




APPENDIX D
ENGINEERING SERVICING REPORT

Report Name: Lot 52 and Lot 2979 Illareen Road, Katanning
Proposal for Rural Subdivision

Project Title: Engineering Servicing Report

Project No: PC17193



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Revision	Description	Author	Checked	Approved	Date
A	Issued for Review	HW	OO	EBF	10/01//2017

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1. INTRODUCTION

Peritas Group was commissioned by Elberton Property Group (Elberton) to review the Engineering constraints and servicing requirements associated with subdivision of Lot 52 and Lot 2979 Illareen Road, Kattaning (Site).

The Site occupies an approximately 215ha land area, consisting of cleared grassland. There are a number of agricultural drains, dams and two seasonal water courses on the property.

North of the Site are lots 50 and 51 which fronts the Kojonup-Katanning Rd, a sealed road linking Katanning and Kojonup. The site is bounded to the west by unsealed Illareen road and a sealed Prosser Street to the east, refer to Appendix A.

Elberton proposes for the site to be subdivided into 77 rural properties, ranging in size from 1-4ha developed over 5 stages (Appendix B).

Planning Context

The Site is currently zoned as *Special Rural* area under the Shire of Katanning Town Planning Scheme 4 (TPS4). The Shire have in recent times prepared a Local Planning Scheme 5 (LPS5) noting the Site to be zoned *Rural Residential*, refer to Appendix C.

When Gazetted, the LPS5 will supersede the TPS4. However, the LPS 5 is currently a draft in its final stages of adoption. The Shire of Katanning have advised that TPS4 will continue to apply and that "due regard" must be given to LPS5.

The TPS4 and LPS5 both support the rural subdivision. Preliminary advice from the Shire of Katanning noted the requirements for a Structure Plan and Local Water Management Strategy to be formalised.

Summary

In summary this report highlights:

- The subject land is capable of sustaining the increased density of *Rural Residential* lots.
- The land is capable of being serviced with water, power and telecommunications services.
- Wastewater management will be by means of on-site disposal either by septic tanks, Aerobic Treatment Unit (ATU) or Alternative Treatment System (ATS).
- Retention of vegetation and rural landscape is required for *Rural Residential* lots. Accordingly, earthworks will only be undertaken to provide internal road network and for drainage purposes.

The following additional studies & site works are recommended:

- Geotechnical Investigation.
- Feature Survey.
- Bore pump test and water quality test (if bore water is the intended primary water source).
- Formal Submission of LSP to enable Water Corporation to consider the development in their upcoming water supply planning.

NATURAL FEATURES

Topography

Appendix D shows elevation data from Landgate, Nearmap and Google earth. The contours on the plan are sourced from Landgate and the profile is obtained from Nearmap & Google. Although there are variations to the levels, the general trend is similar for all three data sets.

There is a substantial level variation in the north south direction, ranging from 320m AHD to 330m AHD. The slope of the land is approximately 5-10%. The centre of the Site appears to be on a ridge, grading down towards seasonal water courses to the north and south of the Site. The contour lines run parallel to the east west lot boundary for the bulk of the site, identifying a lesser degree of elevation variation.

Nearmap elevation data identified a 18% gradient, which could potentially be incorrect. The data presented is obtained from aerial photography which will also pick up features such as trees, rock outcrops, etc. and hence accuracy of ground surface levels can be affected.

National Elevation Data Audit 2011 by Geoscience Australia advised a vertical accuracy between 1-5m of error for Landgate contours. Feature survey will be required prior to detail design phase to enable road and drainage design.

Geology

The Geological Survey of Western Australia 1:250,000 map indicated that 50% of the Site consisted of colluvium and minor alluvium (silt sand and gravel). The balance of the Site consisted of biotite granite (refer to Appendix E).

The above would suggest an underlying rock formation and therefore it is unlikely for the Site to be suited for on-site water disposal.

Geotechnical investigation will be required to be undertaken prior to detail design phase of the development.

Surface Water

The Site has a number of cut-off agricultural drains and dams. According to aerial imagery, the bulk of the drains are used to direct water into the dams and are localised to the Site. There are two exceptions, which are the seasonal water courses located north and south of the site.

Opus undertook a flood assessment report in 2014 and identified that seasonal water courses are subject to flooding. The Shire of Katanning provided the 1:100yr ARI (1% AEP) flood mapping, attached in Appendix F.

Groundwater

The Department of Water and Environmental Regulation (DWER) manages a database of groundwater data across Western Australia. Peritas have corresponded with DWER who supplied a list of monitoring bores surrounding Katanning. However, there appears to be no information available for both water level and water quality at the Site and in its immediate vicinity.

No records of groundwater extraction license can be found for the Site and properties in the immediate vicinity.

INFRASTRUCTURE AND SERVICING

Road Network

Access to the first few stages of the site will be via Kojonup-Katanning road and Prosser Street. As the development proceeds, internal roads will be constructed to ensure each lot has a road frontage. In the ultimate development, the internal road network will link Prosser Street and Illareen Road (refer to Appendix B).

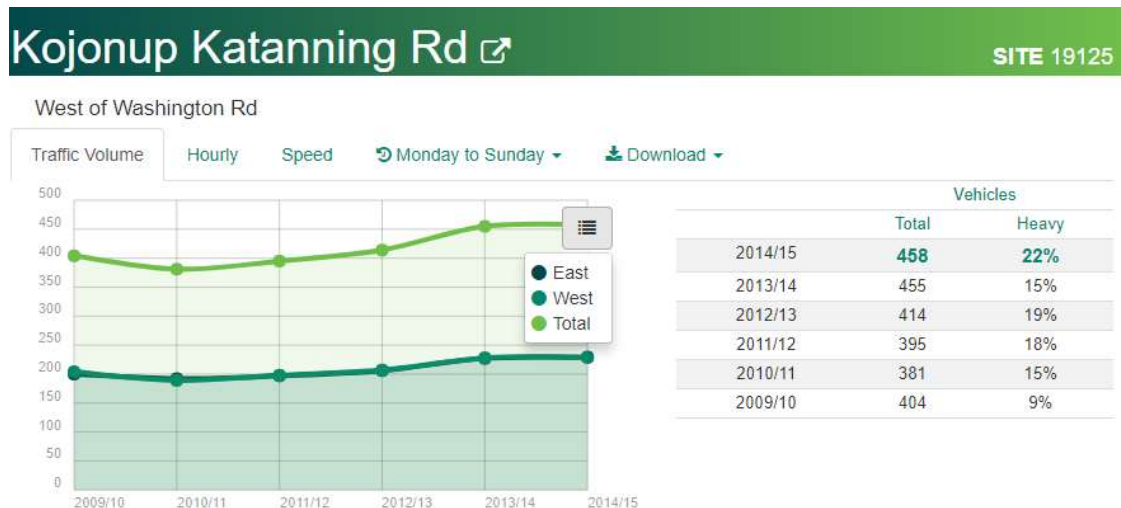
1.1.1 Kojonup – Katanning Road

The Kojonup-Katanning Road is a Main Roads Western Australia (MRWA) Primary Distributor. The road has a single carriageway, has a 110km/hr speed limit and is designed to allow inter regional movements.

