

Sellicks Beach Structure Plan

Utilities Infrastructure Assessment

City of Onkaparinga

ECM 4996900
8 September 2020
Ref: 201217R001B



Building exceptional
outcomes together



Document History and Status

Rev	Description	Author	Reviewed	Approved	Date
A	Draft for Comment	DS	CW	DS	13/08/2020
B	Revised following client comment	DS	CW	DS	08/09/2020

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201217R001B Sellicks Beach Structure Plan | Utilities Infrastructure Assessment

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1 Introduction and Background

1.1 Introduction to the Project

The City of Onkaparinga (Council) has engaged Tonkin to undertake a high-level infrastructure assessment to assess the capacity and augmentation requirements to cater for development within land currently zoned as 'deferred urban', 'primary production' and 'residential' within Sellicks Beach.

The infrastructure assessment was undertaken for the following services and involved liaising with service authorities to determine the level of upgrades required to meet the extra demand generated by the developments:

- Water supply and sewerage treatment through SA Water, Willunga Basin Water Authority and Council
- Electricity supply through SA Power Networks (SAPN)
- Gas supply through APA Gas
- Telecommunications through the National Broadband Network

The assessment for wastewater treatment has also incorporated the existing areas to determine theoretical flow rates for the ultimate wastewater solution. The basis for the ultimate wastewater solution for Sellicks Beach is as follows:

- On site disposal areas - existing residential areas currently with septic tank and soakage trench disposal or other domestic residential treatment systems.
- CWMS areas - existing residential areas currently serviced by an effluent collection network and treatment plant.
- Redevelopment within the existing built up areas (i.e. subdivision from 1 lot to 2 lots for allotments greater than or equal to 650 m²).
- Areas currently unserved and zoned as 'deferred urban', 'primary production' and 'residential'.

1.2 Background – Wastewater Treatment

Sellicks Beach is a southern suburb of Adelaide with a population of 2616 on 1,317 occupied allotments (Australian Bureau of Statistics, 2016 Census).

The wastewater solution for the current population consists of either:

- On site disposal (i.e. septic tank and soakage trench disposal or other domestic residential treatment system).
- Septic tank effluent collection and sewer collection network and treatment plant – the Community Wastewater Management System (CWMS).

Council currently operates the Sellicks Beach wastewater treatment plant (WWTP) which receives septic tank effluent and sewerage from the Sellicks Beach CWMS. The treatment process at the WWTP includes a sequencing batch reactor and chlorination. The main disposal path of the recycled water is via a 4 km pipeline to the Willunga Basin Water Company (WBWC) distribution network where treated water from the Sellicks Beach WWTP is used to irrigate agricultural sites in McLaren Vale. A minor amount of treated water from the Sellicks Beach WWTP is also used to irrigate an open space reserve adjacent to the treatment plant.

The Sellicks Beach WWTP supplies 25 kL/hr to WBWC; Council invested in sizing the connecting pipe network to sufficiently convey the full flow from a fully developed scenario of the existing catchment (i.e. all connected allotments being occupied), however the wastewater situation in Sellicks Beach is the limiting factor for development.



Based on discussions with WBWC, it is understood a new dam has been constructed at Seaford Heights which has given WBWC the ability to store an additional 600 ML per annum. As a result of the additional storage capacity, WBWC would be able to accept additional volumes of treated wastewater provided there is no change to the current maximum flow rate of 25 kL/hr (or 6.94 L/s). Therefore, although there is potential to increase the level of disposal to WBWC, this option (based on flow advice provided by WBWC) is inadequate for a fully developed scenario of the current developed areas.

The number of properties currently connected to the Sellicks Beach WWTP is at capacity based on the number of connections served and the theoretical flow rates into the plant, however actual flow rates have been less than the theoretical values and therefore Council has currently obtained approval for a further 20 connections to be added. Further connections above the additional 20 could be added subject to a reassessment of the WWTP's capacity.

2 Methodology

In undertaking this project, Tonkin has undertaken the following tasks:

- Determined the developable area within the deferred urban, primary productions and residential zones.
- Estimated the number of allotments based on average block sizes for full sewer collection, including assumptions on allowances for urban development, roads, parks etc.
- In liaison with service authorities, review the location of existing SA Water supply and sewer networks, SAPN infrastructure, Gas (i.e. APA Gas) infrastructure and NBN infrastructure and investigate augmentation requirements.
- Consideration of two WWTP options.
- Developed a report to document findings.

3 Developable Area

3.1 Existing Allotments

According to Australian Bureau of Statistics (ABS) census data from 2016, there are 1,317 private dwellings in Sellicks Beach that are serviced by either a Community Wastewater Management Scheme (CWMS) or on-site water systems. According to Council records, there are approximately 400 CWMS connections, with the remainder being on-site systems or vacant blocks.

Based on parcel information supplied by Council, there are 156 vacant lots within the existing residential area.

Therefore, in total there are 1,473 allotments within this area that need to be considered for the wastewater solution. The ultimate wastewater solution would also need to consider any redevelopment within the existing areas, and Council have identified that within the next 25 years, the most likely scenario would be that up to 50% of allotments are subdivided from 1 lot to 2 lots. For this assessment, Tonkin have assumed that allotments greater than or equal to 650 m², of which there are approximately 325 allotments, will be subdivided from one to two in the next 25 years.



3.2 Deferred Urban, Primary Production and Residential Zones

The deferred urban area (denoted by 'DefUrb' in Figure 1) is approximately 87 hectares, and the area zoned as primary production (denoted by 'PrPro' in Figure 1) is approximately 48 hectares. The residential area shown in blue in Figure 1 has an area of approximately 8.4 hectares.

Based on information supplied by Council the 'deferred urban' area consists of 16 different parcels of land, with a separate title.

The 'primary production' area consists of 14 parcels of land with 12 titles. And based on LocationSA, the blue residential area consists of 3 parcels with 3 titles.

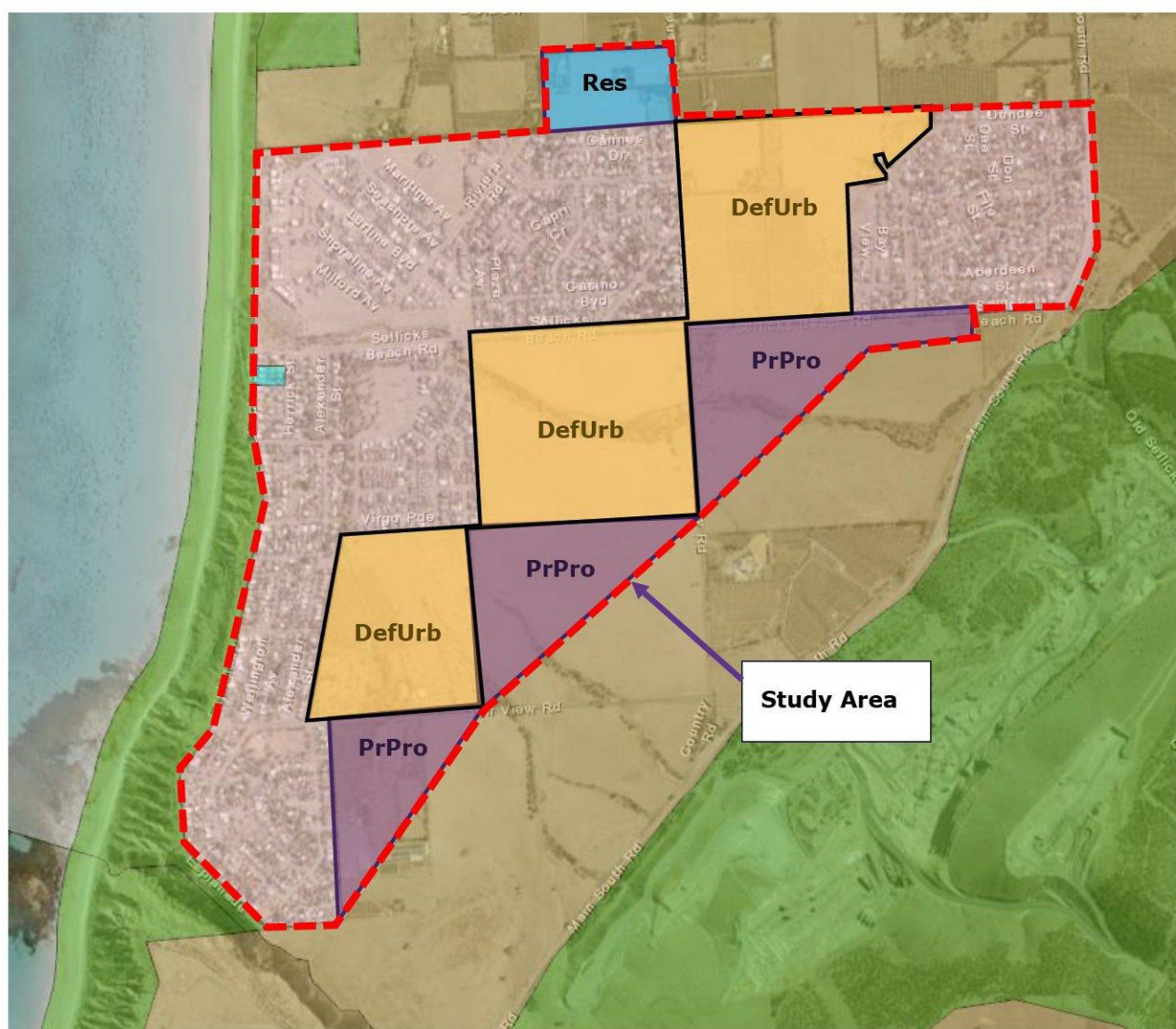


Figure 1: Study Area



The natural features (e.g. water courses) of the deferred urban area and primary production zone results in reductions to the developable area. The developable area is also reduced due to other land requirements such as parks and reserves, paths and roadways.

3.2.1 Watercourses

There are existing watercourses and basins within the deferred urban area and primary production zone. Figure 2 shows the existing watercourse lines in blue, which have been extracted and defined based on a digital elevation model data supplied by the City of Onkaparinga.

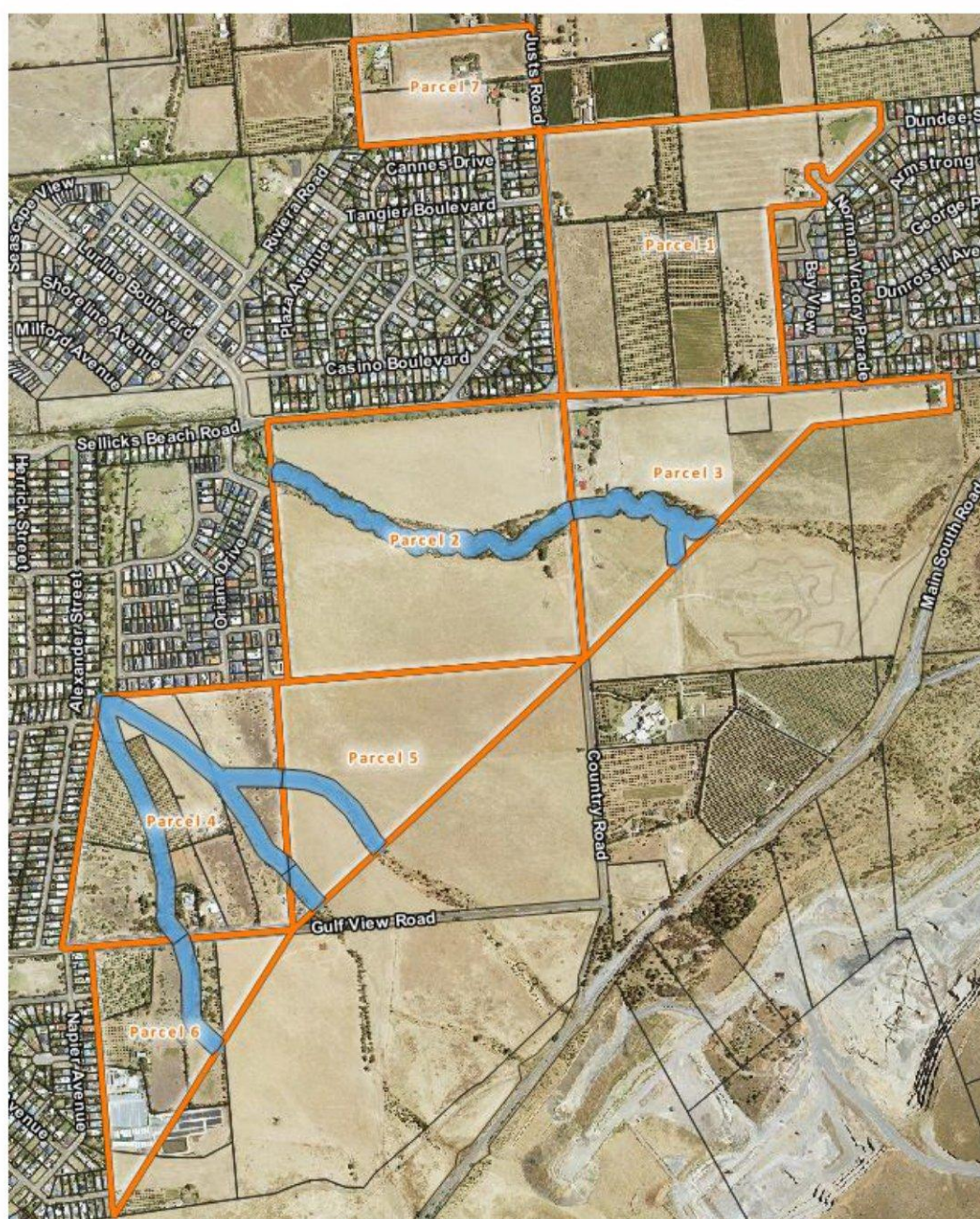


Figure 2: Existing watercourses



It is assumed that these watercourses will be retained during development. A buffer width of 20 m on either side of the channel invert of each watercourse has been adopted based on the new Planning and Design Code expected to be implemented in late September 2020, as an exclusion zone for future development. Table 3-1 shows the total area of each land parcel, the estimated area of each watercourse (including the assumed 20 m buffer zone).

