

# **UTILITIES INVESTIGATION REPORT**

## **RESIDENTIAL SUBDIVISION**

### **MUNDAMIA EAST**

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**CLIENT: TWYNAM MUNDAMIA PTY LIMITED**



## TABLE OF CONTENTS

1.	INTRODUCTION .....	3
2.	THE SITE .....	3
3.	INFRASTRUCTURE REVIEW.....	4
3.1.	SEWERAGE INFRASTRUCTURE .....	4
3.1.1	Physical Infrastructure.....	4
3.1.2	Development Contributions .....	5
3.2.	WATER SUPPLY INFRASTRUCTURE .....	6
3.2.1	Physical Infrastructure.....	6
3.2.2	Development Contributions .....	7
3.2.3	Alternatives to Town Water Supply .....	7
3.3.	ELECTRICITY INFRASTRUCTURE .....	7
3.3.1	Physical Infrastructure.....	7
3.3.2	Development Contributions .....	8
3.4.	WASTE DISPOSAL INFRASTRUCTURE .....	8
3.4.1	Physical Infrastructure.....	8
3.4.2	Development Contributions .....	9
3.5.	TELECOMMUNICATIONS INFRASTRUCTURE .....	9
3.5.1	Physical Infrastructure.....	9
3.5.2	Development Contributions .....	9
3.6.	GAS INFRASTRUCTURE .....	9
3.6.1	Physical Infrastructure.....	9
3.6.2	Development Contributions .....	10
3.7.	GENERAL INFRASTRUCTURE .....	10
3.7.1	Physical Infrastructure.....	10
3.7.2	Development Contributions .....	11
3.8.	CONCLUSION .....	11

### Appendices

#### Table of Revisions

Rev	Date	Details
00	9 May 2012	Issued for inclusion in EAR documentation
01	15 June 2012	Jemena Gas advice updated
02	14 November 2012	Comments from Test of Adequacy review incorporated

Report Prepared by:



Matt Philpott

**Allen Price and Associates**

## 1. INTRODUCTION

Twynam Mundamia is proposing a residential subdivision over lot 3 DP 568613 & Lot 384 DP755952 off George Evans Rd, Mundamia (near West Nowra). The expected lot yield of the proposal is approximately 300 residential allotments, 1 rural lot containing an existing rural dwelling plus associated public reserves.

The site is located within the coastal zone (under SEPP71) and is therefore defined as a Major Project under Part 3A of the Environmental Planning and Assessment Act, 1979. (EPA Act)

The Minister for Planning has formed an opinion that the proposal is a Major Project and the Director General of the Department of Planning has issued Environmental Assessment Requirements (EAR) under s75F of the EPA Act.

The purpose of this report is to address EAR's 4.1 and 4.2 which are outlined below:

- 4.1 Address existing capacity and requirements of the development for sewerage, water, electricity, waste disposal, telecommunications and gas, in consultation with relevant agencies. Identify and describe staging of infrastructure works; and
- 4.2 Address and provide the likely scope of a planning agreement and /or developer contributions with Council/government agencies.

The site has been identified by Shoalhaven City Council as being suitable for residential development as outlined in the Nowra-Bomaderry Structure Plan. The Department of Planning has given further weight to the future development of this area via the adoption of the South Coast Regional Strategy, which concurs with the recommendations of the Nowra-Bomaderry Structure Plan.

Council has prepared a draft Shoalhaven Local Environment Plan 2009 that proposes to modify the current rural zoning to a large section of R1 General Residential Zone and perimeter bushland areas as E2 Environment Conservation Zone. As part of the rezoning process, and to ensure a coordinated development delivery, Council are also in the process of preparing an Infrastructure Plan, Development Control Plan and Section 94 Plan for the Mundamia Growth area.

## 2. THE SITE

The existing site comprises the two parcels mentioned above totalling approximately 43Ha of land. The site is located approximately 2.7km (straight line) east-south-east from Nowra CBD, and is located 1km north of Yalwal Rd, West Nowra (see figure 1).

The site is bounded by an un-formed Crown road reserve to the west, Jonsson Rd to the north-west, private property to the north and east, Crown land to the south-east and an undeveloped portion of the University of Wollongong's land to the south-west. Two small rural allotments are located directly adjacent to the site western boundary. The University of Wollongong's Shoalhaven Campus is located approximately 400m to the south-west.

The site is accessed from George Evans Rd and Jonsson Rd, off Yalwal Rd.



Figure 1: Site Plan

The site predominantly is comprised of gently sloping land to the north-east. The eastern edge of the land is steep and rocky and falls generally easterly.

The site is generally cleared rural land that has previously been used for grazing and other rural activities. Some bushland still exists near the eastern boundary of the site and each allotment contains a rural dwelling and other associated sheds.

### 3. INFRASTRUCTURE REVIEW

The following infrastructure has been reviewed and discussions held with each service provider as outlined below:

Sewer – Shoalhaven Water  
 Water Supply – Shoalhaven Water  
 Electricity Reticulation – Endeavour Energy  
 Waste Collection and Disposal – Shoalhaven City Council  
 Telecommunications – Telstra and or/NBN Co  
 Gas – Jemena Pty Ltd  
 General Infrastructure – Shoalhaven City Council

A drawing showing approximate locations of existing infrastructure is shown in Appendix A.

#### 3.1. SEWERAGE INFRASTRUCTURE

##### 3.1.1 PHYSICAL INFRASTRUCTURE

The site is currently unserviced with sewerage reticulation. However, as part of Shoalhaven Water's Development Servicing Plans for Sewerage Services (November 2005), it has been identified that a sewerage pumping station (SPS) and rising main (RM) is required to service the site.

Shoalhaven Water has proposed a single SPS to service the site, which will be located near the north-eastern corner of the residential component of the land. The SPS will be sized to cater for the proposal plus additional development areas that will also drain to the SPS from neighbouring parcels. The location of the SPS and route of the RM is shown indicatively on the plan attached in Appendix B. It is also understood that an existing

gravity main (GM) in West Nowra will need to be augmented to allow for the additional load on the existing gravity sewerage system.

As the SPS, RM and GM augmentation are included in Shoalhaven Water's DSP2005, the construction of this infrastructure will be the responsibility of Shoalhaven Water. The work will be funded by developers through the contribution of Section 64 charges paid by Twynam Mundamia and other developers in the area.

DSP2005 outlines the timing of the work to be in 2016/2017, however Shoalhaven City Council has brought forward the necessary design and construction works to allow early release of the development area in accordance with the land release schedule contained in the draft LEP2009.