Traffic count information is available approximately 13km west of the Site as shown on Table 1. The latest data recorded was in 2014/15, noting a traffic volume of 460 vehicles per day (vpd). This is a very low traffic count considering that an Access Street is designed for 3000vpd. There is a general increase of traffic trend of approximately 3-4% per year.

The subdivision will potentially increase the traffic volume moving towards Kojonup. However, there is a large degree of spare capacity on Kojonup-Katanning Road that the development is unlikely to be an issue.

Table 1 Kojonup-Katanning Road Traffic Count



1.1.2 Prosser Street and Illareen Road

Prosser Street and Illareen Roads are both Shire of Katanning’s access roads. Prosser Street is currently sealed and hence making it the most suitable entry point to the development at early stages.

Illareen Road is currently an unsealed road. In the later stages of the development, this road will need to be upgraded to a sealed road with a rural profile – unkerbed with roadside swales.

The intersection from Kojonup-Katanning Road to Illareen Road is currently sealed. However, the surfacing have deteriorated. It is recommended for the intersection to be re-surfaced.

Some upgrades to existing roads might be requested by Shire during subdivision process that may include resealing of the existing or construction of kerbs in the location of the intersections.

Bulk Earthworks & Drainage

The TPS4 and LPS5 both require the retention of vegetation and rural landscape. Accordingly, it is recommended for bulk earthworks to be limited to the construction of internal road reticulation and for drainage purposes.

Section 0 noted silty sand and gravel geology, which is not suited for in-situ stormwater disposal. Therefore existing drains and dams will most likely pool with water. Smaller dams which are fully contained within a proposed lot may be left as is. However, there are a number of dams and rural drain traversing across multiple future lots which needed to be graded out or filled. This is to avoid having concentrated stormwater flows across private properties in the future.

It is anticipated that the proposed internal roads will be set slightly proud of the surrounding land to avoid having to box out into the granite subgrade. Culverts may be required to allow flow across the road reserve. This is subject to site survey, geotechnical report and detail design.

There will be a small increment of impervious areas due to the creation of houses. However, this increment is inconsequential relative to the overall site area.

Section 0 noted areas subject to 100yr ARI flooding. In accordance to LPS5, development within the 100yr ARI floodway is prohibited. At this stage, due to the lack of digital data, the lots within the influence of the floodwater cannot be accurately defined. Upon finalisation of precal, survey and with the assistance of Shire of Katanning, the flood extent can be properly mapped. A restrictive covenant may be used to constraint future owners from building within the floodway.

The seasonal water course are currently not protected by environmental regulations. The Shire of Katanning have noted intent to establish protection areas around the water courses. The establishment of protection areas is outside of the control of the developer. However, the restrictive covenant when imposed will provide similar effects and can be used as an interim measure until a formal protection zone for the water course is established.

Water Supply

There are several viable options for water supply to the site as outlined in this section.

1.1.3 Groundwater

Correspondence with DWER noted that there is no known groundwater resources of significance within the area. Section 0 noted that there is inadequate data to determine suitability of groundwater resources for water supply.

However, this does not automatically rule out the use of groundwater. This is because the DWER allow exemptions from licensing if the groundwater is used exclusively for domestic, household purposes, watering stock, fire fighting, and watering lawns less than 0.2ha, not from artesian sources. There appears to be a number of bores identified in DWER database without licenses. Peritas is unable to confirm if any of these bores are utilised as production bores.

Desktop study will not yield any further data, if groundwater is considered to be adopted for water sources, site drilling will need to be undertaken to determine yield and water quality.

1.1.4 Rainwater Tanks

LPS5 noted that if rainwater tanks are considered, a minimum of 135kl of storage on site is required.

The Bureau of Meteorology records indicated that Katanning experienced a mean rainfall of 440mm (from 1999-2017). The lowest annual rainfall being 290mm, and this equates to 58kl of rainwater being collected over a 200m² roof area. The Water Corporation statistics indicated that in 2015-16, the average water consumption (per person) in Perth was 127kl – Averaging at 320l/day, this would include both potable and non-potable applications.

Therefore to generate 135kl of water, a roof area of 470m² is required (if 100% of rainwater in the year is captured – based on min rainfall). This is perhaps not realistic unless the tank is supplemented by other sources such as bore

water.

The wet winter and dry summer climate pattern also tend to render rainwater tanks inefficient. The tanks will be full relatively quickly during winter periods and will run out of water during summer months.

The above would suggest:

- Rainwater tank is better suited only as a supplementary water source for potable water application.
- If rainwater tanks are to be considered as the primary source of water supply, potable and non-potable water application needed to be separated. The cleaner rainwater from roof is better suited for potable applications while dams can be used to collect water for non-potable applications such as grazing water, irrigation, etc.

1.1.5 Scheme Water

Katanning township water supply is serviced by the Water Corporation from Harris Dam as part of the Great Southern Towns Water Supply Scheme (GSTWSS). Water Corporation water mains are available around the Site (Refer to Appendix G). However, the Water Corporation have advised that the proposed development is outside of current water supply zone and that there is probably limited capacity in the existing network to supply the full development.

Rural Residential lots east of Prosser Street are currently serviced via a DN100 water main (refer to Appendix C). Prosser Street being the extent of the water supply zone. The Corporation have advised that the initial stages of the subdivision along Prosser Street may potentially be supplied via the DN100 main along Prosser Street. Outside of this, major Water Corporation infrastructure upgrades may be required to supply the entire development with scheme water.

The Water Corporation have further advised that water resource planning in this region is due for a review within the next 6 months. A formal Local Structure Plan or Western Australia Planning Commission (WAPC) subdivision application will need to be lodged for the Water Corporation planning to consider this development in their review.

Providing scheme water will be the most reliable option for the development.

Wastewater

The Water Corporation do not have a gravity wastewater system in the vicinity of the site. The nearest gravity system is located approximately 1.2km east of the Site.