Table 3-1: Estimated watercourse area

Parcel	Land use	Total Area (ha)	Estimated Watercourse area (ha)
Parcel 1	Deferred Urban	30.41	0
Parcel 2	Deferred Urban	34.49	3.05
Parcel 3	Primary Production	18.78	1.69
Parcel 4	Deferred Urban	22.34	4.64
Parcel 5	Primary Production	17.01	1.47
Parcel 6	Primary Production	12.19	1.02
Parcel 7	Residential	8.41	0
Total		143.63	11.87

The estimated watercourse areas listed in the table above have been subtracted from the area available for development.

3.2.2 Roads

Based on typical development areas, it has been assumed that 25% of the deferred urban area, primary production area and residential area, after the removal of watercourse areas, will be required for road corridors.

No specific allowance has been made for Council's Recreation Trails, Pedestrian and Cycling Networks, however these requirements may be accounted for within the roads allowance.

3.2.3 Parks and gardens

Based on typical development areas, it has been assumed that 12% of the deferred urban area, primary production area and residential area, after the removal of watercourse areas will be required for parks and gardens.

A portion of this 12% allowance may include any required stormwater basins. It is thought that during development some areas may be designed to have a dual purpose of both a grassed park area and a basin.



3.2.4 Developable Area

The developable area has been calculated as the total deferred urban area, total primary production area and total residential area (as depicted in Figure 1) less the area allowed for watercourses and the allowance for roads, parks and gardens. The remaining developable area is approximately 83 hectares as shown in Table 3-2.

Table 3-2: Developable Area

Area	Size	
Total deferred urban area	87.2	ha
Total primary production area	48.0	ha
Total residential area (undeveloped)	8.4	ha
Watercourse area	11.9	ha
Road Area Required	32.9	ha
Open Space Required	15.4	ha
Available Allotment Area	83.0	ha

3.2.5 Dwellings within the Developable Area

The majority of existing residential allotments within the Sellicks Beach area are between 400 and 1000 m². It is expected that new dwellings would be within a range of 450 to 750 m², therefore the allotment yield has been determined for varying allotment sizes as shown in Table 3-3.

Table 3-3 Number of new dwellings within Developable Area

Allotment size (m ²)	No. of new dwellings
1000*	830
750	1,107
450	1,845

* The 1000m² allotments have been included in this table for comparison purposes only. The most likely scenario would be a mix of allotment sizes between 450 and 750m², i.e. these two allotment yields represent the limit of the range to be expected.

In order to retain the character of the area, an allotment size of 750m² was assumed to be the most appropriate for the assessment, given that the average existing lot size is approximately 730 m². However, based on discussions with Council a 450 m² allotment size has also been investigated in addition to the 750m² lot size as it is likely that new allotments would have a smaller allotment size based on current planning policy.

3.2.6 Community Services

A consideration of any new development is the services provided in the form of a primary school, shops or commercial premises, or industrial areas.

Council is undertaking investigations to determine the scope of social/community services required to support the proposed development.

For the purposes of this investigation, an assumption has been made that there will not be social/community facilities such as schools, as they typically generate less wastewater than the equivalent area of residential development. This does not preclude a school from future development.

Council has stated there will not be any industrial areas within the Sellicks Beach suburb, as there is an established industrial estate at Seaford.

3.2.7 Neighbourhood-level Centre, Primary School /Child-care support

Council's brief states the following

"...previous investigations have identified a need for a neighbourhood-level centre and primary school/child care to support existing and future housing in Sellicks Beach". The preferred location for the neighbourhood centre is on the south-west corner of Sellicks Beach Road and Country Roads.

It is believed the previous investigations being referred to are contained within a draft copy of the Sellicks Beach Neighbourhood Centre Development Plan Amendment (2011) where a 12 ha space within the land zoned as 'deferred urban' was nominated for a neighbourhood centre. The Development Plan Amendment also suggested a preferred location for the neighbourhood centre 'Site B' as shown in Figure 3, due to improved access from developed roads.



Figure 3: Potential Neighbourhood Centre Location (Site B)



It is also known that a new birth to year 12 super school is being planned for Aldinga with a student population of 1,600 pupils. Based on the Department for Education website, the extent of the zone for the new super school includes Sellicks Beach. The school zone is presented in the figure below.

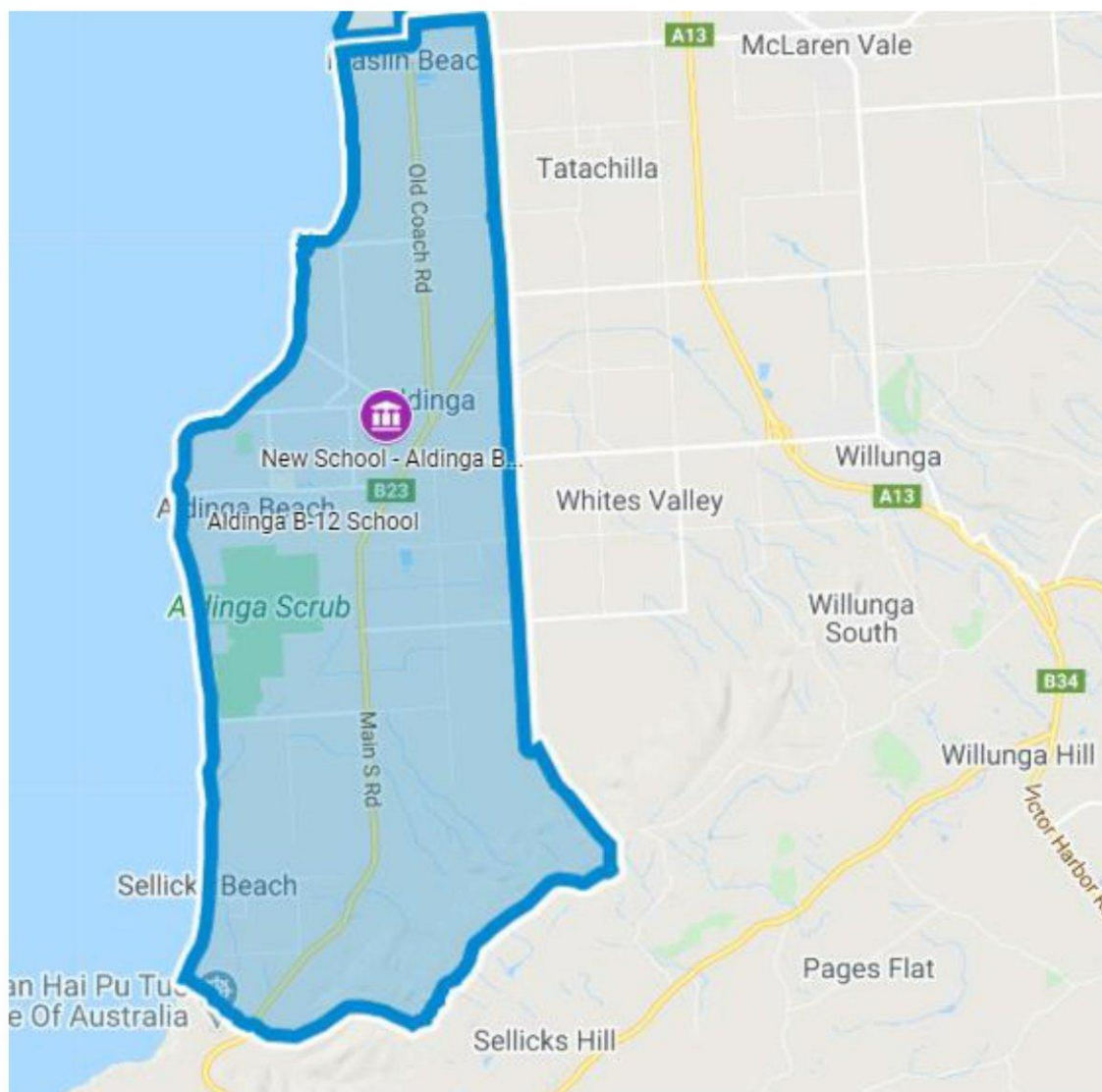


Figure 4: Aldinga Super School Zone - Birth to year 12

For the purposes of the wastewater assessment, a Neighbourhood Centre/Primary School has not been included within the developable area. The need for the Neighbourhood Centre/Primary School needs to be considered during the planning process, especially in light of the new super school being developed in Aldinga. The area shown in Figure 3 has been considered as residential, as the effluent produced by a Neighbourhood Centre/Primary School is expected to be less than that from the same area of residential allotments and is therefore a more conservative scenario for sizing of a WWTP, and also results in higher costs for development and lower sales yield.



3.3 Quarry Operations

An existing quarry/mining operation is located to the south east of Sellicks Beach over Main South Road. Based on the current version of the guidelines titled "EPA Evaluation distance for effective air quality and noise management (2016)" an individual assessment would be required to be undertaken for the Sellicks Beach quarry in order to determine current requisite separation distances. For the purposes of this investigation, the requirements specified within the older "Guidelines for Separation Distances (EPA, 2007)" have been adopted. For 'Extractive Industries' an air separation distance of 300-500 m is required depending on the mines activity and a noise separation distance of 3,000 m.

Although these EPA Guidelines suggest defined separation distances, it is expected the mine site may have its own approved environmental plan in which alternative separation distances may exist. At this stage, Tonkin has not approached the mine operators to request such a document. The location of an existing residence within 300 m of the quarry site suggests alternate separation distances may apply in this case.

It is recommended that a better understanding of the implications of the current EPA guidelines relating to the quarry should be explored as it may place a potential constraint on the developable area within Sellicks Beach. The quarry site may also be an opportunity with the potential to generate recycled water for dust suppression.

4 Infrastructure Assessment

4.1 Water Supply to Developable Area

Any new development within South Australia that requires a significant upgrade to the potable water supply, attracts an augmentation fee from SA Water. The list of developments and suburbs attracting augmentation fees is publicly available via the SA Water website. The current augmentation lists for year 2020-21 are quite variable, with fees ranging from \$881-28,176 per allotment for allotments greater than 400 m². Note that according to the SA Water website, there are no augmentation fees currently listed for the Sellicks Beach area.

A preliminary assessment of augmentation requirements has been undertaken by SA Water, with the following information provided with regards to water supply to support the potential future growth in the Sellicks Beach area.

Email from SA Water

Please find attached the prelim requirements for water within the Sellicks Beach area. The nature of these requirements are preliminary only.

Based on Systems Planning investigation, the network has sufficient capacity to support the future growth in Sellicks Beach to result in a total of 3,000 dwellings (including existing allotments), subject to the following augmentation works:

2018-2023

- *Construct a new DN200 branch and main off the Ex.1090 MSCL Myponga TM (i.e. Trunk Main) and lay parallel to Ex.150 AC (i.e. Asbestos Cement) main in Sellicks Beach Rd up to existing Sellicks Hill EL188/140 PRV (i.e. Pressure Reducing Valve) ~10m, **shown at A on Figure 5.** (duplicating supply to PRV)*



2023-2028

- Construct a new DN200 main from existing Sellicks Hill EL188/140 PRV in Sellicks Beach Rd parallel to Ex.150 AC main (~390m length) and link-in to Ex.375 DI CL main, **shown as A-B on Figure 5.** (duplicating supply from PRV to support future growth in the EL140 and EL80 pressure zone's)
- Upgrade Sellicks Hill EL188/140 PRV to operate at increased flows, if required.

2028-2048

- Construct a new DN150 branch and main off the Ex.300 DI CL Sellicks Beach EL126 Tank outlet extending ~1,100m along Gulfview Rd, **shown as C-D on Figure 5.** (duplicating supply from Tank to support future growth in EL126 pressure zone).
- Upgrade inlet to Sellicks Beach EL126 Tank inlet, if required.