At its meeting on 27 January 2009, Council resolved the following:

- a) *Council adjust its Development Servicing Plan for Water and Sewerage by bringing forward the investigation, concept design and environmental studies for the Mundamia release area to the 2008/2009 financial year, with funding provided through its deferred developer works;*
- b) *Council adjust its Development Servicing Plan for Water and Sewerage by bringing forward the detailed design and construction works to service the Mundamia release area to 2009/2010. The implementation of these works would be pending gazettal of the draft LEP;*
- c) *Council adjust the water and sewerage capital works program to reflect the alteration in the DSP;*

A copy of written advice from Shoalhaven Water is attached in Appendix C.

Shoalhaven Water has confirmed recently that environmental studies and concept designs for the trunk sewer infrastructure have been completed. These are not currently available for release as they are internal working documents within Council. Shoalhaven Water has confirmed verbally that it is still proposed to provide the necessary infrastructure in accordance with Stage 1 release of the development, following gazettal of the Shoalhaven LEP.

Sewerage reticulation to each individual allotment will be the responsibility of the developer. APA has prepared draft sewerage reticulation layout for the site (see APA drawing 25489-07 Sheets 1 to 3 attached in Appendix D) showing a possible layout for the sewerage reticulation network. The layout shows that for the bulk of the site, a conventional gravity sewer reticulation system will provide a suitable solution for drainage the lots. However, a small number of lots near the south-eastern corner of the site will be unable to economically drain to the proposed SPS site. It is proposed in this location to utilise a low pressure sewer system such as that used by Shoalhaven Water in other areas of the LGA to overcome the cost implications of an excessively deep gravity sewer system in rock.

It is proposed that the existing residence on proposed lot 1 will also be connected to the sewer system.

In conclusion, the sewerage infrastructure that is proposed to be installed by Shoalhaven Water and the developer will adequately service the development and provides no constraints to development proceeding.

### 3.1.2 DEVELOPMENT CONTRIBUTIONS

The development contributions payable are in accordance with DSP2005 indexed to current rates. At the time of writing, the current Section 64 Contribution is \$8,096/ET.

This contribution is paid to Shoalhaven Water prior to the release of the Subdivision Certificate.



## 3.2. WATER SUPPLY INFRASTRUCTURE

### 3.2.1 PHYSICAL INFRASTRUCTURE

The site is currently serviced with water supply infrastructure via a single service to the existing residence on proposed lot 1 off a reticulation main in Jonsson Rd.

As part of Shoalhaven Water's Development Servicing Plans for Water Supply Services (November 2005), it has been identified that an additional trunk main will be required to service the proposed development on the site.

Shoalhaven Water has proposed a single DN250 spur main from the existing DN675 trunk main (located west of George Evans Rd) to the site. The location of the trunk main is through private property owned by Shoalhaven City Council. The final location of the trunk main will be determined in accordance with the land owner. The location of the trunk main is shown indicatively on the plan attached in Appendix E.

As the trunk main is included in Shoalhaven Water's DSP2005, the construction of this infrastructure will be the responsibility of Shoalhaven Water. The work will be funded by developers through the contribution of Section 64 charges paid by Twynam Mundamia and other developers in the area.

DSP2005 outlines the timing of the work to be in 2010/2011, however the provision of this infrastructure will be deferred by Shoalhaven City Council until gazettal of the Shoalhaven LEP 20909 has occurred and to allow release of the development area in accordance with Stage 1.

At its meeting on 27 January 2009, Council resolved the following:

- d) *Council adjust its Development Servicing Plan for Water and Sewerage by bringing forward the investigation, concept design and environmental studies for the Mundamia release area to the 2008/2009 financial year, with funding provided through its deferred developer works;*
- e) *Council adjust its Development Servicing Plan for Water and Sewerage by bringing forward the detailed design and construction works to service the Mundamia release area to 2009/2010. The implementation of these works would be pending gazettal of the draft LEP;*
- f) *Council adjust the water and sewerage capital works program to reflect the alteration in the DSP*

Shoalhaven Water has confirmed recently that environmental studies and concept designs for the trunk water infrastructure have been completed. These are not currently available for release as they are internal working documents within Council. Shoalhaven Water has confirmed verbally that it is still proposed to provide the necessary infrastructure in accordance with Stage 1 release of the development, following gazettal of the Shoalhaven LEP.

Water supply reticulation to each allotment will be the responsibility of the developer. APA has not prepared a draft water supply reticulation layout for the site. Water mains will be provided in each roadway adjacent to proposed lots and will be sized to cater for the necessary requirements of Shoalhaven Water for pressure and flow and will also be provided with hydrants in accordance with AS2419.1 to ensure suitable water is available for fire fighting purposes.

In conclusion, the water supply infrastructure that is proposed to be installed by Shoalhaven Water and the developer will adequately service the development and provides no constraints to development.

### 3.2.2 DEVELOPMENT CONTRIBUTIONS

The development contributions payable are in accordance with DSP2005 indexed to current rates. At the time of writing, the current Section 64 Contribution is \$6,386/ET.

This contribution is paid to Shoalhaven Water prior to the release of the Subdivision Certificate.

### 3.2.3 ALTERNATIVES TO TOWN WATER SUPPLY

The DGR's require alternatives to town water supply to be assessed.

Through the BASIX program and the developers commitments, rainwater (via 5kL rainwater tanks installed on each lot) will be utilised in toilet flushing, clothes washing and outdoor irrigation. This alleviates some of the load on the town water supply and extends the capacity of existing water supply infrastructure.

Alternatives for primary contact water (eg drinking and washing) are not appropriate to be considered for public health reasons.

Another alternative for the site is the possibility of utilising treated sewage for outdoor irrigation and other suitable uses. Unfortunately, due to the sensitive nature of downstream lands, this option is not feasible as it will upset the water balance for the site which may have potential consequences on the downstream water quality and quantity and may affect local flora and fauna species.

## 3.3. ELECTRICITY INFRASTRUCTURE

### 3.3.1 PHYSICAL INFRASTRUCTURE

The site is currently serviced with overhead electrical cables infrastructure owned and operated by Endeavour Energy (EE) to both existing dwellings. The location of the infrastructure is shown on APA drawing 25489-06 attached in Appendix A.

The expected load for a 312 lot subdivision is approximately 2.0MVA.

Nowra Zone Substation and the high voltage distribution network supplied by Nowra Zone Substation has been upgraded in the last couple of years to cater for future growth in this area.

