFLOW model to determine the critical storm duration (the storm duration resulting in the highest mean peak flow from the ten temporal patterns) at various locations in the catchments. The approach is conceptualised in Figure 3-7.

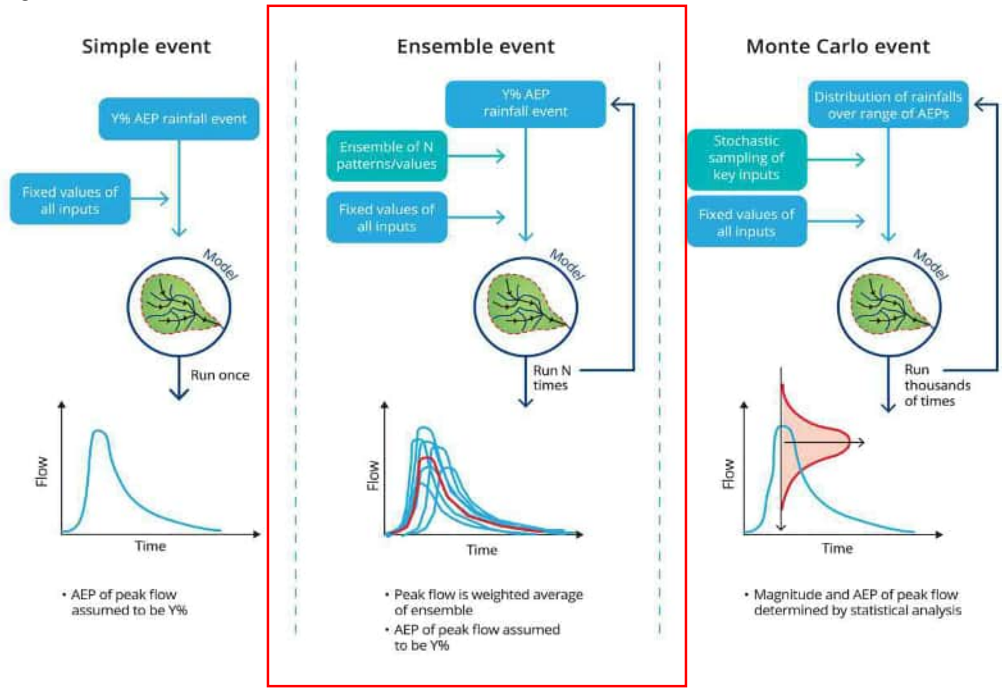


Figure 3-7. Ensemble approach conceptual model (Ball et al., 2019)

3.2.6 Design events

Table 3-5 summarises the design storms assessed in the TUFLOW model when simulating the 1% AEP event. The 1% AEP rainfall depths were extracted from IFD grids (BoM, 2016). Storm durations up to 72 hours were assessed to ensure that the critical duration in the main flow paths across the study area was identified.

Table 3-5: Design storms assessed in TUFLOW model

Storm detail	Events assessed
Annual Exceedance Probabilities (AEP)	1% AEP
Design Storm Durations (minutes)	60, 90, 120, 180, 270, 360, 540, 720, 1080, 1440, 1800, 2160, 2880 and 4320

3.2.7 Results

The 1% AEP flood maps showing maximum flood depths and peak velocities are presented in Appendix A.

4 Flood risk assessment

A preliminary flood risk assessment of the proposed Yinnetharra Project was completed using the 1% AEP flood maps (Appendix A), with the results summarised below:

- The flood modelling results, and topographic survey data shows an east-west orientated catchment divide passing through the middle of tenement E09-2169, where the Malinda Lithium Prospect is located. Therefore, most of the creeks within this tenement are minor with small catchment areas and peak flows,
- Direct rainfall-runoff within tenement E09-2169 flows north-west and south-west from the catchment divide, before discharging into two larger creeks located west and south of the tenement. The 1% AEP flood depth map shows flooding of minor creeks at depths of 0.2 – 0.5m and sheetflow runoff at depths of <0.2m elsewhere within the tenement area. This runoff is unlikely to pose a significant risk to mine infrastructure,
- A large creek flows through the north-western corner of the tenement E09-2169 with 1% AEP flood depths of up to 2.6m and peak velocities of up to 2.4 m/s,
- Mine infrastructure should be located outside the 1% AEP flood extents where possible to mitigate risk, and
- Haul and access road crossings of creeks should be designed to prevent ponding upstream and maintain flows downstream, thus minimising impacts to the environment.

