REEDS CONSULTING

LAND SURVEYING
CIVIL ENGINEERING
PLANNING
DEVELOPMENT CONSULTING

ENGINEERING SERVICING REPORT

PROPOSED DEVELOPMENT

OF

LILYDALE QUARRY PLANNING SCHEME AMENDMENT
BALANCE LAND
HULL ROAD, LILYDALE

CLIENT: HBI LILYDALE PTY LTD

REF: 22835E REVISION: 8

DATE: OCTOBER 2020

CONTENTS

ANNEXURES

Revision	*Issue Date*	*Status*	*Author*	*Checked*	*Approved*
Rev 1	20/02/2018	Preliminary Issue	P.Miller	H.Day	S. Ravida
Rev 2	22/02/2018	Issued for Client Review	P.Miller	H.Day	S. Ravida
Rev 3	01/03/2018	Client comments adopted	P.Miller	H.Day	S. Ravida
Rev 4	25/03/2020	Updated Layout	P.Miller	H.Day	S. Ravida
Rev 5	08/04/2020	Client comments adopted	P.Miller	H.Day	S. Ravida
Rev 6	14/04/2020	Client comments adopted	P.Miller	H.Day	S. Ravida
Rev 7	29/04/2020	Client comments adopted	P.Miller	H.Day	S. Ravida
Rev 8	16/10/2020	Updated Authority Advice	P.Miller	H.Day	S. Ravida

1 INTRODUCTION

This report has been prepared on behalf of HBI Lilydale Pty Ltd in support of the Lilydale Quarry Planning Scheme Amendment to provide a preliminary engineering assessment and overview of the availability and requirements of servicing infrastructure necessary for the development of the balance of the former Lilydale Quarry Site.

The site is intended to become a multi-use development comprising a varied density residential area and commercial / retail precinct in accordance with the Development Yield Plan contained in **Annexure 1** of this report.

The information contained in this report is based on investigations by Reeds Consulting that have been facilitated by our enquiries and dealings with the Yarra Ranges Council and other servicing agencies including Yarra Valley Water and Melbourne Water. This information is subject to review and written confirmation at the time that the development proceeds.

2 GENERAL

The former Lilydale Quarry is located approximately 34km north-east of Melbourne in the Yarra Ranges Council and is currently zoned as Special Use (SUZ1). Refer to **Figure 1** below for the general location of the subject site.

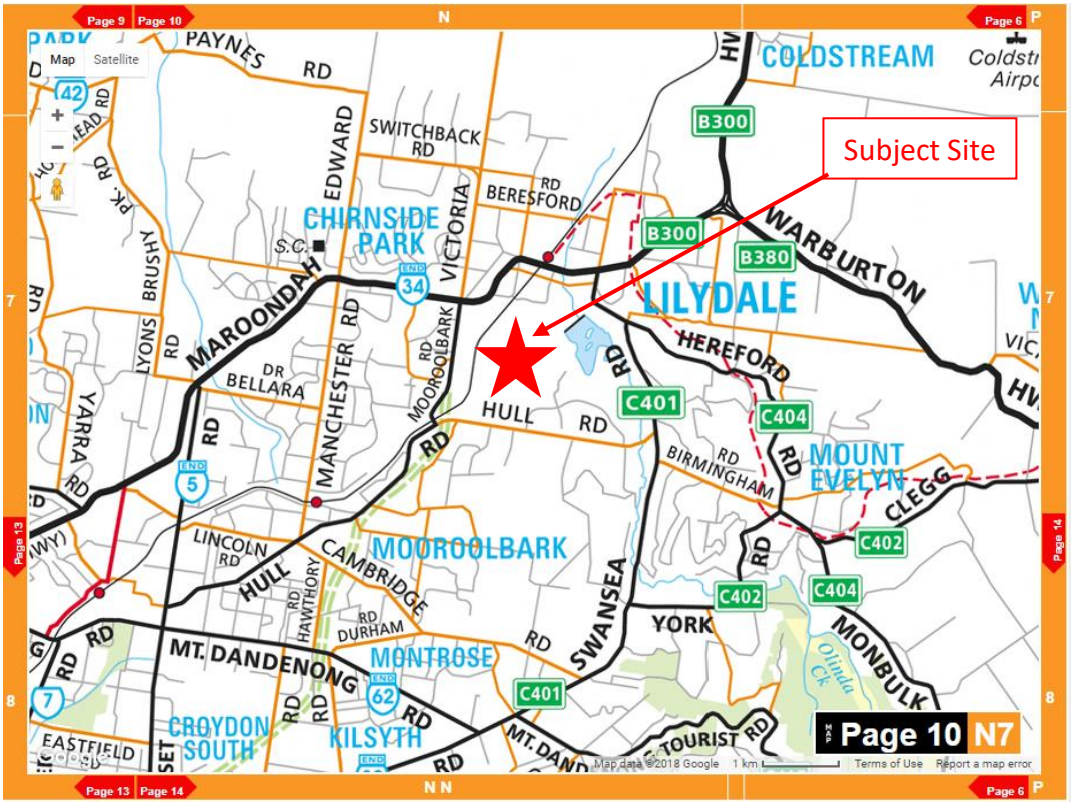


Figure 1 - Site Location (*Source: Melways*)

The subject land is irregular in shape with an area of approximately 144 hectares and comprises of five separate titles.

The site is bound by Mooroolbark Road along the entire west boundary and the Maroondah Highway / Melba Avenue to the north. Existing residential development is located to the south and south east, with a planning permit issued for the proposed development of the Stage 1

area. The Box Hill TAFE Institute abuts the north-east corner of the site. A small industrial estate and Lilydale High School are located near the north boundary of the site.

The site has varying topography and features due its previous use and falls generally away from the high point at the centre of the site to the north, east and south. The current surveyed high point of the site is 166m RL, with a low point of 12m RL, resulting in gradients of up to 16% across the site. The Melbourne – Lilydale railway dissects the site in a north-south alignment. The rail separates two land titles to the east from three titles to the west. Refer **Figure 2** for Aerial site plan showing general features and surrounding land uses.

Figure 2 - Aerial Site Plan (*Source: Google Maps*)

The land form to the east of the railway line has predominantly been used for quarry operations. These operations have resulted in an approximately 120m deep open cut pit in the centre of the site, which will require fill works and rehabilitation. The land further to the east of the pit has been used as a stockpile for quarry spoil and is currently over-burdened by circa. 40m of excess fill. Various sheds and buildings are also located on-site, which were used for quarry operations.

The quarry is proposed to be filled as part of the redevelopment, generally in accordance with the preliminary finished surface model provided in **Annexure 2** - 'Preliminary Site Design Finished Level Contour Model' plan. The site remediation works are to be completed under the supervision and control of the environmental and geotechnical consultants engaged by the developer to prepare the site for its intended development and use.

The land form to the west of the railway line is undeveloped and mostly cleared. This area generally grades away from Mooroolbark Road to the east, with the railway line effectively acting as a catch-drain low point for the east boundary.

Currently the majority of stormwater runoff is contained within the site due to its current form, with the existing quarry pit acting as a retention basin for most of the western catchment. Due to the undeveloped nature of the balance of the site, uncontrolled stormwater runoff currently discharges directly into the Melba Avenue to the north, Lillydale Lake to the east, and Hull Road to the south.

The development proposes approximately 3,060 lots, with a mix of conventional residential, medium density, heritage, terrace housing and apartments. An urban centre is proposed, which could comprise of commercial, retail and office uses. Major open space is also proposed at the low-point corners of the site, with stormwater management devices to be located within these areas. Refer **Figure 3** for the Indicative Yield Plan of the balance of land. Proposed re-grading of the site will result in fall to the north and east of the site.

Figure 3 – Draft Concept Plan Ver F (*Source: RobertsDay*)

3 SERVICES

3.1 INTEGRATED ROAD NETWORK

The internal and external street network strategy is set out in the Draft Concept Plan, which has been designed in conjunction with advice from Cardno and their *Lilydale Quarry Integrated Transport Plan, October 2020*.

The development will integrate the vehicle road network with both pedestrian and cyclist transport within the site. As noted by Cardno in their ITP report:

"All roads within the subdivision have been designed to provide for convenient access to individual allotments and are suitably designed to cater for both pedestrian and cyclist trips. Walking and cycling will be encouraged throughout the development with bicycle lanes and a shared path provided on Connector Streets. End of trip facilities and bicycle parking will also be provided at the new train station located within the Quarry site. "

Access to the site will be obtained through the construction of new intersections on Hull Road, Mooroolbark Road and Melba Avenue. A main north-south collector road will provide internal access to the site and connect Hull Road in the south to Melba Avenue in the north. The major Hull Road intersection is proposed to be constructed as part of the Stage 1 works to the south, which has been approved under a separate planning permit.

Developer Contributions may be required to fund the major infrastructure items for the precinct. Refer to the Development Contributions report for the subject site prepared by Urban Enterprise, in support of the Planning Scheme Amendment.

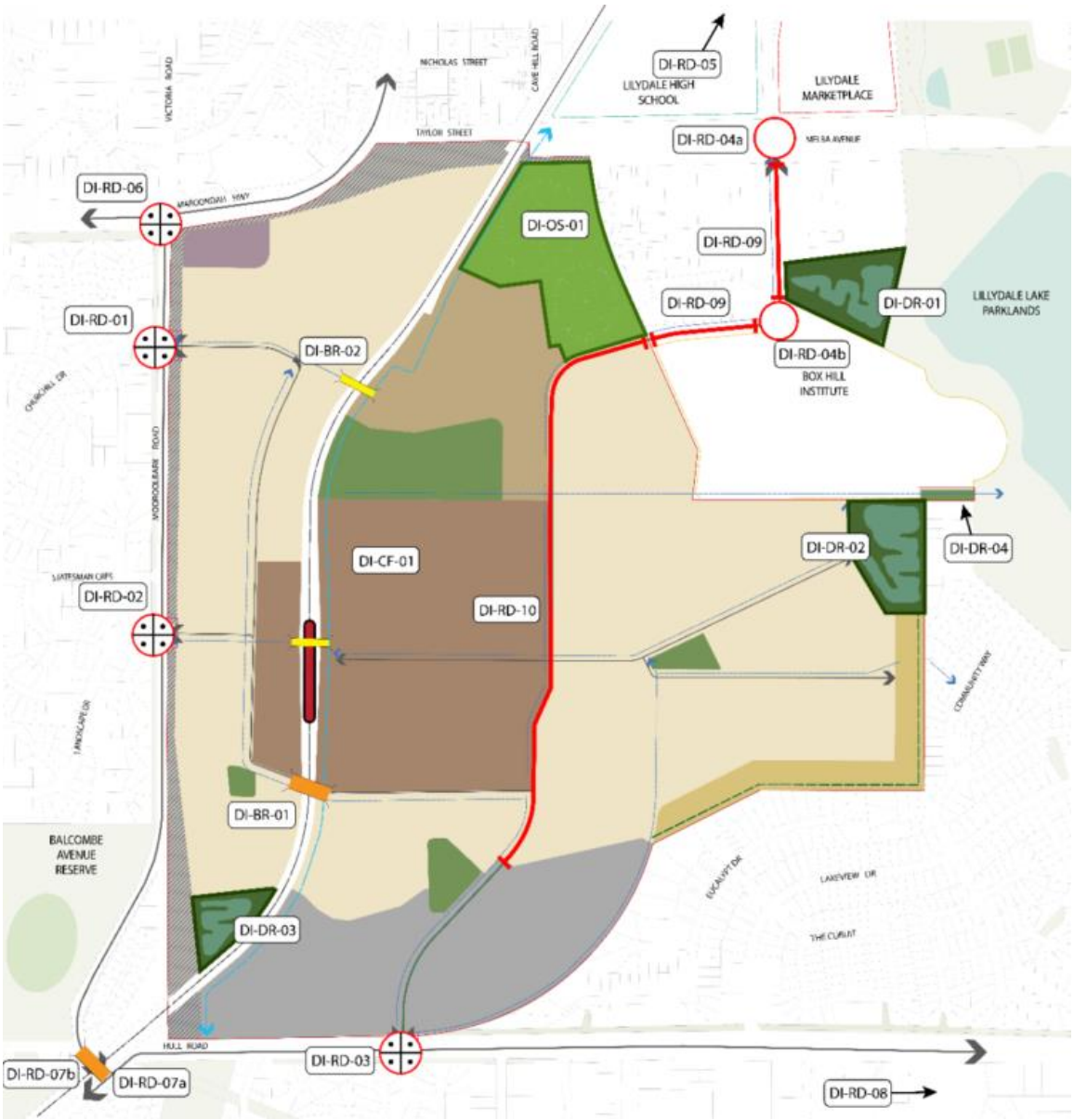


Figure 4 – DCP Framework Plan (*Source: Urban Enterprise*)

Major road items requiring Developer Contributions would likely include the north-south collector road, two bridges across the railway line and external intersections. Developer Contributions could further likely fund additional non-road items such as drainage infrastructure, open space items and community facilities. See Proposed Framework Plan in **Figure 4** above.

External roadworks, including the proposed intersections on Mooroolbark Road and Hull Road and associated turning lanes will be subject to a detailed traffic impact report and functional design by the consulting traffic engineer to the requirements and approval of the Department of Transport.

The internal roadworks for the proposed development will be designed in accordance with the agreed road cross section and functional requirements detailed in Consultant Traffic Reports and Yarra Ranges Council standards. All roads will be fully sealed with approved surfacing, kerb and channel, footpaths, drainage and incorporate underground power and other services.

3.2 POTABLE WATER RETICULATION

Yarra Valley Water is the Water Supply Authority for the Lilydale area including the proposed development.

Yarra Valley Water provided 'Preliminary Servicing Advice' in relation to the provision of water supply in correspondence on 3 December 2018. This advice is included in **Annexure 4** of this report. Further clarifying advice was also received on 24 June 2020, see **Annexure 3**.

The advice confirms that potable water supply is available to the proposed development from existing potable mains in Hull Road, Mooroolbark Road and Melba Avenue.

The subject site is located at the boundary of four separate potable water distribution zones (WDZ), with the proposed development considered to be ultimately serviced by the Plantes Hill (Lilydale) Reservoir WDZ.

Interim provision of potable water (Stage 1 and part of Phase 2) will be initially supplied by the Olinda-Mitcham WDZ ('Area A' in Figure 5), up to a maximum of 500 lots from existing supply in Hull Road. A main 225mm extension will run through the proposed north-south collector road, and then continue west across the train line to connect to the ex. water main in Mooroolbark Road. See **Figure 5** below for the delineation between the proposed potable water servicing zones. The TWL for this Water Supply Zone is 204 (m) AHD.