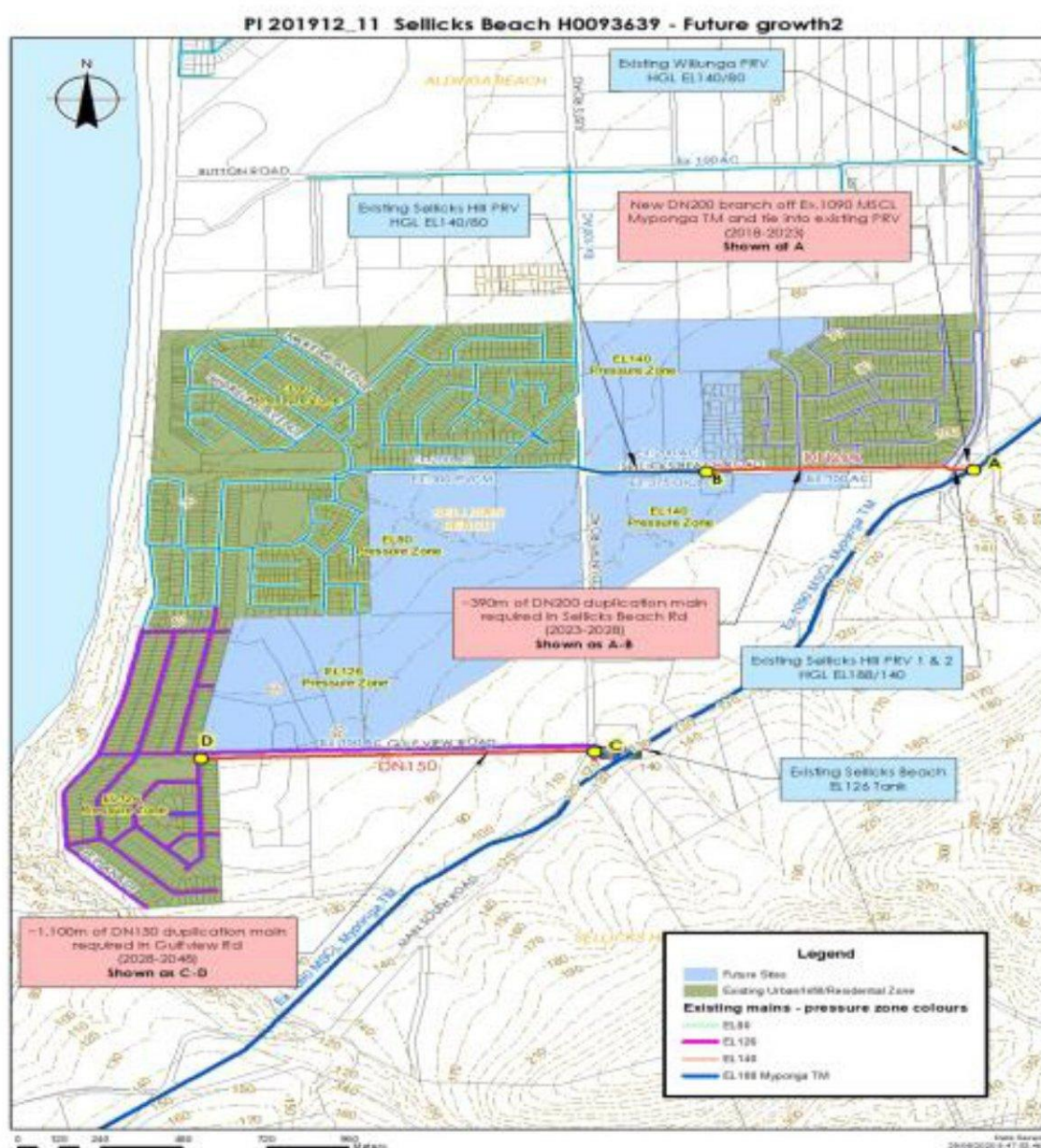


Figure 5: SA Water - Water Supply Augmentation (preliminary advice)



The above advice is based upon a desk top investigation and modelling, whilst SA Water endeavours to encapsulate all of the works potentially incurred to service the above mentioned development, there are possibilities for the requirements to vary upon a more thorough investigation being conducted, alterations to the number of allotments being created, the number of fixture units, peak flows and/or a change in the nature of development will have implications on this advice provided and a new investigation will be required. Should everything remain the same this advice is valid for 12 months.

4.2 Gas Supply to Sellicks Beach

Based on discussions with APA Gas, the following information was provided regarding the supply of gas to Sellicks Beach.

Email from APA Gas

Further to your enquiry regarding extending the natural gas distribution to Sellicks Beach, this is currently being evaluated by the APA Engineering Team.

However, as the closest natural gas mains to the proposed development is approximately ten kilometres away it would be grossly unviable to extend the gas mains at this point in time. Also, an assessment of the existing mains would need to be conducted to determine whether there is sufficient capacity in the existing gas mains to support the gas demand of the proposed development.

As an option the installation of an LPG distribution network could be considered to service this area with gas supply. There are a number of residential housing developments within South Australia where it is unviable to extend natural gas infrastructure, so LPG infrastructure has been reticulated. These developments include reticulated LPG networks in areas of; Roxby Downs, Victor Harbor, Renmark, Port Lincoln, Cape Jaffa Anchorage, Wallaroo, Mount Barker.

Australian Gas Networks have recently commissioned an LPG network at the housing development of Glenlea in Mount Barker. It is expected when fully developed Glenlea will include up to 600 dwellings with most dwelling connected to the LPG network. It is expected that eventually the natural gas network will be extended to Mount Barker and LPG networks converted from LPG to natural gas.

Each enquiry for an LPG distribution network would need to be evaluated to determine whether there would be a cost to the developer and if so, what would that cost be. As an example, the LPG network at Glenlea is being installed at no-charge to the developer although there is an \$800 connection fee for each new connection to the network which is charged to the home builder upon application to connect to the network.

When installing an LPG network an area would need to be provided to accommodate the LPG gas tanks. Attached is an indicative design of an LPG gas tank compound, and photo to indicate what it would look like.

To evaluate the installation of an LPG network the following information would be required:

- *A proposed location for the LPG tanks to be advised.*
- *Date when the subdivision would commence.*
- *Estimated build rate (of new homes) within the proposed subdivision*
- *Road layout of the proposed subdivision*

Over a period of time it would be expected the existing natural gas reticulation network in Aldinga would continue to expand, in doing so could lessen the distance to extend the natural gas infrastructure to Sellicks Beach. Also, there may be a point in time when the number of consumers connected to a proposed LPG network at Sellicks Beach would reach critical mass to enable the extension of natural gas infrastructure as a viable project.

4.3 NBN to Sellicks Beach

As part of their assessment, NBN required a parcel of land to be nominated as "Stage 1" (or the first parcel of land that would be developed) and an entrance point to be specified. In liaison with Council, and in light of the fact that there are currently no plans in place for knowing which of the parcels will form Stage 1, the 'Deferred Urban' parcel shown in red in the figure below was selected as Stage 1, with the entrance denoted by the star. The basis for the selection of this parcel is as follows:

- It is assumed that given the existing level of development on either side, this parcel of land could be developed sooner than others
- There are no large watercourses running through this parcel

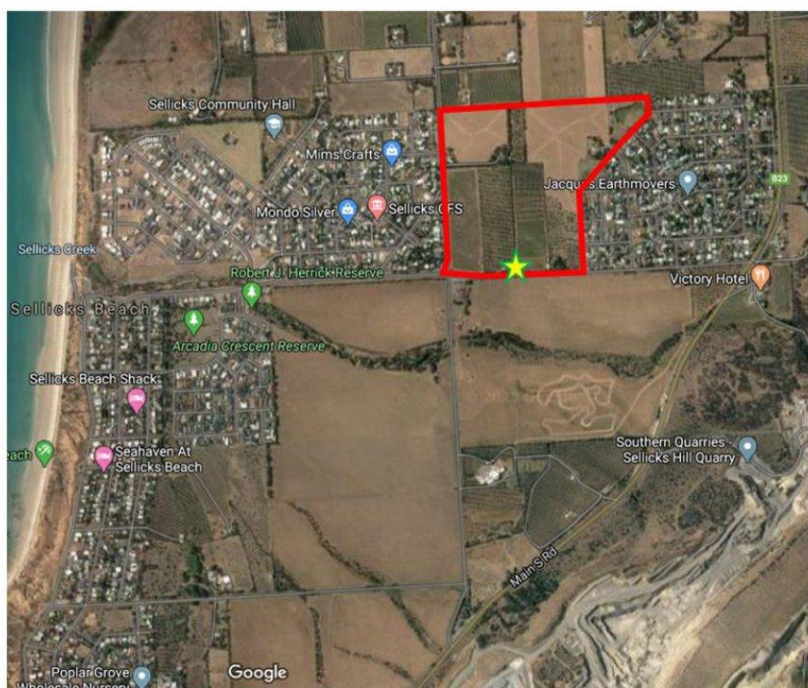


Figure 6: Stage 1 parcel and "entrance" point

Email from NBN

We've undertaken a high-level planning assessment and there is currently capacity in our network to support the development with Fibre to the Premises via the proposed stage one entrance per the supplied image on Sellicks Beach Road (above). Therefore, no backhaul charges would apply to service the development. This capacity would suit residential and business grade services and is based on 1,845 lots.

The development would be serviced via our new development program, where we would enter into a Master Developer Agreement with the developer. The Telecommunications Infrastructure in New Developments (TIND) Policy which sets the nbn pricing is currently under review and expect to be released in the coming weeks. I'd recommend that this project is reviewed once the new policy is live. Currently the per premises/lot charge is \$600 Single Dwelling Unit and \$400 per Multi Dwelling Unit inc GST (regardless of the lot use ie residential/commercial)

If all of the parcels of land will be developed from the proposed stage 1 entrance contiguously on a stage by stage basis under one master plan, then there wouldn't be an additional new development charges other than the per premises contribution

*If each parcel will be developed individually, under individual master plans then the **nbn** network would need to be delivered to the first stage of each separate development, in which case we'd need to do a*



planning assessment on each parcel based on where we'd need to bring the network to. Given the capacity of the fibre in the surrounding area of Sellicks Beach, this isn't anticipated to be problematic, however further detail would be required to confirm backhaul costs, such as detail of how the parcels are anticipated to be divided and developed or a concept master plan for each as well as anticipate yield per parcel.

4.4 Power Supply to Sellicks Beach

Based on discussions with SAPN, the following information was provided regarding the supply of power to the potential developments.

Email from SAPN

We (SAPN) could supply up to about 1000kVA load (around 200 houses) south of Sellicks Beach Road from Myponga Substation. The remaining load increase will need to connect to Aldinga Substation which will be overloaded quite soon so that will very much limit what can be installed in the very near future as it is around 18 months to install a new substation. To alleviate this, we will need a new substation north of Aldinga Substation, somewhere between Seaford Substation and Aldinga Substation (i.e. Maslin Substation). If the Council could assist us in getting a land parcel (approximately 100m x 100m) in that vicinity along the 66kV line, that would be terrific. We definitely need to start looking at that if this development is going to take off.

Taking your median lot size of 750m² would require around 5,000kVA, at 450m² around 8,500kVA. Previously we were planning to build a new feeder from Aldinga, but this is no longer an option until the new substation north of Aldinga (i.e. the Maslin Substation) is completed. Once Maslin Substation is complete, load can be transferred from Aldinga and the new feeder can be built cost still around \$1.5M to \$2.0M. We will still fund the new Maslin Substation; however, the developer would be up for \$265 per kVA in addition to the costs of building the new feeder and reticulation within the substation.



Figure 7: SAPN infrastructure

4.4.1 Opportunity – ‘Green’ developments with Renewable power

The above statements from SAPN and associated costs have not taken into account the potential for ‘green developments’. There have been significant advances in solar and battery technologies in recent years, to make them more viable on a household scale.

The sizing of sub-stations is dependent on the peak-day demands, which are typically hot days when residences have air conditioning systems operating. If this peak power demand can be reduced, through the use of solar panels or other alternate methods of power generation, this can relate directly to cost savings for the developer.

4.5 Wastewater Treatment for Sellicks Beach

4.5.1 WWTP Options

Two WWTP options have been considered for the Sellicks Beach study area, for current allotments and development within the deferred urban, primary production and residential zones. The two options are based on discussions with both SA Water and the City of Onkaparinga regarding their future planning.

These options include:

- the upgrade of the existing Aldinga WWTP to cater for inflows from the Sellicks Beach study area.



- the construction of a new pumping station and rising main to convey wastewater to the existing Willunga WWTP and its potential upgrade.

4.5.2 Population Data

When determining the estimated population (EP) for new developments, the SA CWMS Design Criteria (2019) standard is 2.6 people/allotment. The ABS data for Sellicks Beach equates to a rate of 2.5 people/allotment.

Therefore, the assumption has been made that for new allotments (both infill and new areas), the SA CWMS Design Criteria of 2.6 people/allotment will be adopted, however the ABS data for Sellicks Beach of 2.5 people/allotment will be taken for existing allotments.