5 Conclusions

This baseline hydrology study represents the results of baseline hydrological and hydraulic modelling within the Yinnetharra Project area (Figure 1-1) using the latest industry assessment methods and data in accordance with Australian Rainfall and Runoff (Ball *et al.*, 2019).

Rainfall-runoff modelling and 2D hydraulic modelling was completed using RORB and 2D TUFLOW modelling software and the models calibrated to recorded streamflow data to determine the catchment loss parameters. The loss parameters were then applied to a high resolution TUFLOW model developed for the Yinnetharra Project area and the 1% AEP event simulated. Flood maps showing maximum 1% AEP flood depths and peak velocities are presented in Appendix A and have been used to complete a preliminary flood risk assessment.

Key conclusions from the flood risk assessment include:

- A large creek flows through the north-western corner of the tenement E09-2169 with 1% AEP flood depths of up to 2.6m and peak velocities of up to 2.4 m/s,
- The 1% AEP flood depth map shows flooding of minor creeks at depths of 0.2 – 0.5m and sheetflow runoff at depths of <0.2m elsewhere within the E09-2169 tenement area. This runoff is unlikely to pose a significant risk to mine infrastructure,
- Mine infrastructure should be located outside the 1% AEP flood extents where possible to mitigate risk, and
- Haul and access road crossings of creeks should be designed to prevent ponding upstream and maintain flows downstream, thus minimising impacts to the environment.

6 Recommendations

It is recommended that proposed mine infrastructure layouts are included in the TUFLOW model, and the 1% AEP simulated. The results should then be used to develop surface water management measures to protect operations from flooding while also demonstrating the proposed development has negligible surface water related impacts to downstream environments. Probable maximum flood (PMF) modelling should also be completed to inform mine closure planning.

7 References

Babister, M., Trim, A., Testoni, I. and Retallick, M., 2016. *The Australian Rainfall and Runoff Datahub*, 37th Hydrology and Water Resources Symposium Queenstown NZ

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)

BMT, 2018. *TUFLOW Classic/HPC User Manual*

Bureau of Meteorology, 2016. *Design Rainfall Data System*. Retrieved from http://www.bom.gov.au/water/designRainfalls/revised-ifd/

Bureau of Meteorology, 2023. *Climate Data Online. Retrieved from http://www.bom.gov.au/climate/data/*

Department of Water and Environmental Regulation, 2023. *Water Information Reporting – retrieved from https://wir.water.wa.gov.au/Pages/Water-Information-Reporting.aspx*