Gravity systems is not efficient in rural lots due to large lot sizes with minimal inflow. As a general rule, the Corporation is required to design a connection capable of serving the entire lot as they are not able to dictate position of facilities requiring wastewater service. The low flow means that the sewer pipes needed to be graded steep to prevent blockage. In context, a 200m long x 100m wide (2ha) lot would require a 5m deep property connection at the lot frontage. A memorial on titles can be included to notify owners limits of wastewater serviceability. However, a far more effective and simpler approach is by means of in-situ wastewater management.

LPS5 table 8, item 7 included provisions for in-situ wastewater management. The Department of Health listed a range of approved wastewater management approach such as septic tanks, Aerobic Treatment Units (ATU) and Alternative Treatment Systems (ATS).

Geotechnical investigation will be required to confirm suitable effluent disposal approach. If the ground is not conducive to infiltration, dedicated spray fields may be required.

Power

The proposed development is currently surrounded by overhead High Voltage (HV) infrastructure ranging from a 3 phase distribution line to a 66kV transmission line located north of Kojonup-Katanning Road. According to Western Power's Network Capacity Mapping Tool, there is currently 5 to 10MVA of spare capacity within the network (Appendix H).

According to Western Power's Design After Diversity Maximum Demand (DADMD) calculator, on average each dwelling in Katanning utilise 6.2kVa of power and therefore the subdivision would require a demand of 477kVa. There should be adequate capacity in the network for the development. An application needs to be lodged with WP at a later stage to confirm the above.

It is anticipated that all lots within the proposed development will be served with underground power. The cost of this work will need to be met in full by the developer. Western Power may also require existing infrastructure to be grounded or relocated as several overhead lines cut across the Site.

Standard Western Power requirements will apply including cost for headworks upgrades and exclusions to serve the site.

Several pad mount sites will be required throughout the development, however, due to the range of sizes of lots proposed within the development, it is not envisaged that there will be a problem in providing the sites strategically located to meet both Western Power design requirements and the requirements of the developer.

Telecommunication

It is anticipated that all lots within the proposed development will be served with Telecommunication services. Telstra services are available all around the Site, refer to Appendix I.

The provider will install telecommunication facilities to the proposed subdivision, subject to the developer providing at his cost, trenching for cable laying.

Alternatively, where cable routes match Western Power underground power supply routes, the communications provider will wherever possible use the Western Power trenches in lieu of the developer providing additional trenching.

Headwork charges for Telecommunication services extensions are anticipated. Unfortunately, Telstra do not provide feasibility assessment for developments in planning phase.

Gas Supply

Dial Before You Dig investigation did not respond with gas infrastructure. It is unlikely for underground Gas reticulation to be available for the Site.

Future lot owners will have to procure gas bottles from Katanning.

REFERENCES

Shire of Katanning 2013, 'Town Planning Scheme No.4'

Shire of Katanning 2017, 'Local Planning Scheme No.5'

Shire of Katanning 2017 'Local Planning Scheme No.5, District Scheme ', sheet 9 of 12.

Government of Western Australia, Geoscience Australia 2011, 'National Elevation Data Audit 2011', pp. 3.

Brakel A.T, J.S. Moncrieff, Muhling P.C. and Chin R.J. 1985, 'Dumbleyung Western Australia. Sheet S1 50-07'.

Opus International 2014, 'Katanning Flood Assessment', pp 21 & 23.

APPENDIX A – LOCALITY PLAN



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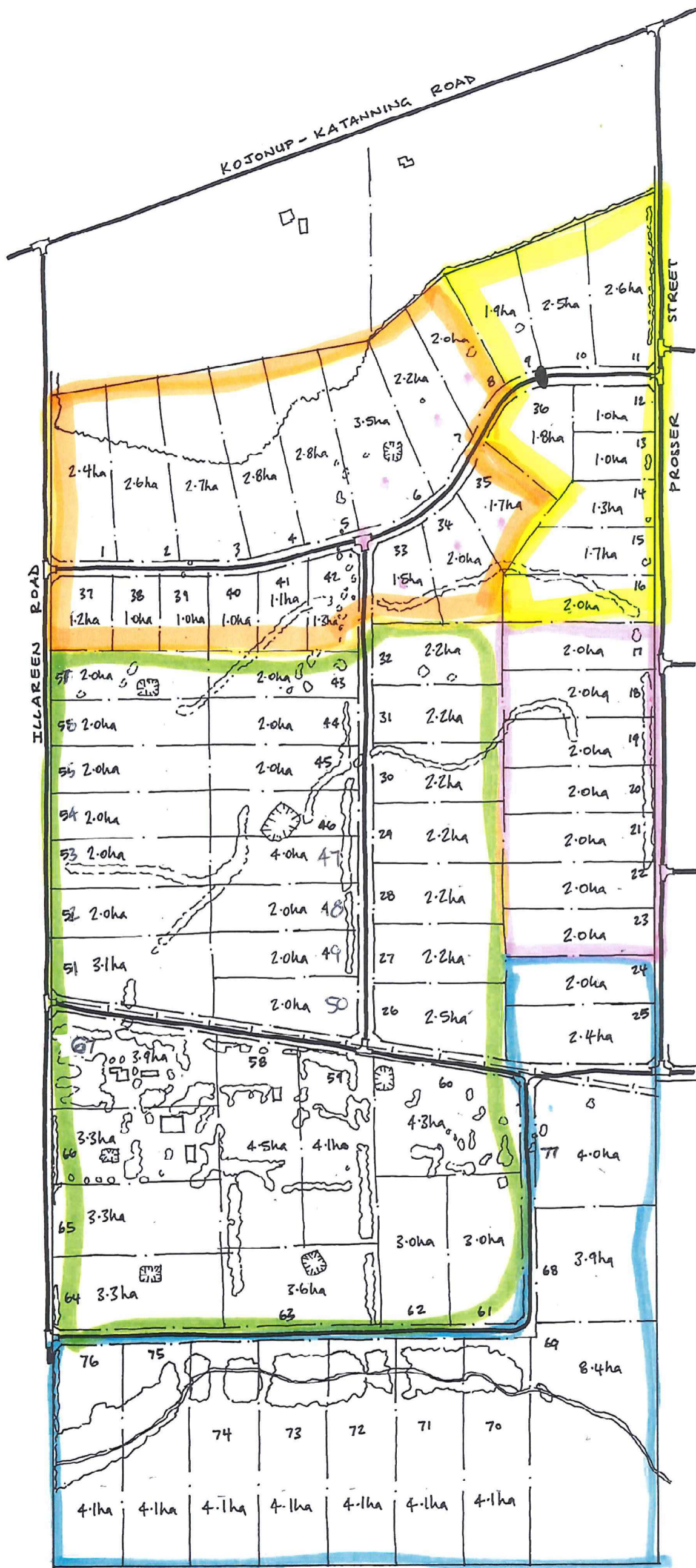
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PROJECT:
**LOT 52 & 2979 ILLAREEN ROAD
 KATANNING**