Endeavour Energy has provided the following advice:

*"At present there is capacity in the existing 11kV network to supply the proposed subdivision. The 11kV supply for the proposed subdivision will be required to be connected to existing padmount substation 20291 which is located off George Evans Road within the University of Wollongong Shoalhaven Campus. An alternative 11kV supply will be required to be provided for the subdivision from the 11kV network located adjacent the proposed subdivision in accordance with Endeavour Energy's supply security standards.*

*The connection to Endeavour Energy's network would be subject to compliance with Endeavour Energy's Network Connection Contestable Works General Terms and Conditions, AS/NZS3000 Wiring Rules and the Service and Installation Rules of NSW.*

*The customer will be responsible for the funding and installation of the "Connection Assets" in accordance with Endeavour Energy's Network Connection Contestable Works General Terms and Conditions and*

*the AER (Australian Energy Regulator) determination for capital contributions. The "Connection Assets" would include all works to make supply available for the proposed subdivision.*

*A Level 3 Accredited Service Provider (refer NSW Department of Trade and Investment, Regional Infrastructure and Services at Industry & Investment NSW at [www.fairtrading.nsw.gov.au](http://www.fairtrading.nsw.gov.au)) will need to be engaged by the customer to carry out the electrical network design of the connection assets. A Level 1 Accredited Service Provider (refer NSW Department of Trade and Investment, Regional Infrastructure and Services at Industry & Investment NSW at [www.fairtrading.nsw.gov.au](http://www.fairtrading.nsw.gov.au)) will need to be engaged by the customer to carry out the electrical network construction of the connection assets."*

This is the normal process for provision of electrical infrastructure to subdivisions of this nature.

Low voltage electrical reticulation to each allotment, along with the supporting high voltage network, will be the responsibility of the developer. APA has not prepared draft electrical reticulation layouts for the site at this time as these will not be a constraint to development. However, an overall electrical reticulation strategy will be provided during Stage 1 detailed design stage to limit the developer's infrastructure costs and to rationalise the location of substation infrastructure.

The existing residence on proposed lot 1 is serviced by overhead electricity fed from overhead mains on Jonsson Rd. It is proposed that this overhead cable will be progressively converted to an underground network as development works progress throughout the site. Eventually, the existing residence will be fed from an underground electrical reticulation system.

The existing residence on Lot 384 will be demolished and the overhead electrical feeder will be removed.

In conclusion, the electrical infrastructure that is proposed to be installed by Endeavour Energy and the developer will adequately service the development.

### 3.3.2 DEVELOPMENT CONTRIBUTIONS

The funding arrangements for electrical infrastructure are documented in the IPART report "Capital Contribution and Repayments for Connections to Electricity Distribution Networks in New South Wales" – Final Report - April 2002.

The IPART determination outlines the manner in which funding for the various aspects of any required works are calculated. Some works are funded by Integral Energy (e.g. zone substation augmentation and high voltage works feeding more than one development), some works are developer funded (e.g. high and low voltage reticulation) and some works are jointly funded.

The final breakdown on funding arrangements will be determined once detailed electrical designs are carried out and works approved by Integral Energy.

## 3.4. WASTE DISPOSAL INFRASTRUCTURE

### 3.4.1 PHYSICAL INFRASTRUCTURE

Shoalhaven City Council currently operates waste collection services throughout the LGA through waste disposal contractors, SITA. Council also self-operates waste disposal facilities throughout the LGA, the closest being at West Nowra, approximately 2km (straight line) from the site.



Council has advised, through its Waste Services Section, that kerbside collection services will be provided on the following conditions:

- The development is in an urban area;
- The roads within the development have been constructed to Council's standards;
- The roads are owned and maintained by Council;
- Properties requiring kerbside collection are residential in nature; and
- Commercial allotments will be assessed at the time of any future development application over the land

As the development complies with the above requirements, kerbside collection services will be available to the site.

In conclusion, waste disposal services require roads to be constructed to Council standards, and to be dedicated as public roads to be owned and maintained by Council.

### **3.4.2 DEVELOPMENT CONTRIBUTIONS**

No development contributions for waste disposal services are payable by the developer. The waste collection service is paid by the individual allotment owners on quarterly rates notices.

## **3.5. TELECOMMUNICATIONS INFRASTRUCTURE**

### **3.5.1 PHYSICAL INFRASTRUCTURE**

The site is currently serviced with telecommunications services to the existing dwellings through Telstra.

Telecommunications infrastructure will be provided by the developer to suit either Telstra's or NBN Co's requirements. NBN Co is proposing to deliver fibre telecommunications services to the adjacent locality of West Nowra from December 2013.

The design and installation of "pits and pipes" will be at the developers expense with design and installation to be approved by the relevant authority. All pits and pipes will be "NBN Co ready" in accordance with current design standards.

Due to the proximity of the site to West Nowra and the University of Wollongong's Shoalhaven Campus plus the greenfields nature of the development site and the pending delivery of NBN Co services to the adjacent area, it is highly likely that infrastructure will be delivered by NBN Co.

In conclusion, the telecommunications infrastructure will be installed by the developer in accordance with current design and construction standards. All telecommunications infrastructure will be "NBN Co ready" with cables being provided by either Telstra or NBN Co. The decision on which authority will provide the infrastructure will be determined at the design phase of each stage of the subdivision.

### **3.5.2 DEVELOPMENT CONTRIBUTIONS**

No development contributions are payable for telecommunications services.

## **3.6. GAS INFRASTRUCTURE**

### **3.6.1 PHYSICAL INFRASTRUCTURE**

The site is not currently serviced with gas infrastructure.

Gas services do exist in the wider area with the closest services being located on the corner of Yalwal Rd and Cabbage Tree Lane (2.4km route length to site) and on the corner of Yalwal Rd and Albatross Rd (3.0 km route length to site).

Jemena Pty Ltd is responsible for the installation and management of the gas reticulation system.

Jemena Pty Ltd undertook investigations into the suitability and economics of supplying gas reticulation to the Mundamia growth area. The investigation concluded that the costs to extend gas are too prohibitive to make the extension of this service worthwhile.

As an alternative to reticulated gas supply, bottled gas supply will be available to future residents and businesses in the Mundamia growth area.

Gas is a non-essential service, so the provision of this service does not affect the suitability of the subdivision.

### 3.6.2 DEVELOPMENT CONTRIBUTIONS

If Jemena Pty Ltd/Actew AGI decides to install gas to the growth area, the gas reticulation can be installed in two different ways as outlined below:

1. The developer can supply a wider trench when installing electrical reticulation to allow the installation of the gas network by Jemena staff; or
2. Jemena staff will install gas reticulation throughout the subdivision following the creation of individual lots.