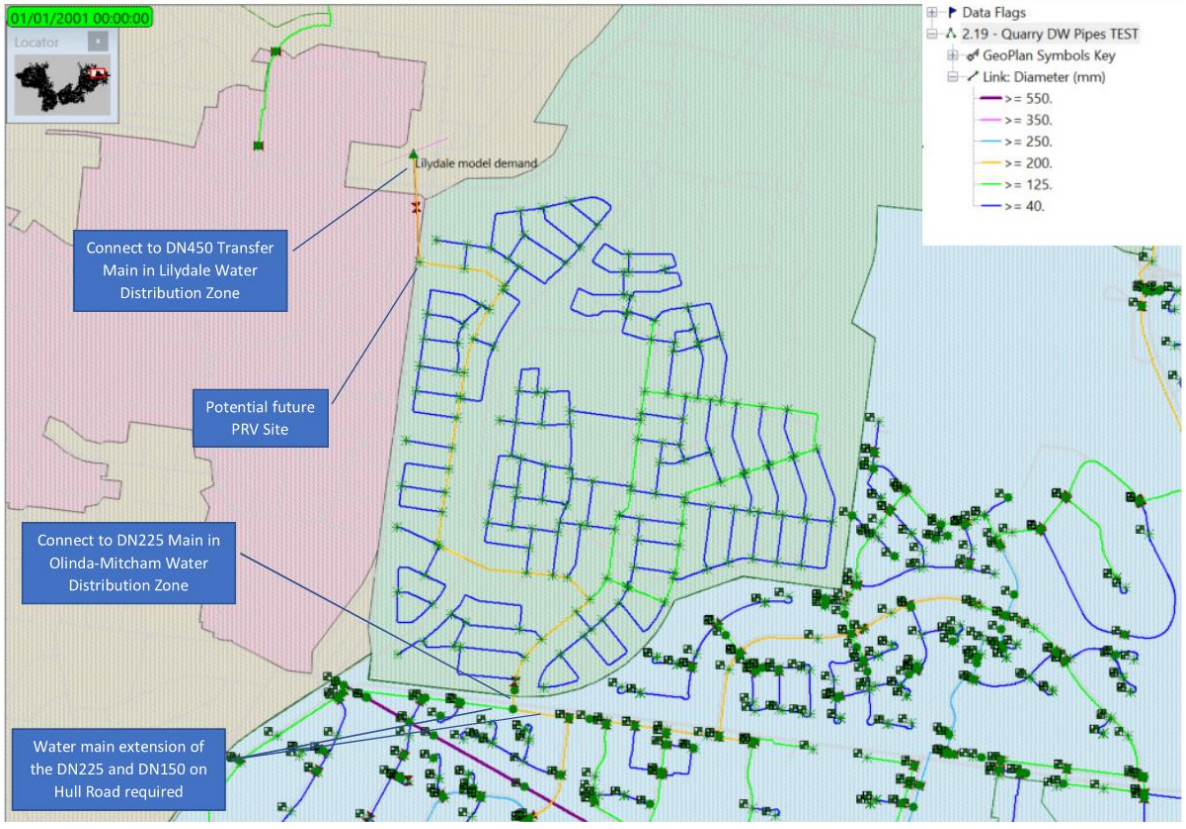


Figure 5 – Potable Water Preliminary Servicing Advice (*Source: YVW*)

Preliminary servicing advice from YVW confirms that the existing 225mm diameter water main in Hull Road ending at Summerhill Park Drive will need to be extended further west, then bored across Hull Road into the proposed development. See **Figure 6** for the proposed water main

extensions anticipated to service the Stage 1 area. The 225mm dia. internal water main will downsize as a 150mm dia. as it continues north through the main north-south collector road.

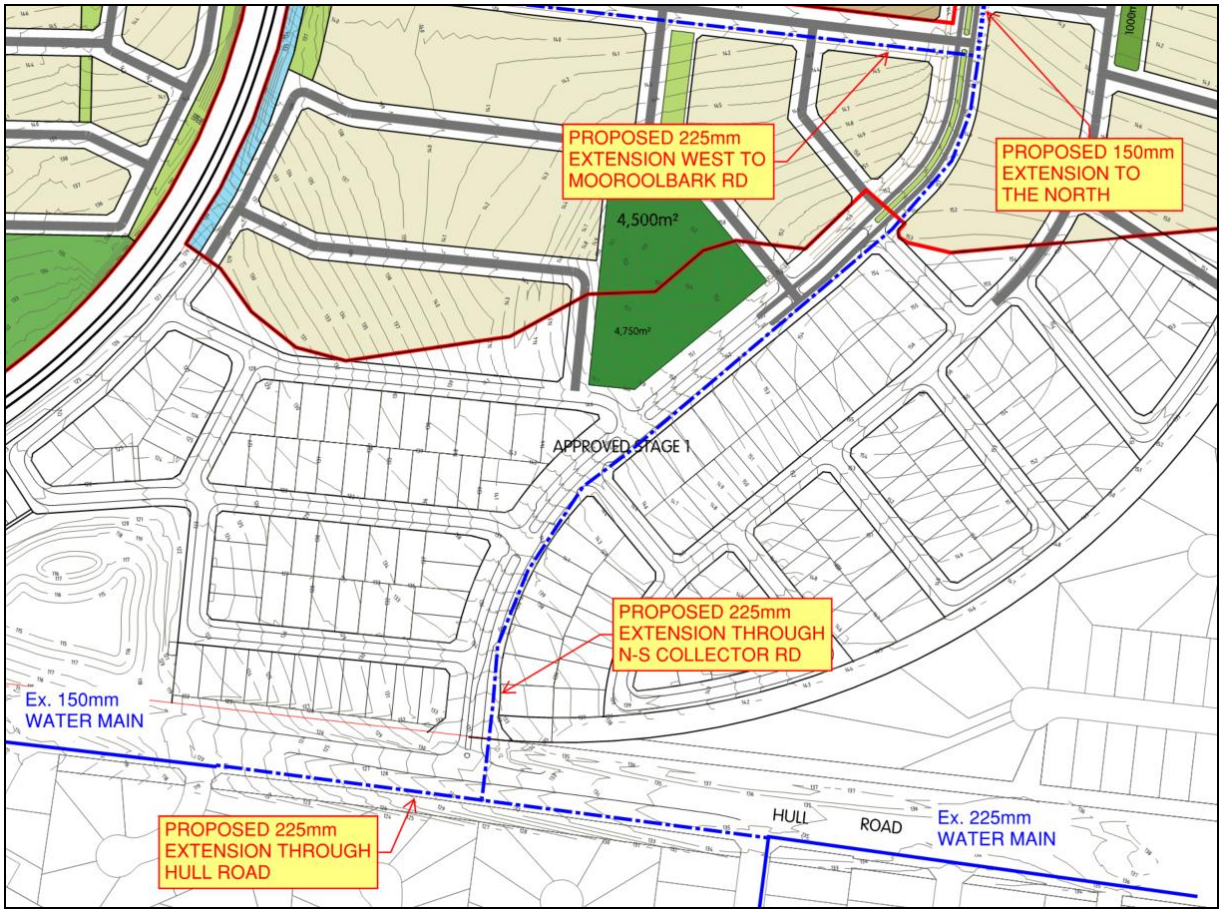


Figure 6 – Potable Servicing Strategy – Stage 1

The north balance of the subject site will be serviced from the DN450 transfer main located in the Lilydale Reservoir WDZ to the north. See **Figure 6** below for the water zone areas adjacent to 'Area B' (the balance land) as provided by YVW. The TWL of the balance land Water Supply Zone of 210 (m) AHD.

It is anticipated that further to the new connection to the existing 450mm diameter transfer main, a new 225mm diameter water main extension will need to be bored under Maroondah Highway to the south. This 225mm extension will continue down the widened Mooroolbark Road, then enter the balance land site. See **Figure 7** for the proposed water main extensions anticipated to service the balance land area.

YVW is currently finalising Functional Design Statement (FDS) details for the required water supply works necessary to service this development area. These FDS details supersede any previously issued Preliminary Service Advice. Any further water supply requirements should align with YVW's FDS requirements for this area, that represents initial and ultimate infrastructure requirements and zone operation for this area.

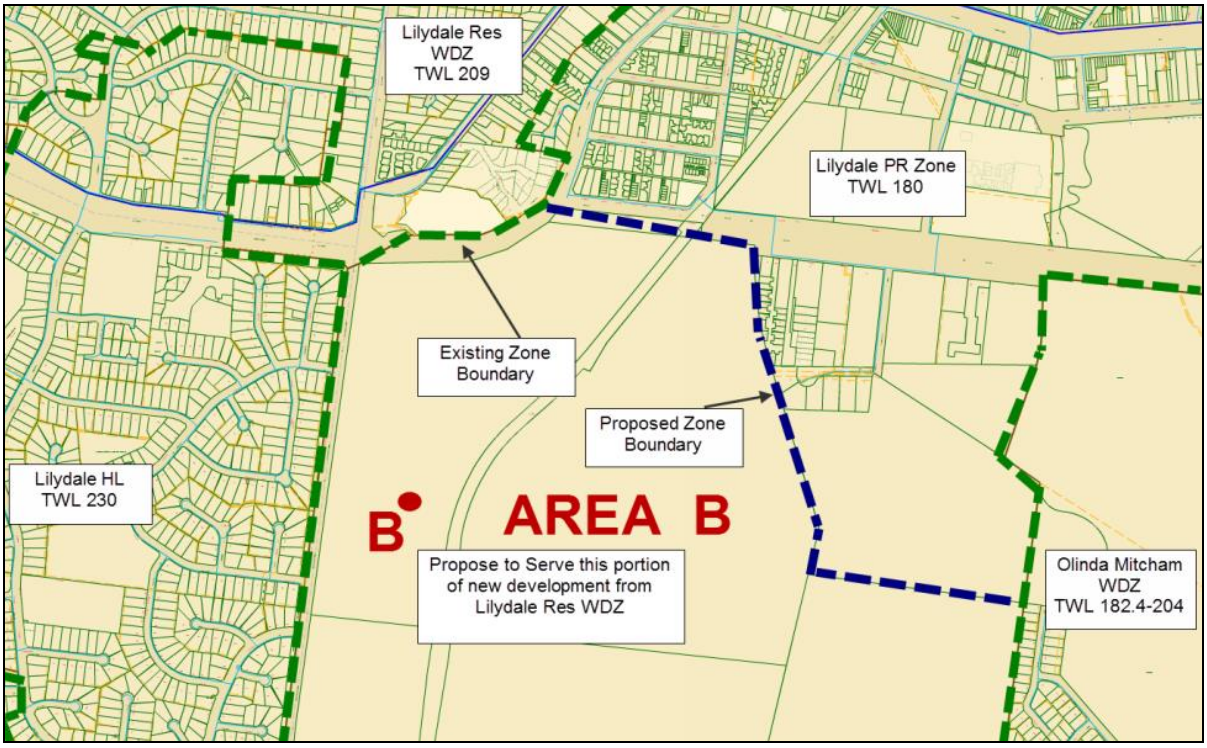


Figure 7 – Potable Water Preliminary Servicing Advice – Balance of Land **(*Source: YVW*)**

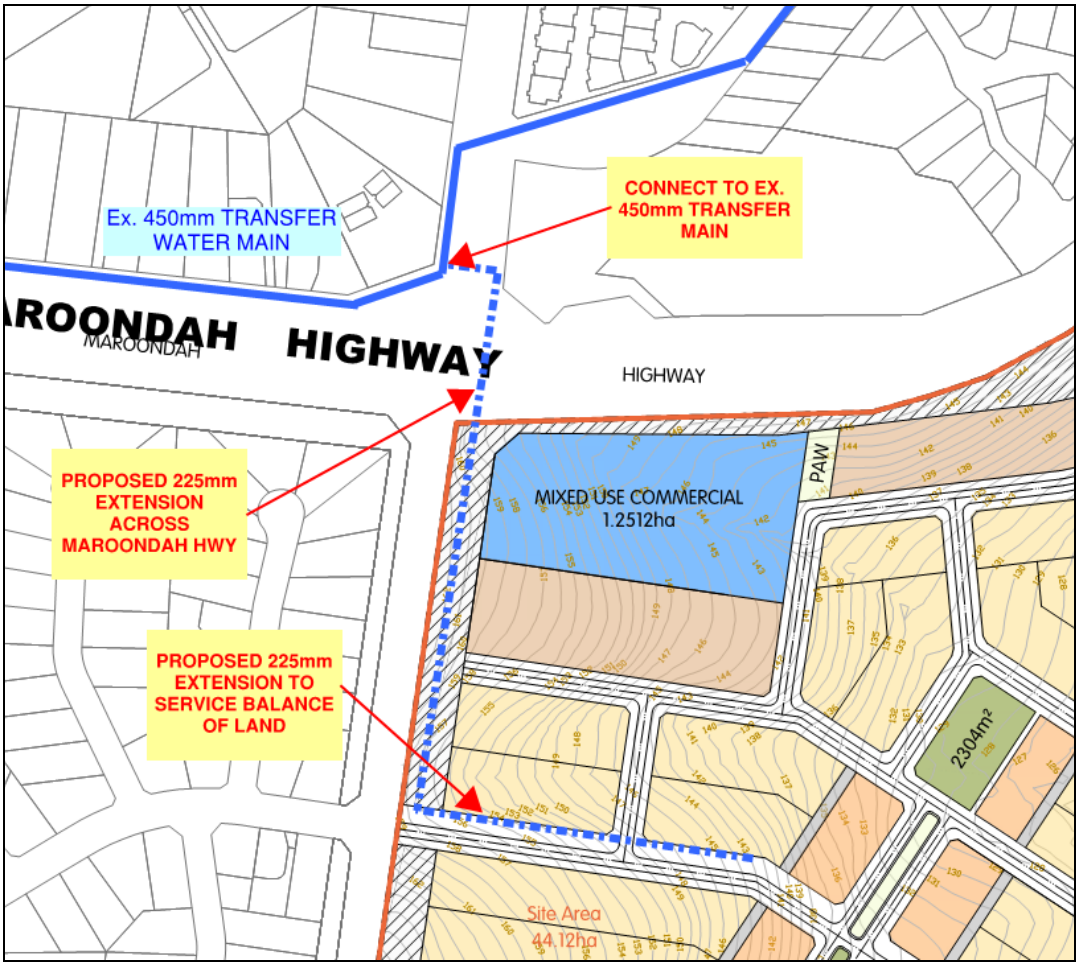


Figure 8 – Potable Water Servicing Strategy – Balance of Land

The development will typically require the construction of normal developer funded 100mm and 150mm diameter water reticulation mains internally to service the proposed lots. Payment of New Customer Contributions will be required for each lot prior to compliance of individual internal stages.

Advice from YVW has indicated that a Pressure Reducing Valve (PRV) will not be required to drop the pressures between the Plantes Hill WDZ (TWL-210m) and the Olinda-Mitcham WDZ (TWL-204m). This is predicated on the assumption that ultimate supply of the site will be from the Plantes Hill (Lilydale) Reservoir WDZ, with only alternative backup supply from the Olinda-Mitcham WDZ. All works are to be constructed in accordance with the Water Standards Association of Australia - Water Supply Code of Australia WSA 03-2011-3.1 Melbourne Retailer's Edition Version 2.

3.3 RECYCLED WATER

Yarra Valley Water is the Recycled Water Supply Authority for the Lilydale area including the proposed development.

Yarra Valley Water provided 'Preliminary Servicing Advice' in relation to the provision of water supply in correspondence on 3 December 2018. This advice is included in **Annexure 4** of this report. Further clarifying advice was also received on 24 June 2020, see **Annexure 3**.

The advice indicates that YVW is currently constructing recycled water infrastructure in the area as part of the Brushy Creek Recycled Water Scheme. Specifically, the Plantes Hill Class A tank is planned for Plantes Hill, 750m to the west of the subject site, as shown on **Figure 9**. Intrapac has reached agreement with YVW to provide a 'Third Pipe' for recycled water to be connected to the development. It is currently unconfirmed if this third pipe can be mandated for commercial uses; further advice from YVW is required.

If recycled water reticulation is available in the surrounding area and the Plantes Hill Class A tank is constructed at the time of development, a 1.2km length 225mm recycled water main extension will be required for the balance land development. Advice from YVW indicates that this extension will run from the Plantes Hill Class A tank north within the existing pipe-track reserve, east along the Maroondah Highway, then south along Mooroolbark Road to the boundary of the subject site. It is not confirmed with YVW if this would be a reimbursable item, or developer funded.

If development precedes construction timing for the Plantes Hill Class A tank, the development will be required to construct a temporary potable cross connection to charge the recycled main reticulation at Hull Road, as shown on **Figure 10** below. This cross connection would only have capacity to service the first 500 lots of the combined development, then would be removed when recycled water reticulation is brought to the subject site in the future.

The development will typically require the construction of normal developer funded 100mm and 150mm diameter water reticulation mains internally to service the proposed lots. Payment of New Customer Contributions will be required for each lot prior to compliance of individual internal stages.

All works are to be constructed in accordance with the Water Standards Association of Australia - Water Supply Code of Australia WSA 03-2011-3.1 Melbourne Retailer's Edition Version 2.

