TIMARU DISTRICT COUNCIL

CONSULTATION RECORD

GENERAL DETAILS:

PROJECT	Plan Change 19 – Geraldine Industrial
PRESENT	George Harper, Lynn River
	Mark Geddes, Timaru District Council
DATE	14 May 2013
LOCATION	Lynn River, Talbot Street
PREPARED BY	Mark Geddes

QUESTIONS & RESPONSES

1	QUESTION	What type of industrial activity do you operate?
	RESPONSE	Glove and safety wear manufacture, importer and exporter. National market. International market mainly restricted to Australia.
2	QUESTION	When was the business established?
	RESPONSE	42 years ago
3	QUESTION	How many full time staff do you employ?
	RESPONSE	30
4	QUESTION	Why have you chosen Geraldine and your site?
	RESPONSE	The business was started by two local farmers who wanted to do something for the town. Now, with modern communications, it is just as easy to be here as anywhere else. The town offers a good lifestyle.
5	QUESTION	Is future expansion of your operation anticipated?
	RESPONSE	Yes, we have run out of room.
6	QUESTION	Is the size and location of your site a constraint to your growth?
	RESPONSE	Yes
7	QUESTION	Would an out of town industrial park work well for your business?
	RESPONSE	Yes
8	QUESTION	Do you think there is a shortage of industrial land in Geraldine?
	RESPONSE	Yes
9	QUESTION	Do you see the shortage of industrial land in Geraldine a future constraint for your business?

	RESPONSE	Yes
10	QUESTION	What is the ideal location for your business?
	RESPONSE	Geraldine, within the town, so that we can walk and bike to work and close to town centre services.
11	QUESTION	Do you have a suitable labour pool in Geraldine?
	RESPONSE	Yes, to a certain level. However higher skilled staff are difficult to find.
12	QUESTION	Does Geraldine have adequate transport services for your business?
	RESPONSE	Yes, there is 12 courier pick up per day
13	QUESTION	Does Geraldine have suitable infrastructure (road, sewer, water, stormwater) for your business?
	RESPONSE	Yes
14	QUESTION	Do you need to be located in Geraldine for your customers?
	RESPONSE	No
15	QUESTION	Do you need to be located in Geraldine for raw materials needed for your business?
	RESPONSE	No
16	QUESTION	Have you seriously considered moving out of Geraldine?
	RESPONSE	Yes
17	QUESTION	Does your business need exposure or a profile onto a busy road?
	RESPONSE	No
18	QUESTION	Has your business been subject to reverse sensitivity complaints?
	RESPONSE	No
19	QUESTION	Can you see reverse sensitivity being a problem for your business in the future?
	RESPONSE	No
20	QUESTION	Does your business rely on, or benefit, from the presence of other industry or businesses?
	RESPONSE	Yes, couriers
21	QUESTION	Is your business susceptible to flooding, or other natural hazards?
	RESPONSE	Yes
22	QUESTION	Which one of the options in the *Growth of Industrial Activities in Geraldine* report do you support?
	RESPONSE	Option 6
23	QUESTION	Is there anything further you wish to add?
	RESPONSE	The Growth of Industrial Activities report was excellent. Being as close to town as possible is important, but we recognise the constraints of achieving this. We don't want to be located in Orari or Winchester. If more industrial land is not provided we will have to move somewhere else. However, we don't want to do this. Industrial building design should be flexible so that they have future value.

APPENDIX B

Infrastructure Investigation Report – Growth Management Strategy – 841 Tiplady Road, Geraldine – July 2020

Infrastructure Investigation Report

Growth Management Strategy

841 Tiplady Road, Geraldine

20097

July 2020

DAVIE LOVELL-SMITH

PLANNING SURVEYING ENGINEERING

Revision History

Rev Number:	Prepared By:	Description:	Date:
R0	Andrew Hall	For Information/Draft	
R1	Andrew Hall	Added Geotech and Completion	4/07/20

Document Control

Action:	Name:	Signed:	Date:
Prepared By	Andrew Hall		4/7/20
Reviewed By	Justin Finlay		4/7/20
Approved By	Andrew Hall		4/7/20

1. INTRODUCTION

This Report has been compiled for the purposes of assessing the servicing of the potential development of 841 Tiplady Road, Geraldine, into a Light Industrial Estate (Industrial L Zone). The proposed site is located at 841 Winchester-Geraldine Road and is situated between Tiplady Road and Geraldine, being legally described as Lot 1 DP 8102. Please refer to the Location Plan in Appendix A.

The site has been identified in the **'Timaru District 2045 – Growth Management Strategy'** (GMS) as being suitable for light industrial development. The GMS is a spatial strategy that will inform the location and quantum of zoned land required in the Timaru District Plan Review.

Council's Infrastructure Group has confirmed that services are not available at the site. Before the site can be considered further for re zoning in the District Plan, Council needs to understand the costs of servicing the site with water, wastewater, stormwater and road access.

Council will be constructing a new roundabout at the corner of Tiplady Road and Winchester Geraldine Road in the 2020/21 financial year. Council also propose to upgrade the siphon for the sewer across the Waihi River in 2020/21. It is not intended that Council would ever service the proposed industrial site with a trade waste sewer. Any trade waste would need to be contained by the future businesses within the development under their own trade waste consents or determine a method of using the Council infrastructure that does not inhibit its intended use.

Council have requested that the following specific matters be addressed:

1. **Provide a rough order of costs to service the site with the following:**
   a) Connection to the reticulated wastewater network
   b) Connection to the reticulated water network
   c) Discharge of stormwater onsite.

2. **Provide advice whether there would be:**
   a) Capacity in the planned upgrade of the Waihi River sewer siphon to accommodate wastewater from the site.
   b) Cost efficiencies in making extra capacity in the proposed Waihi River siphon sewer upgrade to service the site.

3. **Provide a rough order of costs to:**
   a) Discharge wastewater on site
   b) Discharge stormwater on site
   c) Install bores to access ground water to service the site for water supply
   d) Estimate how much land this would take up.

4. **Road Upgrades**

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a) any road upgrades would be required to meet the current District Plan requirements
b) the cost of those upgrades.

5. **Consider whether staging of the site's development with onsite discharge first then connection to reticulated services once a critical mass of businesses have been established is feasible and will help reduce initial establishment costs.**

The site slopes from the north-west to the south-east at a gentle grade of approximately 1 in 200. It is currently being farmed. There are occasional stands of trees and individual specimens over the site and a plantation of approximately 3.5ha, but the surface of the property can best be described as pasture fenced into paddocks. A house is located in the northern corner of the site along with out buildings. Please refer to the attached Contours and Aerial Photo Plan in Appendix B.

The site is fee simple and is owned by Donald Harvie Gibson, Christine Anne Gibson and Douglas James Harvie. The sites area is 52.5939ha and is legally described as Lot 1 DP 8102. The title reference is CB35C/1139. Please refer to Appendix C for the Certificate of Title and Quickmap information.

The title is subject to the Conservation Act and Crown Minerals Act. It is not expected that either of these encumbrances will affect the potential development of the land. However, Part IV A of the Conservation Act may cause some margins to be placed along any waterways over the site. It is noted that there are two potential waterways that may apply. One is running northwest to southeast behind the house and the other is on the same alignment but further into the site and is known as Downs Creek. The area between the two stream is generally recognised as being potentially flood prone. Further consultation would be required with Council Planners and Environment Canterbury into the status of these waterways. Please note that both waterways are shown on DP 8102, drawn 1926. For the purposes of this exercise we expect that the Council would like to maintain these waterways with a 10m margin on both banks. This is on the basis that a full margin in terms of the Act is not required.

The area for the proposed industrial development is currently zoned a combination of Rural 1 and 2. It is understood that this area will fall within the General Rural Zone under the new District Plan but would be rezoned for industrial purposes. With regard to environmental and bulk and location standards it is anticipated that there will need to be a setback from the two waterways within the site. The rural provisions have a minimum standard of a 20m building setback which we consider appropriate for this site.

As part of this report, a preliminary geotechnical investigation into gravel depths and groundwater levels has been completed. Some additional geological data is available from the Environment Canterbury Database for Wells and Bores. Please refer to Appendix D for the Geotechnical Details of the site and a plan of the Ecan Bore locations surrounding the site and associated data.

From this information we can determine that the soils on the site include for a layer of topsoil over silts and then gravels. The depth to gravels is approximately 1.5 to 1.8m. Groundwater varies from 3.1 to 7.5m deep. Both depths to gravel and groundwater will require additional investigation if the development is to proceed.

The key outcome of the geotechnical review is the determination that the northern portion of the site, including for both waterways, has deep gravels whilst the gravels are relatively shallow in the southern portion. This has significant effects on the ability to dispose stormwater to ground. When we also consider the potential risk of flooding in the northern part of the site, a conclusion is easily drawn to only develop the land south of Downs Creek.

Please refer to the attached potential subdivision in Appendix E. This plan shows the limit of the shallow gravels, the alignments of the waterway and a potential layout. Downs Creek can form a natural green edge to the development separating it from Geraldine. Therefore, for the reasons of gravel, flooding and a natural green edge, it is our recommendation that the development be limited to this area shown. All analysis will be based on this layout.

The Listed Land Use Register has been searched and there is no record of contamination on the site. However, a Preliminary Site Investigation in terms of the National Environment Standards should be undertaken in the next stage of this investigation.

There is one Environment Canterbury consent attached to the property. CRC111262 for a domestic septic tank associated with the house is attached here in Appendix F.

Consultation has occurred in an ongoing manner with Timaru District Council (TDC) staff regarding the infrastructure requirements for the development site.

2. ROADING

The site is bounded by Tiplady Road to the southwest and the Winchester to Geraldine Road to the east. Both roads provide several safe locations for entry into the site as the alignments are generally at a constant grade and there is only one minor bend in the Winchester to Geraldine Road. The potential entry to the site off the Winchester to Geraldine Road is shown on the layout plan. The sight distance is approximately 450m to the north and 150m to the south. Tiplady Road is straight with great visibility.

The Winchester to Geraldine Road is not an NZTA road. However, it is a key route between Gearldine and State Highway 1 to the south and onto Timaru. The road is well formed and sealed. Tiplady Road is a well-sealed two lane rural road.

It would be the expectation that any Industrial Development along Winchester to Geraldine Road would require some screening as this is a key entrance to Geraldine. This screening would involve perhaps a 5m wide planted buffer and no direct access onto industrial sites.

The frontage of Tiplady Road would be upgraded to an urban standard, widened and used for access over its entire length. There is already a trucking/contractors yard on Tiplady Road at the western corner of the site.

With regard to setbacks from Tiplady and Timaru-Geraldine Roads, a building setback at least 20m would be appropriate given the rural setting.

Due to the size of the development we would expect one major connection onto Winchester to Geraldine Road. This entry would be subject to specific traffic design but may be expected to include dedicated turn lanes similar to the details shown in Appendix G. We would also expect two access points onto Tiplady Road but these would most probably be "Give Ways" similar to the detail shown in Appendix H.

The estimated cost of the major entry and the give ways are also provided in Appendix I

Future roads are in accordance with Council standards but it is highly recommended that the pavement finish is Asphaltic Concrete rather than chip seal for the purposes of heavy transport turning.

In direct reference to the TDC District Plan, it is noted that all industrial roads outside of Washdyke are the same, be they Collector or Local. 18m legal width with 12m carriageways and 3m berm/ footpath widths.

All roads are to be lit to Council standards.

3. WATER SUPPLY

The provision of a water supply to the proposed development can be delivered by three alternative methods:

A. By way of the existing Geraldine water supply network
B. By way of a new single bore on site and a network throughout the development servicing each new lot.
C. Each new site to have a private bore

Option A – Connect to Geraldine

Consultation has been undertaken with Selwyn Chang – Water Services Projects Engineer with the TDC. Selwyn's advice is that the Geraldine Network may not be able to service the development, subject to demand and modelling.