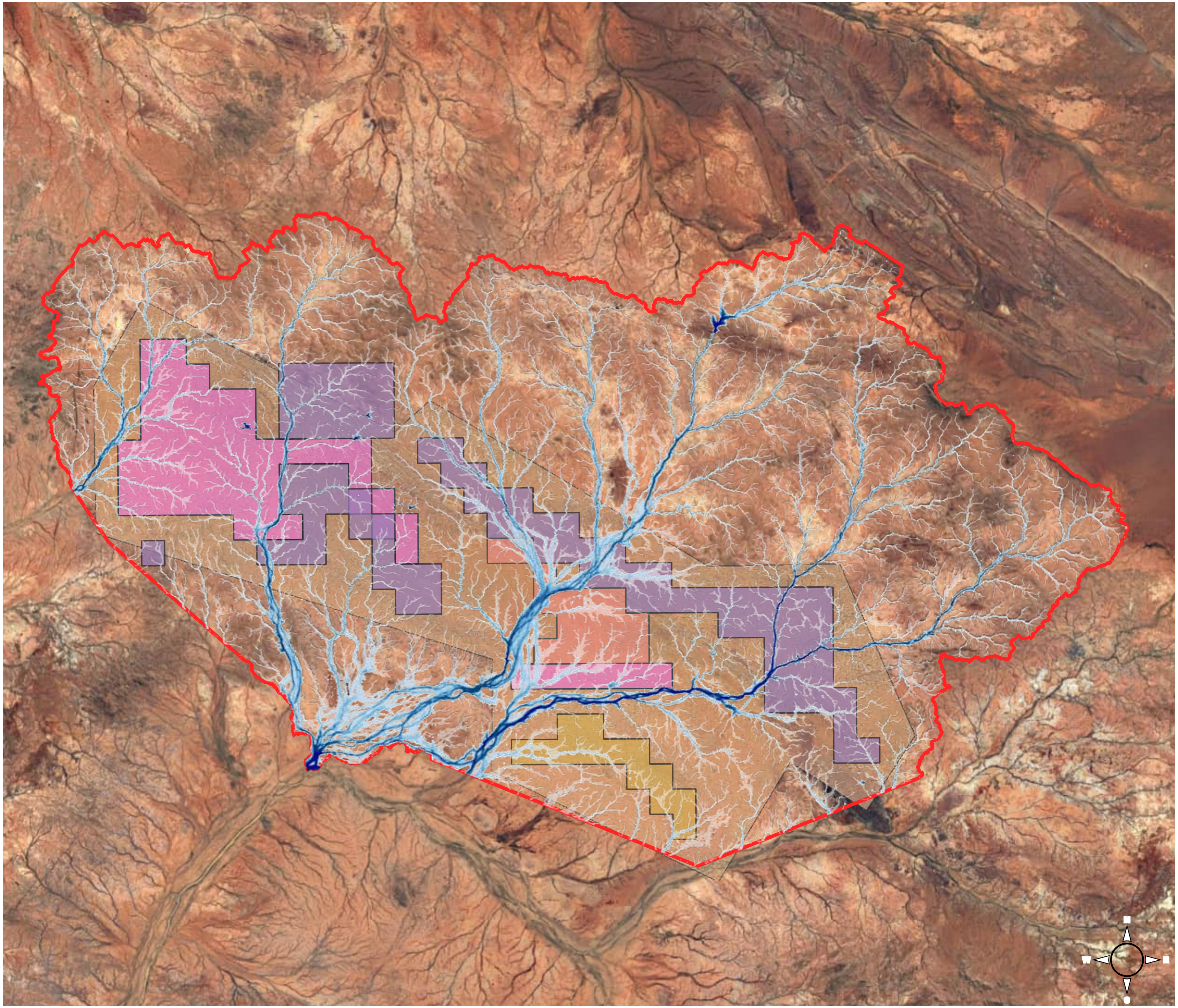
Department of Primary Industries and Regional Development, Western Australia, 2019. *Dominant soil groups - Highest probability, retrieved from Dominant soil groups - Highest probability (DPIRD-077) - Datasets - data.wa.gov.au*

Flavell, D. (2012), *Design Flood Estimation in Western Australia*, Australian Journal of Water Resources, 16(1), 1-20.

SKM, 2002. Lower Gascoyne River Carnarvon Floodplain Management Study. Waters and Rivers Commission.

USGS., 2023. Shuttle Radar Topography Mission (SRTM). Retrieved from *https://earthexplorer.usgs.gov*

Appendix A 1% AEP Flood Maps



Delta Lithium Yinnetharra Baseline Hydrology

1% AEP Flood Depth

Legend

- Tenement E09-2169
- Tenement E09-2170
- Granted Tenements
- Pending Tenements

Maximum Depth (m)

- <= 0.05 (not shown)
- 0.05 - 0.20
- 0.20 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 3.00
- > 3.00