Occasionally, Jemena may also wish to charge a developer contribution but this has not been resolved at this time.

The option selected above is dependent upon cost and will be the subject of negotiations during detailed design phase with Jemena staff.

## 3.7. GENERAL INFRASTRUCTURE

### 3.7.1 PHYSICAL INFRASTRUCTURE

As previously stated, Council is in the process of preparing studies on the necessary infrastructure to support the Mundamia growth area.

These studies include passive and active open space requirements, road capacity and access issues, bushfire protection, emergency services provision and various other matters.

Following the finalisation of these studies, Council will prepare a Development Control Plan for the site and a Section 94 Plan that will both be finalised when the rezoning work is completed.

Council has advised that liaison with property developers in the Mundamia area will be undertaken during the preparation of the infrastructure plans. A small amount of this consultation has already occurred although no details have been provided to developers.

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### 3.7.2 DEVELOPMENT CONTRIBUTIONS

Due to the preliminary nature of Council's infrastructure studies, the exact quantum of any developer contributions is not known. Council has advised that developer contributions may be around \$14,000/lot although no details are known at this stage about what these contributions include.

### 3.8. CONCLUSION

Correspondence with Shoalhaven Water indicates that the sewer transportation system (sewerage pumping station, rising main and gravity main augmentation) will be provided by Shoalhaven Water through its Development Servicing Plan as required by the delivery timeframe of the development. Gravity reticulation will be provided throughout the estate by the developer with some low pressure sewerage units being required to drain the south-eastern corner of the site.

Correspondence with Shoalhaven Water indicates that the water trunk mains will be available to the development through Shoalhaven Water's Development Servicing Plan as required by the delivery timeframe of the development. Water reticulation will be provided throughout the development by the developer.

Correspondence with Endeavour Energy indicates that electrical distribution infrastructure is available for connection. Electrical reticulation infrastructure will be provided throughout the development by the developer.

Waste services will not be a constraint to development proceeding as all roads will be public roads to Council standards.

Telecommunications will not be a constraint to development as Telstra or NBN co will supply the necessary services to the development.

Gas services will not be a constraint to development as they are a non-essential service.

Other local and regional infrastructure will be provided by Council under a Section 94 Plan currently being prepared for the area.

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**Appendices:**

Appendix A: Existing Infrastructure - APA Drawing ref: 25489-06

Appendix B: Shoalhaven Water DSP2005 Sewer Infrastructure – West Nowra

Appendix C: Shoalhaven City Council letter dated 4 February 2009

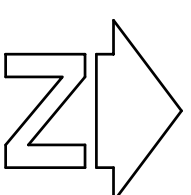
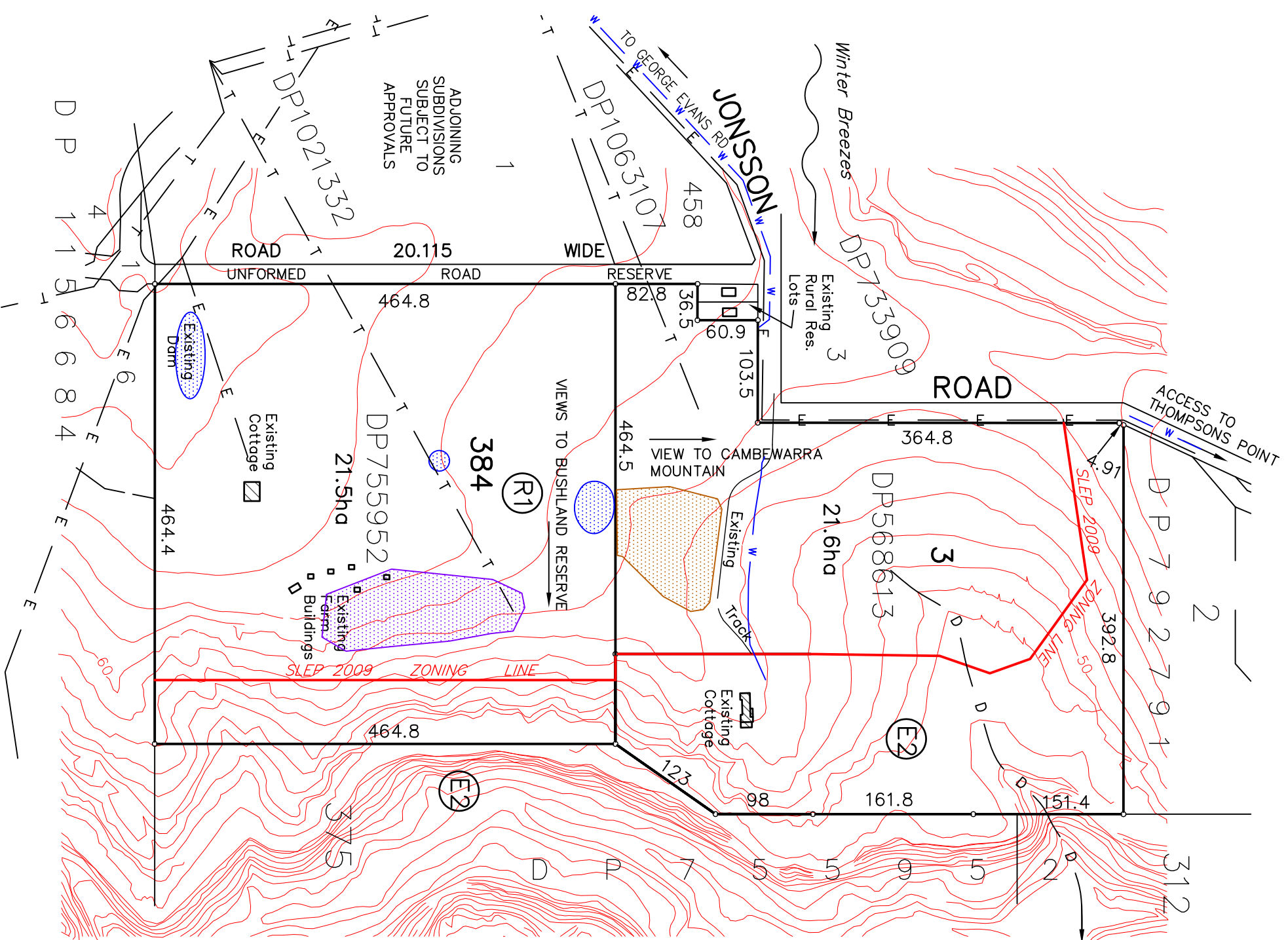
Appendix D: Sewer Reticulation Concept Design - APA Drawing ref 25489-07 Sheets 1 to 3