The modelling of a network is not within the brief of this exercise but consideration can be made towards what may result in this option being not feasible.

To determine the overall site demand we have referenced the Christchurch City Infrastructure Design Standard (CCC IDS) rather than NZS4404. NZS4404 does not address commercial or industrial water supply demands.

The CCC IDS provides a table for determining peak business zone water demand based on the number of sites. Please refer to the IDS Part 7 Chart 2. The number of sites has been estimated on the attached Layout Plan in Appendix E. This layout shows 56 sites. From Chart 2 this equates to 0.55 l/s/site. Over 56 sites, this amounts to 30.8l/s peak flow.

In addition to the basic water demand, the design needs to include for Firefighting Demand. The network should be modelled to ensure compliance with Fire Hazard Category FHC2 and Fire Water classification FW3, as dictated by SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice. This model is a minimum standard for an Industrial Estate. This category requires 50l/s.

Council may consider the FW2 standard at 25l/s is sufficient, but that classification will dictate that all buildings in the proposed development will need to be sprinklered and that may not be a rational approach to development.

Therefore the overall peak demand flow can be determined as 50l/s firefighting flow, plus 60% of the peak basic demand (0.6 x 30.8l/s = 15.4l/s).

50l/s + 15.4l/s = **65.4 l/s**.

If a pipe were to be laid from the existing Geraldine Network to the site then the pipe size would need to be 250mm (ID) with the following characteristics:

Pipe diameter 250mm
Gradient - 1 in 182
Pipe Roughness - ks 0.015mm

Velocities	1.335 m/s
Discharge	65.52 litres/sec
Discharge	0.0655 m^3/sec

The existing Geraldine Network pipe size on Winchester to Geraldine Road is only 150mm dia and the network will simply not be able to provide for this demand. In discussions with Selwyn Chang, he has significant concerns in regards to negative pressures resulting in the system and we would agree.

Option B – Create a New Bore on site and Associated Reticulation

In consultation with Selwyn Chang at TDC, it has been determined that the cost and other efficiencies of a standalone bore and reticulation would be unnecessarily expensive. There are some key reasons for this:

1. The main portion of the cost would need to be at the start of the project including for the bore, pump station and larger pipework. A project of this size and nature may take many many years to complete and the recovery of this initial outlay cost may prove to be inefficient from a cost perspective.
2. A number of the sites are large and this will result in longer street frontages and therefore higher infrastructure build costs.
3. The expected firefighting classification is FW3. Under these circumstances there will be a number of sites that will require additional on-site storage and pumping.
4. There are better options available.

Council's estimated cost for this system would be $4-6 million. A portion of this cost is due to the system having to meet the community drinking water standards.

If a developer chose to construct a fully reticulated system then our estimated cost would be significantly less. Please refer to the cost estimate in Appendix K. There would of course be an expectation that this system would be adopted by Council and rates would apply for maintenance etc.

Option C – Each New Site to have a Private Bore

This is an option that we have successfully used to good effect on other similar projects. The basic principle is that as part of any building on site, the owner will install a bore for the purposes of providing water for potable and firefighting use.

Each allotment can obtain water from a separate bore located within each site. Each allotment is permitted under Environment Canterbury's Land and Water Regional Plan to take water at a rate of less than 5 L/s and no more than 10m^3 per day, but the bore must be 20m from the boundary or a waterway. If wastewater is to be discharged on site then there needs to be a 50m separation.

This flow and quantity should easily be enough for the proposed site activities associated with Light Industrial.

Certificates of Compliance can be obtained from Environment Canterbury to cover this proposal. No specific consents would be required.

Each site will be required to individually provide their own water supply to comply with NZS PAS 4509:2008 NZFS Firefighting Water Supplies Code of Practice. This will be based on the each individual use and as such will be addressed as part of the building consent. A consent notice can be proposed to address this aspect and to ensure that prospective purchasers are fully aware of the situation.

From a cost perspective this option is attractive to TDC as there are no upfront construction costs, no on-going maintenance and no ongoing compliance costs. The consenting around the bores and abstractions would be a Regional Council issue.

Should a particular purchaser of a site need more than this permitted amount, then there is the ability for that purchaser to make an application to Environment Canterbury for whatever amount that they may be permitted. As at the time of writing this report the Orari-Opipi Groundwater Allocation Zone was not yet fully allocated. Please refer to the attached Allocation Map in Appendix I.

4. WASTEWATER

The provision of wastewater drainage from the proposed development can be provided by five alternative methods:

1. By way of connecting to the existing Geraldine sewer network via Local Pressure Sewers
2. By way of connecting to the existing Geraldine sewer network via a new pump station
3. By way of a new connection directly to the Geraldine Wastewater Treatment Plant via Local Pressure Sewers
4. By way of a new connection directly to the Geraldine Wastewater Treatment Plant via a new pump station
5. Each new site to have a private treatment unit and discharge to ground.

To determine the overall site demand, we refer to advice from TDC.

Max Flow Industrial Zone L = P/A*SPF*ASF*Industrial L (Ha)

Dry Weather Diurnal Peak to Average Ration, P/A = 1.8 (This is reference from Christchurch City Council Infrastructure Design)
Storm Peak factor including infiltration, SPF = 2.78 (This is reference from Christchurch City Council Infrastructure Design)
Industrial L (Ha) = 40.9 ha
Average Sewer Flow (ASF) = 0.15 l/s/ha (This is reference from Christchurch City Council Infrastructure Design)

Therefore MF Ind L = 1.8*2.78*0.15*40.9 = 30.7 l/s

Alternatively, it is common in Christchurch to use the rate of 0.09l/s/ha for industrial developments that are expected to be dry industry. That is; the land use is primarily sheds for storage and logistics.

Under these circumstances the MF becomes 18.4l/s.

Discharge on site is not considered a suitable environmental option and a concentration of septic tanks such as this would most likely not be approved by Environment Canterbury.

In discussion with TDC it is clear that these flows would inundate the treatment plant and associated infrastructure if allowed to flow at peak times. Major WWTP upgrades would be required and costs are estimated to be in excess of $3 to 4 million.

In consideration of this we can immediately refine the scope of investigation to exclude any uncontrolled connection to the existing town infrastructure. The realistic options left are the use of Local Pressure Sewers with a direct connection to the treatment plant or proposed siphon link with an attenuated flow.

Local Pressure Sewers

In discussions with Council Officer Mr Grant Hall, there appears to be limited capacity in the existing and proposed infrastructure connecting to the WWTP. There is also a limiting factor in the treatment plant itself. These limitations may be able to be avoided if flows from the proposed industrial estate could be attenuated and discharged at time during the day when flows from the township are low.

Under this arrangement, each industrial site would own a small pump station with a connection to a rising sewer pipe in the street. This rising sewer would collect flows from all of the industrial sites and the combined pumping action would be sufficient to either pump the wastewater to the proposed siphon or alternatively, directly to the WWTP.

In discussions with Grant Hall, there appears to be a capability in the proposed siphon to allow additional flows at off peak times. We would therefore propose that a connection be made to this pipe.

Consultations have been undertaken with Ecoflow. Ecoflow are the agents for the E-One Low Pressure System. This system is the most common of its type in New Zealand and has many similar applications to this proposal.

Under the Ecoflow arrangement, there would be a pipe in every street with a backflow controlled connection to every site. Each site would install a suitably sized pump and reservoir at the time of Building Consent. The reservoir size may be required to hold say three days of flows in emergency situations. The requirements surrounding the pump, reservoir and maintenance can be controlled by way of consent notice on each individual title.

The key to this arrangement being feasible is to control and attenuate the flows. This can be done by several methods:

a) Timers

Each pump can be placed on a timer. The timers can be set to start the pumps at a predetermined time when the flows are expected to be low. The allocated time can be added to each new titles Consent Notices. The timers can be staggered to ensure that there is always some capacity in the proposed siphon for unexpected events. This arrangement will require pump owners to ensure that their systems are maintained and that the timers are correct. This may pose a problem but otherwise this would be a very simple solution.

b) Actuator Valve

Discharge can be controlled by monitoring the flow through the siphon pipe. This monitoring is achieved with an electronic flow meter on the siphon. Once the flow in the siphon reduces to an acceptable level, the flow meter can signal an actuated valve on the low pressure pipe and allow flows to commence from the proposed industrial site.

The key to this being a successful option is to determine what flow would be best suited to allow the industrial discharge to occur. It would be expected that the valve would only be allowed to open once there is at least capacity for the 30.7l/s. This would ensure that flow velocities in the pressure pipes would be self-cleansing. If the system was just left to run without the valve then low velocity flows would result in pipe deposition and maintenance issues.

This would be a very simple option that would simplify the pump arrangements and allow TDC better overall control.

c) Telemetric System

A monitoring system can be installed on each of the pump stations and also at the receiving locations to determine when flows are low enough to allow discharge to be pumped from the sites.

A system such as this can be provided by Ecoflow Ltd using the E-One pump systems and an Iota One Box controller. These systems are very common in Christchurch and appear to be working well.

Under this arrangement, each pump would be telemetrically linked to the WWTP and activated when flows are low. This is a more complicated arrangement and is probably best suited for larger catchments with very restrictive flows.

It would be our expectation that the system most likely to be adopted would be the Actuated Valve.

Under all of these arrangements the basic pipe installation is all the same. We can complete a preliminary design for the size the pipes using some basic criteria as follows:

- Minimum pipe size 50mm (OD)
- Minimum pipe velocity 0.6m/s
- Maximum pipe velocity 2m/s

Please refer to that attached Cost Estimate for this system in Appendix K.

Further assessment will need to be made into modelling the discharge and pipe sizes. This modelling can be completed by Ecoflow Ltd. It is expected that a reliable diurnal flow pattern will be able to be provided by TDC depicting a time of day when flows from the development are best suited.

Trade Waste

The proposed industrial area is not expected to contain heavy industry and the discharges associated with this type of landuse. Any trade waste produced by a future occupant of a site will be dealt with under a separate consent to be obtained during development of the individual lot and as part of the future Building Consent application.

5. STORMWATER

The provision of stormwater drainage from the proposed development can be provided by three alternative methods:

Option A: By treatment, detention and discharge of all stormwater to a watercourse under Council held stormwater discharge consent
Option B: By treatment, detention and discharge of all stormwater with the exception of roof water to ground under Council held stormwater discharge consent. Roof water to be discharged directly to ground on site up to the 2% AEP.
Option C: Each new site to have private discharge to ground consent up to the 2% AEP event. Roads to be treated and discharged to ground up to the 2% AEP event.

In all options roads and reserves within the subdivision are required to have a discharge consent. Stormwater emanating from roads within the subdivision will require treatment and detention under a Council operated discharge consent. Discharge on site can either be via a Council Global Consent or individual owners consents.

Consultation with Regional Council is required to assess the storm requirements, however for the purposes of this report a storm of 2% AEP 60 hour storm duration was considered.

As discussed previously, the geology of the site has shallow gravels in the southern half of the property. If the sites were to discharge stormwater to ground then it is this shallow gravel that is most suitable. The discharge to ground is always the least expensive option as it removes the need for extensive pipework and land being taken up by large basins.

If the discharge to ground is not permitted then discharge to a watercourse (Option A) would be the alternative option. Stormwater treatment would be by first flush basin and a detention basin would attenuate the discharge to a watercourse at a flow rate similar to pre-development conditions. Treatment and detention basins would be split and located adjacent to the lowest lying watercourse.

Option A
Each site is to discharge to the roads. The roads and the sites are to be collected via sumps and pipes, transferred to basins, treated and discharged to ground up to the 2% AEP event.