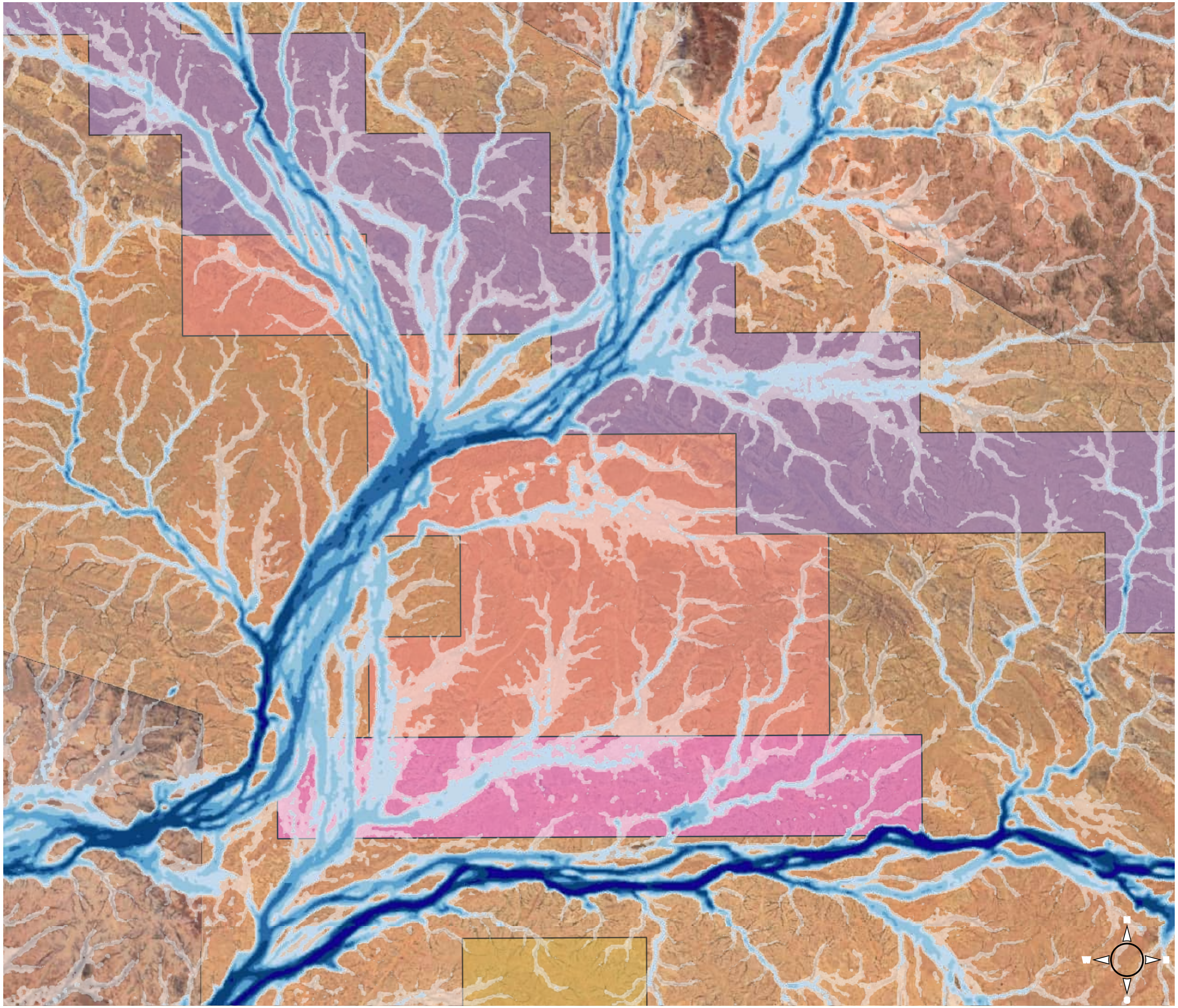
DELTA LITHIUM

Advisian

Worley Group

Date Created: 2023-10-04
Map CRS: GDA94 / MGA zone 50
Map Scale: 1:400,000
Project File: Delta Lithium Yinnetharra Baseline Hydrology Figures - Copy.qgz

0 8 16 24 *kilometers*



Delta Lithium Yinnetharra Baseline Hydrology

1% AEP Flood Depth

Legend

- Tenement E09-2169
- Tenement E09-2170
- Granted Tenements
- Pending Tenements

Maximum Depth (m)