Further opportunities for water reuse will be explored as part of the Water Quality / ESD review for the development – refer also section 5.3 Water Sensitive Urban Design.

Figure 9 - Preliminary Servicing Advice - Recycled Water (Source: YVW)

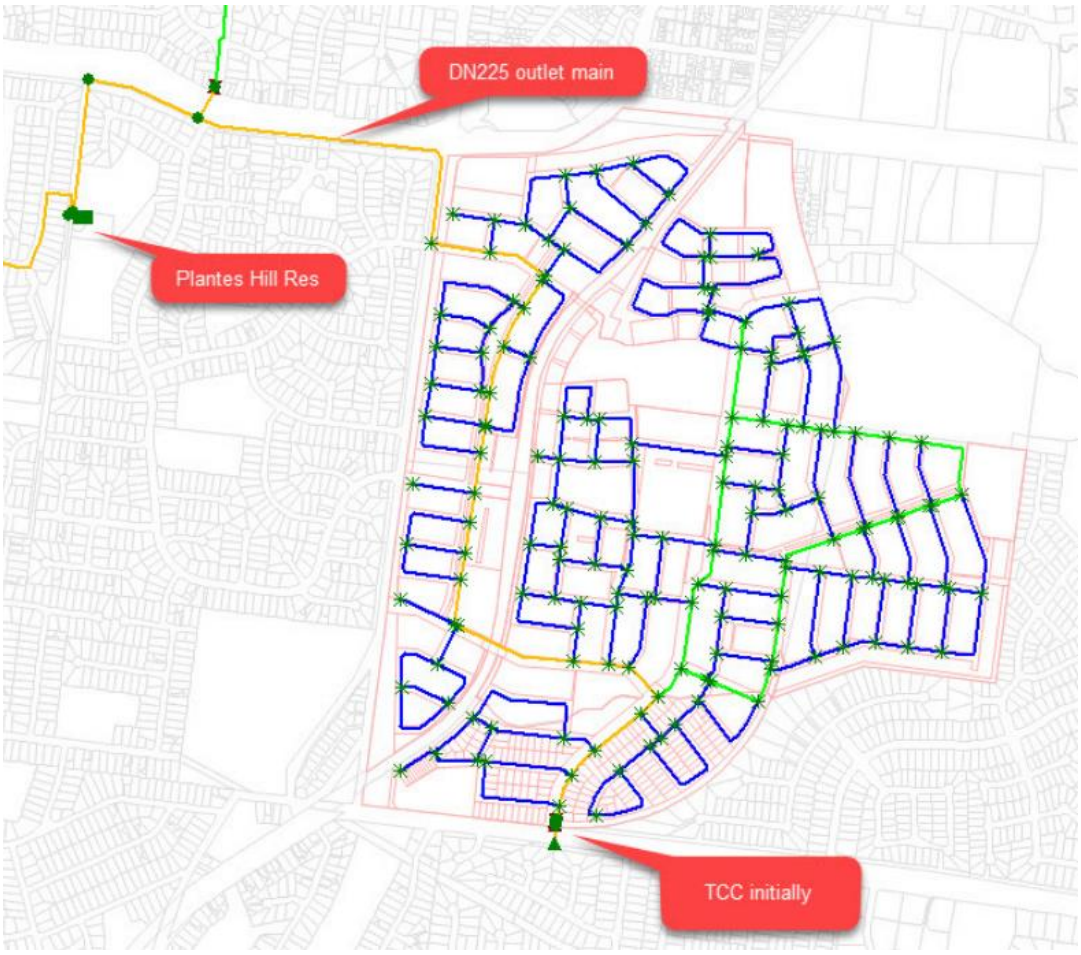


Figure 10 - Preliminary Servicing Advice - Recycled Water (Source: YVW)

3.4 SEWERAGE RETICULATION

Yarra Valley Water (YVW) is the Sewerage Authority for the subject land and surrounding area.

Yarra Valley Water provided 'Preliminary Servicing Advice' in relation to the provision of sewerage reticulation in correspondence on 21 May 2019. This advice is included in **Annexure 4** of this report. Further clarifying advice was also received on 24 June 2020, see **Annexure 3**.

The advice indicates that the subject site can be serviced by existing sewers in the area. Following from previous advice provided in 2014 and 2018, the site is split into three main sewerage catchments, being the Brushy Creek system to the south and the Lilydale system to the north & north-east. See **Figure 11** below.

YVW advises that the Stage 1 development, and a south-west portion of Stage 2 (Area A in **Figure 11**) will be catered by the Brushy Creek System to the south. Assessing the asset map of the area, it appears that there are nearby 150mm diameter sewers in the residential development to the south in Carronvale Road and Camelot Court and a 300mm diameter sewer in Balcombe Avenue to the south-west. YVW has confirmed in their servicing advice that connection to maintenance structure **BCA2** will be required, along with an external sewer extension through Hull Road.

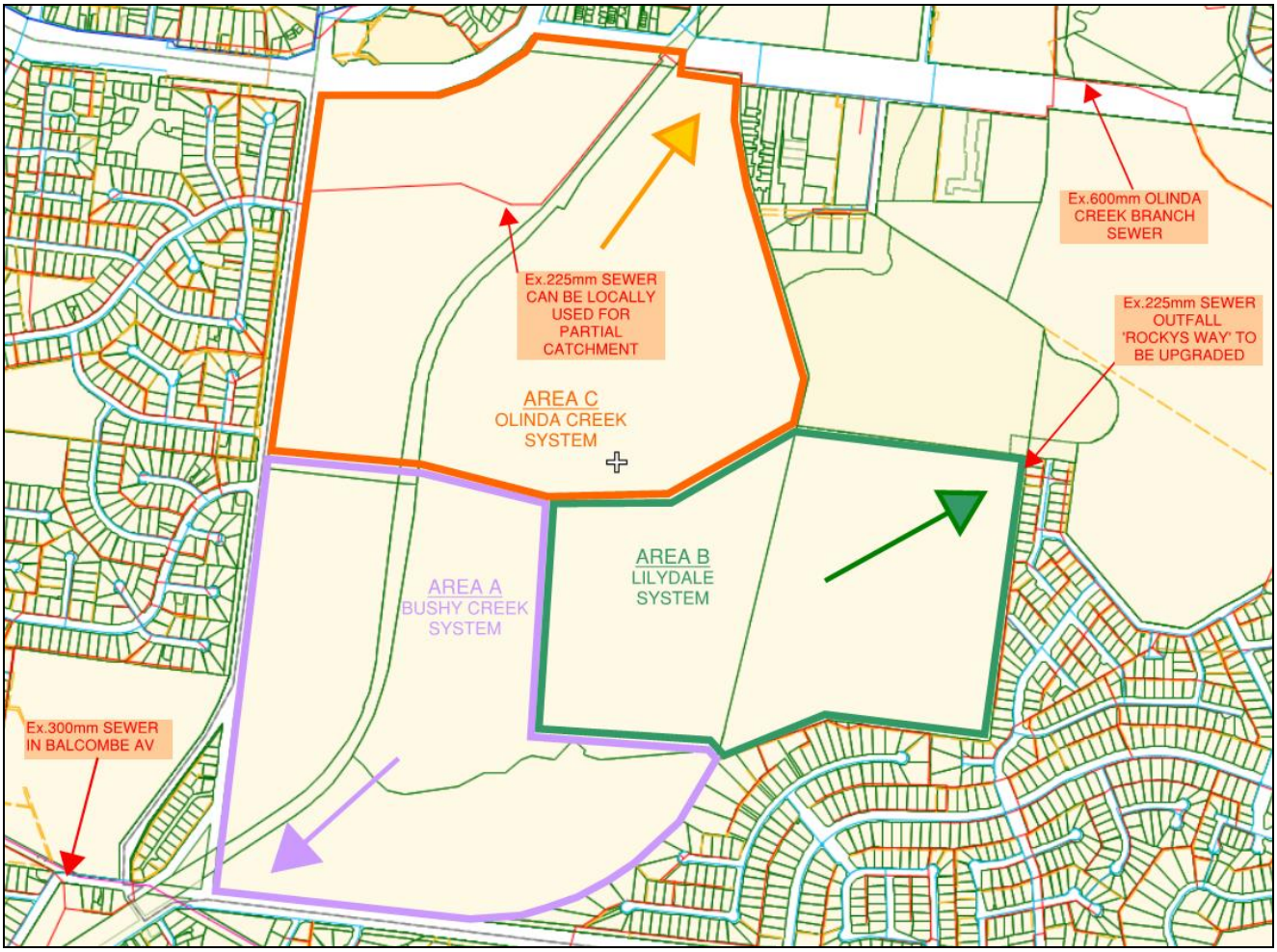


Figure 11 - Asset Map - Sewer Servicing Strategy (*Source: YVW*)

YVW also advises that the east grading section of the site (Area B of Figure 10) can discharge to existing Rockys Way sewer at east boundary of the site. This advice however also indicates that the existing sewer in Rockys Way is currently at capacity and will not be able to cater for flows from the development until it is upgraded. The scope of this external sewer upgrade and the exact outlet location is to be confirmed by YVW.

The remaining balance of the site (Area C of Figure 10) grades to the north-east, and YVW advice confirms that it will be ultimately controlled by the Olinda Creek Branch Sewer located in Melba Avenue to the north-east. Advice from YVW confirms upgrade works of the existing DN225 reticulation sewer is required as external upgrade works as per the below in **Figure 12**.

- The development requires 136m of DN**300** sewer to replace an existing DN225 sewer between existing maintenance structures **MBA1-8 and MBA1-11. (refer to attached plan)**.
- The development requires 260m of DN375 sewer to replace an existing DN225 sewer between existing maintenance structures **MBA1-49 and MBA1-8. (refer to attached plan)**.
- The development requires 365m of DN450 sewer to replace an existing DN225 sewer between existing maintenance structures **MBA1 and MBA1-49. (refer to attached plan)**.

Figure 12 – Sewer External Upgrade Works (*Source: YVW PSA, May 2019*)

Accordingly, the development will be able to progress in a planned and logical sequence without the need for major on-site temporary infrastructure facilities. If required, temporary management of sewer flows by eduction based on a specific eduction management plan can be implemented subject to the specific requirements and approval of Yarra Valley Water.

The development will typically require the construction of normal developer designed and constructed 150mm and 225mm diameter sewerage reticulation mains within the development to service the proposed lots plus payment of New Customer Contributions. It is also confirmed by YVW that each property connection will require installation of a boundary trap and each new sewer extension will require a water seal to be constructed.

The sewers servicing each lot within this development must accommodate full gravity drainage of the serviced area of the lot as defined in Clause 4.6.4 of the WSA 02-2014 Gravity Sewerage Code of Australia Version 3.1, MRWA Edition.

3.5 ELECTRICITY / STREET LIGHTING

AusNet Services is the electrical company responsible for supply to the Lilydale area and the proposed development.

Ausnet provided 'Preliminary Servicing Advice' regarding electrical servicing of the proposed development in correspondence on 8 April 2016. This advice is included in **Annexure 5** of this report. Verbal confirmation from Ausnet on 19 February 2018 confirms that this servicing advice is still current, with recent policy changes applicable to the advice (new standard kiosk substation reserve sizing, LV rebate being abolished).

Further recent engagement with Ausnet has also moved to resolve a special specification for the development that will permit delivery of 100% solar.

The advice from Ausnet indicates that the load requirement for the future development of ~3,000 lots is estimated to be around 10MVa. Due to two existing substations on-site being previously used for quarry operations, now being abolished ('Cave Hill 5 Melba'), there is a load reduction of 1.5MVA applicable to the site.

The net gain in network load (8.5MVa) has been confirmed by Ausnet to be accommodated by three HV feeders adjacent to the site. These feeders are denoted as LDL11, CPL23 & LDL24. These three feeders have capacity together to facilitate the entire development, however Ausnet have stressed the importance to distribute the load evenly between the feeders. See **Figure 13** below.

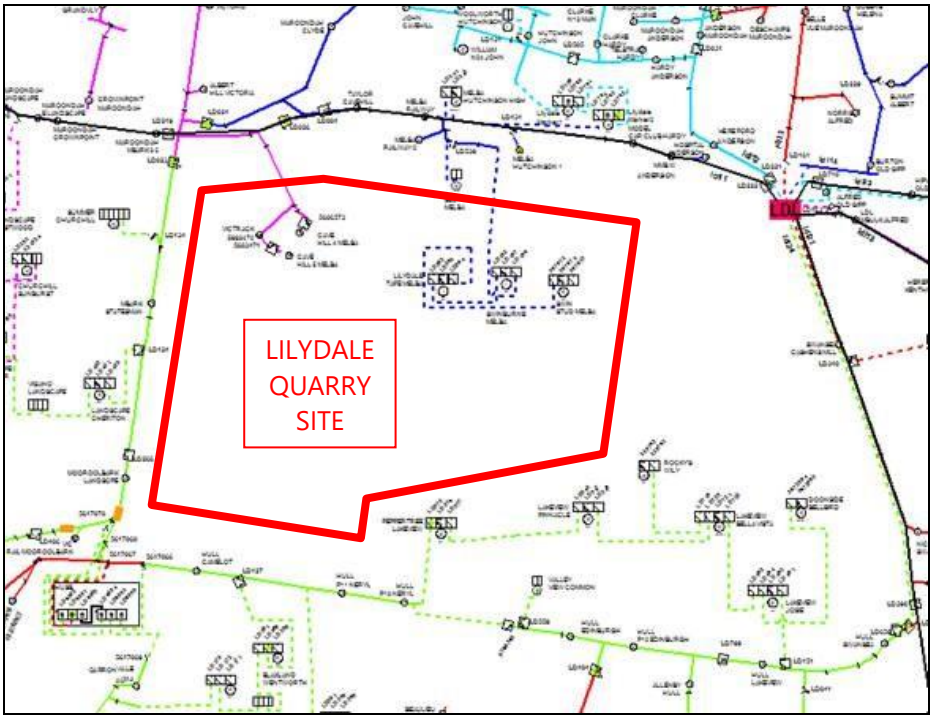


Figure 13 - Electrical Network Map - Servicing Advice (*Source: Ausnet*)

The LDL 24 feeder on the south side of Hull Road is adjacent to Stage 1 of the development and a section of the Stage 2 (Balance of Land) between Mooroolbark Road & the railway line. Ausnet have confirmed that HV connections and internal kiosk substations can be used to provide supply to approx. 200 lots of Stage 1, as shown in **Figure 14** below.

Figure 14 - Electrical Servicing Advice - Stage 1 (*Source: Ausnet*)

An existing overhead high voltage line enters the site from Maroondah Highway to the north-west of the site, which provided electrical supply to the previous quarry operations. It is expected that this HV line will be abolished to facilitate the proposed development layout.

Blue Frog Designs has been engaged for electrical design and PM2 capability for the Stage 1 development on the subject site. See **Figure 15** below for the electrical masterplan of the first 200 lots, approved by Ausnet in February 2019. We note that approved Masterplan is consistent with Ausnet advice from 2016, there are two substation kiosks proposed to be installed within the Stage 1 area.

Figure 15 - Electrical Preliminary Design - Stage 1 (*Source: Blue Frog Design*)

Underground power HV and LV cables and suitably located kiosk substation facilities will be master planned for the overall development at an early stage. The detailed design of electrical works, cabling, lighting and the final siting of kiosk substation/s will be undertaken on a stage by stage basis in accordance with the proposed network scope and general requirements of AusNet Services. It is estimated by Blue Frog that for the remaining ~3,000 lots in the balance Lilydale Quarry development site that a further 22 substation kiosks will be required, if adopting a 100% solar specification. As outlined earlier however, recent engagement with Ausnet has created a 100% solar mandate for the site. Therefore, the exact number of substations will be subject to further detailed electrical masterplanning and design and is subject to change.