Stormwater emanating from the whole development can be treated, detained and discharged to a watercourse under a Council operated discharge consent. The whole development would need to be included in the reticulation within the roads.

Please refer to Appendix K for a plan of potential basin locations and their discharge locations. The basins shown in Appendix K are sized based on 1m depth but this could be deeper.

Due to the costs associated with the stormwater reticulation to cater for sites and the loss of land for basins this option should be advanced as a last option for Council.

Option B

Each site is to discharge roof water directly to ground and all hardstand to roads the roads. The runoff from the roads and the sites is to be treated and discharged to ground up to the 2% AEP event.

Stormwater emanating from the hardstand and roads can be treated via roadside swales and discharged to suitably sized soakpits under a Council operated Discharge Consent. There would be very little pipework as there would be regular swales and soakpits dealing with small manageable catchments. Please refer to Appendix L for a detail of a potential catchment, treatment and disposal facility.

Option C

Each site is to contain its stormwater within the individual site with treatment and discharge to ground up to the 2% AEP event. The roads are to be treated and discharged to ground up to the 2% AEP event.

The developer would obtain a basic Global Discharge Consent for the sites and each new owner would have the consent transferred into his/her name.

Discharge off the roads would also require a consent and this would effectively replicate Option B.

Due to the costs associated with upsizing the stormwater reticulation to cater for sites, and the loss of land that the basins for this option require, this option should be investigated as a primary option for Council.

6. CONCLUSIONS

Considering the original brief as follows with comments:

1. Provide a rough order of costs to service the site with the following:

a) Connection to the reticulated wastewater network – **As Provided in Appendix M**

b) Connection to the reticulated water network – **Discounted due to existing capacity issues and confirmed by TDC. However an on site reticulation has been priced in Appendix M.**

c) Discharge of stormwater onsite. – **Subject to a geotechnical review, this is very feasible and cost effective but requires Ecan consent. Stormwater on the individual building sites would be addressed by the future Building Consents. TDC would only need to address the costs of the discharge of stormwater off the roads. This would be achieved via treatment and detention basins. Creating a single integrated stormwater facility for the whole development may still be an option should the underlying gravels be unsuitable for soakage.**

2. Provide advice whether there would be:

a) Capacity in the planned upgrade of the Waihi River sewer siphon to accommodate wastewater from the site. – **Subject to the confirmation that there are periods during the day where there is low flow into the WWTP, there is potential for the flows from the proposed Industrial Park to be included in the existing pipe without any needs for upgrades.**

b) Cost efficiencies in making extra capacity in the proposed Waihi River siphon sewer upgrade to service the site. – **At this stage it seems unlikely that an upgrade would be required.**

3. Provide a rough order of costs to:

a) Discharge wastewater on site – **Nil, each site to have an individual wastewater treatment unit.**

b) Discharge stormwater on site - **Nil for the individual sites but please refer to the attached cost breakdown for Stormwater in Appendix M**

c) Install bores to access ground water to service the site for water supply – **Nil, Each site to have an individual private bore**

d) Estimate how much land this would take up. – **If there were to be bores and wastewater disposal on each site then the bores need to be 20m from a boundary and 50m from a wastewater disposal area but otherwise take up very little space and can even be placed in a manhole. Stormwater soakholes can be placed under pavements or in road berms.**

4. Road Upgrades

a) any road upgrades would be required to meet the current District Plan requirements – **The entrances to the proposed development will require extensive road upgrades similar to that shown in Appendices G and H.**

b) the cost of those upgrades. **Refer to Appendix M for Cost Assessments.**

5. Consider whether staging of the site's development with onsite discharge first then connection to reticulated services once a critical mass of businesses have been established is feasible and will help reduce initial establishment costs.

The logical best options at this stage are as follows:

Sewer – Local pressure sewer network with attenuation control to allow discharge during periods of low flow into the WWTP with a new connection to the plant directly from the Industrial Park.
Water Supply – Each new site to have a private bore or an onsite community bore and reticulation.
Stormwater – Each site to contain its stormwater within the individual site with treatment discharge to ground up to the 2% AEP event. Roads to be treated and discharged to ground up to the 2% AEP event.

Discounted Options
Sewer

- Treatment Plant on-site to service the whole development. Always easier to expand an existing WWTP if it is nearby.

7. NEXT STEPS

1. Contamination investigation – Preliminary Site investigation and potential Detailed Site Investigation in terms of the National Environment Standards.
2. Investigation into the existing diurnal flows into the WWTP and determination of potential low flow periods.
3. Investigation into the performance of the WWTP in receiving a more constant flow. That is to say a higher average flow whilst a similar maximum flow as existing.
4. Consultation with Environment Canterbury into the potential discharge of Industrial based domestic wastewater to ground.
5. Consultation with Environment Canterbury into the potential discharge of Industrial based stormwater to ground for sites and roads.
6. Consultation with Environment Canterbury into the potential water take.
7. Full Development Estimate including not only the piecemeal costs attached to this report but a full development cost appraisal. This needs to be considered if Council intends to be the developer.

Andy Hall
Chartered Professional Engineer

8. APPENDICIES

Appendix A – Location Plan

Appendix B - Contours and Aerial Photo Plan

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

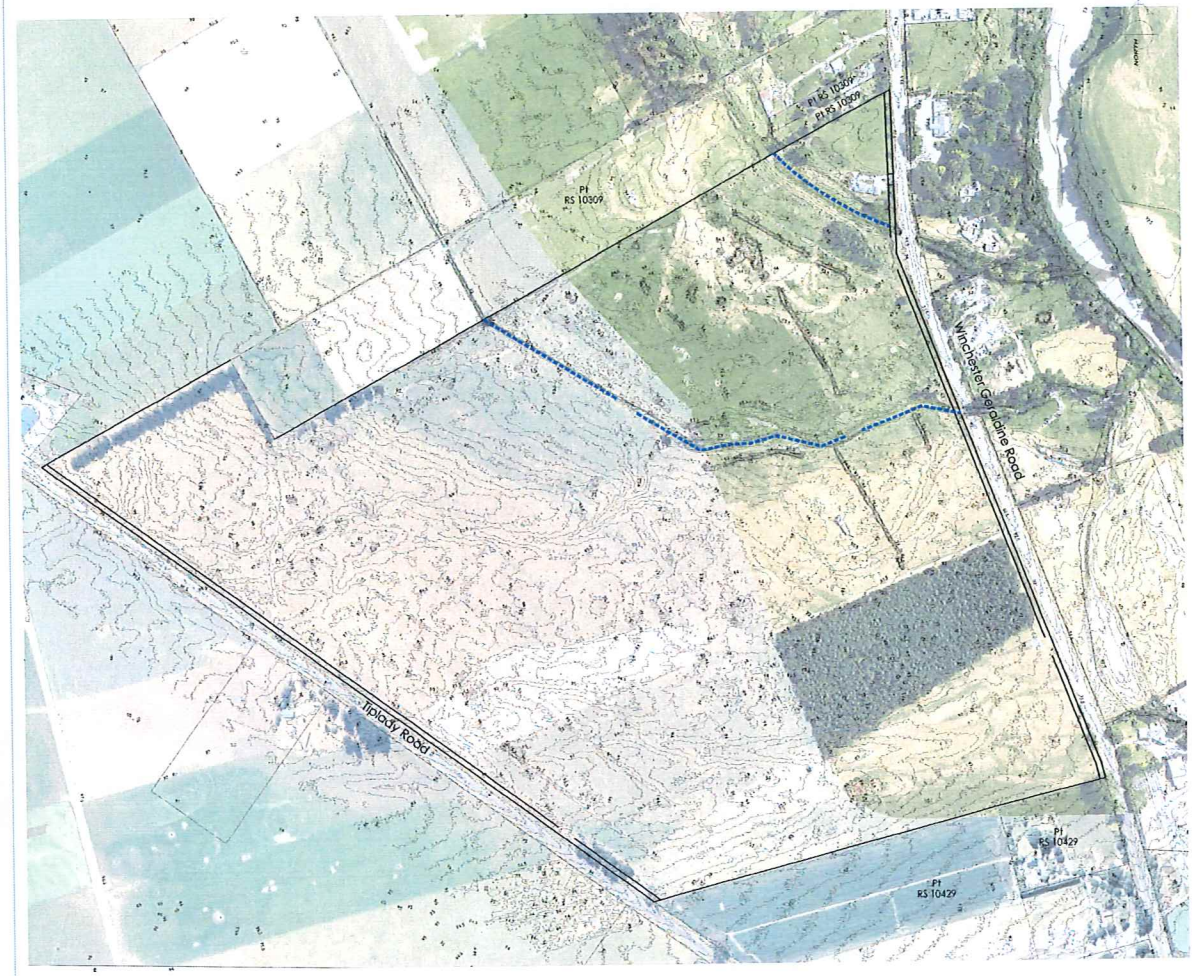
Tiplady Road

Lot 1 DP 8102
Location Plan

For Discussion Purposes

SCALE: 1:2000 @ A1, 1:4000 @ A3 DATE: February 2020

DRAWING No.: E20097 SHEET No.: 1 OF 1 REVISION: R0



AMENDMENTS

AMENDMENT	DATE	DESCRIPTION

NOTES

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

116 Rhodes Road P O Box 679 Christchurch 8145 New Zealand
Telephone 03 974 5733 Website www.dls.co.nz E-mail office@dls.co.nz

JOB TITLE
Tiplady Road

SHEET TITLE
Existing Contours of Lot 1 DP 8102

DRAWING STATUS
For Discussion Purposes

SCALE: 1:2000 @ A1 1:4000 @ A3 DATE: February 2020

CAD FILE: J:\2020\E20097 Geraldine Subdivision\Tiplady Contours.dwg REVISION

DRAWING No. **E20097** SHEET No. 1 OF 1 **R0**

Appendix C – Title Information

Appendix D – Geotechnical Information & Bore Data

Bore or Well No	BZ19/0100
Well Name	65 Kennedy Street
Owner	RY and SE Bradley

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	BZ19/0100	File Number	CRC152740
Owner	RY and SE Bradley	Well Status	Active (exist, present)
Street/Road	65 Kennedy Street	NZTM Grid Reference	BZ19:59148-14753
Locality	Geraldine	NZTM X and Y	1459148 - 5114753
Location Description	65 Kennedy Street, Geraldine	Location Accuracy	50 - 300m
CWMS Zone	Orari-Temuka-Opihi-Pareora	Use	Stock Supply, Irrigation
Groundwater Allocation Zone	Orari-Opihi	Water Level Monitoring	--
Depth	10.00m	Water Level Count	1
Diameter	300mm	Initial Water Level	5.80m below MP
Measuring Point Description	Ground Level	Highest Water Level	5.80m below MP
Measuring Point Elevation		Lowest Water Level	5.80m below MP
Elevation Accuracy		First reading	20 Jan 2015
Ground Level	0.00m above MP	Last reading	20 Jan 2015
Strata Layers	3	Calc Min 95%	
Aquifer Name		Aquifer Tests	0
Aquifer Type		Yield Drawdown Tests	1
Drill Date	20 Dec 2014	Max Tested Yield	
Driller	Murray Gibbs Contracting	Drawdown at Max Tested Yield	
Drilling Method	Machine Dug	Specific Capacity	2.00 l/s/m
Casing Material	PVC	Last Updated	23 Feb 2016
Pump Type		Last Field Check	20 Jan 2015
Water Use Data	No		

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Slotted PVC	6	10			300	

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
21 Dec 2014	1	5	65.99092	2.5	2