4.5.3 WWTP Setback Requirements

An important consideration during the placement of any new WWTP is the establishment of an air separation distance between the WWTP and sensitive receptors. The radius of this separation distance varies depending on the size of population serviced by the WWTP, as stated in the "EPA Evaluation distance for effective air quality and noise management (2016)".

A WWTP servicing up to 5,000 EP requires a setback of 200 m whereas a WWTP servicing between 5,000 and 15,000 EP requires 300 m. For WWTPs servicing an equivalent population (EP) greater than 15000EP, the "EPA Evaluation distances for effective air quality and noise management" document requires an individual assessment for setback distances be undertaken.

The WWTP options considered include the Aldinga WWTP and the Willunga WWTP:

- Aldinga WWTP - The Aldinga WWTP is a SA Water asset and as discussed in Section 4.5.6, there are future stages planned. Based on available information, the current design capacity of the Aldinga wastewater treatment plant (Stage 2A) is 16,000 EP, with Stage 2A intended to cater for growth in the Aldinga catchment. With the Stage 2A upgrade of the Aldinga WWTP due to be completed towards the end of this year (or early next year), separation distances for the Stage 2A upgrade would have been considered acceptable for the WWTP's level of use for Stage 2A. Future upgrades of the WWTP to take additional flows would likely require a reassessment of setback distances. Based on discussions with SA Water, a future Stage 2B upgrade of the Aldinga WWTP is intended to cater for wastewater inflows from the Sellicks Beach area. No investigations have been undertaken to assess setback requirements for the future Stage 2B upgrade.
- Willunga WWTP - Tonkin is currently undertaking an investigation into the current capacity of the Willunga WWTP to determine the feasibility of accommodating additional wastewater flows from expected future population growth, and extensions to the existing CWMS networks in McLaren Flat and McLaren Vale. Should additional flows from Sellicks Beach be transferred to the Willunga WWTP this could have an impact on the required setback distances.

4.5.4 Wastewater Flow Contribution from Currently Developed Areas

The wastewater flows from current developed areas is shown in Table 4-2. The flow rates take into consideration the flows from the CWMS, and on-site areas which make up the balance of connections. Flow rate data provided by Council/TRILITY show that over a period of twelve months (i.e. between 1 July 2019 and 31 July 2020) flow rates into the existing Sellicks Beach WWTP averaged 103 kL/day (influent) and peaked in June at 172 kL/day (influent). The maximum flow capacity of the WWTP is 238 kL/day and it is understood that approximately 416 properties are serviced; 260 connections in the Prodec development north of Sellicks Beach Road, and 156 connections in the Bluewater development south of Sellicks Beach Road. This is presented in Figure 8.

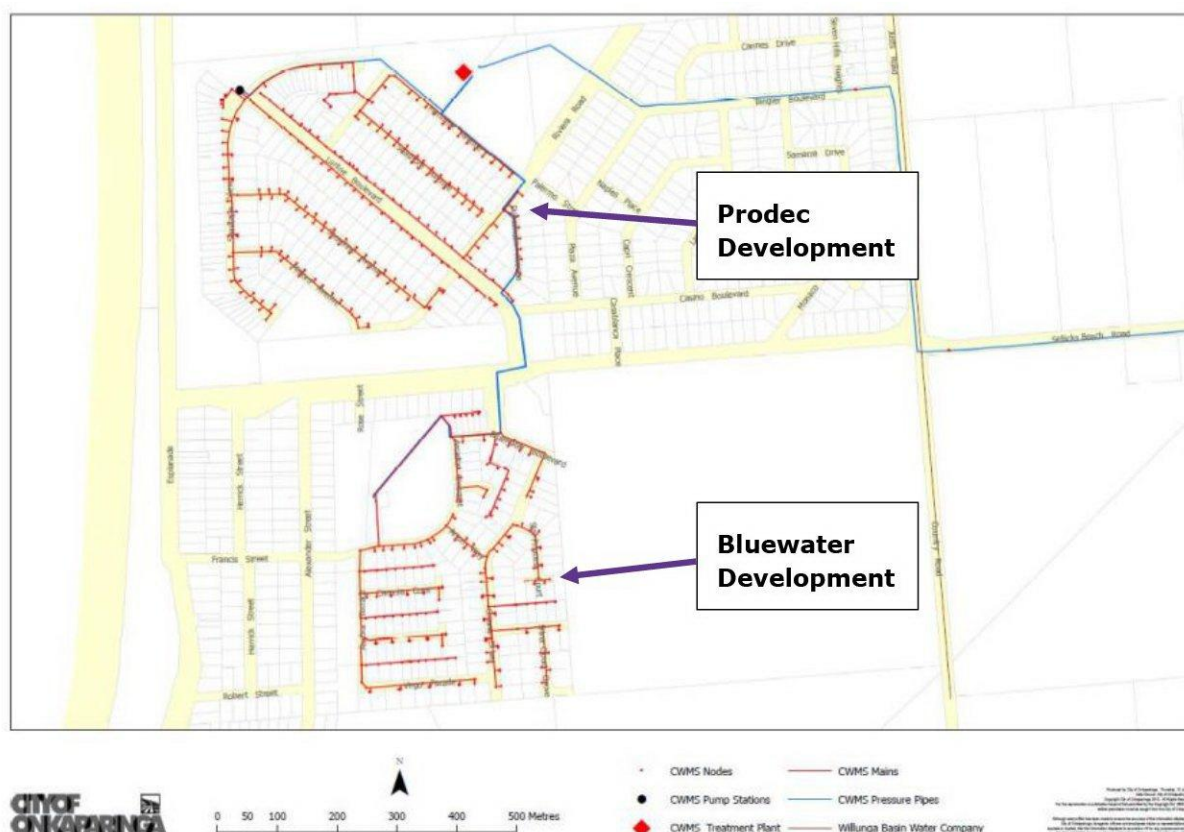


Figure 8: Existing CWMS infrastructure

Table 4-1: Population and flows from current developed areas

	Allotments	Population	Flow (kL/day)
Existing Occupied Allotments (ABS, 2016) – refer Section 3.1	1,317	3,293	560*
Undeveloped allotments - refer Section 3.1	156	405	69
Total - refer Section 3.1	1,473	3,698	629

*A significant proportion of the existing occupied properties are not connected to the CWMS which would explain the difference between the flow rates entering the WWTP and the estimated flow rate generated by all existing occupied allotments as presented in Table 4-1 above. This shows that the Sellicks Beach WWTP does not have the capacity to service all existing occupied allotments and given the existing setback issues at the Sellicks Beach WWTP, further upgrades to increase the population served by the WWTP cannot be undertaken. Restrictions on WBWC's treated wastewater flowrate intake from the Sellicks Beach WWTP is also a limiting factor. Hence, a new wastewater treatment solution and disposal path is required to allow future growth to occur within Sellicks Beach.

4.5.5 Population and Flows from the developable area

The contribution of flows to a new WWTP from the deferred urban area, primary production zone and residential zone (i.e. the developable area) is shown in Table 4-2, together with the combined total with



the existing allotments and a combined total assuming redevelopment within existing allotments with areas greater than or equal to 650 m².

Table 4-2: Population flows from developable area

	Developable Area Allotments	Developable Area Population	Developable Area Flow (kL/day)	Total Flow (incl. Existing Allotments) (kL/day)	Total Flow (incl. Existing Allotments and redevelopment) (kL/day)
No. 750m ² dwellings	1,107	2878	489	1,118	1,262*
No. 450m ² dwellings	1,845	4796	815	1,444	1,588*

* Ultimate development scenarios

It is noted the resultant treatment capacity of a WWTP servicing the ultimate development scenario in Sellicks Beach is expected to be approximately 20-30% greater than the capacity of the existing Willunga WWTP (1,060kL/day design capacity).

If redevelopment is taken into consideration within the current developed areas, it is estimated that there are 325 allotments with allotment areas greater than or equal to 650 m², and depending on the Council development policy, these allotments could be subdivided (i.e. 1 lot subdivided into 2 lots) in the next 25 years. This could yield an additional 325 properties, resulting in an additional population of 845 people (based on 2.6 persons per allotment) and an increase in the daily inflow by 144 kL/day (based on 170 L/pp/day).

Based on the estimates provided in Table 4-2, the revised values incorporating redevelopment are 1,262 kL/day for the 750 m² dwelling size scenario or 1,588 kL/day for the 450 m² size scenario, which are the ultimate development scenarios. These flow rates represent a total of between 2,855 - 3,592 allotments; the upper limit compares well with SA Water's investigations which estimates a future total dwelling figure of 3,615 allotments as per Table 4-3 below.



4.5.6 Aldinga WWTP – SA Water Investigation

SA Water has conducted an investigation into sewerage the Sellicks Beach area as recently as 31 February 2020. This investigation was preliminary, and the findings are to be treated as such. The investigation contemplated the following:

Table 4-3: SA Water Modelling Parameters

Area	Provided data				Modelled data	Comments
Existing allotments (potential)	1142	1142	1142	1142	1512	The calculated number of potential future customers (parcel and high-density living sites) from SA Water's GIS data was higher
Existing (estimated connections from the total allotment number)	400	400	400	400		
Dwellings/gross ha	10	10	15	15	15	
Residential area (undeveloped) ha	5	5	5	5	8.2	The calculated undeveloped area from SA Water's GIS data was higher than the provided data.
Residential area (undeveloped) allotment #	50	50	75	75	123	
Total Area	132	132	132	132		
Future site area (ha)	122	122	122	122		
Future allotments	1220	1320	1830	1980	1980	
Total new dwellings	1670	1770	2305	2455		
Total dwellings	2812	2912	3447	3597	3615	

In order to service Sellicks Beach and the surrounding area SA Water's initial investigations have centred around providing a backbone only for developers and existing residents to connect to. Our starting position on this is a three-pump option.

Pump Station A

The main pump station which directs wastewater flows to the Aldinga Wastewater Treatment Plant.

- The pumping main has been estimated at approximately 7,340 metres of DN 250



- Gravity Main of approximately 5,655 metres of DN 150 connecting the other pump stations
- Gravity Main 1350 metres of DN 225
- Gravity Main 690 metres of DN 300
- Gravity Main 20 metres of DN 375

Two re-lift pumps have also been included in the servicing plan – Pump Station B and Pump station C.

Pump Station B

- Pumping Main 620 metres of DN 200
- Gravity Main 2685 metres of DN 150
- Gravity Main 575 metres of DN 225

Pump Station C

Pumping Main 330 metres of DN 100

It is proposed that the Sellicks Beach wastewater catchment be serviced by the Aldinga treatment plant. The upgrades to the Aldinga Wastewater Treatment Plant have been split into two stages

- Stage 2A to be completed towards the end of this year early next year. **(Note: based on discussions with SA Water, Stage 2A has been designed to cater for the Aldinga area only, and at this stage it is not clear whether the WWTP can cater for the fully developed scenario within Aldinga. Once the WWTP is commissioned and running, the plant capacity will be reassessed to determine actual treatment capacity).**
- Stage 2B: WWTP to service approximately 10,300 connections forecast for approximately 10+ years depending on demand and the plants performance. **(Note: based on discussions with SA Water Stage 2B is expected to cater for the Sellicks Beach area).**

Please be advised that the information above is in its infant stages and is very generic. SA Water is refining its plans for this area in order to garner the best possible outcome for existing and future customers.

The above advice is based upon a desk top investigation and modelling, whilst SA Water endeavour to encapsulate all of the works potentially incurred to service the above mentioned development, there are possibilities for the requirements to vary upon a more thorough investigation being conducted, alterations to the number of allotments being created, the number of fixture units, peak flows and/or a change in the nature of development will have implications on this advice provided and a new investigation will be required. Should everything remain the same this advice is valid for 12 months.

4.5.7 New Pump Station and Rising main to Willunga WWTP

Council owns the CWMS network in Willunga, however the Willunga WWTP is owned by TRILITY. Ownership of the Willunga WWTP will be transferred to Council at the end of the 25-year Build, Own, Operate, Transfer (BOOT) agreement.

The Willunga WWTP is approximately 10 km in a direct line from Sellicks Beach, and approximately 15 km via the road network.

One option is the construction of a new pumping station within Sellicks Beach (probably at the current WWTP site) and a new rising main along the road network to the Willunga WWTP. At this stage, an assessment of any upgrade requirements at Willunga WWTP has not been undertaken. As mentioned previously, a capacity assessment is currently being undertaken at the Willunga WWTP by Tonkin.

A new pump station would need to receive the flows from the fully developed area (i.e. primary production + deferred urban + residential areas), in addition to the existing areas, of up to 1,588 kL/day (assuming 450 m² allotments plus redevelopment in existing areas with allotments greater than 650 m²) and have sufficient emergency storage to prevent overflows.