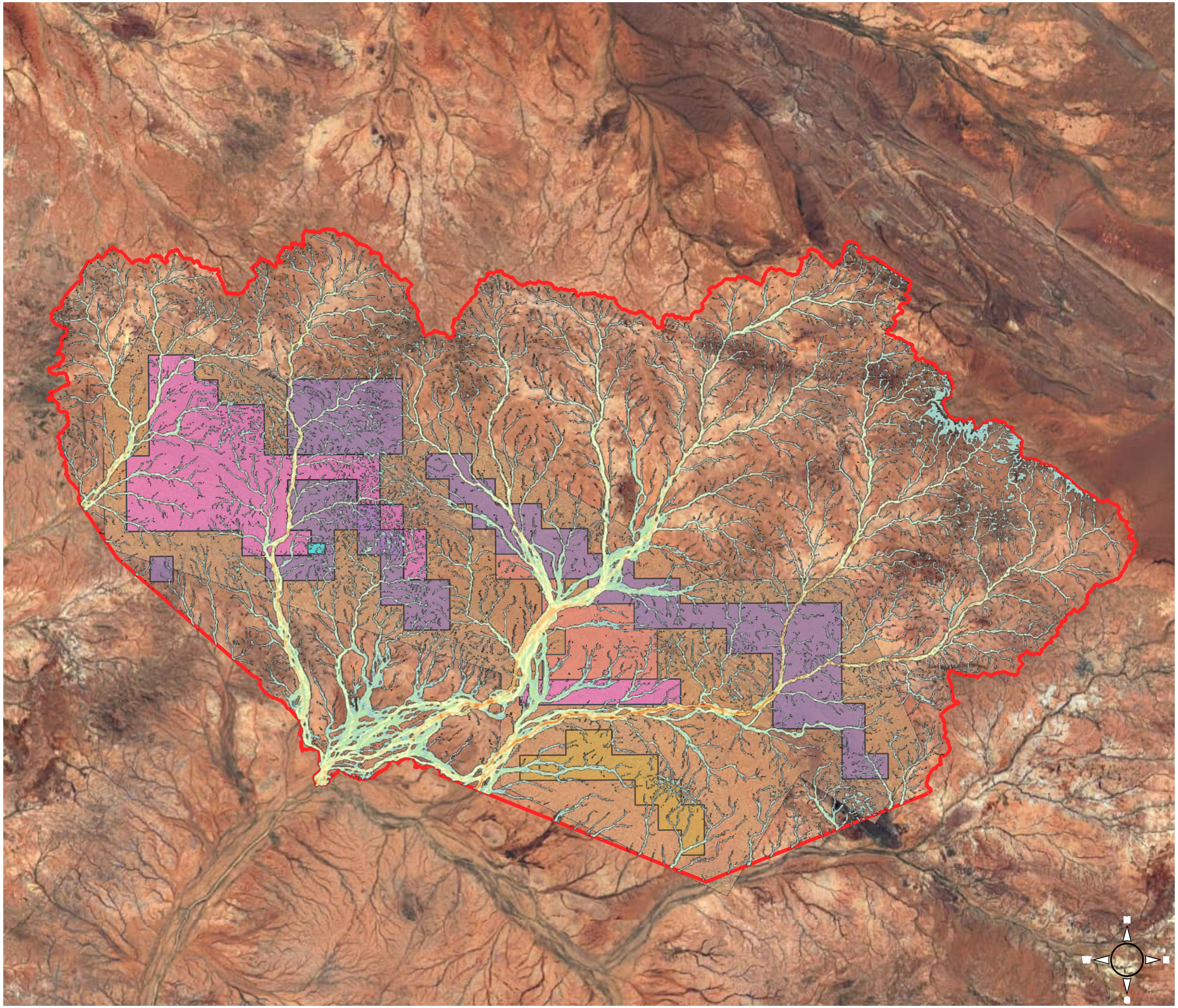
- <= 0.05 (not shown)
- 0.05 - 0.20
- 0.20 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 3.00
- > 3.00

Date Created: 2023-09-28
Map CRS: GDA94 / MGA zone 50
Map Scale: 1:100,000
Project File: Delta Lithium Yinnetharra Baseline Hydrology Figures - Copy.qgz

0 2 *kilometers* 4 6

Delta Lithium Yinnetharra Baseline Hydrology

1% AEP Flood Velocity



Legend

- Tenement E09-2169
- Tenement E09-2170
- Granted Tenements
- Pending Tenements

Maximum Velocity (m/s)

- <= 0.2 (not shown)
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 3.0
- 2.5 - 3.0
- > 3.0