DRAWING TITLE:
LOCALITY PLAN

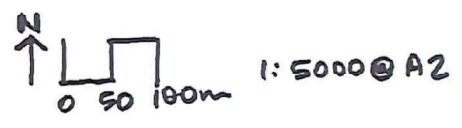
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APPENDIX B – SUBDIVISION LAYOUT



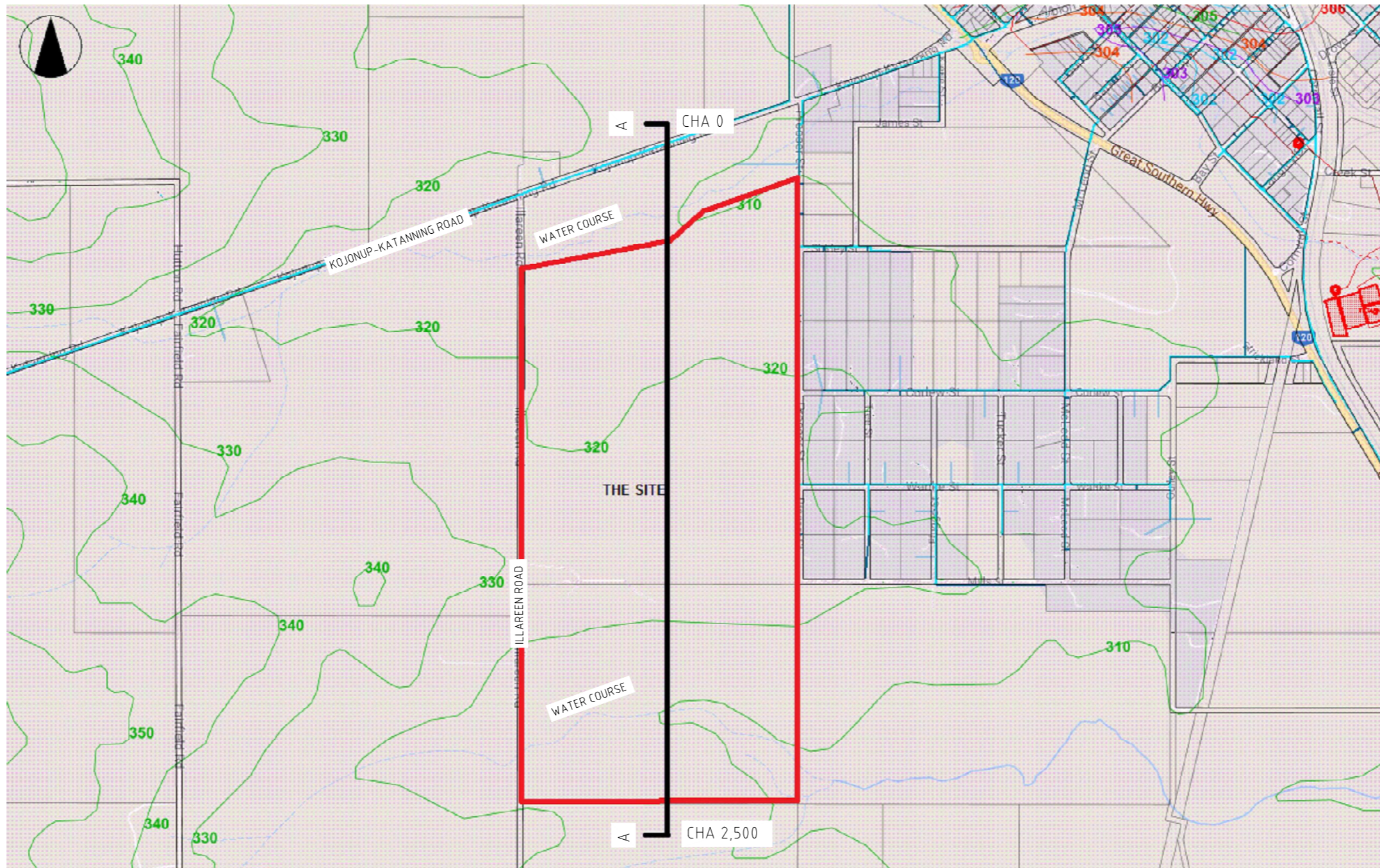
- STAGE 1
9 lots
 - STAGE 2
7 lots.
 - STAGE 3a & 3b
17 lots
 - STAGE 4
12 lots
 - STAGE 5a & 5b
32 lots
- TOTAL 77 Lots