The installation of electricity conduits, service pits, trenching and backfill works will be carried out by the developer's civil contractor and the cabling and jointing will be undertaken by an approved electrical contractor under the project management and auditing requirements of the electrical company. Street lighting and in particular the type of pole and light fittings internal to the development will be subject to approval of Council and AusNet Services and externally, in the arterial road network, lighting will require the relevant road authority's approval.

The development will include energy conservation measures to reduce greenhouse gas emissions and provide long term energy savings in its infrastructure. The public lighting design of the roads within the development will specify the use of energy efficient street light fittings such as LED lamps, subject to the approval of Council and AusNet Services. Where applicable, lighting within parks will also be based on LED lighting technology subject to ultimate design review and approval by Council.

3.6 TELECOMMUNICATIONS

Telstra and NBN both have existing assets within the surrounding road network abutting the subject land. It is noted that these assets can form the basis of supply for the proposed telecommunication network for the development.

The developer of the subject site has however engaged OptiComm to deliver optic fibre telecommunication services to the proposed development. OptiComm is an Australian

Government policy compliant wholesale carrier that delivers telecommunication. Opticomm is the largest independent provider of broadband infrastructure with over 195 Greenfield developments nationally and more than 70,000 lots constructed to date.

Application and registration requirements for the provision of telecommunication services for Stage 1 of the development has already been made with OptiComm.

OptiComm will deliver Fibre-to-the-Premises through a service fee to be paid by the developer. OptiComm will design and install the infrastructure within the development on a staged basis and also install the extension of the network or backhaul to the development as required. OptiComm will also be responsible for installation of pits and conduits within the development in a co-ordinated manner with the other civil works.

3.7 GAS SUPPLY

Multinet Gas is the gas company responsible for gas supply to the proposed development and the surrounding Lilydale area.

Multinet Gas has existing high pressure gas mains located in Hull Road, Maroondah Highway and Melba Avenue. A transmission 250mm diameter gas main is located in Mooroolbark Road, which is not suitable for connection.

It is expected these mains will form the basis of gas supply for the proposed development. Stage 1 gas supply will be procured from the existing 100mm and 200mm diameter gas mains in Hull Road, with applications to be made to Multinet to secure site supply demands. The balance land gas supply will likely be obtained from the existing 100mm diameter gas main in Melba Avenue and Maroondah Hwy.

Multinet Gas will provide gas reticulation to the development on a stage by stage basis, generally at no cost to the developer for residential zoning. Industrial/commercial required gas extensions will be subject to developer contributions as required by Multinet Gas. It is proposed that the gas works will be constructed concurrently with the water supply works and the developer will be required to provide trenching and backfill requirements to the gas company's current requirements.

An existing decommissioned 100mm diameter gas main currently extends into the site parallel to the train line reserve from Melba Avenue to the north. It is unconfirmed if this gas main can be re-activated. It is expected that this internal gas main will be demolished to facilitate the proposed development layout.

4 EARTHWORKS & FILLING

The site is being substantially remediated, filled and shaped to the proposed preliminary finished surface levels as generally shown on the Preliminary Site Design Finished Level Contour Model plan contained in **Annexure 2** of this report. The proposed finished design model is preliminary only and is subject to review and possible minor changes as the engineering design is developed through the functional and detailed design phases.

In this instance the geotechnical and environmental testing, reporting and monitoring requirements associated with the execution of the site remodelling and remediation, are being co-ordinated and undertaken by Tonkin & Taylor, Geotechnical & Environmental Consultants.

The earthworks and filling on the site will be carried out to be in line with Tonkin & Taylor geotechnical advice and a Geotechnical Framework agreed with the relevant authority. The works will be undertaken by an experienced contractor under the full time and direct supervision of a qualified geotechnical consultant to ensure that the required compaction levels are achieved and reported accordingly.

The relevant Australian Standards (AS3798 and AS1289) require a minimum 95% Standard Compaction Test Density to be attained on the filling of the residential development areas and 98% Standard Compaction Test Density for the commercial development area. Filling of proposed road reserve areas will also require specific control and testing based on the requirements of the Australian Standards and also Council requirements. These issues are to be addressed in the report/s of the responsible environmental and geotechnical consultants.

Where applicable, all existing open drains, dams, areas requiring fill for drainage or environmental purposes will be appropriately breached, cleaned out and filled with compacted selected quality site material under the supervision of a geotechnical and where applicable by the appointed environmental consultant in accordance with the above mentioned Australian Standards, progressively with the subdivision of the land.

For further detail on geotechnical and quarry pit filling matters, please refer to *Former Lilydale Quarry Planning Scheme Amendment Geotechnical Overview*, prepared by Urbis Pty Ltd, and *Kinley Development Geotechnical Framework*, prepared by Tonkin & Taylor.

Figure 16 - Existing Quarry Pit

5 STORMWATER DRAINAGE

5.1 GENERAL

The Yarra Ranges Council and Melbourne Water are responsible in their capacity as the managers of the local drainage network and the regional drainage catchment respectively for the drainage of the site and the proposed development.

The subject site is not located in an active Melbourne Water drainage scheme. The site catchment is split into three sub-catchment; with the south catchment (39ha) draining to the Melbourne Water Mooroolbark Drain catchment to the south-west, the east catchment (55ha) draining to the existing Lillydale Lake RB to the east, and the north catchment (76ha) draining to the Melbourne Water Melba Avenue Drain to the north-east. See **Figure 17** below.

Figure 17 - Catchment Characteristics (Source: Incitus)

Advice received from Melbourne Water indicates that the Mooroolbark Drain is currently experiencing flooding issues and has no additional capacity for major or minor flows from the proposed development. All flows from the subject site south (Mooroolbark) catchment will need to be retarded to the pre-developed conditions.

The east internal (Lilydale Lake) catchment of 55ha has an acting external catchment of 3ha from existing residential development to the south. The Lillydale Lake RB to the east of the site acts as a retarding basin for Olinda Creek and the existing catchment. The

design of the outlet connection to the lake will need to be approved and constructed to the satisfaction of Melbourne Water.

The north internal (Melba Av) catchment of 76ha also has an acting external catchment of 23ha from the northwest along Maroondah Highway. The Melba Avenue Drain is a 1200mm diameter Melbourne Water drain and does not permit discharge of the major 1% AEP storm event.

Site investigation and survey have confirmed that three separate culvert crossings are existing under the Lilydale railway line. These culverts from north to south are sized at 1500mm, 900mm diameter and 600mm diameter respectively.

The development of the site will require the proper management of the above and any other external flows in addition to the internal stormwater flows to ensure no adverse effects on receiving Melbourne Water and Council drainage systems.

As part of the review of the proposed Yield Plan, the above issues and requirements have been formally investigated and an extensive assessment and hydraulic analysis of the impact of the proposed development on the existing drainage catchment and stormwater system has been undertaken, in consultation with Melbourne Water and Council, including full catchment based flood modelling using the original RORB modelling created by Melbourne Water and also a HEC RAS analysis of overland flow path capacities through the development.

A full hydraulic impact analysis of the proposal will be undertaken as part of future precinct planning stages. This will include submission of an independent overall Stormwater Management Strategy to Council satisfaction. At each stage, engineering submissions will include stage-specific catchment plans, drainage computations of minor and major drainage system events to demonstrate development compliance with appropriate flood freeboard and flood safety requirements, and no negative hydraulic impacts on the existing system as a result of the proposed development. The analysis will be undertaken by a suitably qualified civil engineer, accounting for appropriate blockage scenarios and pit capacities as per the guidelines in Australian Rainfall and Runoff.

5.2 DRAINAGE STRATEGY

The 'Drainage Strategy Plan' for the proposed development has been prepared by drainage consultant **Incitus**, as part of a comprehensive Stormwater Management Strategy Report (SWMS) **VER 7 dated 5 October**. The SWMS details all key drainage elements of the proposed development including the external catchment influence, the proposed retarding basins & treatment facilities, existing & proposed pipeline systems, discharge arrangements, and will provide thorough RORB, MUSIC and drainage modelling to support the strategy.

To facilitate the proposed development, the subject site will require filling/remodelling to ensure major stormwater flows are restricted to designated drainage channels or road ways. Minor flows will be catered for by constructing underground pit & pipe drainage infrastructure.

The internal stormwater system will be designed to cater for the 10% AEP (10 yr) storm flow for the residential area and 5% AEP (20 yr) storm flow for the commercial/ retail

precinct. The existing and proposed overland flow routes will be integrated with roads, reserves or other dedicated overflow routes which will be designed to cater for the 1% AEP (100 yr) storm requirements.

All overland flow paths will be designed to meet Melbourne Water floodway safety criteria and to the satisfaction of the Yarra Ranges Council. All proposed finished levels and grading of surfaces within the development area will be designed to not cause adverse impacts on adjacent properties. All flow paths will be designed such that adequate freeboard is provided to all existing and proposed development. Stormwater detention via the proposed retarding basins will ensure no adverse effects on downstream Melbourne Water and Council drainage systems.

Detailed civil design is required to appropriately size proposed drainage infrastructure to facilitate conveyance, retention and treatment of incoming flows to appropriate levels as per best practise guidelines.

All drainage infrastructure costs will be at the developers own cost, with no reimbursable scheme items currently offered.

5.2.1 DRAINAGE INFRASTRUCTURE

The preliminary siting and spatial requirements of the retarding basins and wetlands for all three sub-catchments have been planned in conjunction with the project Urban Designer and Landscape Architect. The result has been to integrate this element as a key part of the amenity of the open space reserves having due consideration to the recreation and access uses of the reserve by the public and the proposed drainage function.

Particular regard has been given to the planning of the proposed levels and other aspects of the reserve including assessment and review of the variation in the design flood levels for various storm events, the grading and treatment of the reserve including edge treatments, the nature of planting and landscape, the location of inflow and discharge points, pedestrian movement and access for maintenance and operational requirements which includes provision for a drying area for silt and sediment removed from the proposed sediment pond based on the current guidelines of Melbourne Water.

There are currently four main drainage projects proposed as part of the Development Plan for the site, see **Figure 18** below. As shown, the Mooroolbark Drain catchment will have one retarding basin (DI-DR-03) upstream of the Stage 1 works which will have its own retarding basin & integrated treatment at Hull Road. The Lillydale Lake catchment will have a single treatment facility (DI-DR-02) with an outlet channel of 35m width (DI-DR-04) towards Lillydale Lake. The Incitus SWMS will investigate and detail the Melba Av Drain catchment being catered by off-site constructed treatment facility (DI-DR-01). As per the above, Lillydale Lake has been demonstrated to cater for the full stormwater storage of the Lillydale Lake Catchment, with the Melba Av drain to continue operating in its current form, therefore only the Mooroolbark catchment requires dedicated on-site retardation.

It is noted that the specific outfall arrangements for each drainage project, including connection to existing Melbourne Water or Council drainage assets, will be subject to further detailed design and authority design & construction approval.

The future management and maintenance of the retarding basins and associated wetlands are subject to further detail and agreement.

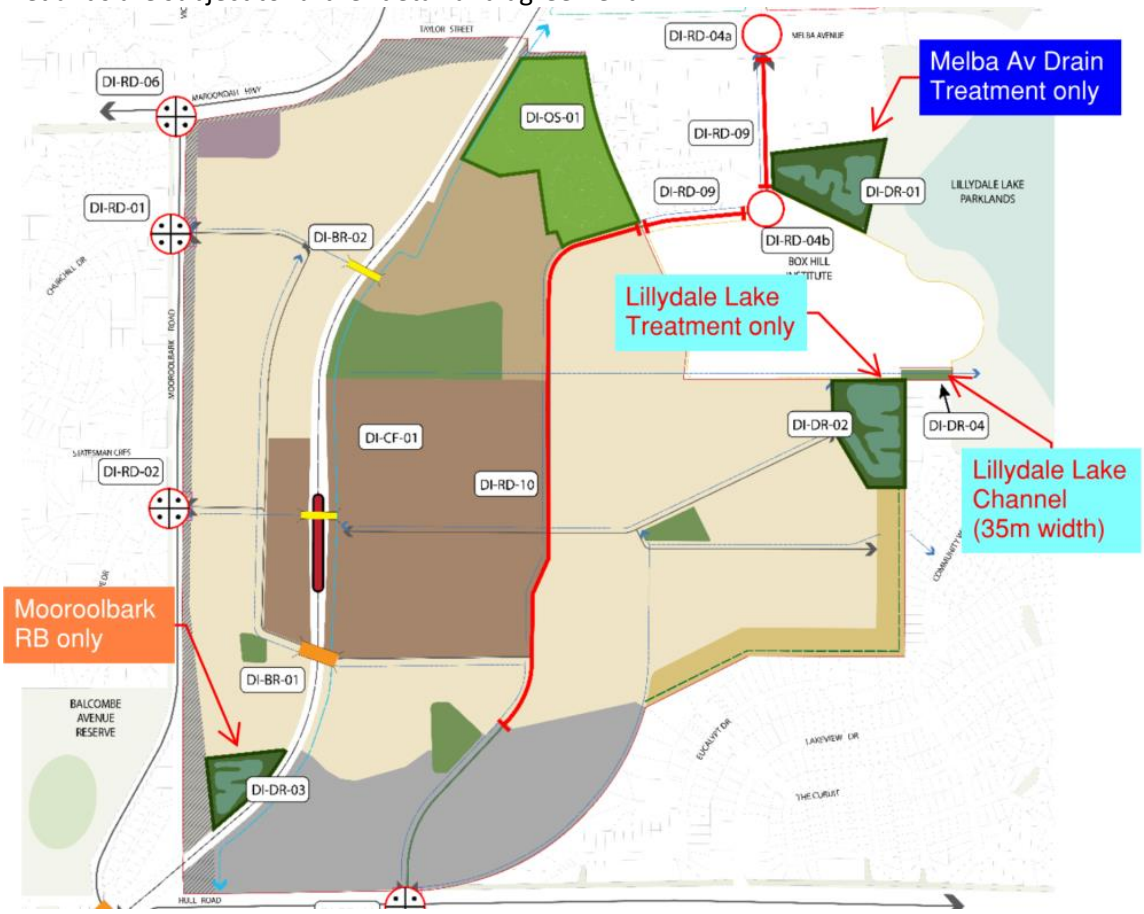


Figure 18 – Drainage Strategy – Drainage Infrastructure Locations

Detailed design of the open space and retarding basin interface will be undertaken as part of detailed Precinct Plans, subject to approval of a Comprehensive Development Plan for the whole site. This will achieve a more usable, functional and maintainable open space and to ensure that land contributed as open space is not unreasonably flood prone, to Council's satisfaction, when assessing the suitability open space contribution.

Temporary retardation and water quality measures will be provided in staged manner as required. The east portion of the property will be temporary drained to the existing quarry hole to the centre of the site which will be partially filled and managed until such time as the proposed retarding basins are constructed.

Until a substantial part of the catchment is developed there will not be adequate flow to maintain RB/Wetland health. During construction all appropriate measures as outlined in contractor's approved Site Environmental Plan will be provided to manage protection of the retarding basin from siltation to Council's satisfaction.

5.3 WATER SENSITIVE URBAN DESIGN (WSUD)

One of the key rezoning objectives is the sustainability of the development, which in this instance will be facilitated by the integration of Economically Sustainable Development (ESD) principles including Water Sensitive Urban Design (WSUD). Incitus has prepared an Integrated Water Management Strategy (IWMS) for the site (Ver 4 dated 12 October)

which provides a detailed analysis of the specific WSUD strategies used for the site, including drainage modelling demonstrating Best Practise treatment of the proposed site.

The aim of WSUD is to minimise the impact of urbanisation on the receiving waters and natural water cycle and to fulfil these objectives in an integrated development approach directed at:

- Managing the volume, rate and quality of catchment run-off;
- Protecting the aquatic habitats of accepting waterways;
- Providing the safe conveyance of stormwater flows for typical and flood events;
- Providing and promoting stormwater elements as an integral part of the urban form.