Appendix E: Shoalhaven Water DSP2005 Water Infrastructure – West Nowra

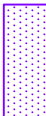
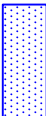
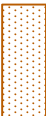




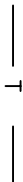

## Appendix A

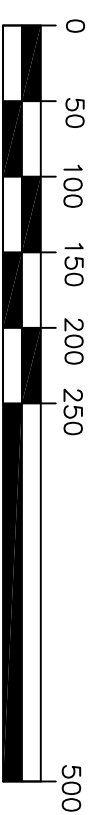


# SERVICES ANALYSIS PLAN

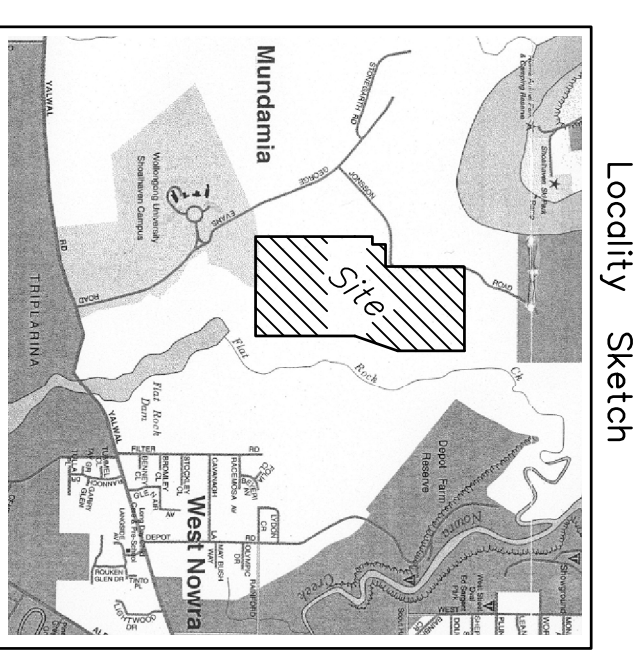


## LEGEND

-  OBSERVED GROUNDWATER SEEPAGE  
 EXISTING DAMS  
 WATERLOGGED SOIL  
 PROPOSED SLEP 2009 ZONING LINE  
 PROPOSED ZONING UNDER SLEP 2009  
 D DRAINAGE LINE  
 W WATER SUPPLY MAINS (APPROX.)  
 T TELSTRA LINE (APPROX.)  
 E ELECTRICAL SERVICE (APPROX.)

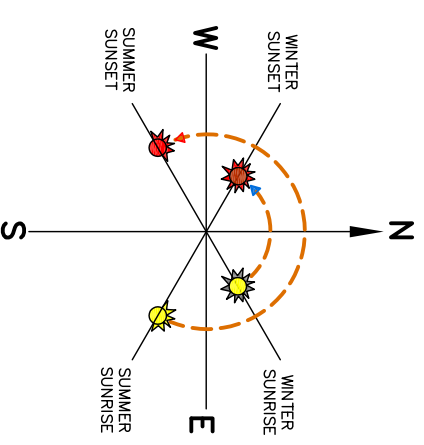


	REVISION	BY	DATE



Map drawn and published by Cartodraft Aust P/L

**SOLAR  
ACCESS**



Liability limited  
by a scheme  
approved under  
Professional  
Standards  
Legislation.

SKETCH PLAN SHOWING EXISTING SITE SURVEY  
AND PROPOSED ZONING  
OVER LOT 3 DP568613 & LOT 384 DP755952  
AT MUNDAMIA FOR TWINNAM MUNDAMIA PTY LTD

- NOTES**

1. ALL DIMENSIONS AND AREAS ARE SUBJECT TO SURVEY.  
2. CONTOURS PROVIDED BY SHOALHAVEN CITY COUNCIL FROM AERIAL PHOTOGRAPHY  
3. ALL SERVICES ARE GENERALLY PLOTTED INDICATIVELY FROM INFORMATION SUPPLIED BY THE RELEVANT AUTHORITIES AND ARE TO BE CONFIRMED AND LOCATED PRIOR TO ANY CONSTRUCTION WORKS TAKING PLACE

RATIO 1: 5000    DATE APRIL 2012 REF: 25489-06

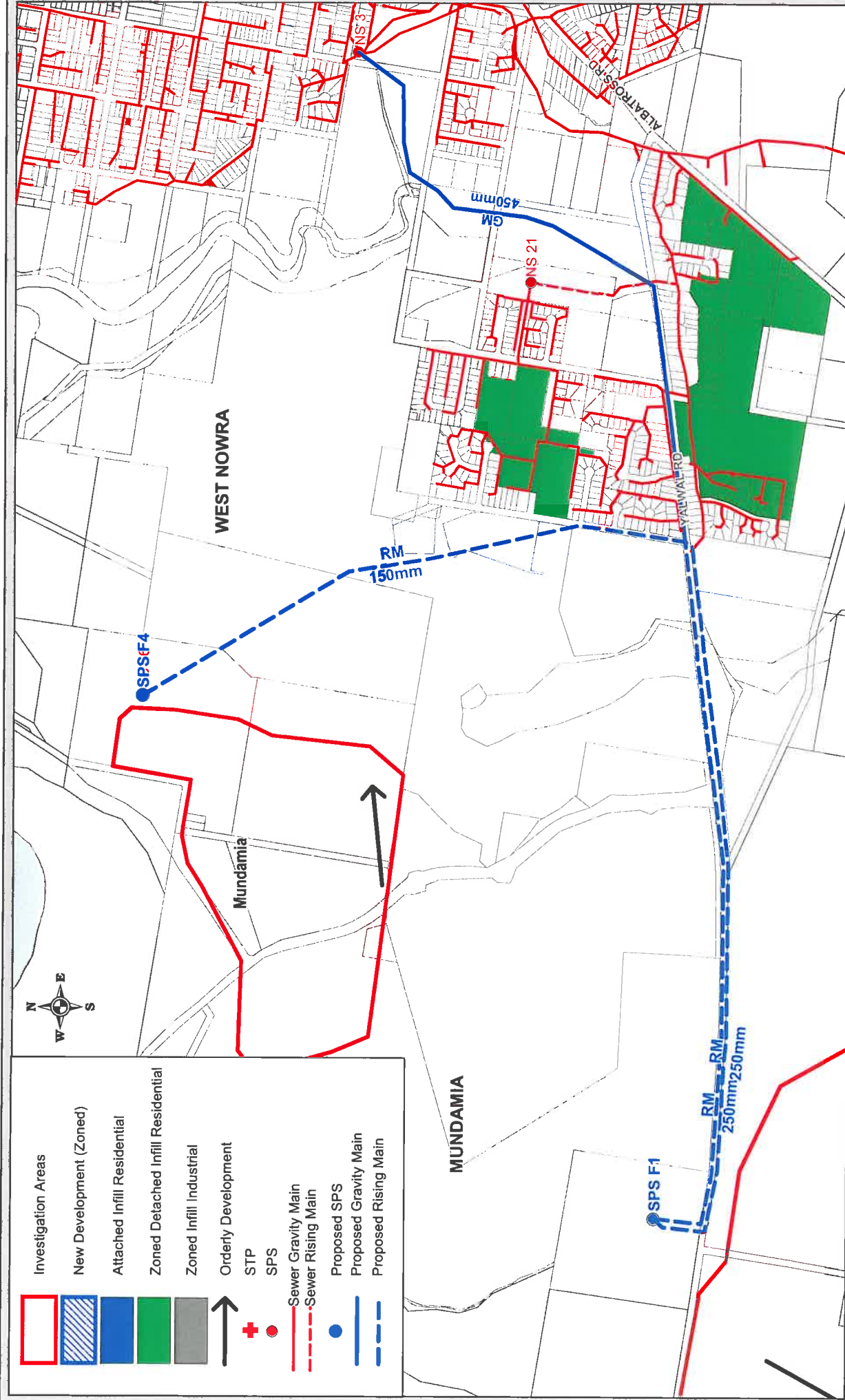
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**allen, price & associates**  
land and development consultants