SUBDIVISION CONCEPT PLAN

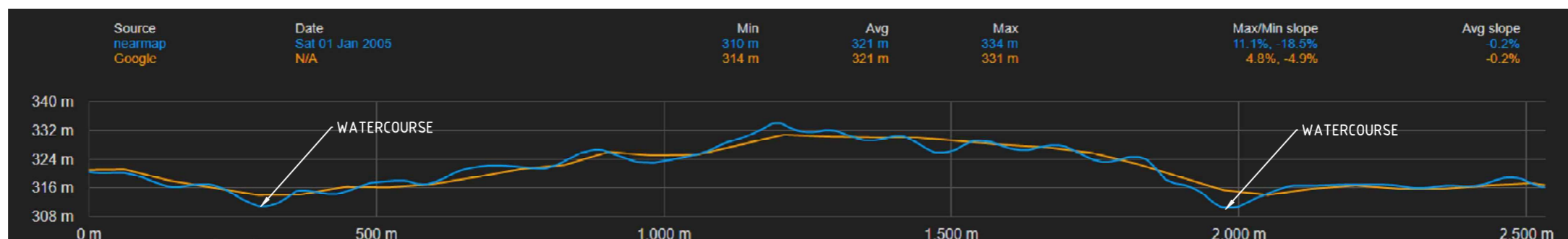


APPENDIX C – LPS5 ZONING

APPENDIX D – TOPOGRAPHY



PLAN
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SECTION A-A
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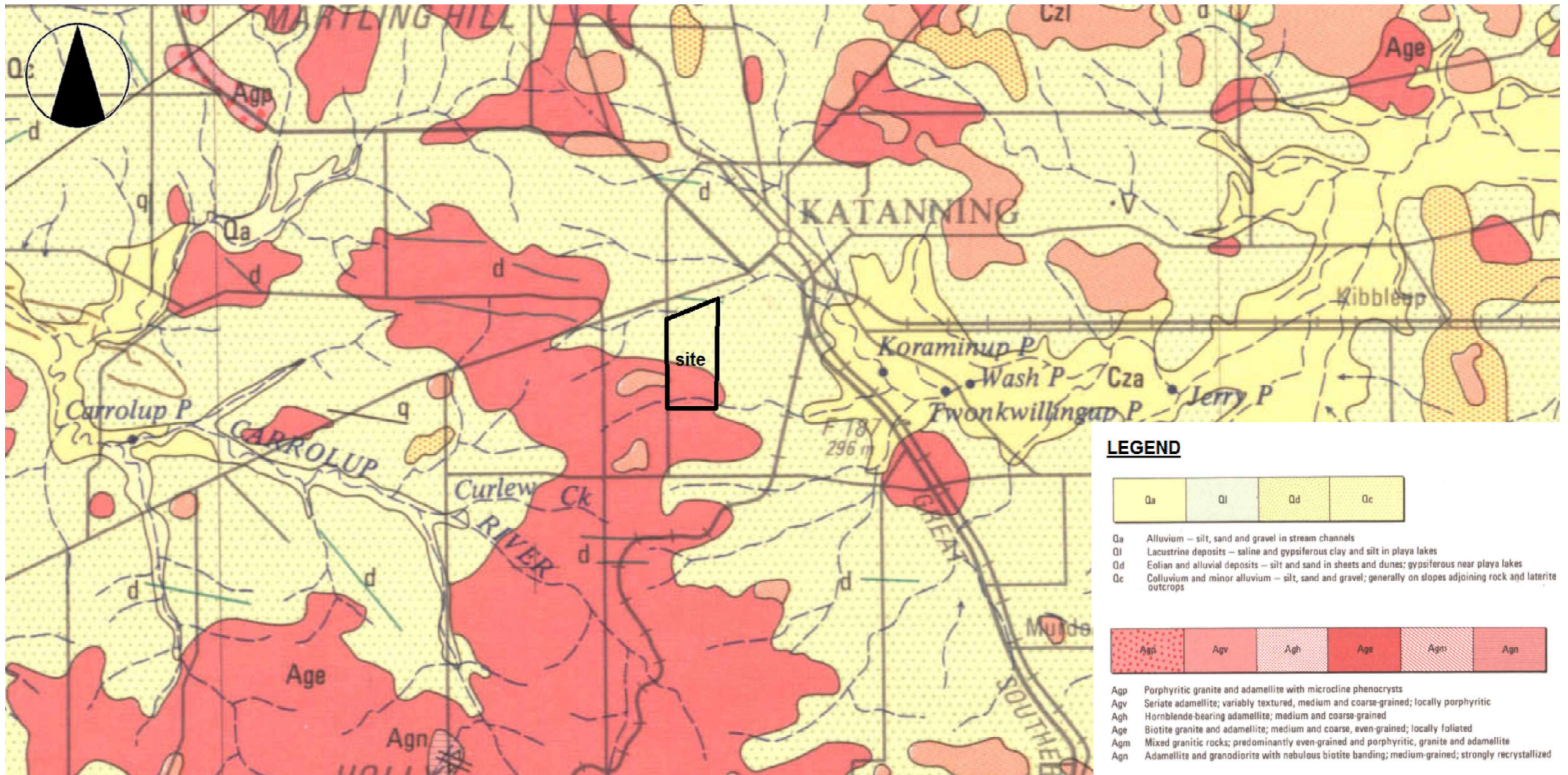
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TOPOGRAPHY

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APPENDIX E – GEOLOGY



LEGEND

Qa	Ql	Qd	Qc		
Agp	Agv	Agh	Age	Agn	Agn

Qa Alluvium – silt, sand and gravel in stream channels
 Ql Lacustrine deposits – saline and gypsiferous clay and silt in playa lakes
 Qd Eolian and alluvial deposits – silt and sand in sheets and dunes; gypsiferous near playa lakes
 Qc Colluvium and minor alluvium – silt, sand and gravel; generally on slopes adjoining rock and laterite outcrops

Agp Porphyritic granite and adamellite with microcline phenocrysts
 Agv Seriate adamellite; variably textured, medium and coarse-grained; locally porphyritic
 Agh Hornblende-bearing adamellite; medium and coarse-grained
 Age Biotite granite and adamellite; medium and coarse, even-grained; locally foliated
 Agm Mixed granitic rocks; predominantly even-grained and porphyritic, granite and adamellite
 Agn Adamellite and granodiorite with nebulous biotite banding; medium-grained; strongly recrystallized