The design of WSUD elements is based on MUSIC (Model for Urban Stormwater Improvement Conceptualization, CRCCH) software modelling program and analysed to ensure that the proposed strategy treatment measures for a catchment can achieve the specified reduction targets required under Best Practice Guidelines.

These targets are based on the general Victorian Planning Policy pollutant removal requirements for Total Suspended Solids, Total Phosphorus, Total Nitrogen and Gross Pollutants.

The MUSIC model design simulation requirements adopted for the proposed strategy treatment measures for the proposed development based on current Best Practice requirements are noted below:

Target Reduction Water Quality	**% Reduction**
Total Suspended Solids (kg/yr)	80%
Total Phosphorus (kg/yr)	45%
Total Nitrogen (kg/yr)	45%
Gross Pollutants (kg/yr)	70%

The water quality strategy has investigated the preliminary spatial and siting opportunities and restrictions, landscaping proposals, location of drainage inlets and outlets, simplicity of operation, capital costs, public safety, maintenance costs, access requirements, existing and proposed site grading and the type of soil and ground conditions including proposed fill areas to arrive at the most efficient and practical WSUD 'Best Practice' outcome.

As per the Incitus IWMS report (Ver 7 dated 12 October) the following key WSUD elements may been selected and incorporated into the development proposal:

a) Wetlands will treat the majority of the residential development area and will be the primary WSUD treatment system. The wetland will include a sediment basin and other facilities based on the requirements of Melbourne Water 'Constructed Wetlands Guidelines'.
Major flows will be designed to bypass the wetlands area by containment / diversion within pipelines and/or reserves.

b) Construction of raingardens within designated road reserve areas and some nominated open space areas.

The proposed rain garden system sizing & locations will be confirmed with detailed design of the development, which will include a schematic cross section of the rain garden facility relative to the proposed road reserve boundary and also a typical detail of the rain garden with notes outlining the filter and planting composition and interim protection requirements during the construction of the development.

c) Gross pollutant control is proposed 'at source' via grated pits within road areas and will prevent gross pollutants from entering the minor drainage system and loading the proposed wetland. In addition to the grated pits, a proprietary Gross Pollutant Trap (or approved equivalent, such as Stormceptor unit) will be provided upstream of the wetland on Council drainage system as part of requirements imposed by Melbourne Water.

Other water related ESD initiatives that may be used to reduce the developments dependency on potable water supplies and further improve the water quality of emissions include:

(i) The use of captured stormwater for passive irrigation of the key open space areas and street trees;
(ii) The use of porous paving and other water quality measures within car parking areas and certain road elements;
(iii) Provision of recycled water supply to the development;
(iv) Grey water reuse in housing and other areas of development;
(v) Planting and landscape in public and private areas designed with water conservation and sustainability objectives as key considerations;
(vi) Promoting water conservation and waterway health issues and strategies for residents and occupiers of the development via public signage and other promotional and educational material.

The operation and ongoing maintenance of the selected water based ESD elements must be simple and economical and based on established principles and maintenance regimes. Specific ESD outcomes for the development will be regarded in detail in the Drainage Strategy Plan and should consider the Sustainability Framework prepared by WSP.

6 SUMMARY & CONCLUSION

This report has provided an engineering assessment of the key servicing and stormwater management and related civil development issues for the balance of the former Lilydale Quarry Site in support of the Planning Scheme Amendment Application.

Our investigation has reviewed the availability and requirements for all necessary infrastructure including drainage, water supply, sewerage, utility services including electricity / lighting, telecommunications and gas and also provided an overview of proposed roadworks and earthworks requirements as further discussed in the specialist consultants' reports. All necessary infrastructure is available to the site and the upgrade or augmentation of certain services required to meet the demands of the overall development will be in planned manner to suit the proposed staging and timing of the development.

The report demonstrates that the integration of the key WSUD elements of the drainage strategy, such as proposed raingardens, retarding basins & wetlands, can be incorporated effectively into the open space area as part of an overall urban design and landscape approach to provide a high level of amenity to the community. Appropriate stormwater conveyance and management will be provided for the development including the provision of the necessary protection requirements of property and the public.

This report has also outlined a range of key water quality and associated water conservation elements and also other opportunities for consideration as part the overall ESD initiatives proposed for the development which should be read in conjunction with the Sustainability Framework prepared by WSP and the Incitus Integrated Water Management Strategy.

Based on the investigation and analysis of the engineering servicing and stormwater management issues and proposals undertaken in conjunction with the preparation of the Planning Scheme amendment, we are able to confirm and conclude that the subject site can be developed in a timely and economic manner, in accordance with the draft plans and the conditions and approval processes of the responsible authorities.

Prepared by:
REEDS CONSULTING PTY LTD

PHILLIP MILLER
Engineering Project Coordinator

Disclaimer
The information contained within this report has been obtained from various servicing Authorities either verbally or in writing however, until such time as formal applications made and the applicable written conditions, statutory permits and all relevant approvals obtained it should only be used as a guide. Any party wishing to use the material contained within this report should make their own inquiries to satisfy themselves to the accuracy of the information.

ANNEXURE 1

Development Yield Plan

LILYDALE HIGHSCHOOL

LILYDALE MARKETPLACE

TAYLOR ST

MAROONDAH HIGHWAY

MELBA AVENUE

MIXED USE COMMERCIAL 1.25ha

PAW

1500m²

Parking

RECREATION RESERVATION 6.7ha

20m

HERITAGE QUARTER

COOPERS LN

Potential Educational Facility 1.4ha

BOX HILL INSTITUTE

1300m²

5200m²

DISTRICT PARK 3.2ha

Potential Civic Institution, 0.5ha

MOOROOLBARK ROAD

Potential Carpark 200+ Cars

Potential Multideck Carpark 500+ Cars

Potential Carpark 400+ Cars

FUTURE RAILWAY STATION

TRANSIT ORIENTATED DEVELOPMENT

1200m²

2.4ha

5400m²

1500m²

PAW

2,700m²

BRIDGE

1000m²

4,500m²

4,750m²

1.23ha

APPROVED STAGE 1

HULL ROAD

LEGEND

SITE AREA	143.81ha
QUARRY FILL ZONE	

ENCUMBERED LAND

RETENTION BASIN & WETLANDS (2.6% OF SA)	3.68ha
PUBLIC ACQUISITION AREAS	5.73ha
CHMP RESERVATION	0.036ha
TOTAL	9.44ha
% OF SA	7%

GROSS DEVELOPABLE LAND (GDL) 134.37ha

PUBLIC OPEN SPACE

MAJOR PARKLAND	3.17ha
RECREATION RESERVATION	6.77ha
NEIGHBORHOOD PARK	0.98ha
LOCAL PARK	1.80ha
CIVIC PLAZA	1.70ha
RAIL TRAIL	1.38ha
TOTAL	15.80ha
% OF GDA	11.7%

NET DEVELOPABLE LAND (NDL) 118.57ha

ROAD NETWORK

NORTH SOUTH CONNECTOR	3.01ha
ROADS	35.15ha
POTENTIAL CAR PARKING AREAS	2.58ha
TOTAL	41.12ha
% OF GDA	30%

POTENTIAL COMMUNITY AND CIVIC USES

POTENTIAL EDUCATIONAL FACILITY	1.40ha
POTENTIAL CIVIC INSTITUTION	0.55ha

NET SUBDIVISABLE LAND (NSL) 75.88ha

DEVELOPABLE

	Gross Areas	Est. Yield
MIXED USE COMMERCIAL	1.25ha	--
RETAIL OPPORTUNITY	0.53ha	--
MIXED USE URBAN LIVING	2.93ha	600
URBAN CORE	12.9ha	350
HERITAGE QUARTER	4.88ha	250
RESIDENTIAL	49.89ha	1800
LARGE LOTS / INTERFACE	3.5ha	50
TOTAL		3050
AVG. DENSITY		25 dw/ha

REEDS CONSULTING | TORTI GALLAS + PARTNERS | T.C.L | RobertsDay planning·design·place | INTRAPAC PROPERTY | Bayport

robertsday.com.au planning·design·place

WORKING PROGRESS

1:2000 SIZE A0 0 20 40 60 80 100 metres N

REV	DESCRIPTION	DD/MM/YY	DRAWN	APPR'D
F	FOR DISCUSSION	20.03.14	MJ	MD

DRAFT CONCEPT PLAN
Lilydale Quarry
Lilydale, VIC

REF NO. **INT LIL** | DRAW NO. **RD1 004** | REV. **F**

ANNEXURE 2

Preliminary Site Design Finished Level Contour Model

N

LILYDALE HIGHSCHOOL

LILYDALE MARKETPLACE

TAYLOR ST

MAROONDAH HIGHWAY

MELBA AVENUE

Ch 1600.000

Ch 1500.000

Ch 1400.000

Ch 1300.000

Ch 1200.000

Ch 1100.000

Ch 1000.000

Ch 900.000

Ch 800.000

Ch 700.000

Ch 600.000

Ch 500.000

Ch 400.000

Ch 300.000

Ch 200.000

Ch 100.000

Ch 0.000

MIXED USE COMMERCIAL
1.25ha

PAW

1500m²

2ha

3.2ha

Site Area
44.12ha

2000m²

HERITAGE

2700m²

5200m²

1600m²

4.9ha

BOXHILL INSTITUTE

MOOROOLBARK ROAD

CIVIC INSTITUTION

POSSIBLE URBAN SCHOOL

Site Area
99.59ha

TRANSIT ORIENTATED DEVELOPMENT

FUTURE RAILWAY STATION

1700m²

2.4ha

5400m²

1500m²

PAW

1.3ha

1275m²

BRIDGE

BALCOMBE RESERVE

9800m²

APPROVED STAGE 1

HULL ROAD

LAYOUT PLAN

SCALE: 1:3000 @ A1

PRELIMINARY PLAN ONLY
NOT APPROVED FOR CONSTRUCTION

VERSION	REMARKS		
A	PRELIMINARY ISSUE	10.09.19	JB

DRAWN BY	P.BRACOULIAS	DESIGNED BY	J. BOSCO
MELWAY	00, 00	CHECKED BY	
DATUM	AHD	AUTHORISED BY	

REEDS CONSULTING
LAND SURVEYING
CIVIL ENGINEERING
PLANNING
DEVELOPMENT CONSULTING
www.reedsconsulting.com.au
engineering@reedsconsulting.com.au
Lvl 6, 440 Elizabeth Street Melbourne Victoria 3000
p [03] 8660 3000

YARRA RANGES COUNCIL

KINLEY ESTATE

FINAL LANDFORM PLAN
LAYOUT PLAN (1m CONTOURS)

DRAWING No.	VERSION
G10	A

REFERENCE 22835E

SHEET 1 OF 5

ANNEXURE 3

Yarra Valley Water Preliminary Servicing Information – 24 June 2020

Anthony Jansen

From: Dawson, Kevin <Kevin.Dawson@yvw.com.au>
Sent: Wednesday, 24 June 2020 2:58 PM
To: Ben Champion
Cc: Brooke, Nick; Gibb, Lauren; O'loughlin, Rosie; Fittock, Robert; Patrick, Paul
Subject: RE: Yarra Ranges C193 - initial comments

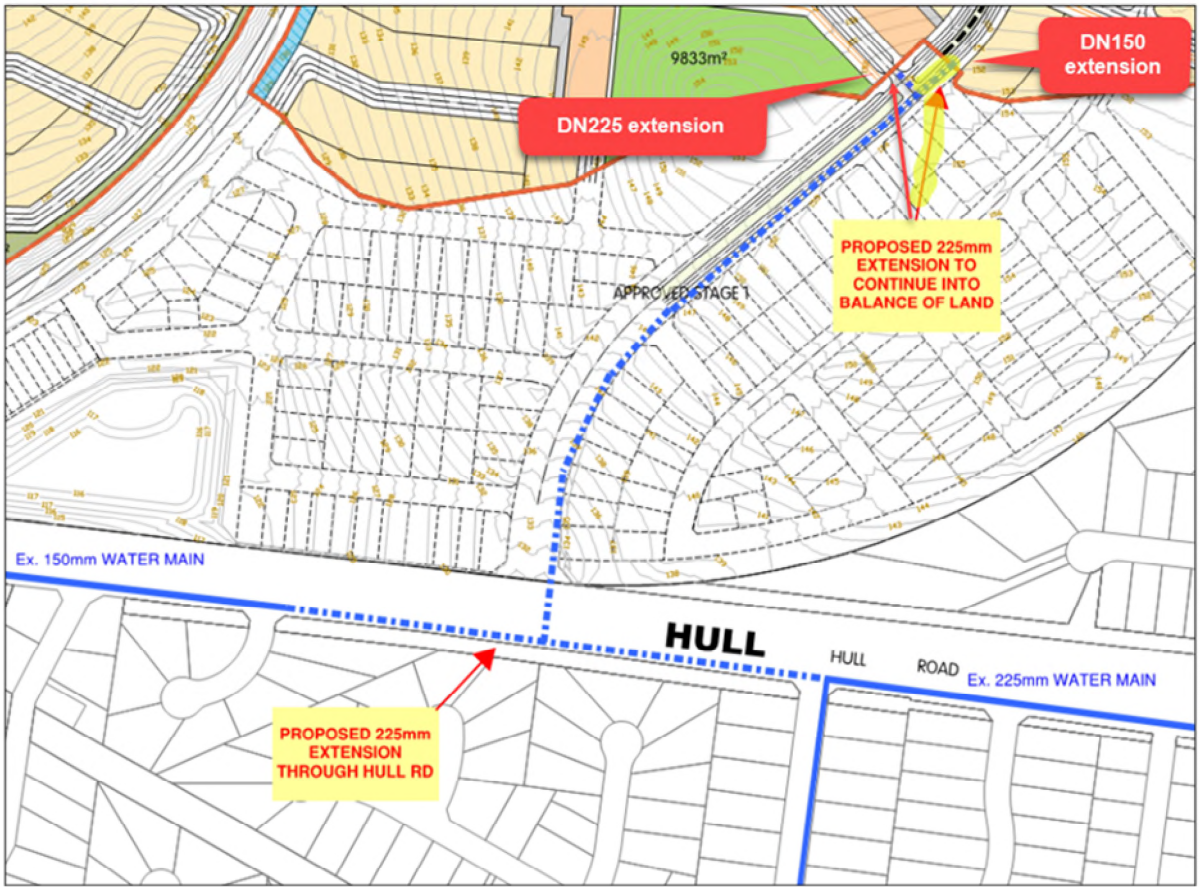
Ben

Thank you for the opportunity to provide initial feedback on the proposed Yarra Ranges Planning Scheme Amendment C193 (Lilydale Quarry Redevelopment)

We have reviewed the available planning report & proposed planning scheme documents and offer the following comments-

Drink Water/Non-drinking Water Supply-

> ## Appendix Z - Engineering Service Report – Reeds Consulting
> **Section 3.2 Potable Water Reticulation** (Drinking Water Supply)
> The current servicing strategy for this development no longer includes supply via two separate Water Distribution Zones (WDZs).
> Phase 1 and part of Phase 2 will be initially supplied by Olinda-Mitcham WDZ, upto a maximum of 500 lots, from the existing water supply network in Hull Rd
> Supply to the development will ultimately be from the Plantes Hill (Lilydale) Reservoir WDZ via the existing DN450 distribution water main in Maroondah Hwy. Once connected, the entire development will be primarily supplied via Plantes Hill Reservoir WDZ with alternate supply backup from Olinda-Mitcham WDZ.
> A PRV will no longer be required as primary supply is will be from Plantes Hill Reservoir WDZ rather than Olinda-Mitcham WDZ.
> YVW is currently finalising Functional Design Statement (FDS) details for the required water supply works necessary to service this development area. These FDS details supersede any previously issued Preliminary Service Advice. Any further water supply requirements should align with YVW's FDS requirements for this area, that represents initial and ultimate infrastructure requirements and zone operation for this area.
>
> **Figure 5 – Potable Servicing Strategy – Stage 1**
> The proposed DN255 will not continue north as shown in Figure 5.
> The proposed DN225 alignment will run west to cross the train line, through the estate to Mooroolbark Rd and then north to Maroondah Hwy, connecting to the Plantes Hill WDZ network near the intersection of Maroondah Hwy and Mooroolbark Rd (DN450 MS main on the north side of Maroondah Hwy).