DELTA LITHIUM

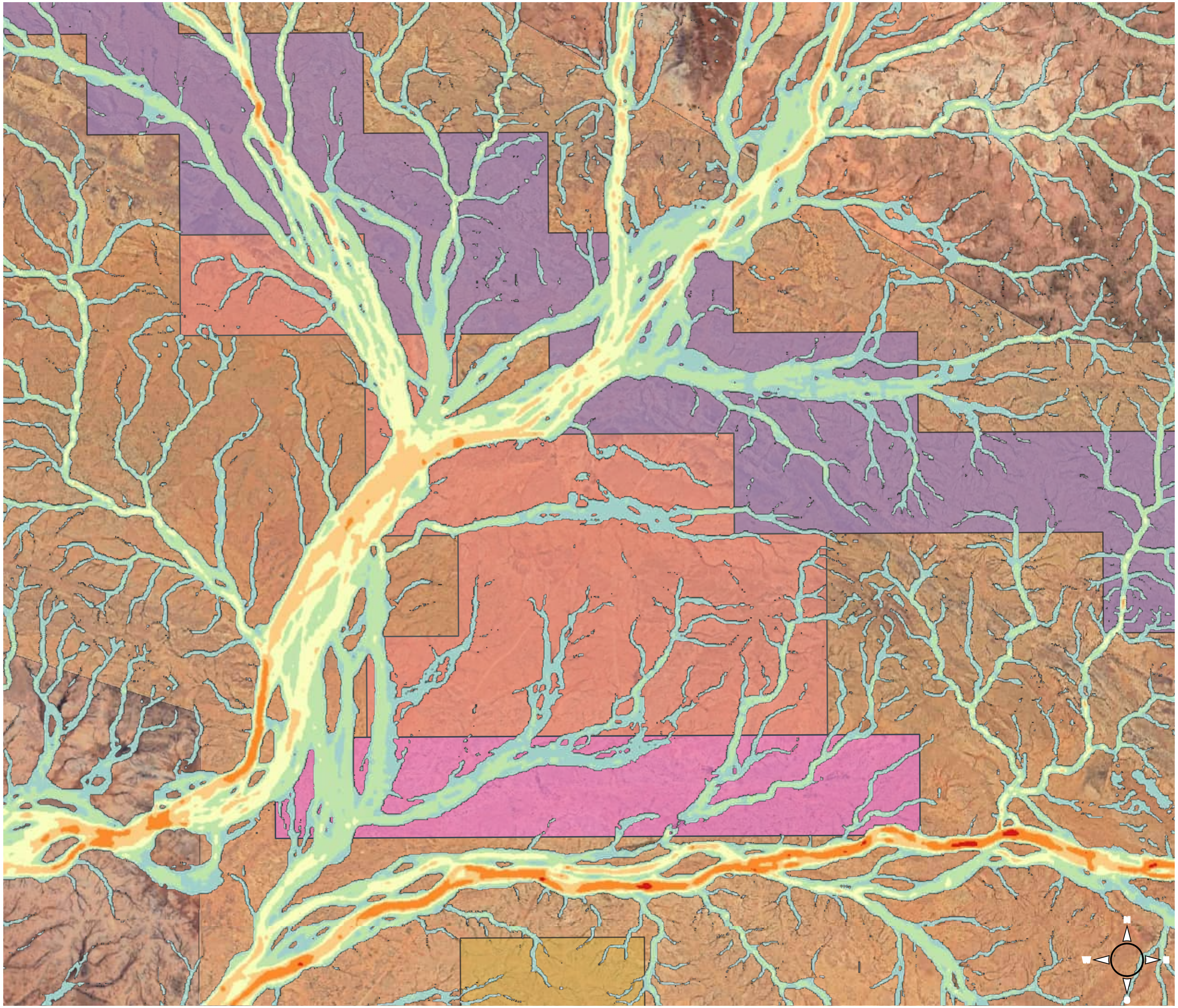
Advisian
Worley Group

0 8 kilometers 16 24

Date Created: 2023-10-04
Map CRS: GDA94 / MGA zone 50
Map Scale: 1:400,000
Project File: Delta Lithium Yinnetharra Baseline Hydrology Figures - Copy.qgz

Delta Lithium Yinnetharra Baseline Hydrology

1% AEP Flood Velocity



Legend

- Tenement E09-2169
- Tenement E09-2170
- Granted Tenements
- Pending Tenements

Maximum Velocity (m/s)