The main advantages of this option are:

- The full developable area in Sellicks Beach will be available for development.
- Additional utilisation of existing facilities (Willunga WWTP).
- Removal of wastewater issues from Sellicks Beach.
- The existing infrastructure at Willunga WWTP for storage, sludge management and disposal/re-use of recycled water can be used for the wastewater from Sellicks Beach.
- The main disadvantages of this option are:
- Long conveyance of wastewater means additional features to deal with septicity and potential odours at Willunga WWTP.
- Consideration of a booster pump station to assist in hydraulics of conveyance will add to cost.

The approximate location of the existing Willunga WWTP in relation to the Sellicks Beach developable area is shown in Figure 9.

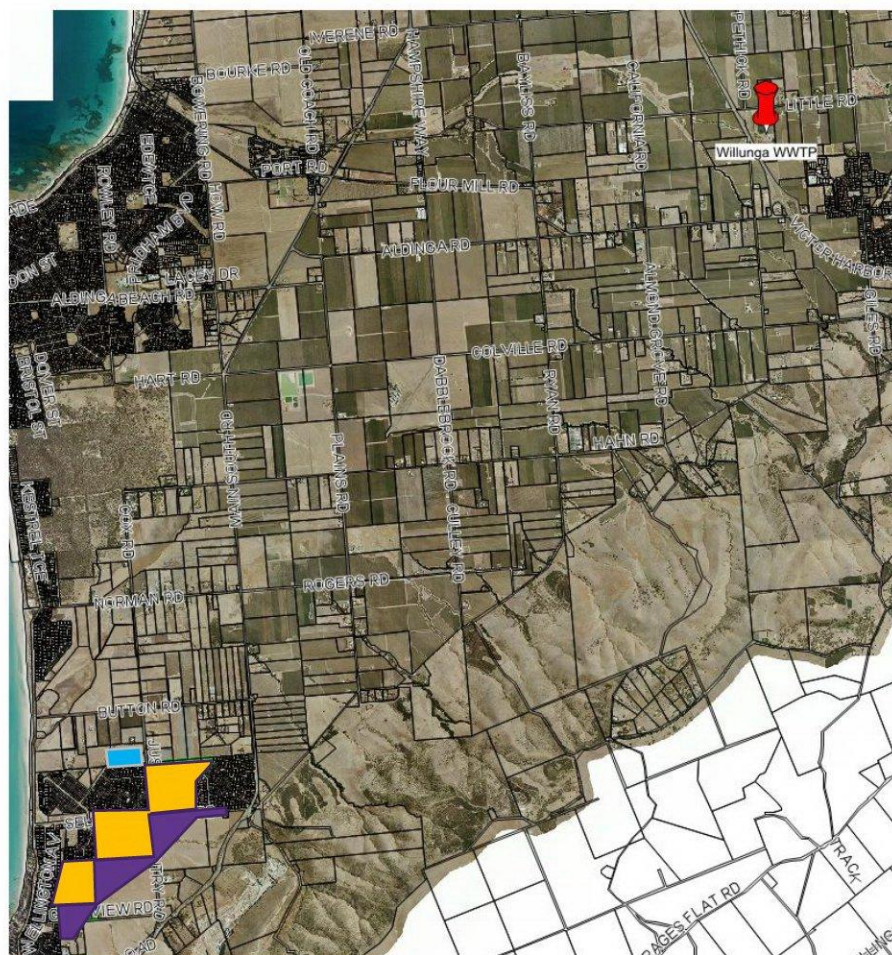


Figure 9: Study Area relative to Willunga WWTP



4.6 Full Sewer Collection System for Sellicks Beach

An investigation undertaken by SA Water in 2010 looked at options for managing wastewater from the Sellicks Beach and Silver Sands areas. The options assessed included a septic tank effluent disposal system (STEDS) and a full sewer system and took into consideration the potential for future development identified in the 30-year plan for the area.

The investigations concluded that a full sewer system would be required to service the existing and future developments within the Sellicks Beach area. This conclusion was based on an on-site wastewater treatment systems survey undertaken by Flinders University which found that the septic tanks in the area were failing and leaking, presenting a public health risk. Therefore, the STEDS solution was discounted.

It is understood that concept plans were prepared for a full sewer system, which were used to provide cost estimates for the following;

1. Upgrades to the Aldinga WWTP to service the Sellicks Beach Area,
2. Distribution Trunk Mains (including Pump Stations) for a full sewer system,
3. Reticulation Mains for the existing developed areas, and
4. Reticulations Mains for the new 'developable' areas.

The outcome of the SA Water investigation was that there was a project funding shortfall and a shortage of funds to cover the whole of life costs for the four components outlined above.

SA Water required the project funding and whole of life cost shortfalls to be funded externally to SA Water in order for the project to proceed, provided that there was majority support (i.e. less than a third of the community opposed to a full sewer scheme) within the community for the project to go ahead.

A letter prepared by SA Water (dated 9 August 2010) outlining the options considered to manage wastewater, cost estimates, funding shortfalls and requirements for the preferred sewer option to go ahead is provided in Appendix E. Based on discussions with SA water, the most recent investigations that have taken place look at providing a 'backbone system' as described in Section 4.5.6 for developers to connect into. Further investigations into a collection system have not occurred since the 2010 investigation.

5 Recommendations

The information in this analysis includes a number of assumptions that need to be tested and developed in more detail. The following further investigations are recommended:

- Further refinement of allotment sizes. This would be in conjunction with the development of layouts for the deferred urban, primary production and residential areas (streets, open space, commercial areas or schools).
- Confirm whether a primary school zone/child-care support is needed given that a birth to year 12 super school is being planned for Aldinga with the school zone extending into Sellicks Beach.
- It is recommended that a better understanding of the implications of the EPA guidelines relating to the quarry should be explored as it may place a potential constraint on the developable area within Sellicks Beach. The quarry site may also be an opportunity with the potential to generate recycled water for dust suppression.
- Liaison with SA Water to determine the scope of augmentation (i.e. 'backbone' only or full sewer collection and transfer systems) and whether augmentation fees are applicable for a potable water supply to the deferred urban, primary production and residential areas.



- The future water supply upgrades investigated by SA Water would provide capacity for 3,000 dwellings (including existing dwellings). Based on estimates within this investigation, it is estimated that with a 450 m² lot size and with redevelopment within larger allotments (i.e. greater than or equal to 650 m²) in current developed areas, there could potentially be a water supply shortfall for around 500 dwellings. Further liaison with SA Water is required to confirm augmentation requirements, once actual allotment yields in the new developable areas are confirmed. It is also noted that redevelopment within existing larger lots is expected to occur over the next 25 years.
- Further liaison with APA Gas by the developers during the master planning of the developments to incorporate an LPG gas supply. APA Gas consider it unviable to extend natural gas to the new developable areas, however an LPG gas network could be considered as an alternative option to service the area with gas and could ultimately make an extension of the natural gas supply to Sellicks Beach viable. The master planning process for the design of the new developments would need to consider locations where LPG tanks could be located. The design of the LPG gas reticulation lines would also need to consider a future change to natural gas.
- Based on a high-level assessment, NBN has stated that there is currently capacity in the NBN network to support an additional 1,845 lots (refer section 3.2.5) with fibre to the premises. The advice provided by NBN is based on the Deferred Urban, Primary Production and Residential Zones being developed as one master planned development. The Stage 1 entrance assumed in this investigation would not attract backhaul charges and as new stages within the single master planned development come online, the NBN network within the development would be extended. It needs to be confirmed whether all zones will be developed under one master plan or whether there will be separate developments under different master plans because for the latter scenario, the NBN network would need to be delivered to the first stage of each separate development which, subject to further detailed investigations, could include backhauling off a telecom retailer's (i.e. Telstra, Optus etc) network. NBN would therefore need to know how the parcels of land are anticipated to be divided and developed. A concept master plan for each zoned area as well as a detailed understanding of allotment yields would also assist in providing Council/NBN with a better understanding of augmentation requirements and likely costs associated with development.
- Noting that SAPN will fund the development of a new substation in Maslin Beach, and that the Aldinga Substation will be over loaded soon, it is recommended that the construction of a new substation be expedited. Council could assist SAPN by commencing the process of selecting a site to be set aside for a new substation in Maslin Beach. Further liaison with SAPN is recommended to determine power supply augmentation requirements and costs. It is also recommended that the power draw for future upgrades of the Aldinga or Willunga WWTP and future pump station infrastructure within Sellicks Beach are also considered.
- WWTP options assessment – which needs to consider the two options discussed herein and take into account environmental, social, technical and economic criteria. The WWTP has a material impact on development costs, and whether a developer would take an interest in Sellicks Beach.
- Indicative layouts and estimation of costs of a collection network servicing the existing old survey and on-site areas, as it is expected Council will need to install this network given the shortfalls highlighted by SA Water for SA Water to construct a sewer scheme. It should be noted that SA Water's investigation in to a sewerage scheme for Sellicks Beach was conducted in 2010. Therefore, to gain a current understanding of requirements, costs and feasibility, it is recommended that Council liaise with SA Water to provide an updated investigation for a full sewer system in Sellicks Beach.



6 Conclusion

This report has been written and the project team has liaised with NBN, WBWC, SA Water, APA Gas, SAPN and Council. Should Council decide to take this investigation to the next stage, we recommend engaging with a range of professional service providers to receive detailed advice on individual aspects pertaining to the development. Based on the high-level investigation that has been conducted, the following conclusions are made.

1. The development of the Deferred Urban, Primary Production and Residential zones will require augmentation for water supply, sewerage collection, transfer and treatment and SAPN. Augmentation of the NBN network is unlikely to be required, however this will depend on the capacity available at the time the developments commence, how the developments are staged and the master planning of the developments.
2. The supply of natural gas is currently unviable; however, a potential alternative solution is to supply LPG gas to the developments.
3. For the Aldinga WWTP to service the Sellicks Beach area, an upgrade to the treatment plant would be required. A reassessment of setback distances may also be required.
4. If the Willunga WWTP is to service the Sellicks Beach area, an upgrade to the treatment plant would be required. A reassessment of setback distances may also be required.
5. While WBWC's storage capacity for treated water has increased, the current maximum flow rate of 25 kL/hr from the Sellicks Beach WWTP cannot be exceeded.



Appendix A – SA Water – Water Supply

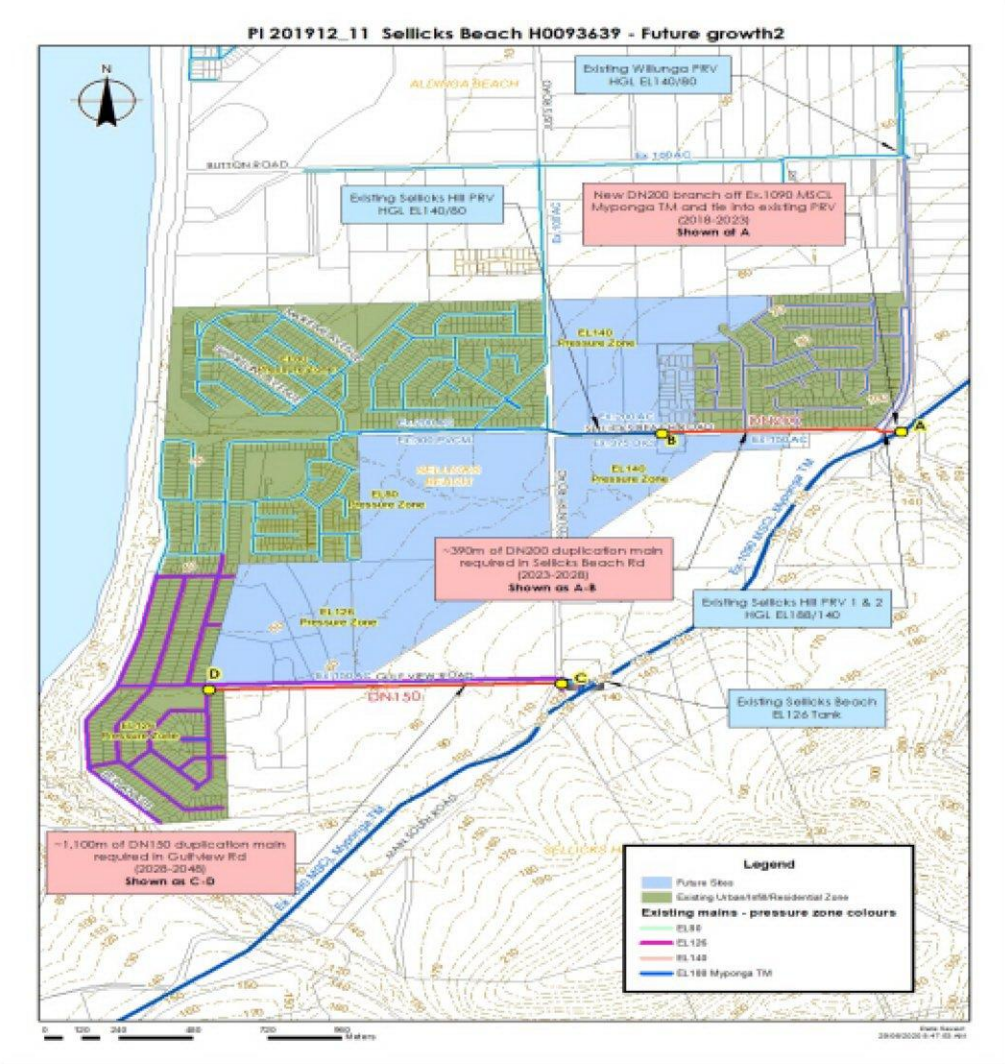
From: Wilkinson, Alex <Alex.Wilkinson@sawater.com.au>
Sent: Friday, 4 September 2020 12:33 PM
To: Deshitha Senanayake
Subject: Selicks - Beach Water

Hi Desh

Please find attached the prelim requirements for water within the Selicks Beach area. The nature of these requirements are preliminary only.