Section 3.3 Recycled Water

Non-Drinking Water (NDW) is not mandated for commercial uses. However, NDW will be made available to commercial sites upon request for connection.

NDW is mandated for residential properties only. This is consistent with the NDW supply requirements throughout the YVW network.

A DN225 NDW main will be required from the proposed Plantes Hill NDW tank to to supply NDW to this site. The DN225 main from Maroondah Hwy should be constructed at the same time as the drinking water main as both are required prior to 500 lots being reached.

No additional temporary cross connections will be approved for the site.

Figure 8 – Preliminary Service Advice – Recycled Water

DN225 main not DN150

Refer to reservoir as Plantes Hill not Lilydale

Appendix L - Integrated Water Management Strategy – Incits

Section 4.1 Drinking Water Supply Objectives

NDW is typically mandated for all toilet use, not where practical (also outlined in Section 4.2). How will this work with the proposal of stormwater to toilets?

Section 4.1 states the intended use of NDW supplied by YVW:

"The recycled water will be supplied from treated effluent with the intent that the purple pipeline supply may be adopted for outdoor use, laundry use where practical and toilet flushing where practical."

However their statement regarding the VBA requirements for six star standard for new developments also comments on water for toilet flushing being provided by rainwater tanks:

"Rain water tanks may be installed on dwellings through the redevelopment for toilet flushing. Utilising harvested rainwater for toilet flushing will reduce the use of drinking water."

Section 4.2 - Reused and Recycled Water Objectives

Further statements in Section 4.2 are unclear about the role of NDW use vs rainwater tank/stormwater use:

"It is envisaged that the recycled water will be utilised for non-drinking purposes including outdoor use such as garden watering and car washing. The recycled water can also be plumbed into the dwellings for uses such as toilet flushing and laundry supply, reducing the demand on drinking water."

It reads like the stormwater use and NDW use will be interchangeable depending on availability, so hard to determine what the actual demand for NDW is going to be for the estate (i.e. if no rainfall, will rely on NDW for irrigation, laundry, toilet flushing).

Sewer

Appendix Z - Engineering Service Report – Reeds Consulting

Sewer servicing of Area A shall be in accordance with the PSA Engineering Servicing Report

Sewer servicing of Area B shall be serviced by existing sewers located in Rocky's Way on the eastern boundary of this area. The outlet located will need to be confirmed with YVW

Sewer servicing of Area C shall be in accordance with the PSA Engineering Servicing Report

Provision of external sewer works to accommodate development of this site shall be in accordance with the PSA Engineering Servicing Report. The scope to these works will need to be confirmed with YVW

If you required any further information regards YVW servicing development of this site or any clarification of the above, please let me know.

We look forward to ongoing discussion regards servicing of this development

Kevin Dawson
Development Planning Lead
Lucknow St, Mitcham, Victoria 3132
T:+61398721474 **M:**+61419535918
E:Kevin.Dawson@yvw.com.au

We proudly acknowledge the Traditional Owners of the land on which we work and live, and pay respect to their Elders past and present. We also acknowledge and pay respect to other Elders within the community.

From: Ben Champion <B.Champion@yarraranges.vic.gov.au>
Sent: Wednesday, 27 May 2020 11:42 AM
To: Dawson, Kevin <Kevin.Dawson@yvw.com.au>
Subject: Yarra Ranges C193 - initial comments

Please find attached a letter seeking your agency's initial views on this proposal.

All documents can be accessed via the link below:

https://cianywhere.yarraranges.vic.gov.au/T1Prod/CiAnywhere/Web/Prod/ECMCore/BulkAction/Get/0e231fa8-5bd8-4445-b03c-dee01fb770e8

This link will expire on 6 July 2020, 10:36 AM.

Ben Champion
Strategic Planner
03 9294 6141
b.champion@yarraranges.vic.gov.au

ANNEXURE 4

Yarra Valley Water Preliminary Servicing Information

Phillip Miller

Subject: FW: Kinley Estate - Lilydale
Attachments: Lilydale Quarry Preliminary Infrastructure Requirements.pdf

From: Brooke, Nicholas <Nicholas.Brooke@yvw.com.au>
Sent: Monday, 3 December 2018 4:02 PM
To: Sam Ravida <sam.ravida@reedsconsulting.com.au>
Cc: Dawson, Kevin <Kevin.Dawson@yvw.com.au>; Achilles, Kimjan <Kimjan.Achilles@yvw.com.au>; Davey-Greene, Ruthven <Ruthven.Davey-Greene@yvw.com.au>
Subject: Kinley Estate - Lilydale

Hi Sam,

Below is a summary of the infrastructure requirements for the drinking and non-drinking water networks:

Drinking Water

- No existing network capacity issues with the additional 3,200 lot quarry development
    - A scenario with greater than 3,200 lots has not been assessed at this stage to determine network capacity
- Dual supply required to service the development
    - DN225 connection to the existing DN450 distribution main (Plantes Hill Res zone) on the northern side of Maroondah Hwy. DN225 to run south down Mooroolbark Road into the development
    - PRV required to drop pressure from Plantes Hill (TWL-210) to Olinda-Mitcham (TWL-204m)
    - DN225 water main extension along Hull Road, connecting the existing DN150 to the existing DN225 mains (Olinda Mitcham Res zone)
    - DN225 supply into the development at Hull Road (Phase 1)
    - Maximum 500 lots off the single source cross connection
    - When 500 lots reached, the second source of supply will be required (northern connection)
- Internal reticulation to be confirmed as development deed applications received. At this stage there is likely to be a DN225 main connecting the two supplies, DN150 and DN100 mains throughout the development

Non-Drinking Water

- No existing NDW infrastructure exists near the development
- Temporary Cross connection required initially to supply Phase 1
    - Maximum 500 lots off the single source cross connection
    - When 500 lots reached, the NDW supply will be required
- NDW supply from future reservoir at the Plantes Hill tank site
- DN225 water mains from the intersection of Maroondah Hwy and Landscape Drive
    - DN225 to run south down Mooroolbark Road into the development
- Likely to be a DN225 running through the development, linking the NDW network through to the location of the TCC. DN150 and DN100 mains throughout the development
- Existing Recycled Water Treatment Plant and Balancing Storage likely to require capacity upgrades. Actual requirements to be confirmed and will be dependent on total lot numbers and scope of NDW supply
    - Need to confirm irrigation of ovals etc. will this be from the NDW network, Storm Water scheme or drinking water? Confirmation of this would be required prior to finalising capacity/ network requirements

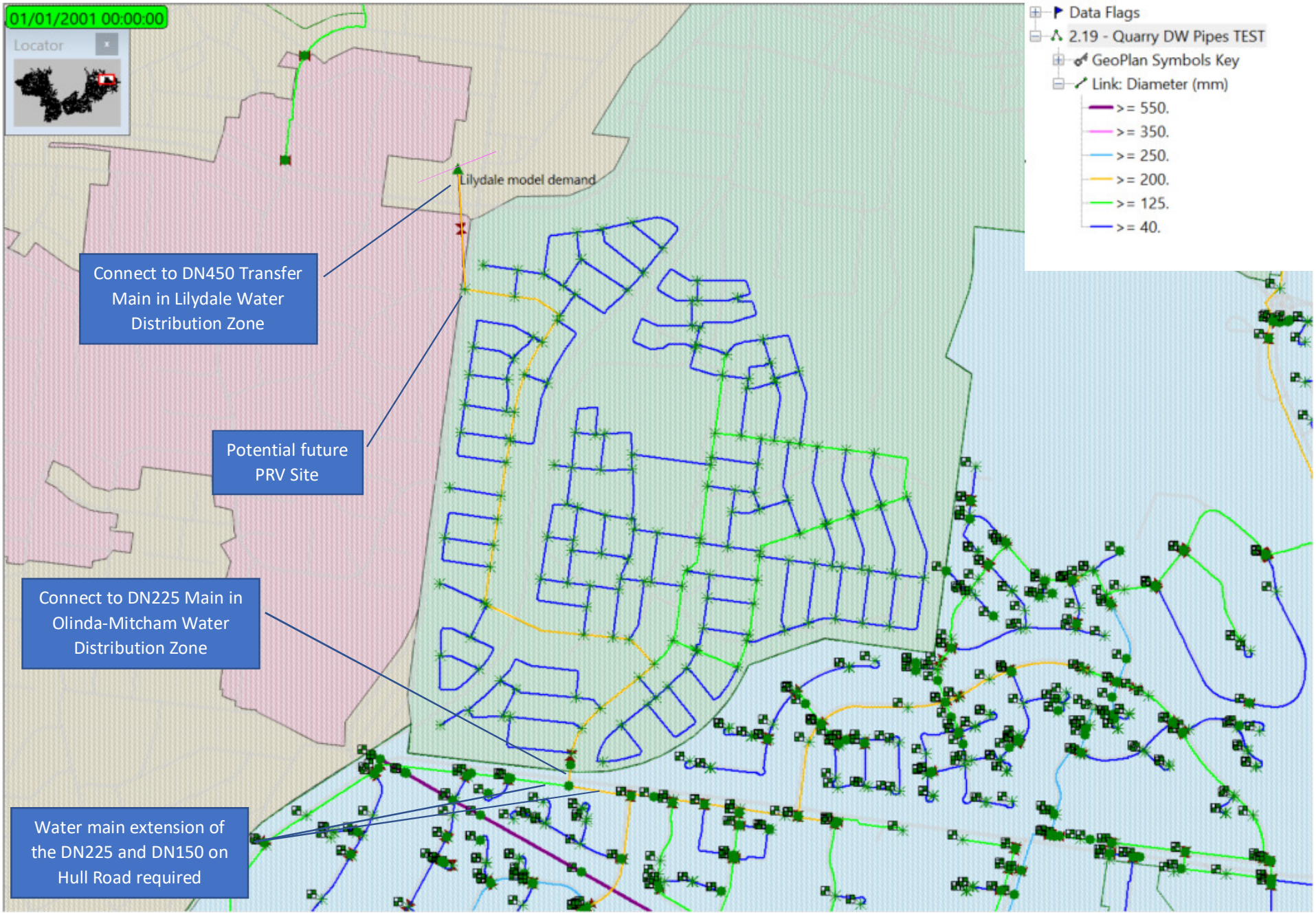
Note all sizing is preliminary at this stage. Once development deeds come in we will confirm actual asset requirements.

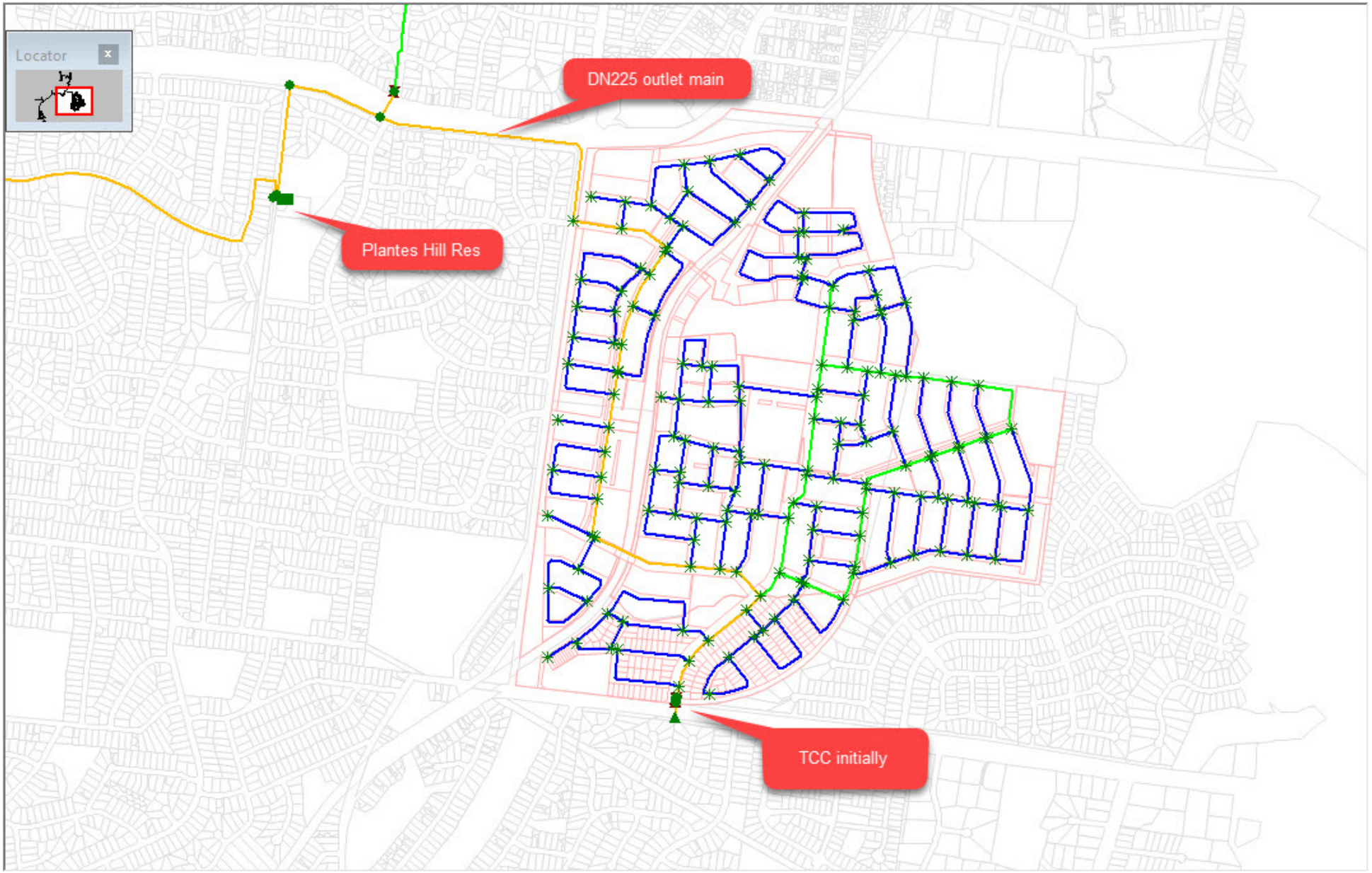
If you have any questions please let me know.

Regards,

Nicholas Brooke
Technical Lead - Water Growth Planning
Lucknow St, Mitcham, Victoria 3132
T:+61398722434
E:Nicholas.Brooke@yvw.com.au

We proudly acknowledge the Traditional Owners of the land on which we work and live, and pay respect to their Elders past and present. We also acknowledge and pay respect to other Elders within the community.


01/01/2001 00:00:00
Locator
Lilydale model demand
Data Flags
2.19 - Quarry DW Pipes TEST
GeoPlan Symbols Key
Link: Diameter (mm)
>= 550.
>= 350.
>= 250.
>= 200.
>= 125.
>= 40.
Connect to DN450 Transfer Main in Lilydale Water Distribution Zone
Potential future PRV Site
Connect to DN225 Main in Olinda-Mitcham Water Distribution Zone
Water main extension of the DN225 and DN150 on Hull Road required



s

SEWER GROWTH PLANNING PRELIMINARY SERVICING ADVICE

Application ID No. 313622

General

- This **preliminary servicing advice** ("advice") is based on the information provided within the developer's Application and will no longer be valid if the information provided by the developer changes subsequent to this Application.
- This **advice** does not constitute an offer and lapses within 3 months of the date of this letter.
- This advice succeeds any prior written or verbal advice provided by Yarra Valley Water.

Design Standards

- Unless otherwise instructed all works shall be designed in accordance with WSA 02-2014-3.1 Sewerage Code of Australia, Melbourne Retail Water Agencies - Version 2.
- The designer should note that WSA 02-2014-3.1 Clause 1.2.7 requires the designer to undertake the necessary design and produce Design Drawings to comply with Yarra Valley Water's concept and/or strategy plan and design parameters.