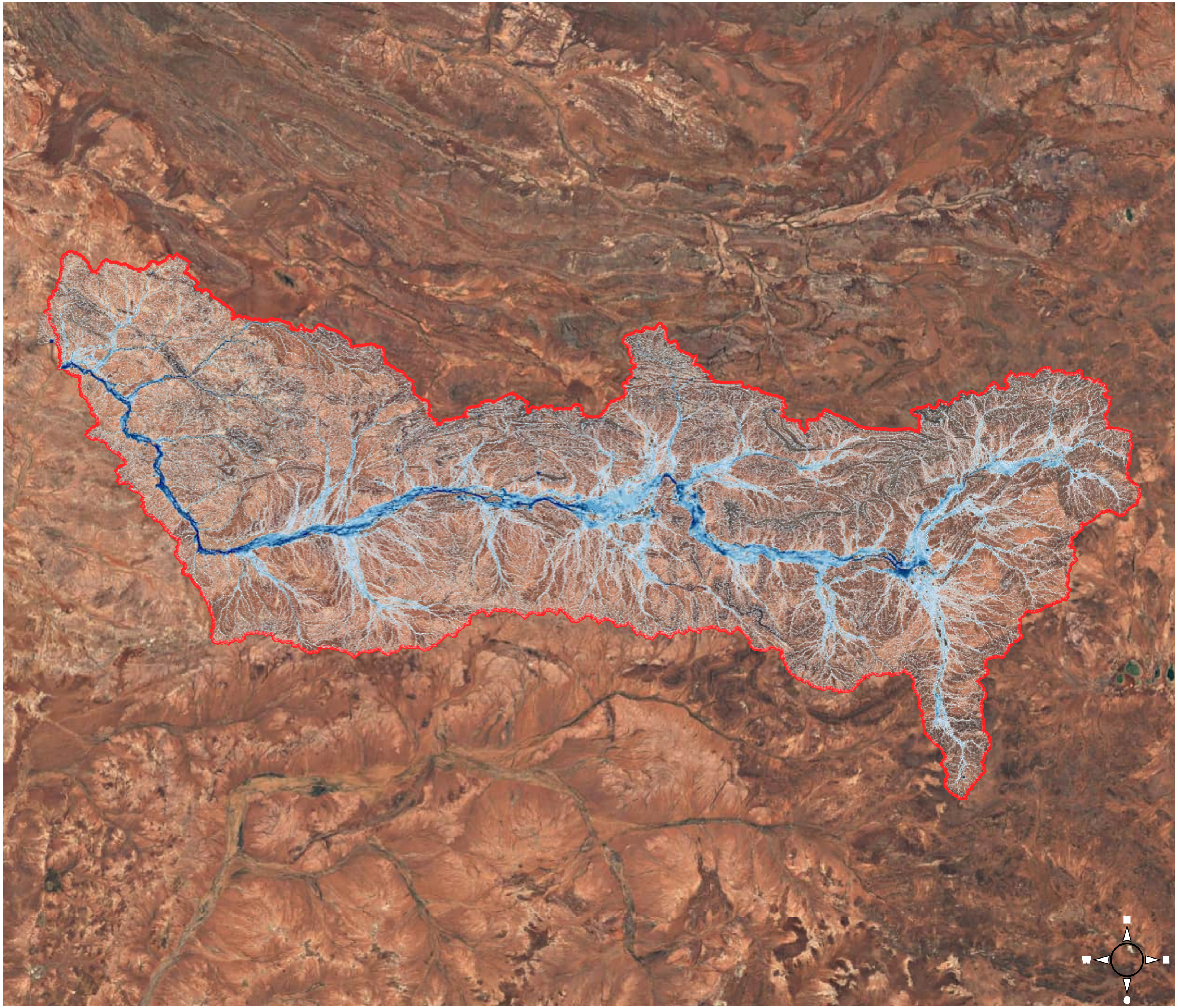
- <= 0.2 (not shown)
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 3.0
- 2.5 - 3.0
- > 3.0

0 2 kilometers 4 6

Date Created: 2023-09-28
Map CRS: GDA94 / MGA zone 50
Map Scale: 1:100,000
Project File: Delta Lithium Yinnetharra Baseline Hydrology Figures - Copy.qgz