**75 plunkett street, nowra, nsw, 2541**

phone: (02) 4421 5544 fax: (02) 4422 1821 DX 5310 nowra  
consultants@allenprice.com.au www.allenprice.com.au

## Appendix B



Shoalhaven Water

Sewerage Infrastructure - West Nowra

## Appendix C



**City Administrative Centre**

Bridge Road, Nowra NSW Australia 2541

Phone: (02) 4429 3111 • Fax: (02) 4422 1816 • DX 5323 Nowra

**Address all correspondence to**

The General Manager, PO Box 42, Nowra NSW Australia 2541

COUNCIL REFERENCE: 39110 (D09/14283)  
CONTACT PERSON: Robert Horner  
YOUR REF:

4 February 2009

Allen Price & Associates  
DX 5310  
NOWRA



Attention Matt Philpott

Dear Matt

**Provision of Water & Sewerage Infrastructure to Mundamia Growth Area**

Reference is made to your correspondence 2 July 2008 and ongoing discussions relating to the provision of water and sewerage infrastructure for the Mundamia growth area.

You have requested that Council give consideration to adjust its Development Servicing Plans (DSP) for Water and Sewerage to align with the Nowra / Bomaderry Structure Plan and the draft LEP (currently with NSW Department of Planning).

Please be advised that Council at its meeting held on 27 January 2009 resolved to adjust its DSP by bringing forward the investigation, concept design and environmental studies for the Mundamia release area to the 2008 / 09 financial year.

Council also resolved to bring forward the detailed design and construction works to service this area to 2009 / 2010 pending gazettal of the draft LEP.

Council trusts this resolution is to the satisfaction of you and your client. If you require further information regarding this please contact Robert Horner, Shoalhaven Water Group on (02) 4429 3223. Please quote Council's reference 39110.

Yours faithfully

A blue ink signature, likely of Robert Horner, written in a cursive style.

**Robert Horner**  
**Planning & Development Manager**



## Appendix D



LOTS AS SHOWN ARE SUBJECT TO FINAL SURVEY  
CONTOURS ARE FOR THE USE OF ALLEN PRICE & ASSOCIATES AND HAVE BEEN OBTAINED FROM SHOALHAVEN CITY COUNCIL AND ARE SUBJECT TO DETAIL SURVEY PRIOR TO DESIGN OR CONSTRUCTION

— DENOTES APPROXIMATE POSITION OF POSSIBLE SEWER MAIN  
- - - DENOTES APPROXIMATE POSITION OF POSSIBLE SEWER RISING MAIN TO SERVE LOW PRESSURE GRINDER UNITS

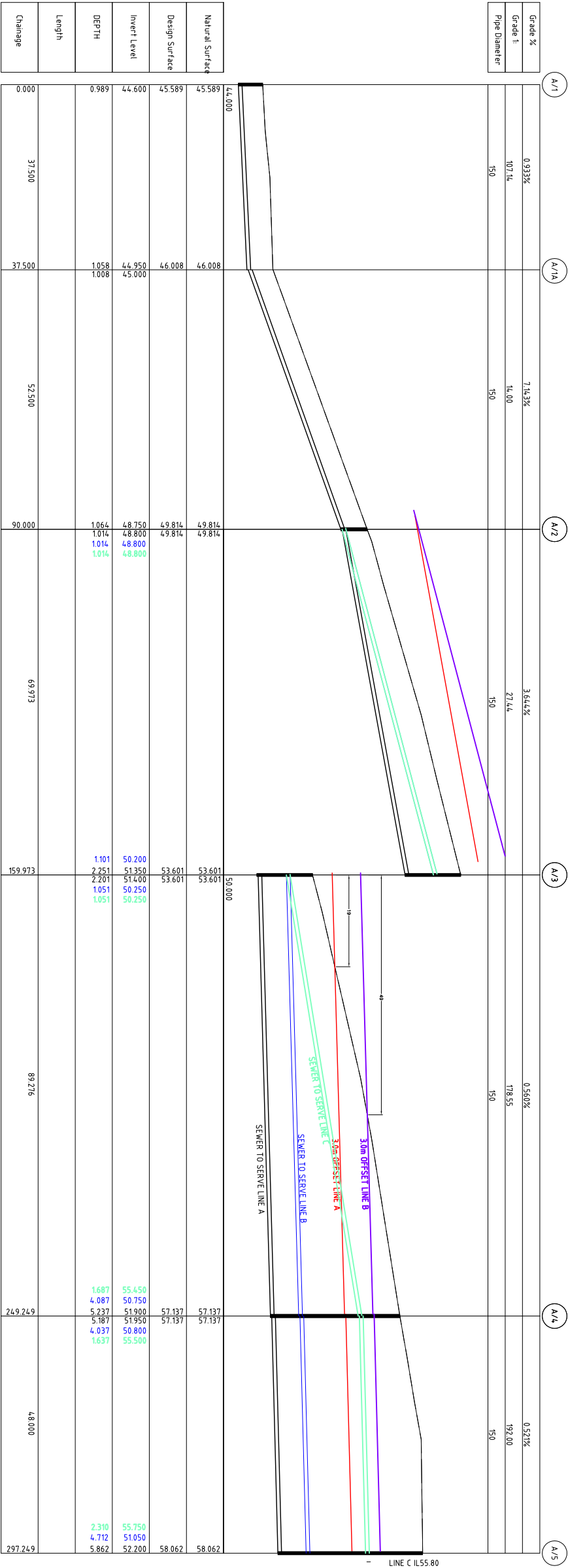
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			DESIGN				
			ORIGIN:				
	DATE OF PLAN: MAY 2012	CHECK'D	MJP				