Comments

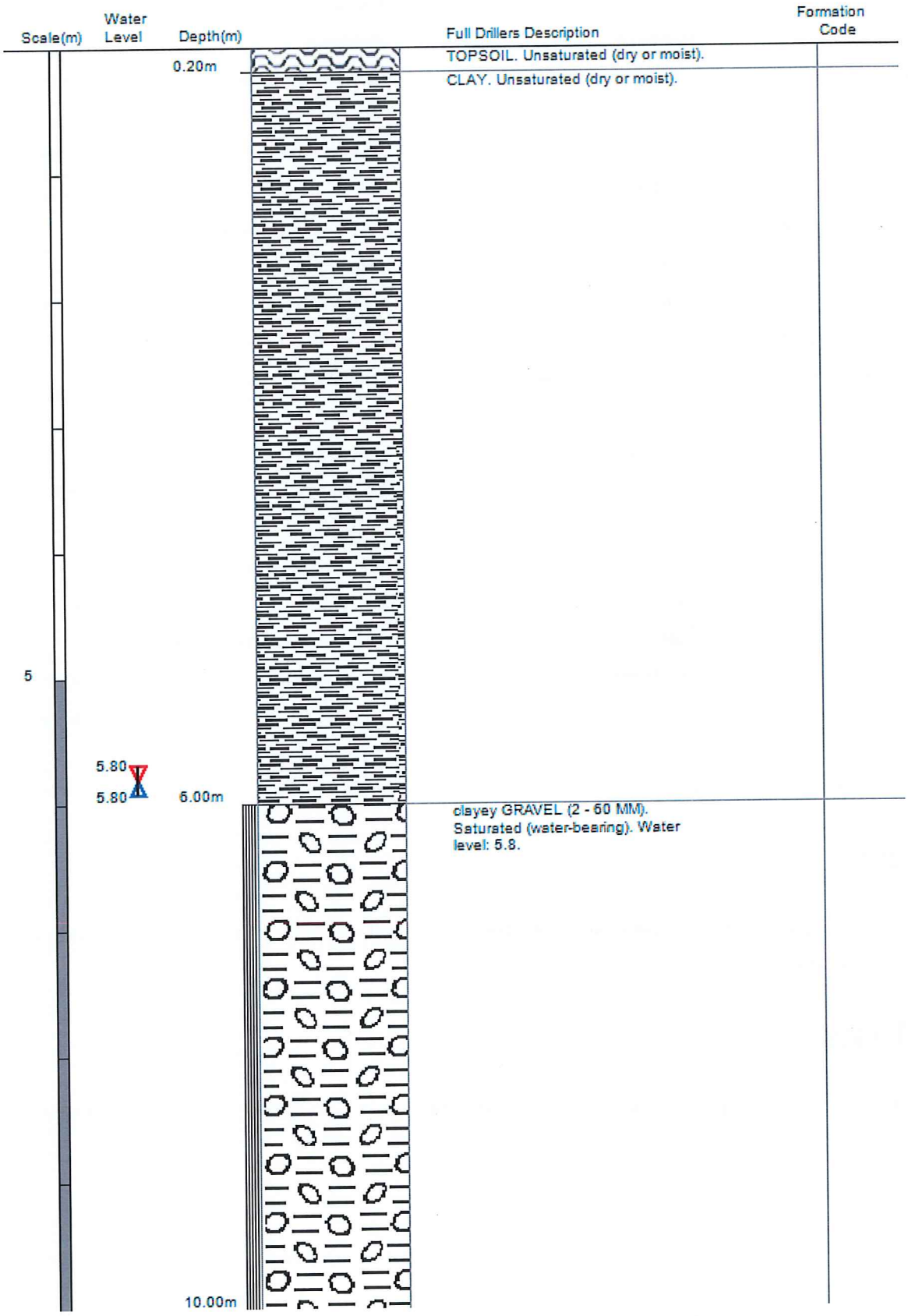
Comment Date	Comment
28 Jan 2015	NZTM Easting/Northing updated from:1459230-5114480 shifted 285m

Bore Log

Borelog for well BZ19/0100

Grid Reference (NZTM): 1459148 mE, 5114754 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: m +MSD Accuracy:
Driller: Murray Gibbs Contracting
Drill Method: Machine Dug
Borelog Depth: 10.0 m Drill Date: 20-Dec-2014

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Bore or Well No	J38/0553
Well Name	Geraldine-Winchester Highway
Owner	AD Dunstan

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	J38/0553	File Number	CO6C/17965
Owner	AD Dunstan	Well Status	Active (exist, present)
Street/Road	Geraldine-Winchester Highway	NZTM Grid Reference	BZ19:59519-14086
Locality	Geraldine	NZTM X and Y	1459519 - 5114086
Location Description		Location Accuracy	10 - 50m
CWMS Zone	Orari-Temuka-Opihi-Pareora	Use	Domestic Supply,
Groundwater Allocation Zone	Orari-Opihi	Water Level Monitoring	--
Depth	17.80m	Water Level Count	0
Diameter	100mm	Initial Water Level	1.78m below MP
Measuring Point Description	ToC	Highest Water Level	
Measuring Point Elevation	98.21m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.30m below MP	Last reading	
Strata Layers	9	Calc Min 95%	5.10m below MP
Aquifer Name		Aquifer Tests	0
Aquifer Type		Yield Drawdown Tests	1
Drill Date	26 Aug 2001	Max Tested Yield	0 l/s
Driller	McMillan Drilling Ltd	Drawdown at Max Tested Yield	1 m
Drilling Method	Rotary/Percussion	Specific Capacity	0.68 l/s/m
Casing Material	STEEL	Last Updated	08 Nov 2013
Pump Type		Last Field Check	
Water Use Data	No		

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Slotted PVC	4.8	17.8				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
26 Aug 2001	1	0.37884	5	0.56	1.75

Comments

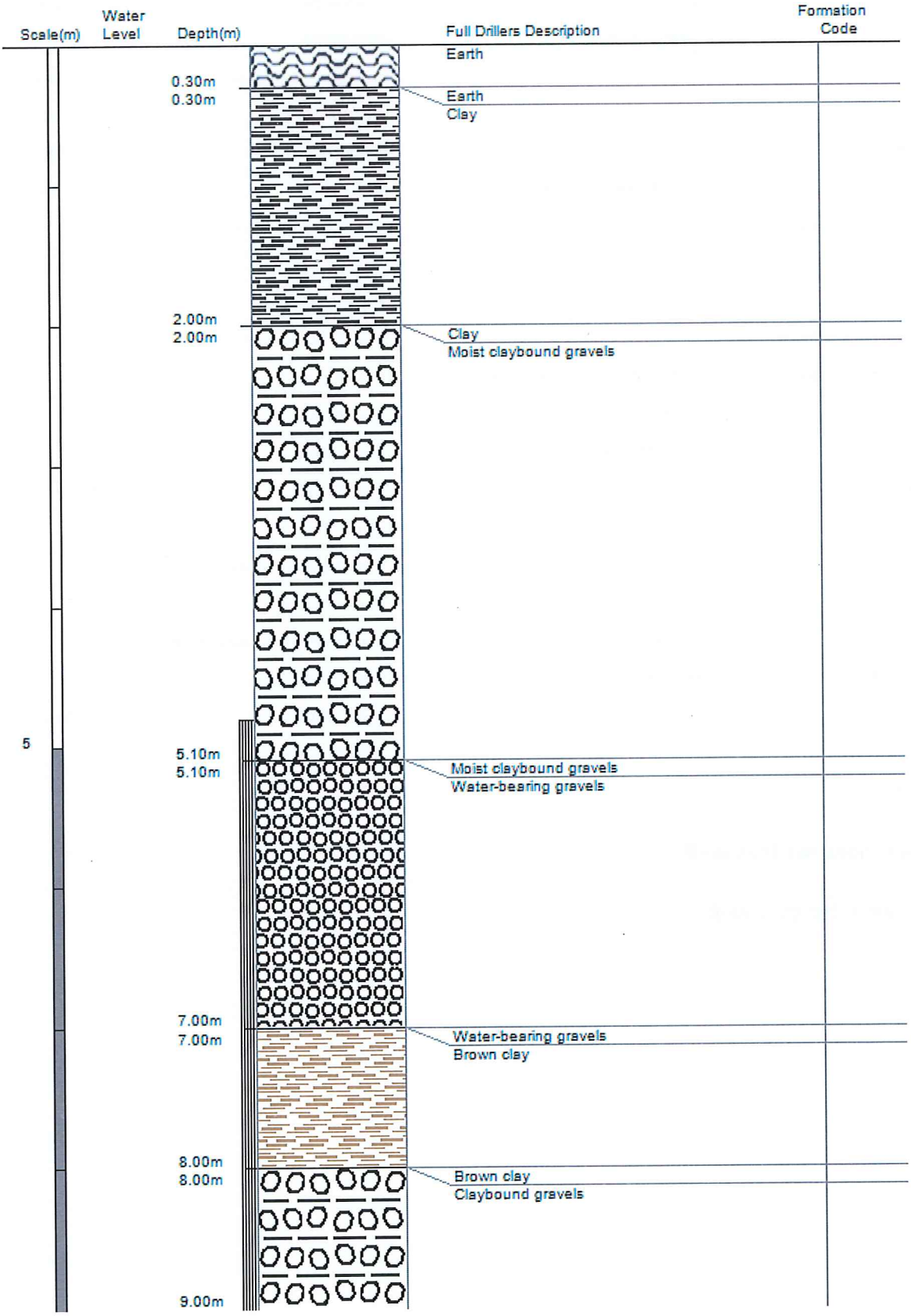
Comment Date	Comment
17 Apr 2003	Owner changed from C B Paddon

Bore Log

Borelog for well J38/0553

Grid Reference (NZTM): 1459519 mE, 5114087 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: 97.9 m +MSD Accuracy: < 0.5 m
Driller: McMillan Drilling Ltd
Drill Method: Rotary/Percussion
Borelog Depth: 18.0 m Drill Date: 26-Aug-2001

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Bore or Well No	J38/0559
Well Name	S H 8
Owner	PEMBERTON, GLB

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	J38/0559	File Number	CO6C/6302
Owner	PEMBERTON, GLB	Well Status	Active (exist, present)
Street/Road	S H 8	NZTM Grid Reference	BZ19:59802-13152
Locality	Geraldine	NZTM X and Y	1459802 - 5113152
Location Description		Location Accuracy	2 - 15m
CWMS Zone	Orari-Temuka-Opihi-Pareora	Use	Domestic Supply,
Groundwater Allocation Zone	Orari-Opihi	Water Level Monitoring	--
Depth	10.00m	Water Level Count	0
Diameter		Initial Water Level	
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	92.19m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	0	Calc Min 95%	5.80m below MP
Aquifer Name		Aquifer Tests	0
Aquifer Type		Yield Drawdown Tests	0
Drill Date		Max Tested Yield	
Driller	not known	Drawdown at Max Tested Yield	
Drilling Method	Unknown	Specific Capacity	
Casing Material		Last Updated	03 Oct 2001
Pump Type		Last Field Check	
Water Use Data	No		

No screen data for this well

No step tests for this well

Comments

Comment Date	Comment
03 Oct 2001	Mr Pemberton reported that his domestic bore was not on the database.