Delta Lithium Yinnetharra Baseline Hydrology

1% AEP Flood Depth



Legend

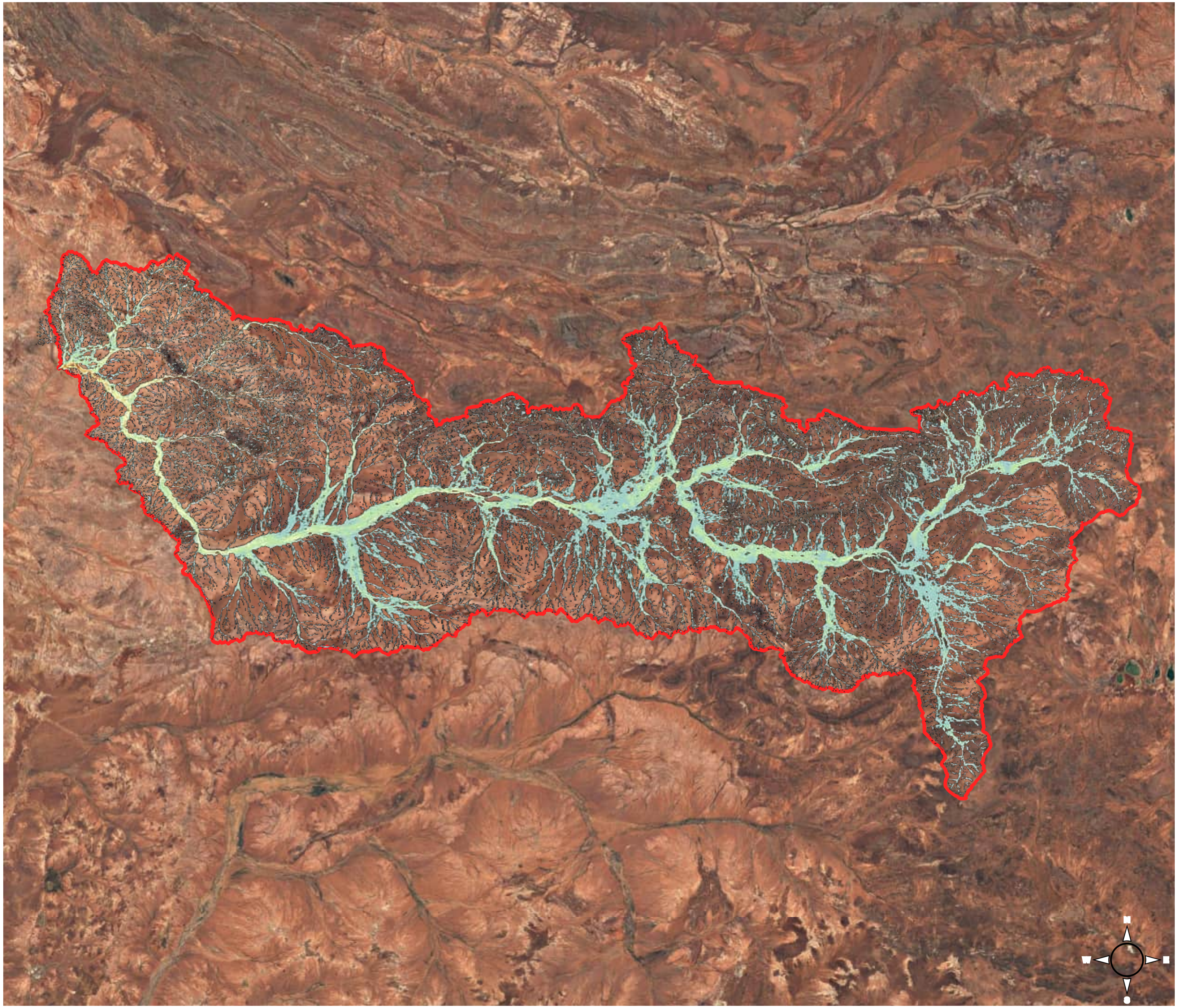
DELTA LITHIUM

Advisian
Worley Group

Date Created: 2023-09-01
Map CRS: GDA94 / MGA zone 50
Map Scale: 1:2,000,000
Project File: Delta Lithium Yinnetharra Baseline Hydrology Figures - Copy.qgz

Delta Lithium Yinnetharra Baseline Hydrology

1% AEP Flood Velocity



Legend

Model Boundary

Maximum Velocity (m/s)

- <= 0.2 (not shown)
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 3.0
- 2.5 - 3.0
- > 3.0

DELTA LITHIUM

Advision
Worley Group

0 40 kilometers 80 120

Date Created: 2023-09-01
Map CRS: GDA94 / MGA zone 50
Map Scale: 1:2,000,000
Project File: Delta Lithium Yinnetharra Baseline Hydrology Figures - Copy.qgz