Based on Systems Planning investigation, the network has sufficient capacity to support the future growth in Selicks Beach to result in a total of 3,000 dwellings (including existing allotments), subject to the following augmentation works:

- 2018-2023
 - o Construct a new DN200 branch and main off the Ex.1090 MSCL Myponga TM and lay parallel to Ex.150 AC main in Selicks Beach Rd up to existing Selicks Hill EL188/140 PRV ~10m, **shown at A on Figure 1.** (duplicating supply to PRV)
- 2023-2028
 - o Construct a new DN200 main from existing Selicks Hill EL188/140 PRV in Selicks Beach Rd parallel to Ex.150 AC main (~390m length) and link-in to Ex.375 DICL main, **shown as A-B on Figure 1.** (duplicating supply from PRV to support future growth in the EL140 and EL80 pressure zone's)
 - o Upgrade Selicks Hill EL188/140 PRV to operate at increased flows, if required.
- 2028-2048
 - o Construct a new DN150 branch and main off the Ex.300 DICL Selicks Beach EL126 Tank outlet extending ~1,100m along Gulfview Rd, **shown as C-D on Figure 1.** (duplicating supply from Tank to support future growth in EL126 pressure zone).
 - o Upgrade inlet to Selicks Beach EL126 Tank inlet, if required.



The above advice is based upon a desk top investigation and modelling, whilst SA Water endeavours to encapsulate all of the works potentially incurred to service the above mentioned development, there are possibilities for the requirements to vary upon a more thorough investigation being conducted, alterations to the number of allotments being created, the number of fixture units, peak flows and/or a change in the nature of development will have implications on this advice provided and a new investigation will be required. Should everything remain the same this advice is valid for 12 months.

Kind regards

Alex Wilkinson
Account Manager – Land Development
SA Water
M 0436 684 899
E alex.wilkinson@sawater.com.au

Be green - read on the screen



Appendix B – APA Gas Supply

Deshitha Senanayake

From: David.Holden@agig.com.au
Sent: Monday, 3 August 2020 12:09 PM
To: Deshitha Senanayake
Subject: FW: [EXTERNAL] APA Gas infrastructure - Sellicks Beach
Attachments: 2020-07-28 - Sellicks Beach – Growth Area.pdf; P1080230.JPG; Indicative Design of LPG Compound.PDF

Hi Deshitha

Further to your enquiry regarding extending the natural gas distribution to Sellicks Beach, this is currently being evaluated by the APA Engineering Team.

However, as the closest natural gas mains to the proposed development is approximately ten kilometres away it would be grossly unviable to extend the gas mains at this point in time. Also an assessment of the existing mains would need to be conducted to determine whether there is sufficient capacity in the existing gas mains to support the gas demand of the proposed development.

As an option the installation of an LPG distribution network could be considered to service this area with gas supply. There are a number of residential housing developments within South Australia where it is unviable to extend natural gas infrastructure so LPG infrastructure has been reticulated. These developments include reticulated LPG networks in areas of; Roxby Downs, Victor Harbor, Renmark, Port Lincoln, Cape Jaffa Anchorage, Wallaroo, Mount Barker.

Australian Gas Networks have recently commissioned an LPG network at the housing development of Glenlea in Mount Barker. It is expected when fully developed Glenlea will include up to 600 dwellings with most dwelling connected to the LPG network. It is expected that eventually the natural gas network will be extended to Mount Barker and LPG networks converted from LPG to natural gas.

Each enquiry for an LPG distribution network would need to be evaluated to determine whether there would be a cost to the developer and if so what would that cost be. As an example, the LPG network at Glenlea is being installed at no-charge to the developer although there is an \$800 connection fee for each new connection to the network which is charged to the home builder upon application to connect to the network.

When installing an LPG network an area would need to be provided to accommodate the LPG gas tanks. Attached is an indicative design of an LPG gas tank compound, and photo to indicate what it would look like.

To evaluate the installation of an LPG network the following information would be required:

- A proposed location for the LPG tanks to be advised.
- Date when the subdivision would commence.
- Estimated build rate (of new homes) within the proposed subdivision
- Road layout of the proposed subdivision

Over a period of time it would be expected the existing natural gas reticulation network in Aldinga would continue to expand, in doing so could lessen the distance to extend the natural gas infrastructure to Sellicks Beach. Also there may be a point in time when the number of consumers connected to a proposed LPG network at Sellicks Beach would reach critical mass to enable the extension of natural gas infrastructure as a viable project.

Please advise if you require additional information or assistance.

Regards

David Holden

David Holden
Business Development Manager (South Australia)

M +61 408 456 684

E David.Holden@agig.com.au



Australian Gas Infrastructure Group

330 Grange Road, Kidman Park, SA 5025

agig.com.au

dbp.net.au

australiangasnetworks.com.au

multinetgas.com.au

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From: David Holden
Sent: Thursday, 9 July 2020 12:26 PM
To: Deshitha Senanayake <Deshitha.Senanayake@tonkin.com.au>
Cc: Jon Bush <Jon.Bush@agig.com.au>
Subject: RE: [EXTERNAL] APA Gas infrastructure - Sellicks Beach

Hi Deshitha

I will look at high-level options and catch up and discuss.

The assessment when considering / evaluating a mains extension a number of factors are considered. Basically an evaluation is done considering the revenue that is expected to be derived from the transportation of gas over an extended period of time versus the cost of the extending/installing the gas infrastructure. The difference between the two is called a shortfall. If there is a shortfall the developer would need to pay this if they wanted gas infrastructure installed.

The provision of gas infrastructure is not a legislative requirement, however it is something that new home owners want and adds to the marketing and sales of lots in a housing subdivision.

Regards

David Holden

From: Deshitha Senanayake <Deshitha.Senanayake@tonkin.com.au>
Sent: Thursday, 9 July 2020 9:59 AM
To: David Holden <David.Holden@agig.com.au>
Cc: Jon Bush <Jon.Bush@agig.com.au>
Subject: RE: [EXTERNAL] APA Gas infrastructure - Sellicks Beach

Thanks David –

I think Council would be interested to know about interim options in addition to the final option as you have proposed – it would definitely add value to the report that we are preparing for them.

With regards to the costs, who covers the costs for the infrastructure? Is there cost sharing between the developer and AGIG? Is the provision of gas a requirement in a new development?

Regards,

Desh

Deshitha Senanayake
Senior Engineer



Tonkin

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From: David.Holden@agig.com.au <David.Holden@agig.com.au>
Sent: Thursday, 9 July 2020 8:55 AM
To: Deshitha Senanayake <Deshitha.Senanayake@tonkin.com.au>
Cc: Jon.Bush@agig.com.au
Subject: FW: [EXTERNAL] APA Gas infrastructure - Sellicks Beach

Hi Deshitha

Thank you for your enquiry. There is existing gas infrastructure at Aldinga. There is the option of extending this infrastructure to Sellicks Beach. Also an option may be installing LPG gas infrastructure for a period of time until it is economical viable to extend the natural gas infrastructure to the area then convert the LPG infrastructure to N/G.

I will commence some preliminary assessments then catch up to discuss.

Regares

Regards

David Holden

David Holden
Business Development Manager (South Australia)

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IMPORTANT - This e-mail and any attachments are confidential.

From: Deshitha Senanayake <Deshitha.Senanayake@tonkin.com.au>

Sent: Wednesday, 8 July 2020 4:19 PM

To: Jon Bush <Jon.Bush@agig.com.au>

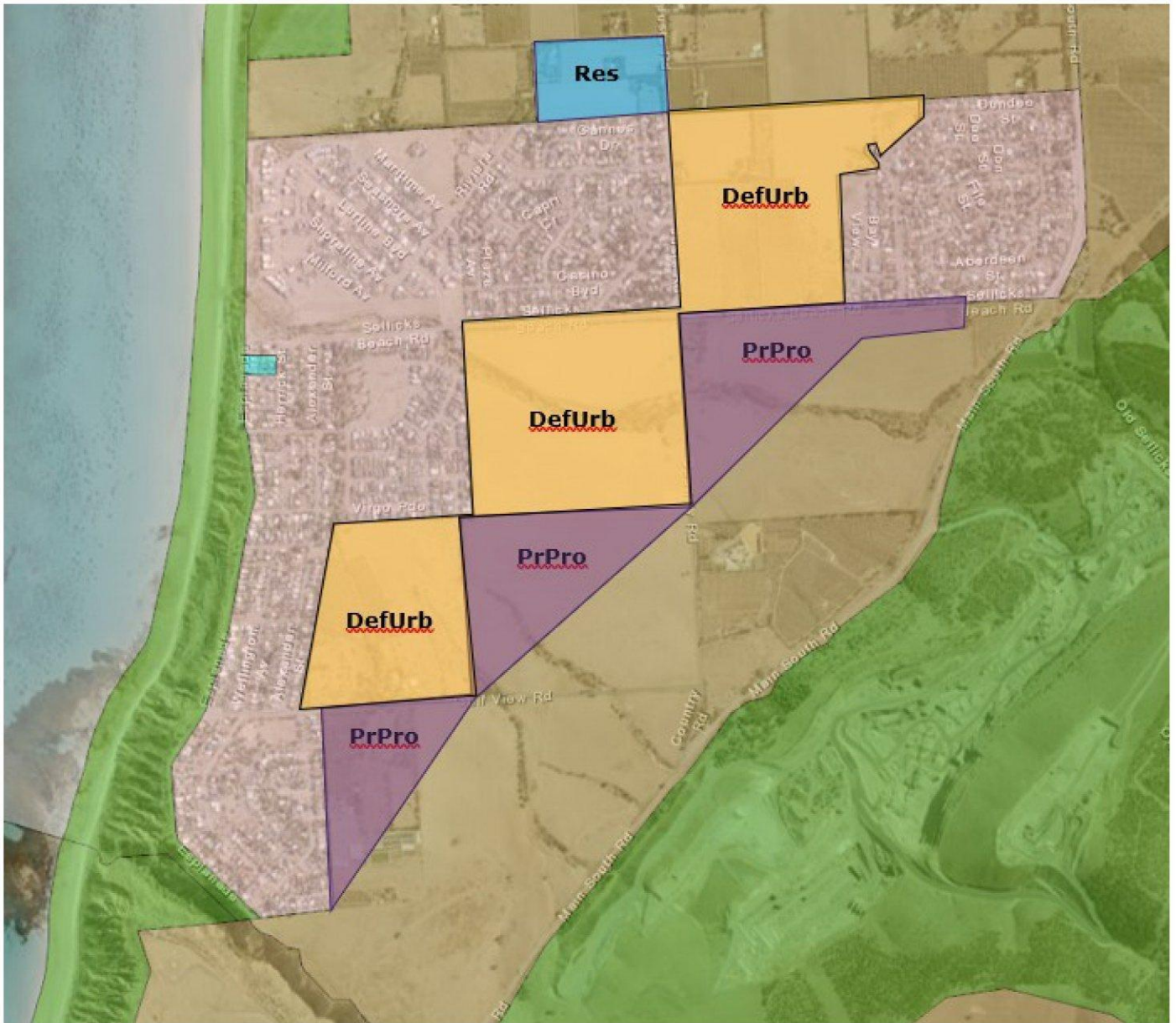
Subject: [EXTERNAL] APA Gas infrastructure - Sellicks Beach

Hi Jon,

As discussed, we have been engaged by the City of Onkaparinga to conduct an infrastructure assessment for the areas shown below in blue, orange and purple (i.e. Res, DefUrb and PrPro areas). Council plans to release these areas for future development but want to get an idea of what infrastructure is there and augmentation requirement to meet the new demand.

The total area is approx. 143 ha but once the watercourses, roads and open spaces are taken into account, we estimate that the developable area is around 84 ha.

Based on a 750 m² lot size, this would equate to around 1124 new lots (assuming all are residential).



We are still waiting on Council to confirm the assumptions stated above, so once they confirm the parameters, we will look to send through revisions to the above.

If you could provide some high level information on the existing infrastructure within Sellicks Beach, the capacity of the existing infrastructure, augmentation requirements to meet the new demand of 1124 new lots, high level costs involved, any known constraints etc that would be appreciated.

We would need the information as soon as possible given that our report to council is due on 31 July.