Bore or Well No	J38/0877
Well Name	TIPLADY ROAD
Owner	WOODLEYS TRANSPORT LIMITED

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	J38/0877	File Number	CO6C/27747
Owner	WOODLEYS TRANSPORT LIMITED	Well Status	No Info Expired Boreconsent
Street/Road	TIPLADY ROAD	NZTM Grid Reference	BZ19:58609-13676
Locality	GERALDINE	NZTM X and Y	1458609 - 5113676
Location Description	Central location	Location Accuracy	< 50m
CWMS Zone	Orari-Temuka-Opihi-Pareora	Use	Other - see comments, Stock Supply
Groundwater Allocation Zone	Orari-Opihi	Water Level Monitoring	--
Depth	20.00m	Water Level Count	0
Diameter	350mm	Initial Water Level	
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	104.61m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	0	Calc Min 95%	
Aquifer Name		Aquifer Tests	0
Aquifer Type		Yield Drawdown Tests	0
Drill Date		Max Tested Yield	
Driller		Drawdown at Max Tested Yield	
Drilling Method	Machine Dug	Specific Capacity	
Casing Material		Last Updated	05 May 2017
Pump Type		Last Field Check	
Water Use Data	No		

No screen data for this well

No step tests for this well

Comments

Comment Date	Comment
14 Oct 2013	Can be used for Fire Fighting
05 May 2017	No drilling information recieved set to NI. If well drilled likely to be unlawfully.

Bore or Well No	J38/0001
Well Name	TIPLADY ROAD
Owner	PEMBERTON G L B

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	J38/0001	File Number	
Owner	PEMBERTON G L B	Well Status	Active (exist, present)
Street/Road	TIPLADY ROAD	NZTM Grid Reference	BZ19:58339-13986
Locality	Geraldine	NZTM X and Y	1458339 - 5113986
Location Description		Location Accuracy	50 - 300m
CWMS Zone	Orari-Temuka-Opihi-Pareora	Use	Water Level Observation,
Groundwater Allocation Zone	Orari-Opihi	Water Level Monitoring	--
Depth	6.00m	Water Level Count	0
Diameter		Initial Water Level	2.60m below MP
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	108.81m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	2	Calc Min 95%	
Aquifer Name		Aquifer Tests	0
Aquifer Type	Semi-Confined	Yield Drawdown Tests	0
Drill Date	02 Nov 1984	Max Tested Yield	0 l/s
Driller	Washingtons Exploration Ltd	Drawdown at Max Tested Yield	0 m
Drilling Method	Cable Tool	Specific Capacity	
Casing Material	STEEL	Last Updated	18 Oct 2006
Pump Type	None Installed	Last Field Check	
Water Use Data	No		

No screen data for this well

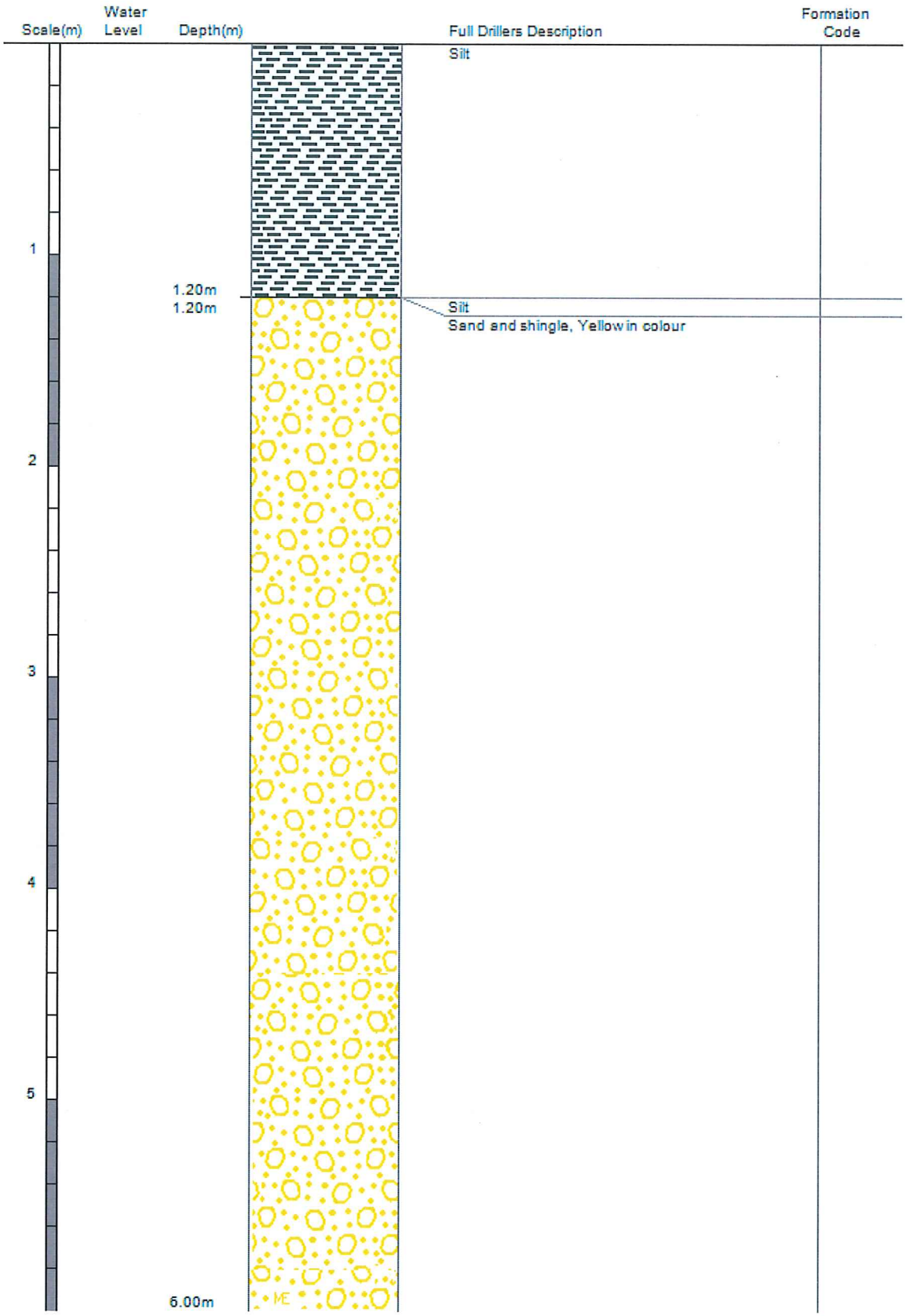
No step tests for this well

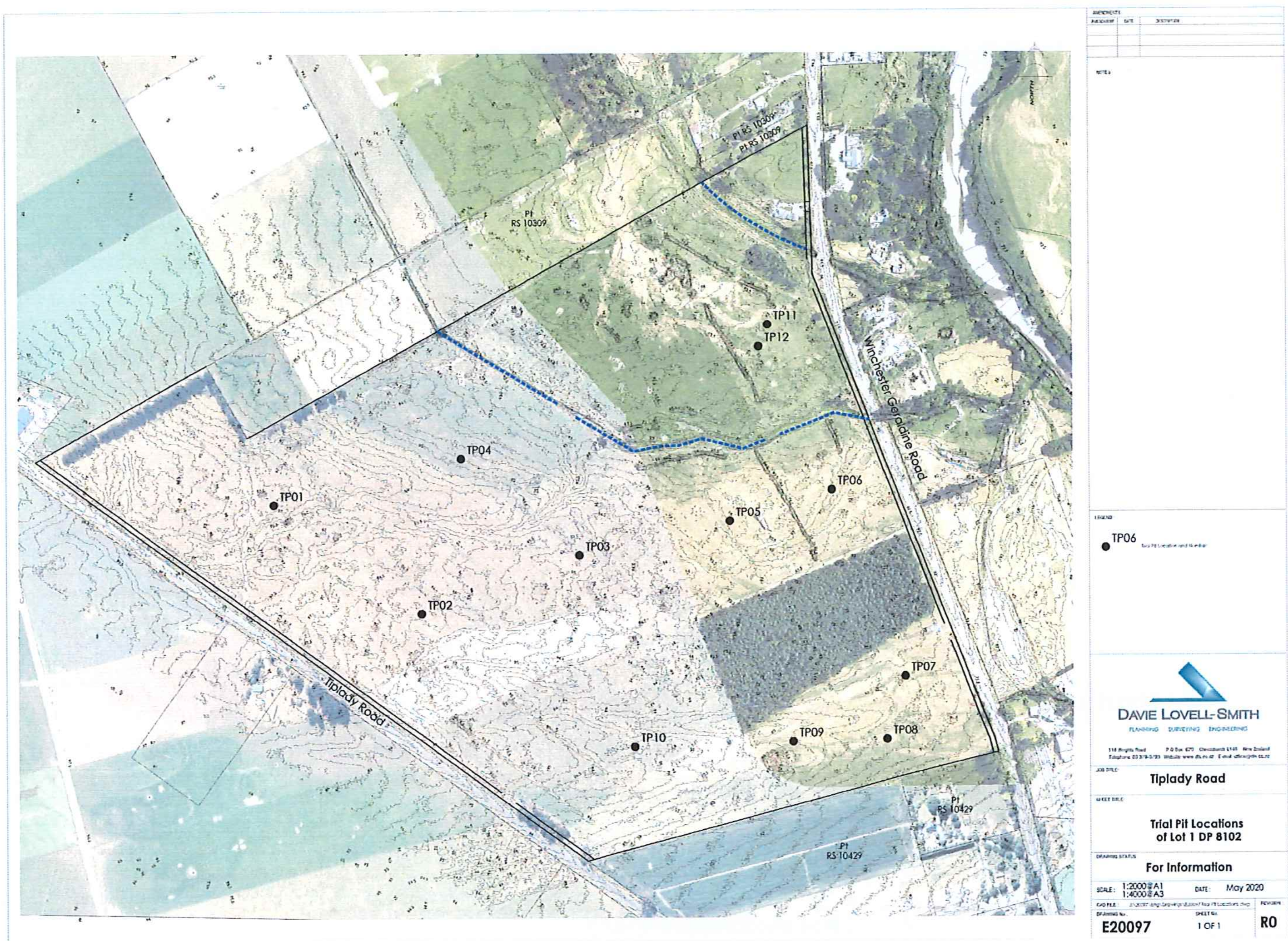
No comments for this well

Bore Log

Borelog for well J38/0001

Grid Reference (NZTM): 1458340 mE, 5113987 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 108.8 m +MSD Accuracy: < 0.5 m
Driller: Washingtons Exploration Ltd
Drill Method: Cable Tool
Borelog Depth: 6.0 m Drill Date: 02-Nov-1984





Pt RS 10309
Pt RS 10309
Pt RS 10309
TP11
TP12
Winchester Geraldine Road
TP04
TP01
TP06
TP05
TP03
TP02
TP07
Tiplady Road
TP10
TP09
TP08
Pt RS 10429
Pt RS 10429
TP06
DAVIE LOVELL-SMITH
Tiplady Road
Trial Pit Locations of Lot 1 DP 8102
For Information
SCALE: 1:2000@A1 1:4000@A3
DATE: May 2020
E20097
1 OF 1
R0

DAVIE LOVELL-SMITH

Site Testing Results

Lot 1, DP 8102

Tiplady Road, Geraldine

1. Top Soil Depths

Refer to site testing plan for labelled locations.