1:250,000 GEOLOGY MAP EXTRACT
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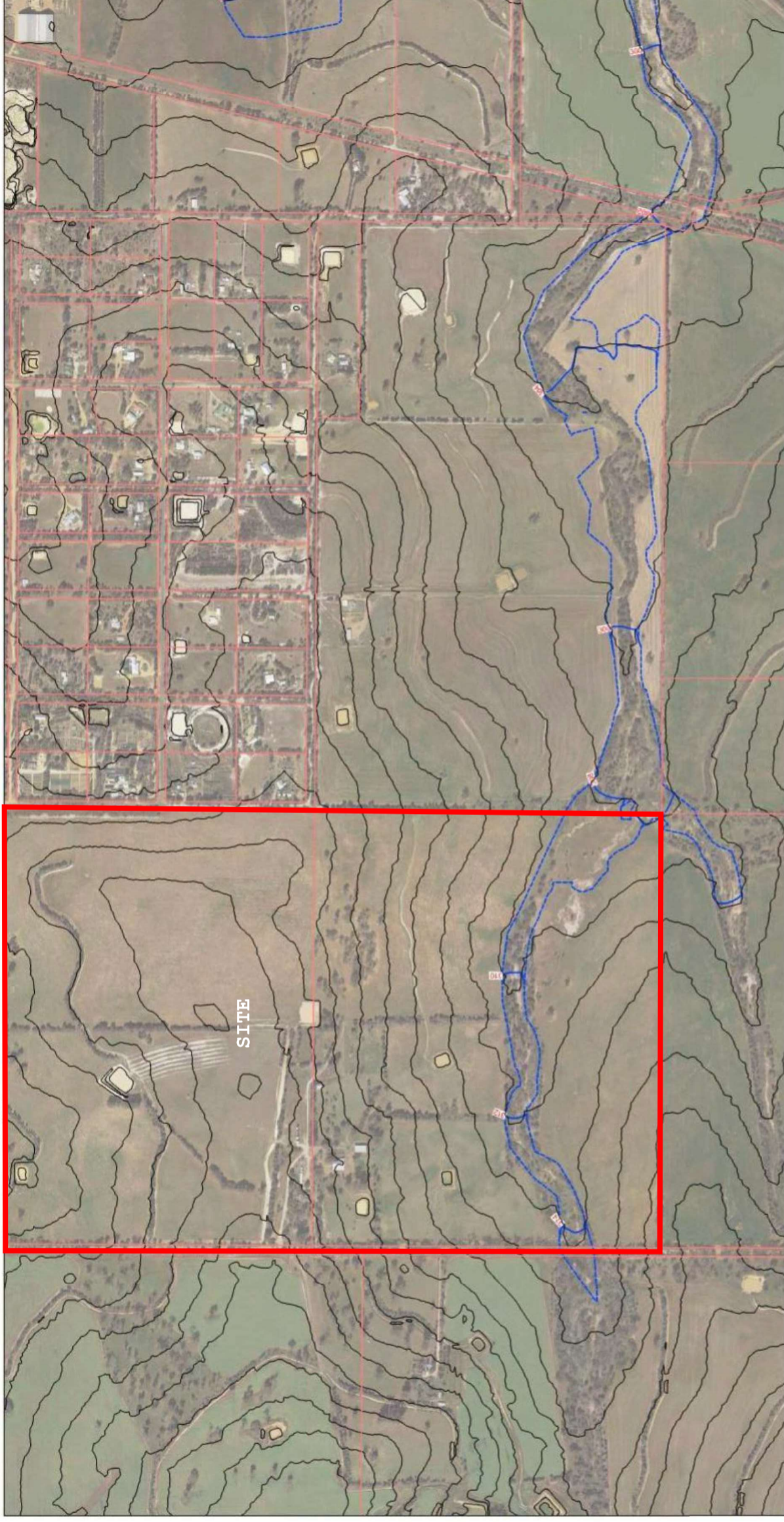
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APPENDIX F – 1% AEP FLOOD