Regards
 Desh

Deshitha Senanayake
 Senior Engineer



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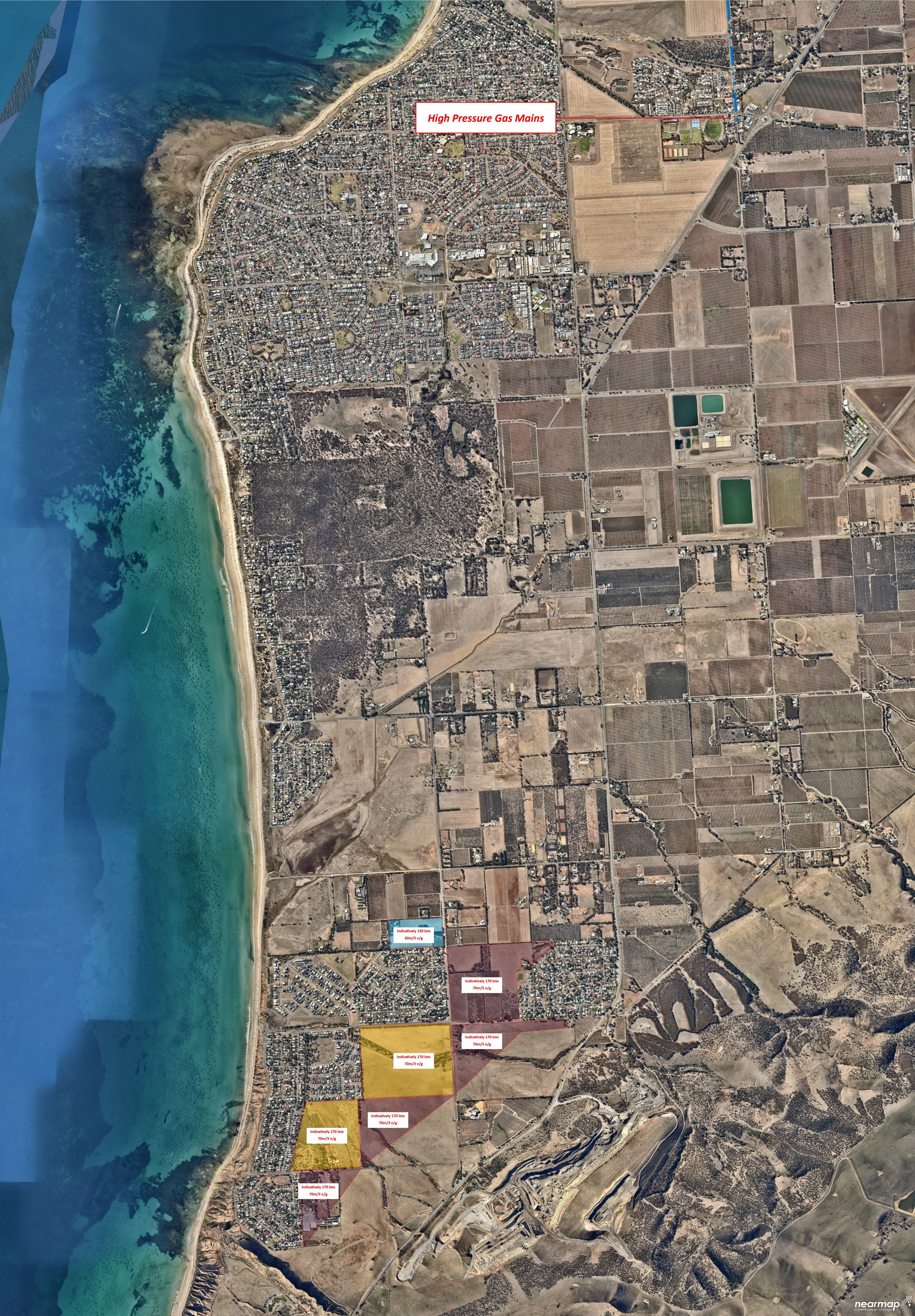
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High Pressure Gas Mains

Indicatively 150 lots
60m/3 n/g

Indicatively 170 lots
70m/3 n/g

Indicatively 170 lots
70m/3 n/g

Indicatively 170 lots
70m/3 n/g

Indicatively 170 lots
70m/3 n/g

Indicatively 170 lots
70m/3 n/g





Appendix C – National Broadband Network

1.1 NBN to Sellicks Beach

As part of their assessment, NBN required a parcel of land to be nominated as "Stage 1" (or the first parcel of land that would be developed) and an entrance point to be specified. In liaison with Council, and in light of the fact that there are currently no plans in place for knowing which of the parcels will form Stage 1, the 'Deferred Urban' parcel shown in red in the figure below was selected as Stage 1, with the entrance denoted by the star. The basis for the selection of this parcel is as follows:

- It is assumed that given the existing level of development on either side, this parcel of land could be developed sooner than others
- There are no large watercourses running through this parcel

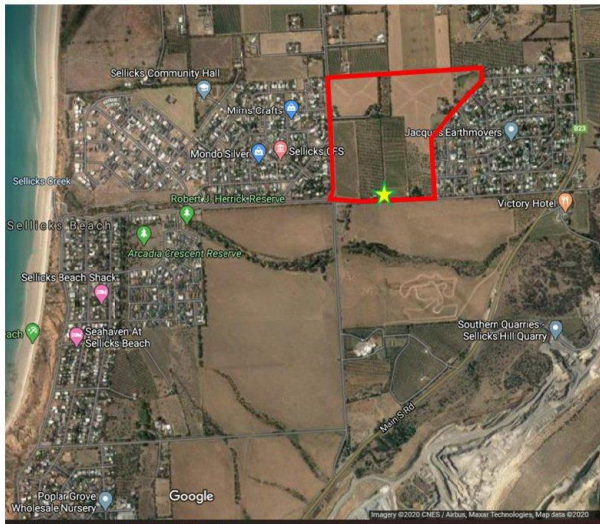


Figure 1: Stage 1 parcel and "entrance" point

11 August 2020

We've undertaken a high level planning assessment and there is currently capacity in our network to support the development with Fibre to the Premises via the proposed stage one entrance per the supplied image on Sellicks Beach Road. There for no backhaul charges would apply to service the development. This capacity would suit residential and business grade services and is based on 1845 lots.

The development would be serviced via our new development program, where we would enter into a Master Developer Agreement with the developer. The Telecommunications Infrastructure in New Developments (TIND) Policy which sets the nbn pricing is currently under review and expect to be released in the coming weeks. I'd recommend that this project is reviewed once the new policy is live. Currently the per premises/lot charge is \$600 Single Dwelling Unit and \$400 per Multi Dwelling Unit inc GST (regardless of the lot use ie residential/commercial)

If all of the parcels of land will be developed from the proposed stage 1 entrance contiguously on a stage by stage basis under one master plan then there wouldn't be an additional new development charges other than the per premises contribution

*If each parcel will be developed individually, under individual master plans then the **nbn** network would need to be delivered to the first stage of each separate development, in which case we'd need to do a planning assessment on each parcel based on where we'd need to bring the network to. Given the capacity of the fibre in the surrounding area of Sellicks Beach, this isn't anticipated to be problematic, however further detail would be required to confirm backhaul costs, such as detail of how the parcels are anticipated to be divided and developed or a concept master plan for each as well as anticipate yield per parcel.*

I'd be more than happy to catch up with council to discuss further

Cheers

Jodie

Jodie Lunn

Senior Business Development Manager SA/NT

New Developments; Business, Enterprise & Government

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jodielunn@nbnc.com.au

business **nbn**[™]



Appendix D – SA Power Networks

Deshitha Senanayake

From: Pat Howard <Pat.Howard@sapowernetworks.com.au>
Sent: Thursday, 30 July 2020 3:16 PM
To: Deshitha Senanayake
Subject: RE: Development at Sellicks Beach - Power

Hi Desh,

I have checked with our planning department is pretty similar to what was provided last time.

We could supply up to about 1MVA load (around 200 houses) south of Sellicks Beach Road from Myponga Sub. The remaining load increase will need to connect to Aldinga Substation which will be overloaded quite soon so that will very much limit what can be installed in the very near future as it is around 18 months to install a new substation. To alleviate this, we will need a new substation north of Aldinga Sub, somewhere between Seaford Substation and Aldinga Substation. If the Council could assist us in getting a land parcel (approximately 100m x 100m) in that vicinity along the 66kV line, that would be terrific. We definitely need to start looking at that if this development is going to take off.

Taking your median lot size of 750m would require around 5,000kVA, at 450m around 8,500kVA. Previously we were planning to build a new feeder from Aldinga but this is no longer an option until the new substation north of Aldinga is completed. Once Maslin Sub is complete, load can be transferred from Aldinga and the new feeder can be built cost still around \$1.5M to \$2.0M. We will still fund the new substation, however the developer would be up for \$265 per kVA in addition to the costs of building the new feeder and reticulation within the substation.

Hopefully this helps, let me know if you need any clarification

Cheers

Pat

Regards

Patrick Howard
Senior Project Manager

Mobile: 0403 582 283
pat.howard@sapowernetworks.com.au

From: Deshitha Senanayake <Deshitha.Senanayake@tonkin.com.au>
Sent: Wednesday, 22 July 2020 9:10 AM
To: Pat Howard <Pat.Howard@sapowernetworks.com.au>
Subject: RE: Development at Sellicks Beach - Power

External email! - Think before you click.

Hi Pat,

As discussed, we have been engaged by the City of Onkaparinga to conduct an infrastructure assessment for the areas shown below in blue, orange and purple (i.e. Residential (Res), Deferred Urban (DefUrb) and Primary Production (PrPro) areas). Council plans to release these areas for future

development and they want to get an idea of what infrastructure is there and augmentation requirements to meet the new demand.

The total area is approx. 143 ha but once the watercourses, roads and open spaces are taken into account, we estimate that the developable area is around 830,000 m².

Council have asked us to consider two development scenarios within the developable area -

- Residential development based on a 750 m² lot size - this would equate to around 1107 new lots
- Residential development based on a 450 m² lot size - this would equate to 1845 new lots

There are plans to provide a neighbourhood centre/primary school in the middle Deferred urban parcel on the south west corner of Country Road / Sellicks Beach Road but for the purposes of our investigation we are assuming the area is all residential, with the assumption being that residential units would draw more power than a neighbourhood centre?. Based on discussions with Council either the Aldinga Wastewater Treatment Plant (WWTP) or the Willunga WWTP has been earmarked for taking in waste water flows from Sellicks beach - these treatment plants would need to be upgraded before this occurs. For the purposes of our high level assessment I think assume the same max power draw of 200-300 kW for upgrades at the Aldinga WWTP or the Willunga WWTP.

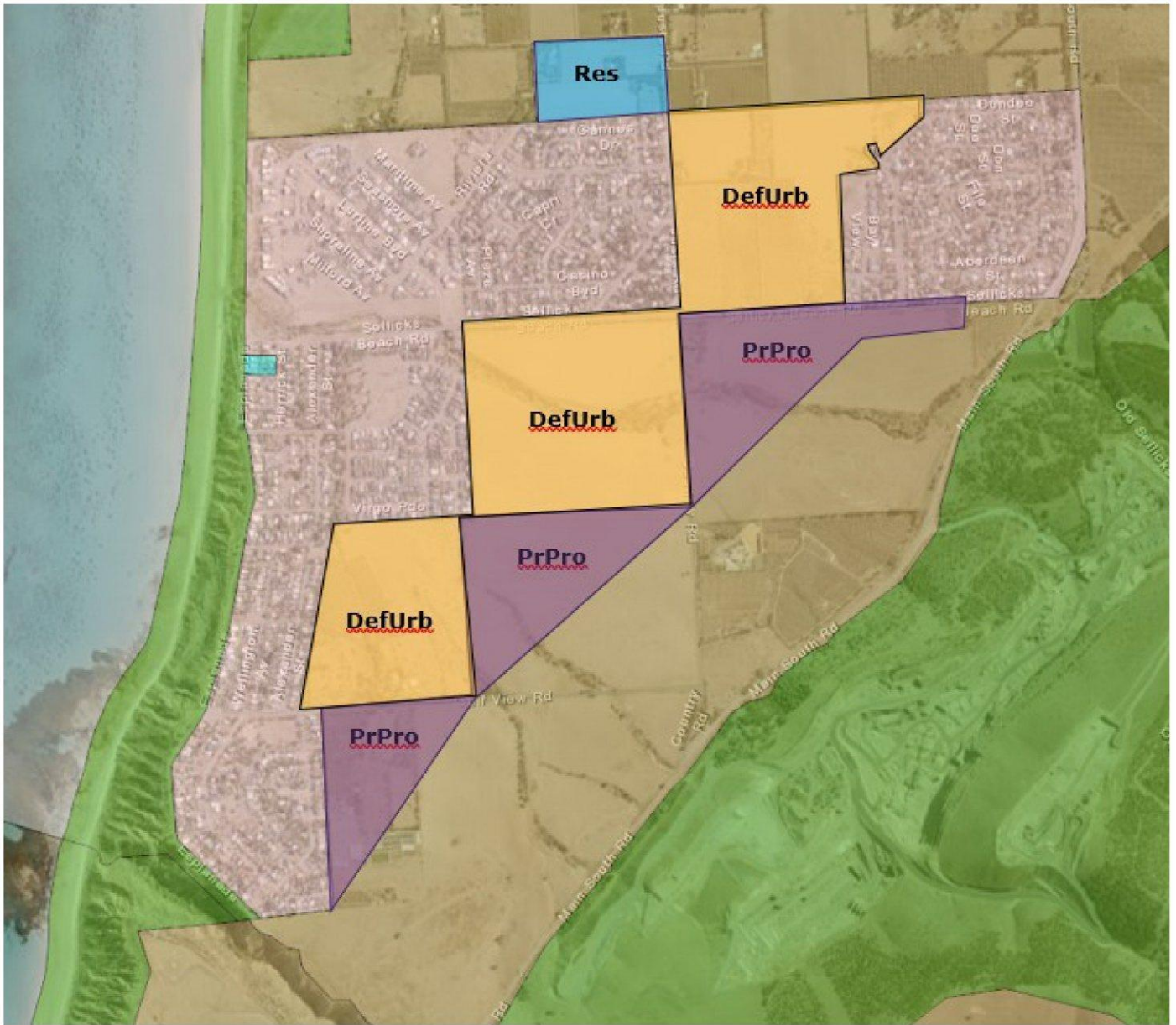




Figure 4.6 Potential Neighbourhood Centre Location (Site B)

Average lot sizes in the Sellicks beach area are around 730 m2 based on the existing residential allotments in the figure below.