Generic Technical Requirements

General

- Upon accepting an Offer the Developer is required to inspect the connecting maintenance structure (i.e. maintenance hole, maintenance chamber, or maintenance shaft) and make an assessment of suitability for connection with regards to access and structural integrity. Any structural defects which the Developer believes will preclude connection must be immediately reported to Yarra Valley Water for rectification. If connection to the maintenance structure is not possible because of other physical constraints, including but not limited to the arrangement of ladders and/or other existing connections, the Developer will have to fully fund construction of a new and/or additional maintenance structure as the case may be.

Location

- Sewers shall be located in accordance with WSA 02-2014-3.1 Clause 5.2.4
- Sewers shall only be located along the rear boundary of private lots where reasonable access to the sewer is maintained, as defined in WSA 02-2014-3.1 Clause 5.2.4.3.
- For sewers proposed to be located along the rear boundary of private lots, a Plan of Subdivision showing building envelopes must be submitted with the sewer design drawings to verify that access requirements can be met.
- Where compliance with access requirements cannot be verified at the design stage, the sewer must be located in public or road reserve. Yarra Valley Water may offer dispensation to this requirement where only a small portion of allotments do not meet access requirements.

- Maintenance holes shall not be located in the rear of private property without reasonable access, unless they are required to accommodate lateral reticulation sewers at the end of a pod of lots in accordance with MRWA Standard MRWA-S-108.
- Notwithstanding any other requirements, sewers servicing industrial /commercial allotments shall be located in the road reserve.
- Construction of works through other properties requires permission from the relevant land owners.
- Unless noted otherwise, internal sewers must be extended to the development's upstream boundary and be designed and constructed to control upstream catchments.
- All sewer constructed within private property will require the creation of an easement in Yarra Valley Water's favour. Easements shall be designed in accordance with WSA 02-2014-3.1 Clause 5.2.8 (Easements). Surveyed verification of planned easement offset from sewer shall be submitted to YVW for approval.
- All buildings / dwellings constructed within private property must comply with YVW's Build Over Easement (BOE) Conditions. The Developer must apply for conditions before building a structure or conducting works (earthworks) within an easement, or in close proximity to a Yarra Valley Water asset.
- Sewers and maintenance structures adjacent to structures such as buildings and retaining walls shall be located clear of the "zone of influence" of the structure's foundations to ensure that the stability of the structure is maintained, excessive loads are not imposed on the sewer and maintenance access is not restricted. Refer WSA 02-2014-3.1 Clause 5.4.4 (Clearance from structures).

Pipe Sizing

- Pipe size and grade shall be such as to contain the design flow without exceeding the specified maximum velocity and to achieve a self-cleansing velocity at peak dry weather flow at least once per day.
- Average dry weather flows from commercial/industrial development expected to be in excess of 0.125 litres per second per hectare are not permitted without additional approval.
- Irrespective of other requirements, for maintenance purposes the minimum sizes of property connection and reticulation sewers shall be not less than those shown in WSA 02-2014-3.1 Table 5.5 and shown below.

TABLE 5.5

MINIMUM PIPE SIZES FOR RETICULATION AND PROPERTY CONNECTION SEWERS

Sewer	Minimum size DN
Property connection sewers servicing single or two occupancy residential lots	100
Reticulation sewers servicing >3 residential lots Property connection sewer servicing commercial and industrial lots	150
Reticulation sewer servicing commercial and industrial lots and other lots where large flows may be expected	225

Property Connection

- All property branches not used must be cut and sealed with a screw cap.
- Multi-unit development sites (i.e. Owners Corporations) comprising up to 30 units (equivalent tenements) may connect directly to a sewer without having to connect via a maintenance structure.
- Irrespective of other requirements, any new connections to sewers >4.1 metres deep must into a maintenance structure. If the connection cannot be made to an existing maintenance structure then a new maintenance structure will need to be constructed on the existing sewer.

Minor Works - Connection Point

- The development designated as 'Area A' located at the southern end of the Lilydale Quarry development site shall connect to maintenance structure **BCA2** (refer to attached plan). 'Area A' will discharge into the Brushy Creek system.
- The development designated as 'Area B' located at the eastern side of the Lilydale Quarry development site shall connect to maintenance structure **BCB15-135** (refer to attached plan). 'Area B' will discharge into the Lilydale system.
- The development designated as 'Area C' located at the northern side of the Lilydale Quarry development site shall connect between maintenance structures **MBA1-11** and **MBA1-19** (refer to attached plan). 'Area C' will discharge into the Lilydale system.

Works - Upgrade

- The development requires 136m of DN**300** sewer to replace an existing DN225 sewer between existing maintenance structures **MBA1-8 and MBA1-11. (refer to attached plan)**.
- The development requires 260m of DN375 sewer to replace an existing DN225 sewer between existing maintenance structures **MBA1-49 and MBA1-8. (refer to attached plan)**.
- The development requires 365m of DN450 sewer to replace an existing DN225 sewer between existing maintenance structures **MBA1 and MBA1-49. (refer to attached plan)**.

Odour Control

- Each lot in this development is to be boundary trapped
- This development requires a water seal to be constructed at the first maintenance structure off the existing sewer for each sewer extension.

Partial Lot Control

The sewers servicing each lot within this development must accommodate full gravity drainage of the serviced area of the lot as defined in WSA 02-2014-3.1 Clause 5.6.4.1.

Partial lot control will only be allowed where Yarra Valley Water agrees that it is not feasible to provide full gravity control. The judgement as to whether full gravity control is feasible is at Yarra Valley Water's sole discretion.

Privately-owned Pump Stations

Yarra Valley Water only allows the use of privately-owned pump stations to service fixtures below the finished surface level of the allotment (e.g. basements and basement car parks). The pump station must discharge to the internal gravity plumbing prior to the 27A connection point (i.e. the interface point where the private gravity plumbing connects to the Yarra Valley Water property branch).

Trade Waste Agreement

A discharge of trade waste from any part of this development will require a Trade Waste Agreement. Trade Waste is broadly defined as any liquid waste discharged to the sewerage system from a trading premise with the exception of toilet/restroom type waste.

Each individual trade waste discharge requires the completion of a Trade Waste Services Application form; available from http://www.yvw.com.au/yvw/groups/public/documents/document/tradewaste_applicationform.pdf, and the completed form should then be returned to Yarra Valley Water who will assess the application and may request more information regarding any site specific requirements.

Appendix – Attached Plans

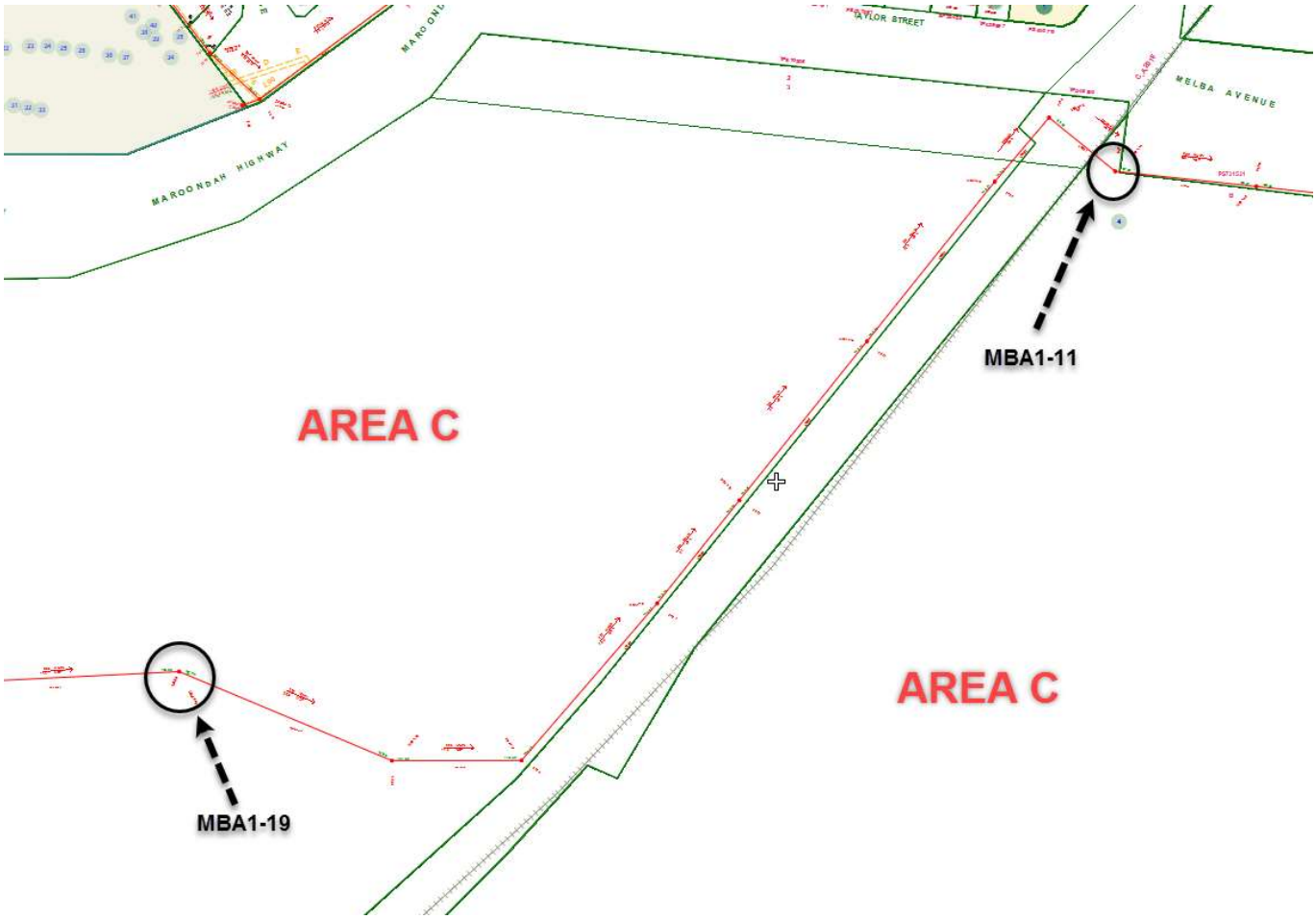
Overall Service Plan

Connection Points

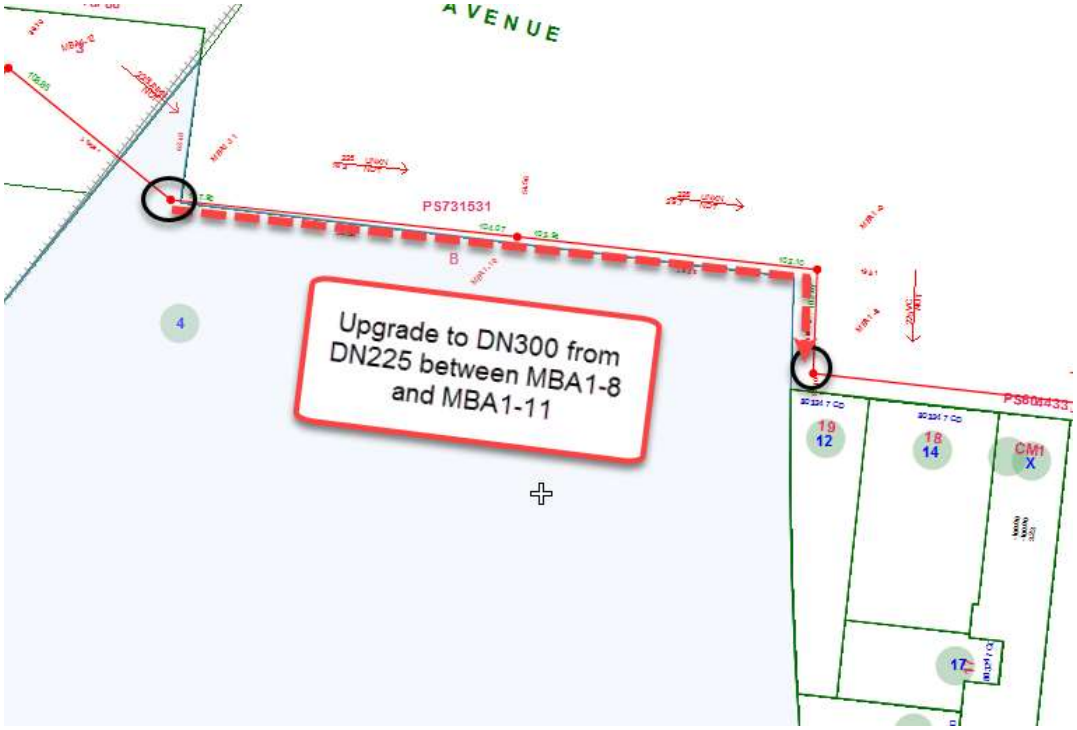
Area A:

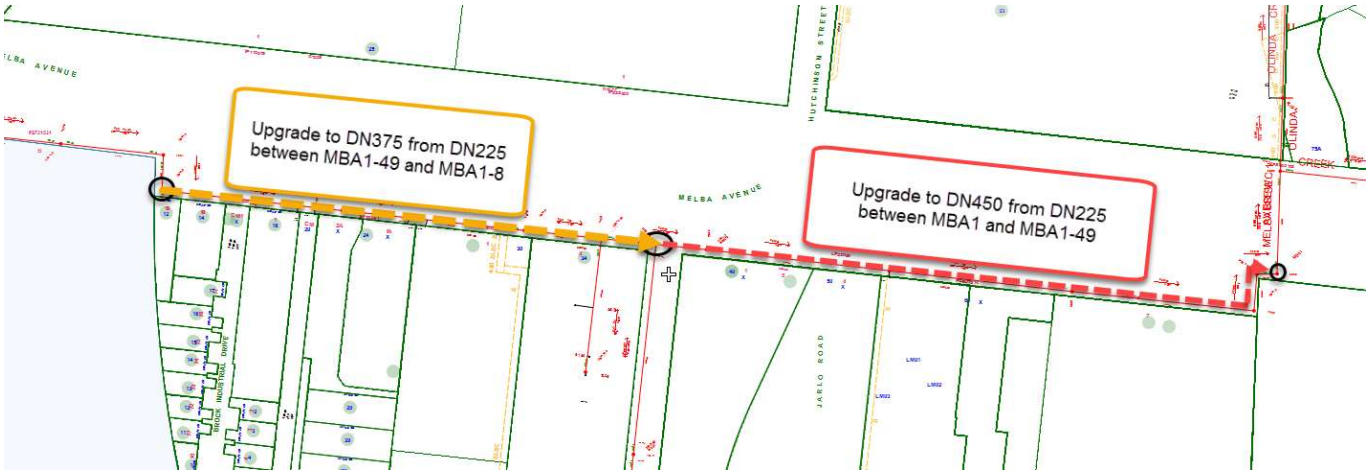
Area B:

Area C:


MAROONDAH HIGHWAY
TAYLOR STREET
MELBA AVENUE
AREA C
AREA C
MBA1-11
MBA1-19

Upgrade Works





ANNEXURE 5

Ausnet Electrical Preliminary Servicing Information

Phillip Miller

From: Sam Ravida
Sent: Monday, 19 February 2018 9:26 AM
To: Phillip Miller
Subject: FW: AusNet response to Cave Hill quarry site feasibility request
Attachments: 74236559 Feasibility response.doc; 74236559amfmplot.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

From: Andrew Webber [mailto:andrew.webber@ausnetservices.com.au]
Sent: Friday, 8 April 2016 5:03 PM
To: Sam Ravida
Subject: AusNet response to Cave Hill quarry site feasibility request

8/4/2016

Sam

See a response prepared in 2014 year for the site near Hull road at the bottom of this email and attached