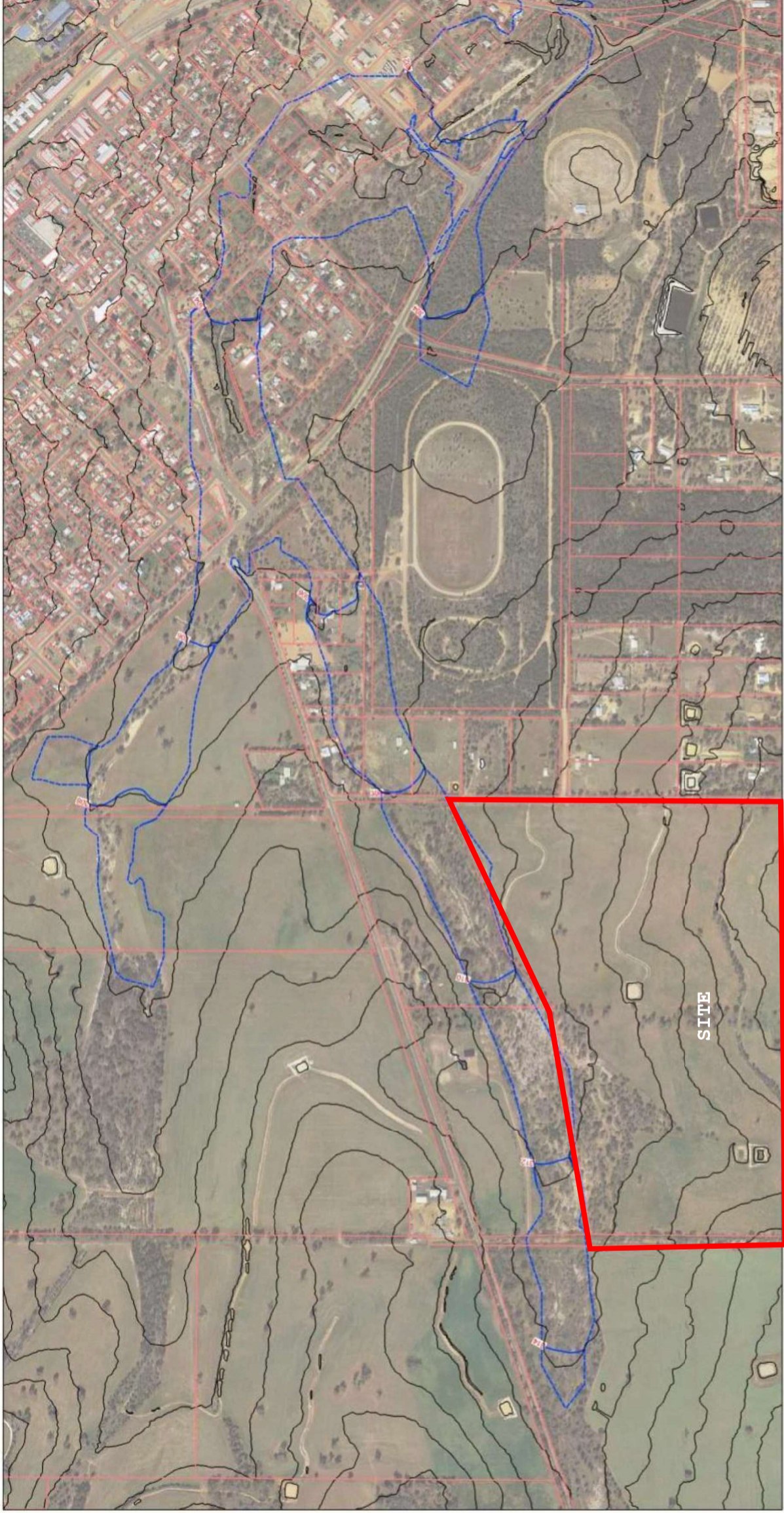
LEGEND

- EXISTING CONTOURS
AT 2.0m INTERVAL
- FLOOD LEVEL CONTOURS
AT 2.0m INTERVAL
- EXTENT OF FLOOD AREA



FIGURE 13 G

Katanning Flood Assessment



LEGEND

- EXISTING CONTOURS AT 2.0m INTERVAL
- FLOOD LEVEL CONTOURS AT 2.0m INTERVAL
- EXTENT OF FLOOD AREA

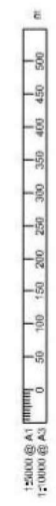
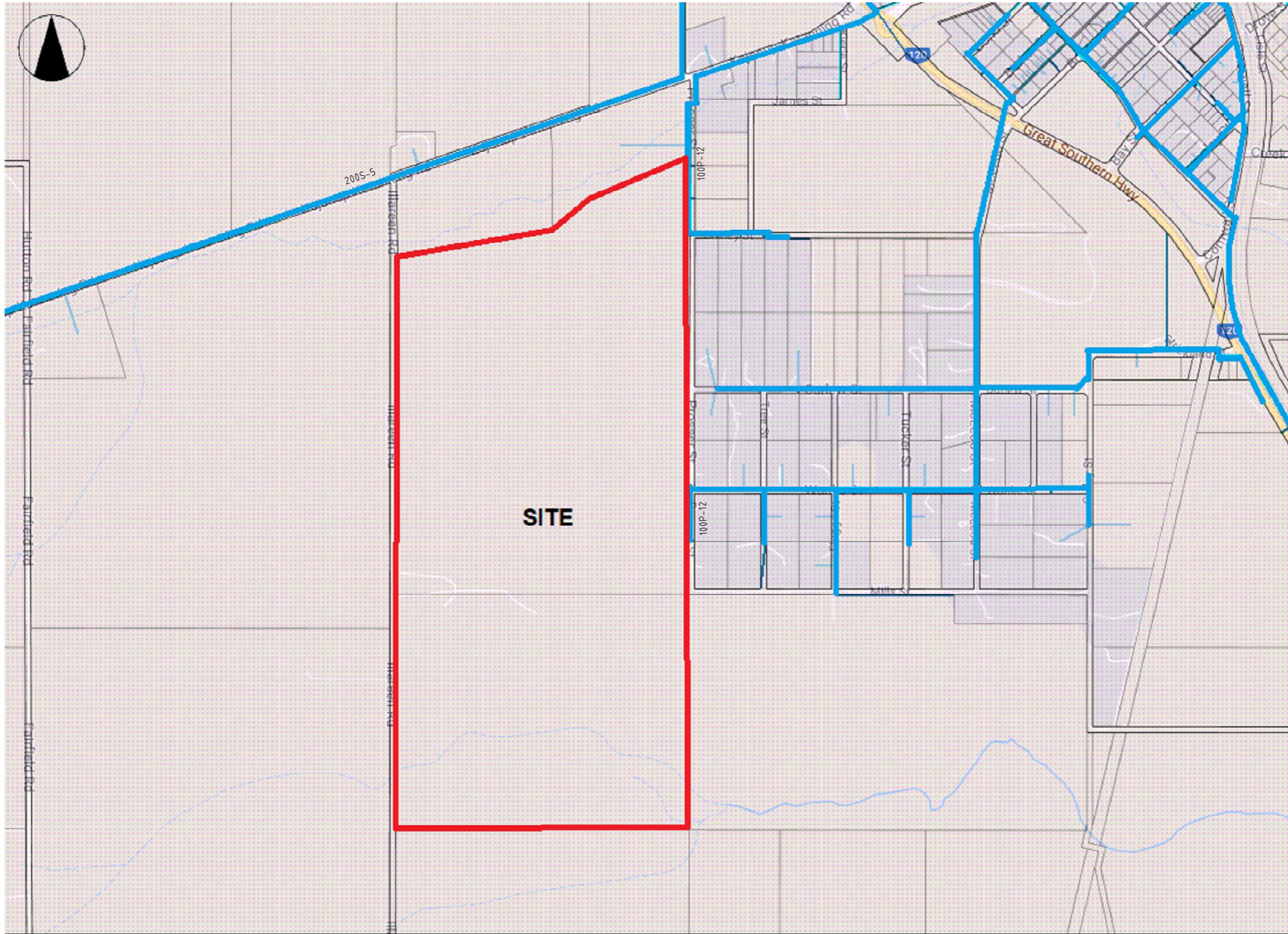


FIGURE 13 E

APPENDIX G – WATER CORPORATION WATER MAINS



WATER CORPORATION WATER MAINS
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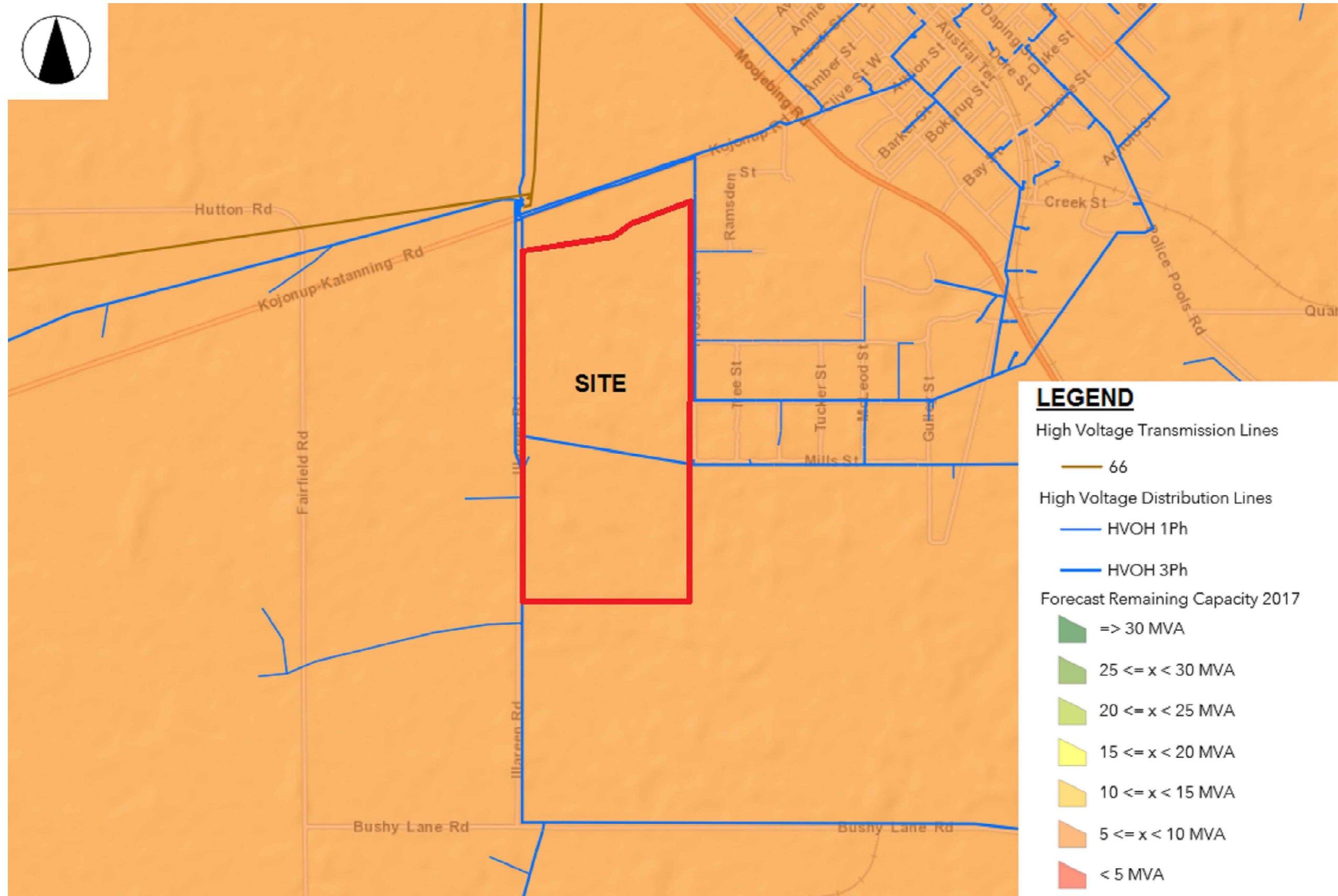
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DRAWING TITLE:
WATER CORPORATION
WATER MAINS