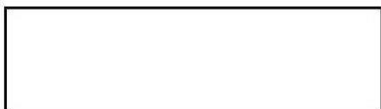
If you could provide some high level information on the existing infrastructure within Sellicks Beach, the capacity of the existing infrastructure, augmentation requirements to meet the new demand of the new lots, high level costs involved, any known constraints etc that would be appreciated. Provided below is the email trail from the previous study that we did earlier this year.

We would need the information as soon as possible given that our report to council is due on 31 July.

Regards,

Desh

Deshitha Senanayake
Senior Engineer



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Appendix E – SA Water - Sewer

Deshitha Senanayake

From: Wilkinson, Alex <Alex.Wilkinson@sawater.com.au>
Sent: Wednesday, 29 July 2020 4:49 PM
To: Deshitha Senanayake
Subject: Sellicks Sewer

Hi Deshitha

SA Water has conducted an investigation into sewerage the Sellicks Beach area as recently as 31/02/2020. This investigation was preliminary and the findings are to be treated as such. The investigation contemplated the following:

Area	Provided data				Modelled data	Comments
Existing allotments (potential)	1,142	1,142	1,142	1,142	1,512	The calculated number of potential future customers (p high-density living sites) from SA Water's GIS data was hi
Existing (estimated connections from the total allotment number)	400	400	400	400		
Dwellings/gross ha	10	10	15	15	15	
Residential area (undeveloped) ha	5	5	5	5	8.2	The calculated undeveloped area from SA Water's GIS higher than the provided data.
Residential area (undeveloped) allotment #	50	50	75	75	123	
Total area (ha)	132	132	132	132		
Future site area (ha)	122	122	122	122		
Future allotments	1,220	1,320	1,830	1,980	1,980	
Total new dwellings	1,670	1,770	2,305	2,455		
Total dwellings	2,812	2,912	3,447	3,597	3,615	

In order to service Sellicks Beach and the surrounding area our initial investigations have centred around providing a backbone only for developers and existing residents to connect to. Our starting position on this is a three pump option.

Pump Station A is the main pump station directing waste to the Aldinga Plant

- The pumping main has been estimated at approximately 7,340 metres of DN 250
- Gravity Main of approximately 5,655 metres of DN 150 connecting the other pump stations
- Gravity Main 1350 metres of DN 225
- Gravity Main 690 metres of DN 300
- Gravity Main 20 metres of DN 375

Two re-lift pumps have also been included in the servicing plan

Pump Station B

- Pumping Main 620 metres of DN 200
- Gravity Main 2685 metres of DN 150
- Gravity Main 575 metres of DN 225

Pump Station C

- Pumping Main 330 metres of DN 100

It is proposed that the Sellicks Beach wastewater catchment be serviced by the Aldinga treatment plant. The upgrades to the Aldinga Waste Water Treatment Plant have been split into two stages

- Stage 2A to be completed towards the end of this year early next year

- Stage 2B: WWTP to service approximately 10,300 connections forecast for approximately 10+ years depending on demand and the plants performance.

Please be advised that the information above is in its infant stages and is very generic. SA Water is refining its plans for this area in order to garner the best possible out come for existing and future customers.

The above advice is based upon a desk top investigation and modelling, whilst SA Water endeavour to encapsulate all of the works potentially incurred to service the above mentioned development, there are possibilities for the requirements to vary upon a more thorough investigation being conducted, alterations to the number of allotments being created, the number of fixture units, peak flows and/or a change in the nature of development will have implications on this advice provided and a new investigation will be required. Should everything remain the same this advice is valid for 12months.

Please do not hesitate to contact me if you should have any queries.

I hope this assists.

My apologies for noyt having anything for you in relation to water I completely missed this.

Kind regards

Alex Wilkinson
Account Manager – Land Development
SA Water
M 0436 684 899
E alex.wilkinson@sawater.com.au

Be green - read on the screen

South Australian Water Corporation disclaimer

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9 August 2010



T. Skeliff

**SOUTH AUSTRALIAN
WATER CORPORATION**

Mr Jeff Tate
Chief Executive Officer
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Telephone +61 8 8204 1000

ABN 69 336 525 019

Dear Mr Tate *Jeff*

Re: Sellicks Beach and Silver Sands Sewerage Scheme Proposal

In response to the City of Onkaparinga's request, SA Water has explored options for managing wastewater from the Sellicks Beach and Silver Sands areas to mitigate potential public health issues associated with failing privately owned septic tanks systems. These activities have taken into consideration the need for management of wastewater from potential future development identified in the 30 year plan for the area.

Options of both centralised septic tank effluent disposal system (STEDS) and sewerage network and treatment system have been considered. A centralised STEDS system would represent the lowest cost option but was discounted due to failure of the septic tanks¹, and the environmental and potential public health impact their leakage would continue to cause. Rectification of these issues would be at significant cost to private land owners notwithstanding the high ongoing operating and maintenance costs. As a result, the option of providing a sewer system discharging to SA Water's Aldinga Wastewater Treatment Plant is regarded as the best long term solution for the area.

SA Water has not investigated the provision of recycled water for irrigation or dual reticulation and this would be the subject of future negotiation with the City of Onkaparinga.

The extension of sewer systems to service Sellicks Beach and Silver Sands would be undertaken in accordance with SA Water's Mains Extension Policy (1987). Under this policy, a standard capital contribution (SCC), indexed to the financial year 2010/11 rate of \$5,935 plus application fee is required from each property owner of an existing allotment upon connection. SA Water would then provide a subsidy of \$8,902 per existing allotment in addition to funding all costs associated with the required wastewater treatment plant upgrade.

Further, each property owner who has an existing septic tank system or advanced wastewater management system may be entitled to a rebate of \$1,500 or \$2,500 respectively, depending on the eligibility criteria being met. Each property owner will also be responsible for all costs to connect to the new sewer system at their property.

¹ On-site Wastewater Treatment Systems Survey Sellicks Beach and Aldinga Beach 2007, Flinders University, 2008.



**Government
of South Australia**

The sewerage network and treatment option would require the following infrastructure and capital investment:

Item	Infrastructure Description	Details	
1	Wastewater Treatment Plant	Proposed wastewater treatment at SA Water's existing Aldinga Wastewater Treatment Plant. A capacity upgrade is required to treat additional sewerage.	\$28 million
2A	Distribution Trunk Main	Approximately 12 kilometres (km) of various diameter pipelines plus 4 sewerage pump stations.	\$38 million
2B	Reticulation (Existing Allotments – Sellicks Beach and Silver Sands)	Approximately 23 km of various diameter pipelines.	
3	Reticulation (Future Development – Sellicks Beach)	Approximately 11 km of various diameter pipelines.	\$20 million
4	Estimated Total Project Cost		\$86 million

Table 1 – Proposed Infrastructure Components

A preliminary financial analysis was undertaken based on the required infrastructure components outlined in Table 1 with the following key issues identified:

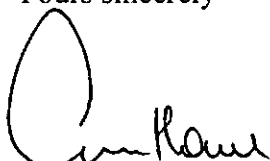
- a) A project funding shortfall of \$13 million; and
- b) Shortage of funds to cover whole of life distribution costs of the project (both the wastewater treatment plant component and the distribution main/reticulation components), estimated at approximately \$1.15 million (on average) per annum.

SA Water will only proceed with this project on the basis that the project and whole of life distribution cost shortfalls are funded externally to SA Water. As such, SA Water welcomes the opportunity to discuss avenues that may be available to the City of Onkaparinga to contribute to the project shortfall. Concurrently, SA Water will also commence discussions with the South Australian Government for the remaining shortfall.

Additionally, confirmation will be required from property owners of the affected areas that less than one third are opposed to the scheme, in order for the scheme to proceed to the next stage. This will be determined through a formal voting process undertaken by an independent third party service provider.

I trust the above provides an overview of the key project issues to enable the City of Onkaparinga to deliberate and respond to SA Water regarding potential funding opportunities.

Yours sincerely



Anne Howe
CHIEF EXECUTIVE



SEWERAGE SCHEME PROPOSED FOR SELICKS BEACH AND SILVER SANDS BY SA WATER

Council has voted to support and advocate for a sewerage scheme to be installed by SA Water in Sellicks Beach and Silver Sands (Aldinga Beach). The proposed scheme would address long-standing public and environmental health issues in Sellicks Beach and Silver Sands related to failing household effluent management systems such as septic tanks.

SA Water is currently collecting feedback on their sewerage scheme proposal for Sellicks Beach and Silver Sands. A copy of their project information sheet is attached.

WHAT ARE SA WATER'S RESPONSIBILITIES?

Sellicks Beach and Silver Sands are located within the urban boundary of Adelaide and thus fall within SA Water's service area.

SA Water is responsible for the project design for the proposed sewerage scheme, its development, costing, funding and operation. The scheme would form part of the broader SA Water network once completed.

SA Water is also responsible for charges to property owners for the establishment of the scheme and subsequent operating charges such as sewerage rates.

WHAT IS COUNCIL'S ROLE?

Our role includes advocating on behalf of the Sellicks Beach and Silver Sands communities for a sewerage system. This has been in response to the high failure rate for on-site effluent management systems in Sellicks Beach and parts of Silver Sands and resulting potential for health and other impacts.

We have supported in principle the proposal by SA Water to install a reticulated sewerage scheme in Sellicks Beach and parts of Silver Sands. The detail of the proposed scheme has recently been released. We will provide feedback to SA Water on the detail of the proposal as the project proceeds and as the outcomes of the community engagement program being conducted by SA Water are known.

We also control a range of public health risks as required by the Public and Environmental Health Act 1987. This includes monitoring any risks associated with the operation and performance of on-site effluent management systems, and enforcement of legislation where required.

WHAT IS THE PROPERTY OWNER'S ROLE?

Property owners have a legal responsibility to manage effluent on their property in accordance with relevant legislation and standards.

This can include an on-site solution such as a septic system or aerobic system or connection to an external service such as an SA Water sewerage system or our community waste management scheme if connection is available.

Note that if an on-site system is operated and maintained in accordance with relevant legislation, the property owner is not obligated to connect to another available sewerage service. However, our experience indicates that most property owners decide to connect to an external service. This is due to the convenience, reduced maintenance and, in some cases, enhanced property value that may result.

The property owner's obligations for on-site systems include but are not limited to:

- ensuring connection to a waste control system that complies with public health and environmental protection legislation
- ensuring that effluent does not leak from the system and seep to the surface or enter a watercourse or stormwater system

- tanks must be de-sludged and pumped out every four years
- ensuring that treated effluent from an aerobic system is irrigated over a defined landscaped area of no less than 200 square metres
- ensuring that aerobic systems are serviced on a quarterly basis by a licensed contractor.

WHAT ARE THE FINANCIAL IMPLICATIONS FOR PROPERTY OWNERS?

If a sewerage service is provided to a property, the property owner is responsible for any charges imposed by SA Water for the connection and on-going service.

In addition, property owners are responsible for any on-property costs associated with connection of the premises to the sewer connection point. These costs will vary from property to property, and owners should obtain their own independent quotes from a registered plumber for on-property works.

FURTHER INFORMATION

For further information on the SA Water proposal for a sewerage scheme for Sellicks Beach and Silver Sands contact SA Water on 1800 812 362.

For information on the operation and maintenance of an existing or proposed on-site effluent treatment and disposal system, please contact the City of Onkaparinga's Environmental Health team on (08) 8384 0666 or email mail@onkaparinga.sa.gov.au