Location	Depth (mm)
1	350
2	450
3	350
4	400
5	500
6	500
7	400
8	400
9	350
10	300
11	300
12	300

2. Depth to Gravel

Location	Depth to Gravel (mm)
1	1450
2	1500
3	350
4	Not encountered at 4200
5	500
6	500
7	400
8	400
9	350
10	450
11	3950 (groundwater at 4200 testing abandoned)
12	Not encountered infiltration test at 1700

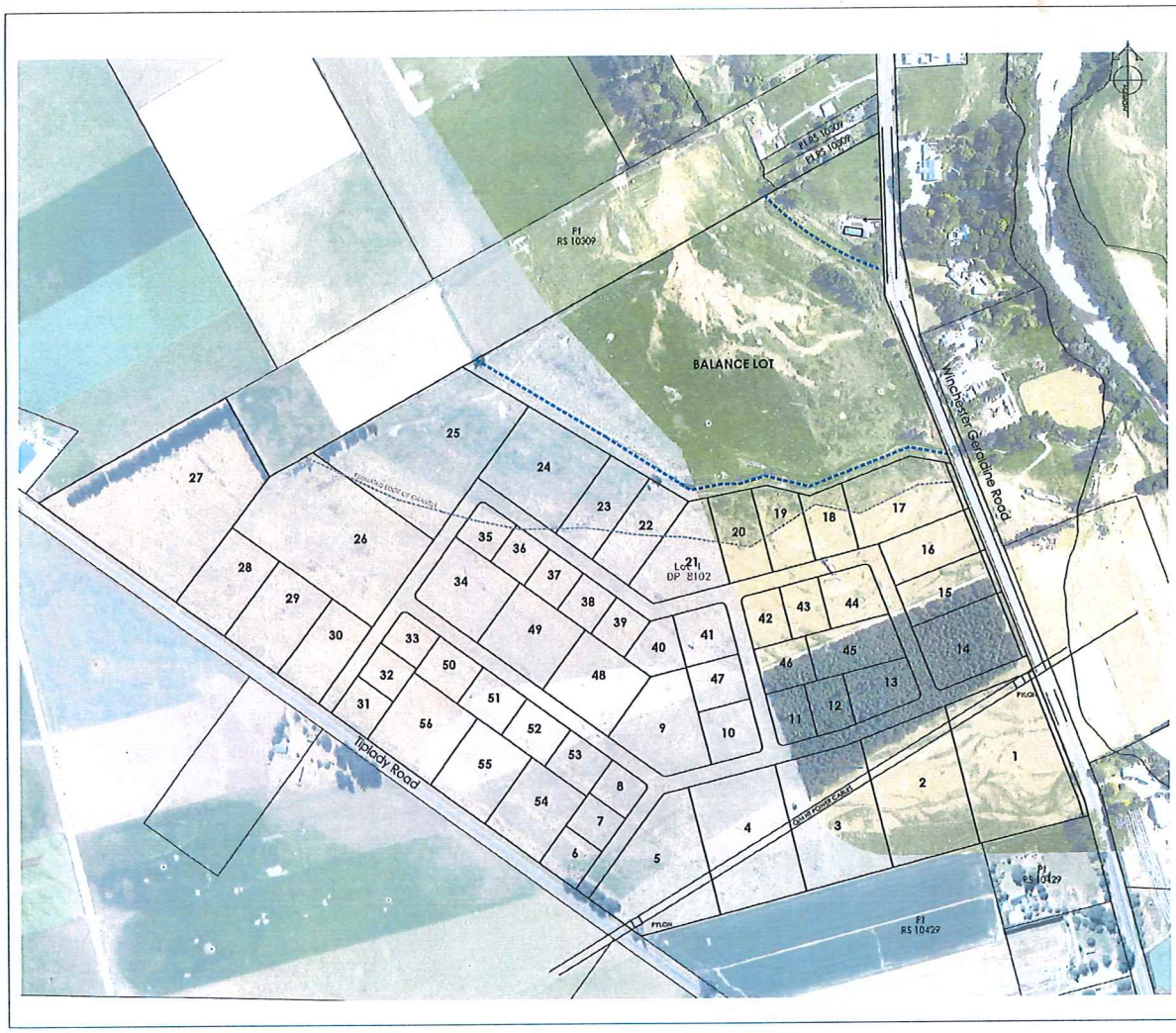
DAVIE LOVELL-SMITH

3. Soakpit Tests

Location	Depth of Test (mm)	Infiltration Rate (mm/hr)
1	2400	1500
2	2500	1800
3	2300	1800
4	N/A	N/A
5	2100	> 7000
6	2000	1200
7	2300	6000
8	1600	1800
9	1600	6000
10	1700	600
11	N/A	N/A
12	1700	60

Justin Finlay
Civil Engineer | Davie Lovell-Smith Ltd
May 2020

Appendix E – Preliminary Subdivision Layout Plan



AMENDMENTS :

AMENDMENT	DATE	DESCRIPTION

NOTES :

1. Areas and dimensions are approximate only and are subject to final survey and deposit of plans.
2. Services easements to be created as required.
3. This plan has been prepared for subdivision concept & discussion purposes only. No liability is accepted if this plan is used for any other purposes.

Total Area :

Comprised In:

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118 Wrights Road P O Box 679 Christchurch 8140 New Zealand
Telephone: 03 379 6783 Website: www.dls.co.nz E-mail: office@dls.co.nz

JOB TITLE:

Tiplady Road

SHEET TITLE:

Proposed Subdivision of Lot 1 DP 8102

DRAWING STATUS

For Discussion Purposes

SCALE: 1:2000@A1 1:4000@A3 DATE: April 2020

CAD FILE : J:\2097\SUBDCH-220097 base plan-fi.dwg

DRAWING No : E20097 SHEET No: 1 OF 1

REVISION: R1

Appendix F – CRC111262

Details for CRC111262

RMA Authorisation Number	CRC111262	**Client Name**	Mr D H & Mrs C A Gibson
Consent Location	841 Geraldine-Winchester Highway, GERALDINE	**State**	Issued - Active
To	Discharge of Domestic Wastewater into Land		
Commencement Date	17 Feb 2011		

- **All Systems**

- **1**
  The discharge shall be only wastewater.
- **2**
  The maximum volume of the discharge from a system shall not exceed two cubic metres per day.
- **3**
  There shall be no discharge of wastewater to surface water or into groundwater.
- **4**
  The discharge shall not result in wastewater flowing, seeping, or ponding on the surface of the ground.
- **5**
  There is no sewerage pipeline network available to collect the discharge. A connection shall be made to a sewerage pipeline network within six months of a network becoming available. For the purpose of this condition, "available" means:
  a. a sewerage pipeline network system passes within 30 metres of the property boundary; and
  b. the property from which the wastewater is generated is less than four hectares in area; and
  c. the distance to the network from the building in which the wastewater is generated is less than 60 metres; and
  d. the network operator will accept the discharge.

- **Existing Systems**

- **6**
  When there is an increase in the volume of the discharge, or any modification to the system, as a result of:
  a. an alteration of a building that requires authorisation under the Building Act 2004; or
  b. the connection to the system of a new or replacement building, or relocated building; or
  c. any alteration to the existing system, excluding routine maintenance of the system;
  d. the discharge shall comply with Conditions (1) to (5) and (8) to (20) inclusive of this rule.
- **7**
  Where the discharge occurs in a Community Drinking Water Supply Protection Zone for a well listed in Schedule WQL2, or within the Christchurch Groundwater Protection Zone 1, or Sub-Zones 1A, 1B, 1C or 1D, or Zone 2 the discharge shall comply with Conditions (1) to (5) and (8) to (19) inclusive of this rule by 1 November 2015.

- **New systems**

The discharge shall not occur:

a. within 20 metres of a river, lake, artificial watercourse, or the Coastal marine area; or
b. at an elevation higher than 1000 metres above sea level; or
c. on land with a slope greater than 20 degrees; or
d. on land:
    i. that is likely to be flooded from a river or lake in an event with an Annual Exceedance Probability of two percent (1 in 50 year event) or more; or
    ii. where water is known to pond for at least two hours in a rainfall event, on average, at lease once in every five years; or
e. within 20 metres of a wetland boundary.

- **9**

The discharge shall not occur where the land is located over:

a. an unconfined or semi-confined aquifer, where the highest groundwater level, which can reasonably be expected at the point of discharge based upon relevant and available groundwater data is:
    i. less than two metres from the ground surface; and
    ii. less than six metres from the ground surface unless the land application consists of a drip irrigation system as described in Condition (12)(b); or
b. the Coastal Confined Gravel Aquifer System, and there is:
    i. less than two metres of undisturbed material between the point of discharge and the Aquifer 1; or
    ii. less than two metres of unsaturated sediment above any water table overlying Aquifer 1.

- **10**

Separation distances shall be maintained:

a. between a well and a discharge system that occurs outside of a Community Drinking Water Supply Protection Zone, as specified in Part A of Schedule WQL6 ; and
b. between discharge systems, as specified in Part B of Schedule WQL6, unless the land application system consists of a drip irrigation system as described in Condition (12)(b), and the site in addition to all adjacent properties are either on a reticulated water supply or are one hectare or more in size.

- **11**

The minimum separation distance between the land application system and a property boundary shall be:

a. 20 metres to the nearest down gradient boundary in the direction of groundwater flow at the site and five metres to any other property boundary; or
b. two metres to any property boundary if the land application system consists of a drip irrigation system as described in Condition (12)(b) and the discharge is into soil.

- **12**

The land application system shall consist of either:

a. a treatment trench, bed or mound:
    i. with media of at least 600 millimetres thick; and,
    ii. of which the media shall be of a grade that fits within the 2A envelope on the diagram in Schedule WQL8; and
    iii. to which the discharge is pumped, or is dosed in fixed quantities, so that the effluent is applied to the treatment trench, bed or mound evenly at a rate of not more than 50 millimetres per day; or
b. a pressure compensating drip irrigation system through which the discharge is applied evenly, and at a rate which shall not exceed the value in Table 4.2A4 in the Australian/New Zealand Standard 1547:2000 On-site domestic wastewater management for the soil type at the site.

- **13**

Where the land application system consists of a treatment trench, bed or mound, as specified in Condition (12)(a), there shall be sufficient additional land available on the property to allow a replacement land application system to be installed.

- **14**

The wastewater shall pass through a proprietary effluent filter before discharge to the land application system.

- **15**

  A copy of the design plan of the treatment and land application system shall be submitted to Environment Canterbury at least twenty working days prior to the installation of the system.

- **16**

  When the construction of the treatment and land application system is completed:
  a. the work shall be certified by a suitably qualified and competent person as having been carried out in accordance with the design plan; and
  b. a copy of the certificate shall be forwarded to Environment Canterbury within twenty working days following completion of the work.

- **17**

  The treatment and land application system shall be operated and maintained in accordance with the system's design specification for maintenance.

- **18**

  The primary treatment tank or chamber shall:
  a. have an access point or points for inspecting and maintaining the effluent filter, monitoring the accumulation of sludge and desludging the tank or chamber. The access point or points shall be accessible for these purposes at all times; and
  b. be inspected at least once every three years and the depth of accumulated sludge in the primary treatment tank or chamber measured; and
  c. be desludged when the accumulated scum and sludge occupy more than two thirds of the volume of the tank or chamber.

- **19**

  The following information shall be recorded, and a copy of these records made available to Environment Canterbury upon request:
  a. maintenance of the treatment and land application system, including inspection, desludging or remedial work; and
  b. date works are undertaken and the name of the company and person undertaking the work.

- **20**

  The discharge shall not occur within a Community Drinking Water Supply Protection Zone for a well listed in Schedule WQL2.