And the one below from 2015

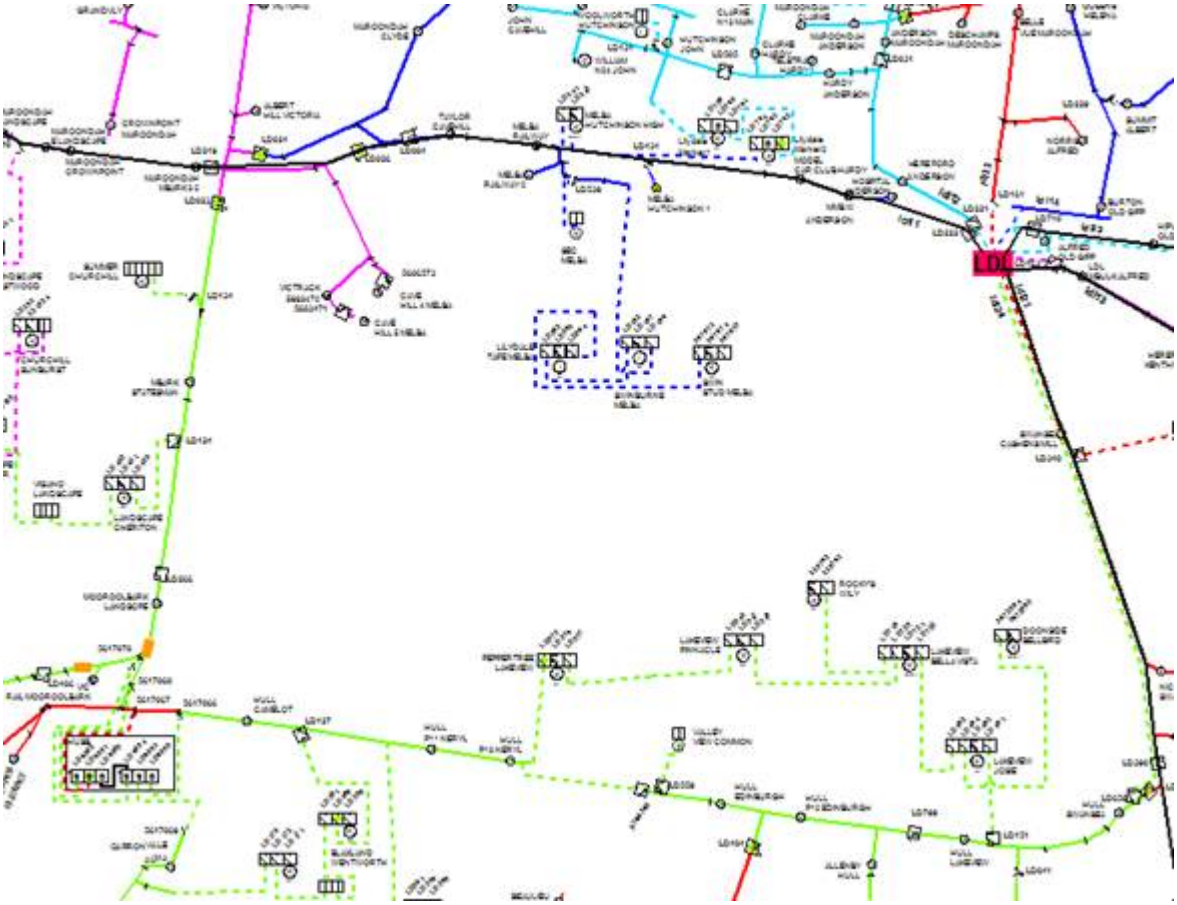
From: Sanath Peiris
Sent: Friday, 22 May 2015 12:00 PM
To: Andrew Webber; Luke Russell
Cc: Ross Morgan; Leesa Penaluna; Mahinda Wickramasuriya; Jacqueline Bridge
Subject: RE: Load forecast : AusNet' s Asset plan in the Lilydale Quarry area

Hi Andrew,

The load requirement for the new housing development will be around 10MVA (2500X4kVA/Cust). The diversified total load used in forecasting will be around 4MVA (2500X1.6kVA/cust).

There is a load reduction of 1.5MVA on CPK23 due to removal of quarry load. Thus the additional on CPK23 load will be 2.5MVA if the development is connected to CPK23. CPK23 can accommodate this load.

As shown below this development can be supplied from three feeders, LDL11, CPK23 & LDL24. These three feeders have sufficient capacity accommodate this load
and thus it is important to distribute this load between the three feeders.



Regards

Andrew Webber
Design Team Leader

AusNet Services - Providing our customers with superior Network & Energy Solutions
30 Melba Avenue
Lilydale Vic 3140 Australia
Tel 9237 4447 Fax 8635 7219
Mobile 0417 367 275
andrew.webber@ausnetservices.com.au
www.ausnetservices.com.au

From: Andrew Webber
Sent: Thursday, 24 April 2014 10:43 AM
To: mail
Subject: SP AusNet response to Cave Hill quarry site draft planning permit ref : S10717

24/4/2014

Attn : Graham Bower

SP Reference : 74236559

Re : SP AusNet response to Cave Hill quarry site draft planning permit
Council Reference : S10717

Morning Graham

In response to council's letter of 9th April 2014 seeking comment on the draft planning permit for the Cave Hill quarry site at Lilydale, I offer the following advice :

Attached is our feasibility response issued to a consultant in 2009. These comments remain unchanged. We note that our standard permit conditions for a residential subdivision have been included in the draft permit.

Provided our comments from 2009 are factored into the draft permit and our standard conditions remain in the permit, SP AusNet has no objection to the draft permit that has been prepared.

Regards

Andrew Webber
Design Team Leader
Service Delivery
PO Box 202, Lilydale, 3140
Ph : 9237 4447
Fax: 9237 4533
MB : 0417 367 275
Email: andrew.webber@sp-ausnet.com.au

SP AusNet
A member of Singapore Power Group

mission zero
zero injuries, zero compromise, zero tolerance, zero impacts

10/05/2009

Nick

In response to your request below, I offer the following advice :

1. There is an existing feeder (Full) rated 22kV overhead line on the South side of Hull Road and the east side of Mooroolbark Road. This line is known as the LDL 24 feeder This line can be used to supply into the estate.

2. Normal underground distribution requirements apply ie Kiosk Substation reserves will be required within the development area and possible cable easements subject to detailed design. I estimate at least 3 kiosk substations will be required for the developmet. One for the 45 lots east of Mooroolbark road but west of the railway line. Another two will be required for the remaining 172 lots in from Hull road.

3. SP AusNet currently reimburses HV infrastructure costs at a scheduled rate and rebates $980 per lot plus GST for LV works for residential development.

4. If there are existing distribution assets on the property, these will need to be relocated or removed, at full cost to your client prior to issue of a statement of compliance for effected lots.

5. Your client has the choice of either SP AusNet design or developer design and SP AusNet construct ar developer construct. Your client will need to advise SP AusNet which option they have chosen when they apply for formal terms and conditions

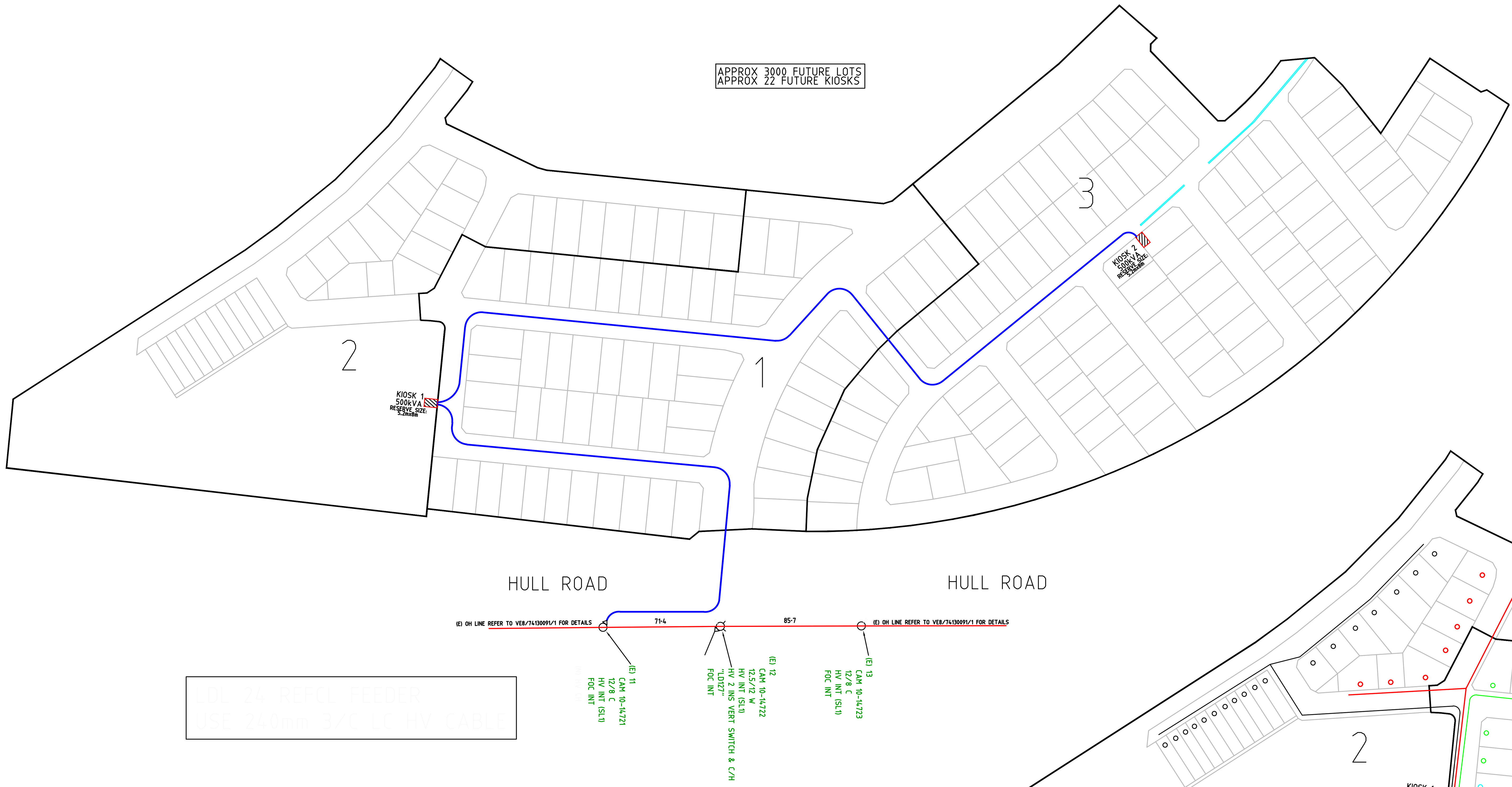
I have marked up our asset plan in the area. The blue line represent our overhead 22kV assets. Do not hesitate to call should you require additional information.

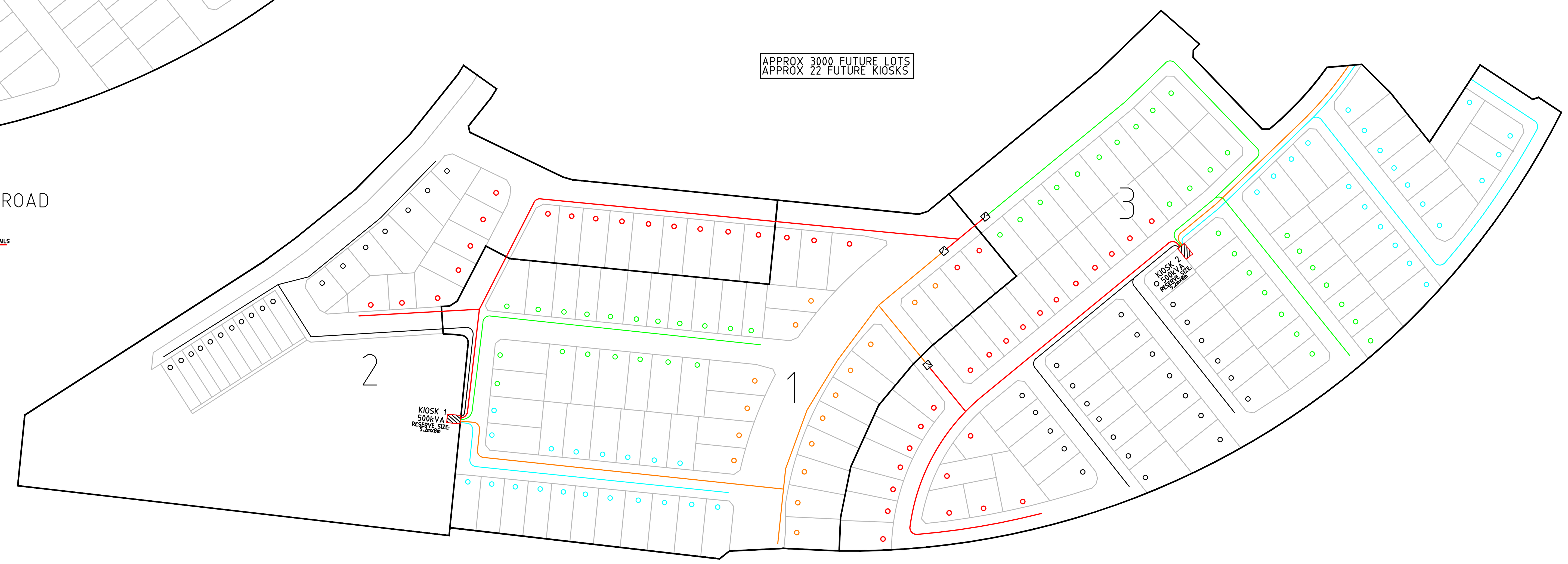
74236559amfmplot.pdf

Regards

Andrew Webber
Design Engineer
Integrated Network Services
PO Box 202, Lilydale, 3140
Ph : 9237 4447
Fax: 9237 4533
MB : 0417 367 275
Email: andrew.webber@sp-ausnet.com.au

SP AusNet
A member of Singapore Power Group





PRELIMINARY VOLTAGE DROP CALCULATION FOR KIOSK 1 (500kVA RMU)

CIRCUIT No	LV CABLE SIZE	TOTAL LOTS	% VOLTAGE DROP
CCT1	240mm² XLPE	18	3.13 %
CCT2	240mm² XLPE	21	4.01 %
CCT3	240mm² XLPE	19	2.06 %
CCT4	240mm² XLPE	16	4.13 %
CCT5	240mm² XLPE	19	1.88 %
	TOTAL	93	

PRELIMINARY VOLTAGE DROP CALCULATION FOR KIOSK 2 (500kVA RMU)

CIRCUIT No	LV CABLE SIZE	TOTAL LOTS	% VOLTAGE DROP
CCT1	240mm² XLPE	26	1.95 %
CCT2	240mm² XLPE	23	3.43 %
CCT3	240mm² XLPE	28	1.69 %
CCT4	240mm² XLPE	0	0.00 %
CCT5	240mm² XLPE	21	4.01 %
	TOTAL	98	

LEGEND

240mm 3/c LC 22kV UNDERGROUND CABLE

240mm 4/c LV UNDERGROUND CABLE

KIOSK S/STN, 5.2mx8m RESERVE.

150NB CONDUIT FOR FUTURE HV CABLE

SCALE OF METRES 1 : 2000 @ B1 SHEET

A	FIRST ISSUE		
REV	DESCRIPTION	DRAWN DATE	CHECKED CKD	APPROVED APP

Surveyor: N/A
Drawn: B.D 01/02/19
Survey/Drafting Checked: J.S 01/02/19
Designed: B.D 01/02/19
Approved: ANDREW WEBBER 22/02/2019

U/G CABLE PLAN
KINLEY ESTATE HV/LV OVERALL
451 HULL ROAD
LILYDALE

Project Manager: ANDREW WEBBER
Project Manager PH: 9237 4447
ORIGINAL Scale: 1:2000
VicRoads/Melway: MEL 38 B9
Project No. 75052892

VE5/75052892/1 Rev A

AutoCAD