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phone:(02) 4421 6544 fax:(02) 4422 1821 DX 5310 nowra  
consultants@allprice.com.au www.allprice.com.au

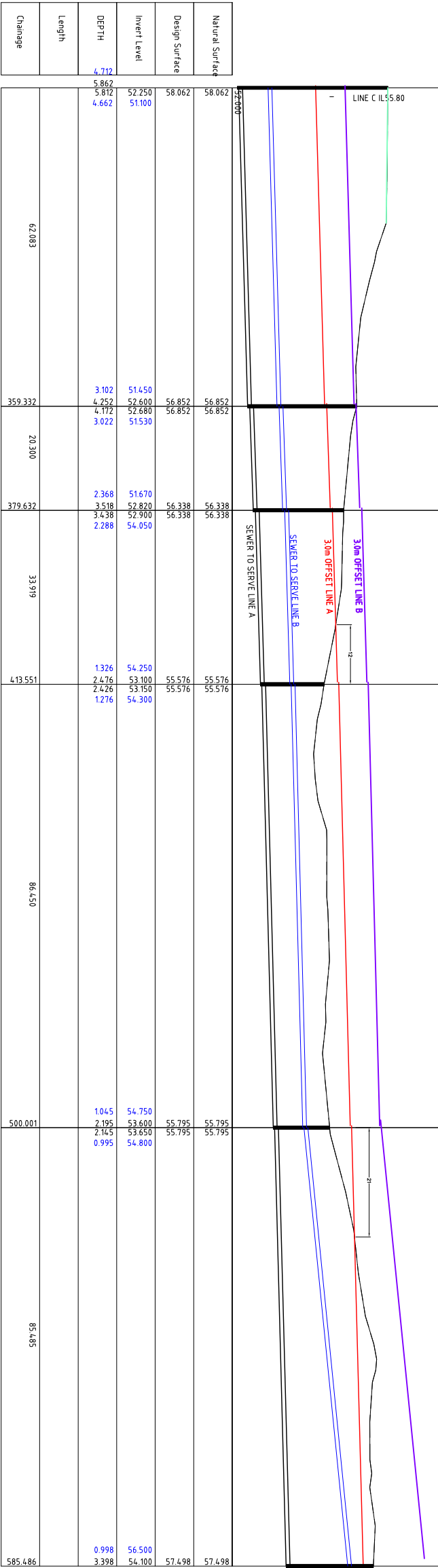
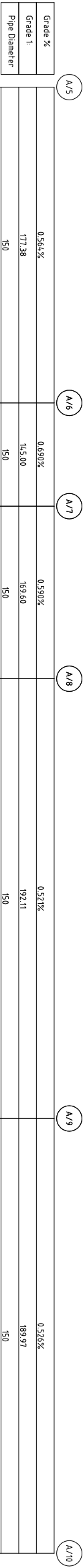
PLAN SHOWING POSSIBLE SEWER LAYOUT  
OVER MUNDAMIA GROWTH AREA  
AT MUNDAMIA  
FOR TWYNAM MUNDAMIA PTY LIMITED

REF. No.		25489-07	
SHEET	1	OF 3	SHEETS
		REVISION	
		00	





LINE A



LINE A

RATIO:  
**1:100V**  
**1:500H**  
(AT A1 SIZE)

DATUM:  
AUSTRALIAN HEIGHT DATUM

SURVEY:  
DESIGN  
CHECK

SCC:  
CEG  
CEG

REVISION

BY

DATE

DATE OF PLAN: MAY 2012

allen, price & associates

land and development consultants

75 plunkett street, nowra, nsw. 2541

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PLAN SHOWING POSSIBLE SEWER SECTIONS – LINE A  
OVER MUNDAMIA GROWTH AREA  
AT MUNDAMIA  
FOR TWYNAM MUNDAMIA PTY LIMITED

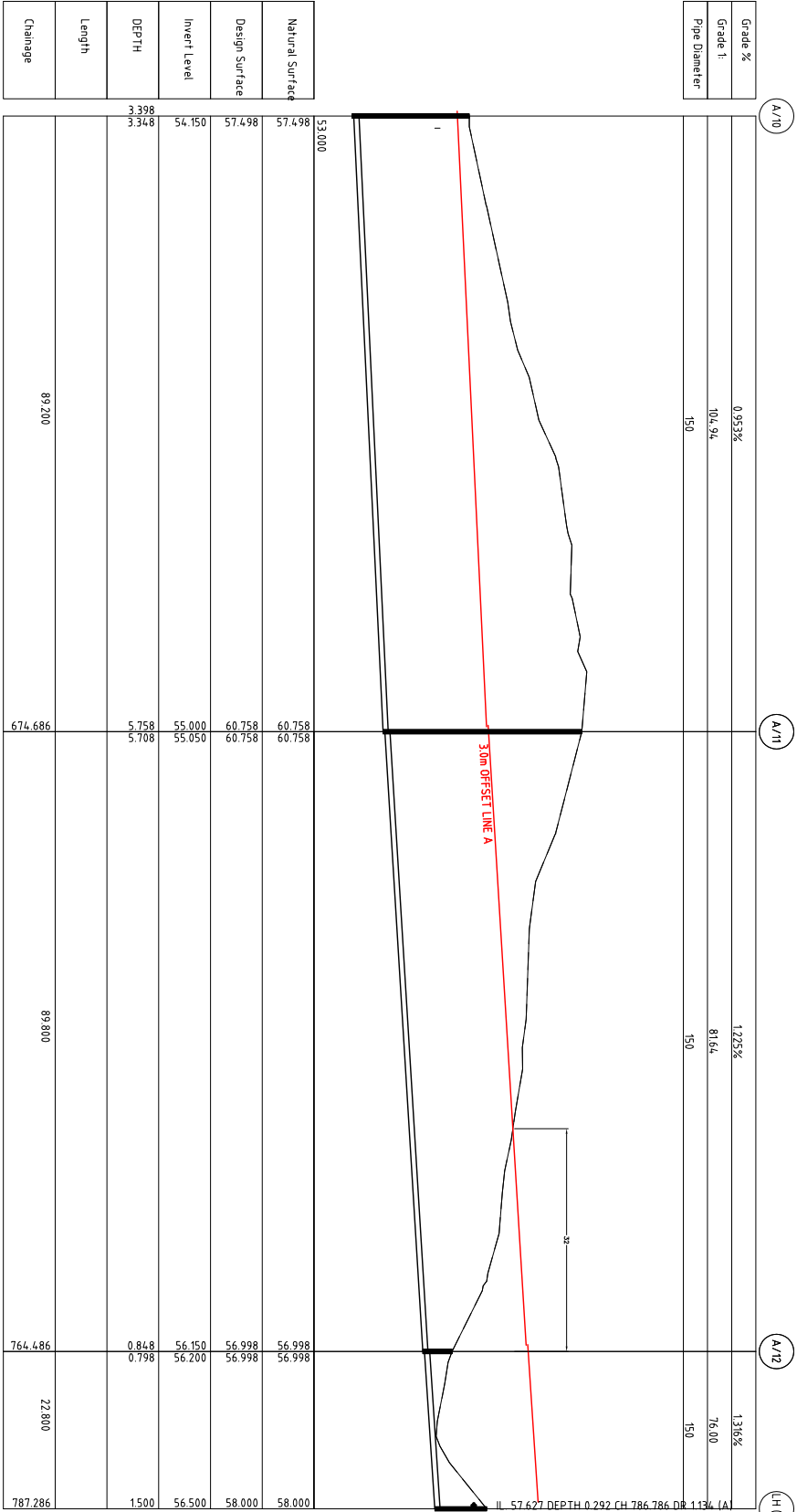
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**25489-07**