Appendix G – Winchester Geraldine Road Intersections

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

Tiplady Road

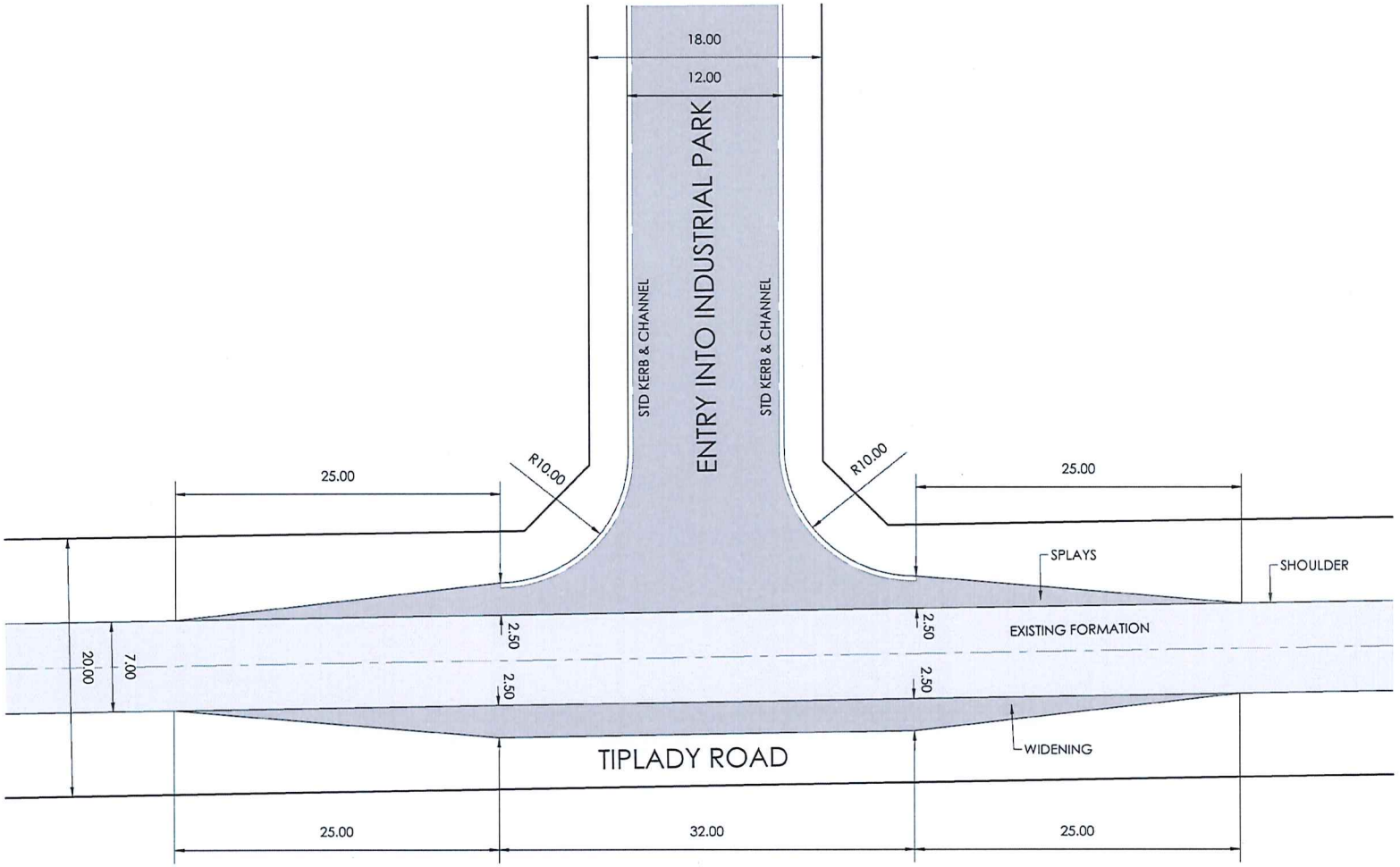
Proposed Winchester Geraldine Road Intersection

For Discussion Purposes

SCALE 1:500@A1 1:1000@A3 DATE July 2020

DRAWING No E20097 SHEET No RD03 REVISION R1

Appendix H – Tiplady Road Intersections Detail



EGEND :

NEW PAVEMENT

EXISTING CHIP SEAL PAVEMENT

Revision:
R0

AVIE LOVELL-SMITH
LANNING SURVEYING ENGINEERING

116 Wrights Road
PO Box 679 Christchurch 8140,
New Zealand
Tele 0-3-3790 793
E-mail: office@dls.co.nz

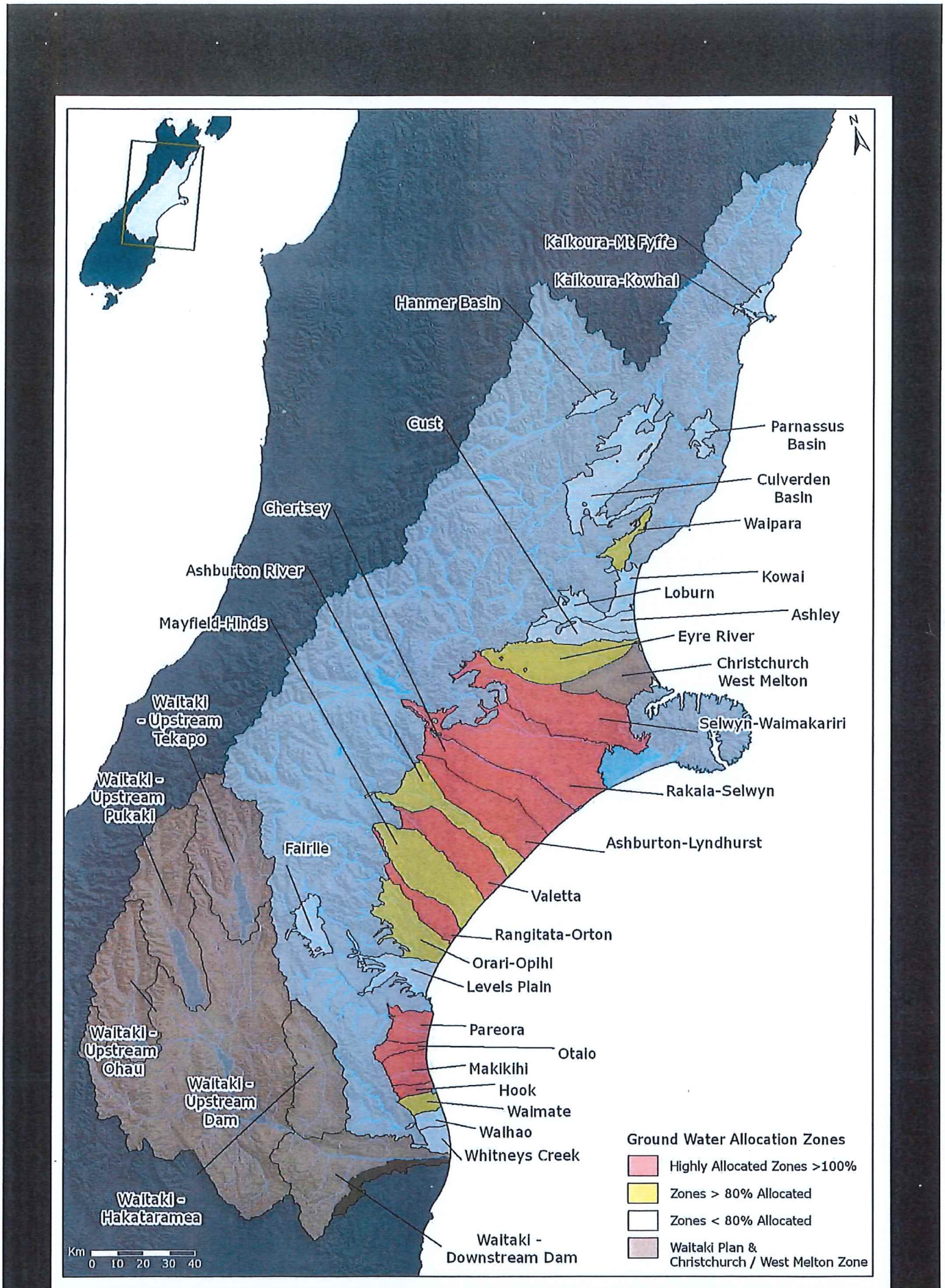
Intersection Details

Scale:1:500@A4
Date: March 2020

Drawing No: E20097 RD04

J:\20097\Eng\Drawings\E20097 RD04 Intersection Details.dwg

Appendix I – Groundwater Allocation Zone Map


N
Kaikoura-Mt Fyffe
Kaikoura-Kowhai
Hanmer Basin
Cust
Parnassus Basin
Culverden Basin
Chertsey
Waipara
Ashburton River
Kowai
Loburn
Mayfield-Hinds
Ashley
Eyre River
Christchurch West Melton
Waitaki - Upstream Tekapo
Selwyn-Waimakariri
Waitaki - Upstream Pukaki
Rakaia-Selwyn
Fairlie
Ashburton-Lyndhurst
Valetta
Rangitata-Orton
Orari-Opihi
Levels Plain
Waitaki - Upstream Ohau
Pareora
Otaio
Makikihi
Waitaki - Upstream Dam
Hook
Waimate
Walhao
Whitneys Creek
Waitaki - Hakataramea
Waitaki - Downstream Dam
Km
0 10 20 30 40
Ground Water Allocation Zones
Highly Allocated Zones >100%
Zones > 80% Allocated
Zones < 80% Allocated
Waitaki Plan & Christchurch / West Melton Zone

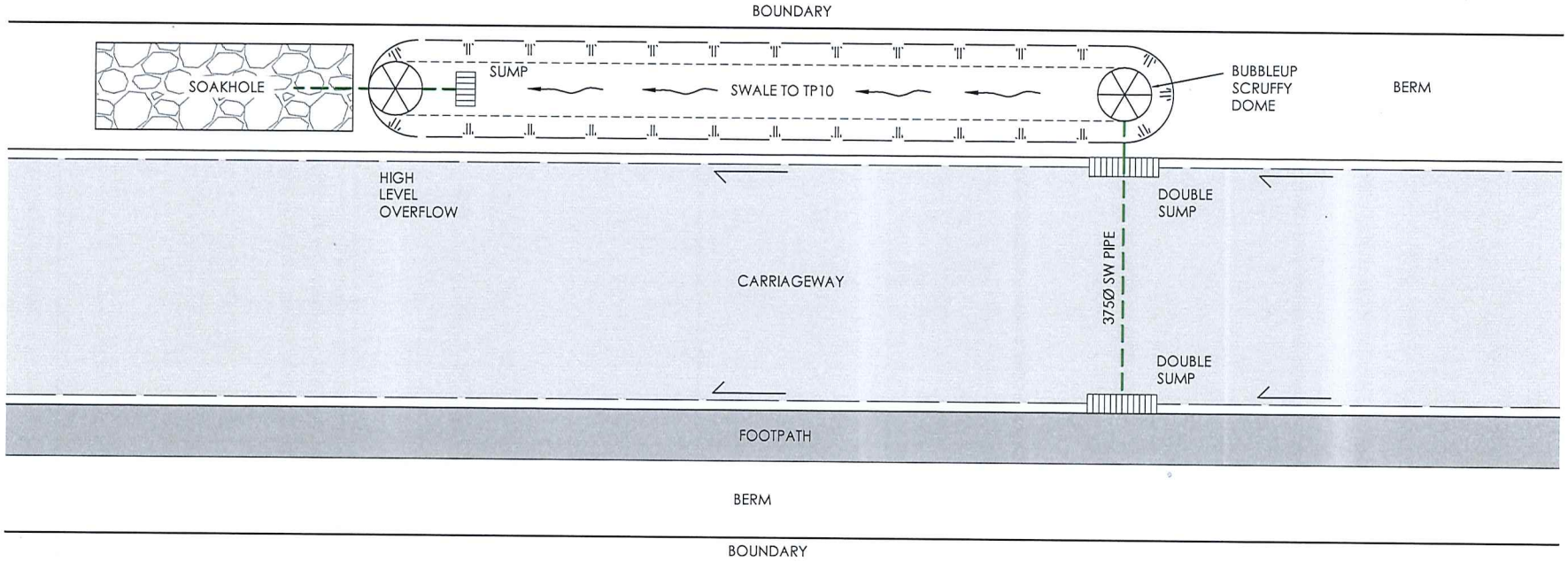
Appendix J – Potential Sewer Connection

NOT USED

Appendix K – Stormwater Basin Land Take Plan


Pt RS 10309
Pt RS 10309
Pt
RS 10309
BALANCE LOT
DOWNS CREEK
Winchester Geraldine Road
EDGE OF GRAVEL
Lot 1
DP 8720
FIRST FLUSH BASIN
1m DEEP
4,621m2 MINIMUM
DETENTION BASIN
1m DEEP
46,378m2 MINIMUM
CONTROLLED
DISCHARGE TO
WATERCOURSE
PYLON
PYLON
Pt
RS 10429
Pt
RS 10429
Tiplady Road
NORTH
AMENDMENTS
AMENDMENT
DATE
DESCRIPTION
NOTES :
PLAN
SCALE
DATE
DESIGNED BY
CHECKED BY
DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING
JOB TITLE:
Tiplady Road
SHEET TITLE:
Stormwater Basin Land Take Plan
DRAWING STATUS:
For Discussion
SCALE: 1:2000 @ A1
1:4000 @ A3
DATE: July 2020
DRAWING No
E20097
SHEET No
SW01
REVISION:
R1