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APPENDIX H – WESTERN POWER NETWORK CAPACITY MAPPING



LEGEND

High Voltage Transmission Lines

— 66

High Voltage Distribution Lines

— HVOH 1Ph

— HVOH 3Ph

Forecast Remaining Capacity 2017

=> 30 MVA

25 <= x < 30 MVA

20 <= x < 25 MVA

15 <= x < 20 MVA

10 <= x < 15 MVA

5 <= x < 10 MVA

< 5 MVA

WESTERN POWER NETWORK CAPACITY
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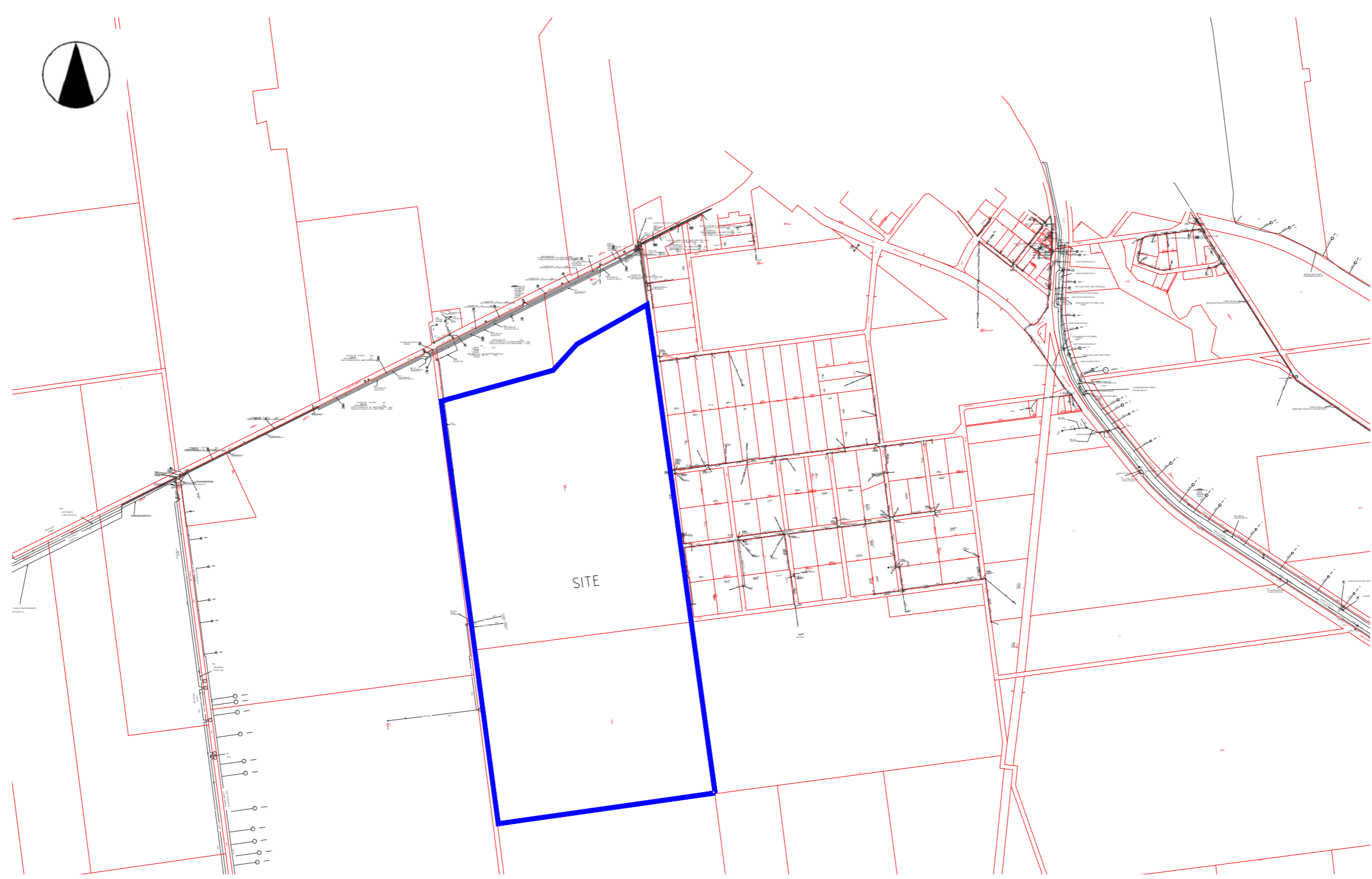
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PROJECT:
LOT 52 & 2979 ILLAREEN ROAD
KATANNING

DRAWING TITLE:
WESTERN POWER NETWORK
CAPACITY MAPPING

SCALE	FILE	THIS PLAN IS NOT TO BE USED FOR CONSTRUCTION UNLESS SIGNED BELOW
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PC17193	SKT-005	

APPENDIX I – TELSTRA TELECOMMUNICATION SERVICE



TELSTRA TELECOMMUNICATION SERVICE
N.T.S

No.	REVISION	BY	DATE

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PROJECT:
**LOT 52 & 2979 ILLAREEN ROAD
KATANNING**

DRAWING TITLE:
**TELSTRA
TELECOMMUNICATION SERVICE**

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