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**2**  
OF  
**3**  
SHEETS

REVISION  
**00**



Liability limited  
by a scheme  
approved under  
Professional  
Standards  
Legislation.



RATIO:

1:100V  
1:500H  
(AT A1 SIZE)

DATUM:

AUSTRALIAN HEIGHT DATUM

SURVEY

DESIGN

DRAWN

CHECKED

SCC

CEG

CEG

REVISION

BY

DATE

DATE OF PLAN:

MAY 2012

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PLAN SHOWING POSSIBLE SEWER SECTIONS – LINE A  
OVER MUNDAMIA GROWTH AREA  
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REF. No.

25489-07

SHEET

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OF 3 SHEETS

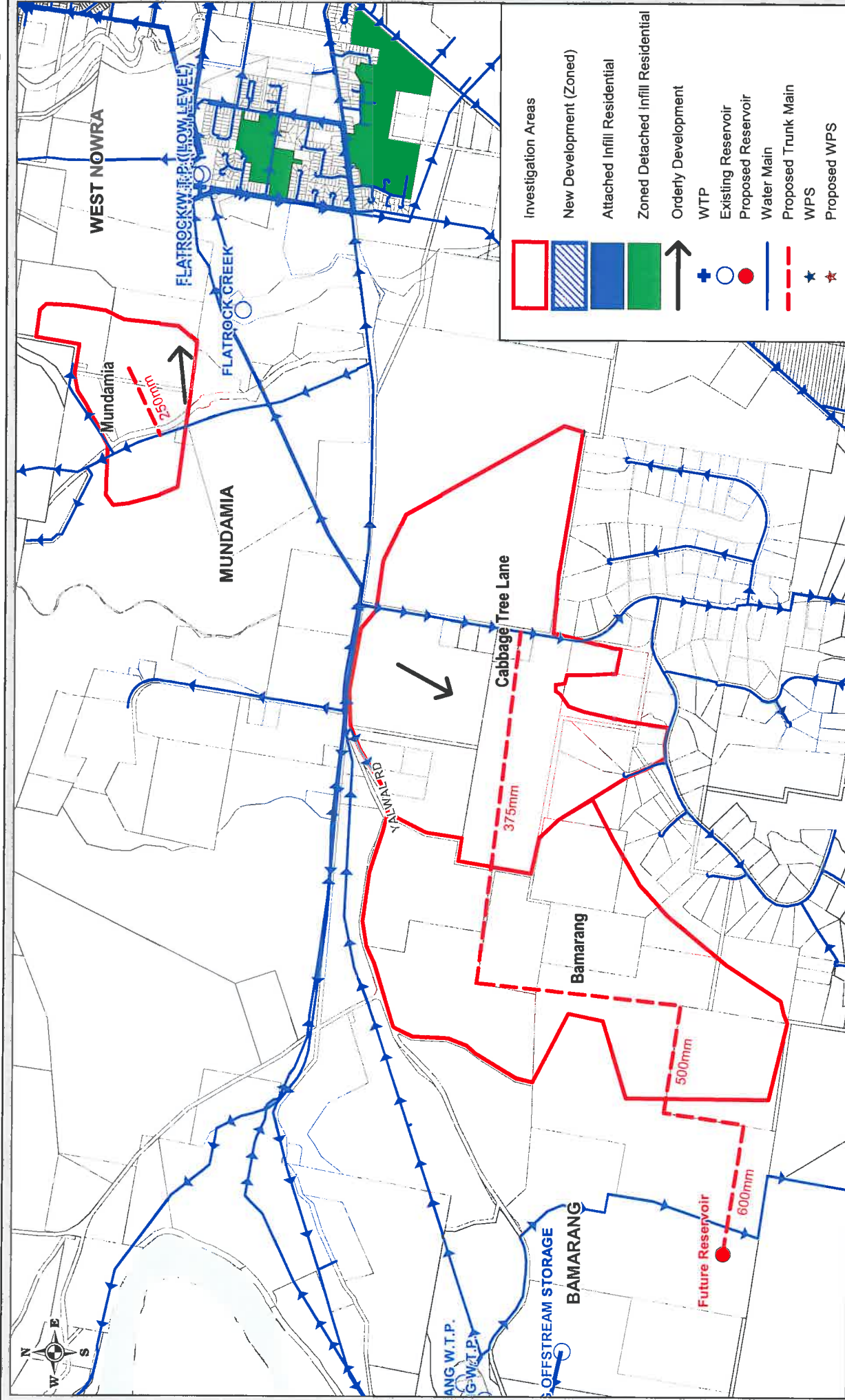
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## Appendix E





Shoalhaven Water

Water Supply Infrastructure - West Nowra