Appendix L – Potential Stormwater Catchment, Treatment and Disposal Facility



SUBJECT TO DISCHARGE CONSENT APPROVAL

Revision:
R0

AVIE LOVELL-SMITH
ANNING SURVEYING ENGINEERING

116 Wrights Road
PO Box 679 Christchurch 8140,
New Zealand
Tele 0-3-3790 793
E-mail: office@dls.co.nz

Swale Detail

Scale:1:200@A4
Date: July 2020

Drawing No: E20097 E SW

J:\20097\Eng\Drawings\E20097 RD04 Swale Details.dwg

Appendix M – Cost Estimates

Tiplady Road Development Roading Estimate						
	Item	Description	Quanitiy	Unit	Rate	Total
1.0 : Primary and general						
	1.1	Site establishment	1	ls	$20,000.00	$20,000.00
	1.2	Setting Out	1	ls	$5,000.00	$5,000.00
	1.3	Determine and protect existing services	1	ls	$3,000.00	$3,000.00
	1.4	Traffic control including approved management plan and all operations	1	ls	$5,000.00	$5,000.00
	1.5	Liaise with other contractors	1	ls	$1,000.00	$1,000.00
	1.6	As Builts data for engineering in digital format	1	ls	$3,000.00	$3,000.00
	1.7	Erosion and Sediment control	1	ls	$5,000.00	$5,000.00
	1.8	Design and approval	1	ls	$20,000.00	$20,000.00
	1.9	Consenting	1	ls	$5,000.00	$5,000.00
	1.10	Contingency 20%	1	ls	$37,375.75	$37,375.75
	1.11	Council fees	1	ls	$10,000.00	$10,000.00
2 : Earthworks						
	2.1	Strip and stockpile topsoil, average of 200mm (prov)	787	sq.m	$1.25	$983.75
	2.2	Screen and respread 150mm Class 1 topsoil from stockpile to berms and sow in CCC berm mix	380	sq.m	$3.00	$1,140.00
	2.3	Sow berms in CCC berm mix	380	sq.m	$0.60	$228.00
	2.4	Remove excess topsoil from site	1	ls	$1,000.00	$1,000.00
3 : Roading						
	3.1	Saw cut and feather into existing pavements including removal	3	ls	$1,260.00	$3,780.00
	3.2	Compaction of stripped road subgrade prior to filling (prov)	567	sq.m	$1.00	$567.00
	3.3	Cut unsuitable material and waste off site (prov)	20	cu.m	$18.50	$370.00
	3.4	Import and lay pitrun to replace unsuitables excavated beneath road pavements (prov)	20	cu.m	$48.00	$960.00
	3.5	Construct standard kerb & channel to NZS 4404, including prep, pedestrian cut downs, joint ea 5m, etc.	105	m	$80.00	$8,400.00
	3.6	Import and lay NZTA AP65 to roads 300mm depth	237	cu.m	$69.50	$16,471.50
	3.7	Import and lay M4 TNZ AP40 to roads to 100mm depth	94	cu.m	$115.00	$10,810.00
	3.8	Import and lay 50mm AC14 on full prime coat (prov)	938	sq.m	$50.00	$46,900.00
	3.9	Import and lay 2 Coat Chipseal Grade 3/5 (prov)	938	sq.m	$8.25	$7,738.50
	3.1	Benkelman beam testing as per standards	1	ls	$1,000.00	$1,000.00
	3.11	ND test on kerb base as per standards	1	ls	$500.00	$500.00
	3.12	ND test on road metals as per standards	1	ls	$500.00	$500.00
	3.13	Kerb core testing as per standards (prov)	1	ls	$750.00	$750.00
	3.14	Asphalt core testing as per standards (prov)	1	ls	$750.00	$750.00
	3.15	Road signs	9	ea	$670.00	$6,030.00
	3.16	All roadmarkings (and blue RPM & paint for fire hydrants)	1	ls	$1,000.00	$1,000.00
				TOTAL ex gst		**$224,254.50**

Tiplady Road Development Wastewater Estimate						
	Item	Description	Quanitiy	Unit	Rate	Total
1.0 : Primary and general						
	1.1	Site establishment	1	ls	$20,000.00	$20,000.00
	1.2	Setting Out	1	ls	$5,000.00	$5,000.00
	1.3	Determine and protect existing services	1	ls	$3,000.00	$3,000.00
	1.4	Traffic control including approved management plan and all operations	1	ls	$5,000.00	$5,000.00
	1.5	Liaise with other contractors	1	ls	$1,000.00	$1,000.00
	1.6	As Builts data for engineering in digital format	1	ls	$3,000.00	$3,000.00
	1.7	Erosion and Sediment control	1	ls	$5,000.00	$5,000.00
	1.8	Design and approval	1	ls	$40,000.00	$40,000.00
	1.9	Consenting	1	ls	$20,000.00	$20,000.00
	1.10	Contingency 20%	1		$108,074.00	$108,074.00
	1.11	Council fees	1		$20,000.00	$20,000.00
4.0 : Sanitary Sewer						
	4.01	Connections to existing Siphon Pressure sewer main	1	ls	$7,000.00	$7,000.00
	4.02	180mm DN65 PN12 Pipework in subdivision all costs including joints, thrust blocks and fitting etc.	1850	m	$5.00	$9,250.00
	4.03	90mm DN65 PN12 Pipework in subdivision all costs including joints, thrust blocks and fitting etc.	1650	m	$80.00	$132,000.00
	4.04	63mm PN12 Pipework in subdivision all costs including joints, thrust blocks and fitting etc.	250	m	$50.00	$12,500.00
	4.05	40mm PN12 Pipework in subdivision all costs including joints, thrust blocks and fitting etc.	670	m	$40.00	$26,800.00
	4.06	Boundary Kits, supply and install, All costs including connections etc	56	ea	$1,300.00	$72,800.00
	4.07	Flushing Point, supply and install, All costs including connections etc (prov)	4	ea	$3,500.00	$14,000.00
	4.08	75mm Pressure Sewer Valve PN16	4	ea	$1,500.00	$6,000.00
	4.09	150mm Pressure Sewer Valve PN16	3	ea	$3,000.00	$9,000.00
	4.10	BEC supply and install all cost including thrust blocks etc	4	ea	$5.00	$20.00
	4.11	Road reinstatement	1	ea	$20,000.00	$20,000.00
	4.12	Preconstruction and Construction testing and flushing of pipes to CCC standards	1	ls	$20,000.00	$30,000.00
	4.13	As Built of Pressure sewer network to CCC standards	1	ls	$4,000.00	$4,000.00
	4.14	Actuated Valve and Water Meter including all testing, chambers etc	1	ls	$75,000.00	$75,000.00
				TOTAL ex gst		**$648,444.00**

Tiplady Road Development Stormwater Estimate						
	Item	Description	Quanitiy	Unit	Rate	Total
1.0 Primary and general						
	1.1	Site establishment	1	ls	$250.00	$250.00
	1.2	Setting Out	1	ls	$250.00	$250.00
	1.3	Determine and protect existing services	1	ls	$50.00	$50.00
	1.4	Traffic control including approved management plan and all operations	1	ls	$50.00	$50.00
	1.5	Liaise with other contractors	1	ls	$50.00	$50.00
	1.6	As Builts data for engineering in digital format	1	ls	$150.00	$150.00
	1.7	Erosion and Sediment control	1	ls	$50.00	$50.00
	1.8	Design and approval	1	ls	$5,000.00	$5,000.00
	1.9	Consenting	1	ls	$2,000.00	$2,000.00
	1.10	Contingency 20%	1	ls	$16,370.00	$16,370.00
	1.11	Council fees	1	ls	$2,000.00	$2,000.00
4.0 Stormwater						
	4.01	Standard double sumps	2	ea	$3,500.00	$7,000.00
	4.02	Standard single Sump and orifice	1	ea	$3,000.00	$3,000.00
	4.03	Scruffy dome chambers	2	ea	$6,000.00	$12,000.00
	4.04	Soakhole	1	ls	$25,000.00	$25,000.00
	4.05	375mm dia uPVC SW pipe	20	m	$400.00	$8,000.00
	4.06	Shape and grade swale	1	ls	$1,000.00	$1,000.00
	4.07	Kerbside bubbleup sumps	4	ea	$2,500.00	$10,000.00
	4.08	225mm uPVC Laterals	20	m	$300.00	$6,000.00
				TOTAL ex gst		**$98,220.00**

Expected to be required for each 150m of roading.

Tiplady Road Water Supply Installation Estimate						
	Item	Description	Quanitiy	Unit	Rate	Total
1.0 : Preliminary and General						
	1.1	Site establishment	1	ls	$40,000.00	$40,000.00
	1.2	Setting Out	1	ls	$5,000.00	$5,000.00
	1.3	Determine and protect existing services	1	ls	$3,000.00	$3,000.00
	1.4	Traffic control including approved management plan and all operations	1	ls	$5,000.00	$5,000.00
	1.5	Liaise with other contractors	1	ls	$1,000.00	$1,000.00
	1.6	As Builts data for engineering in digital format	1	ls	$3,000.00	$3,000.00
	1.7	Erosion and Sediment control	1	ls	$5,000.00	$5,000.00
	1.8	Design and approval	1	ls	$40,000.00	$40,000.00
	1.9	Consenting for bore and water take	1	ls	$50,000.00	$50,000.00
	1.1	Contingency 20%	1		$302,280.00	$302,280.00
	1.11	Council fees	1		$40,000.00	$40,000.00
5.0 : Water						
	5.1	40mm (OD) PE PN12	560	m	$50.00	$28,000.00
	5.2	250mm mPVC PN12 watermain including granular trench backfill, bends and fittings etc	2500	m	$130.00	$325,000.00
	5.3	40mm (OD) PE on 250mm uPVC tapping band	56	ea	$250.00	$14,000.00
	5.4	250mm blank end cap and thrust block	1	ea	$1,500.00	$1,500.00
	5.5	250mm sluice valve	14	ea	$3,000.00	$42,000.00
	5.6	250mm 90 deg bend	3	ea	$1,500.00	$4,500.00
	5.7	250mm Hydrant including markers	27	ea	$3,000.00	$81,000.00
	5.8	250mm on 250mm tee and thrust block	4	ea	$3,000.00	$12,000.00
	5.9	Water meters into lots. All costs including	56	ea	$400.00	$22,400.00
	5.10	250mm 45deg bend and thrust block	2	ea	$1,500.00	$3,000.00
	5.11	Sterilisation with standover	4	ea	$4,000.00	$16,000.00
	5.12	Pressure testing	4	ea	$5,000.00	$20,000.00
	5.13	Bore and associated pumps, controls, telemetry and protection	1	ls	$750,000.00	$750,000.00
				TOTAL ex gst		**$1,813,680.00**