Private Plan Change Request – Hughes Developments Limited
Appendix A – Infrastructure Report

Preliminary Infrastructure Report

Hughes Developments Ltd

Halkett Road • West Melton

H19404

November 2020

DAVIE LOVELL·SMITH

PLANNING SURVEYING ENGINEERING

Shaping the future since 1880

Contents:

Revision History

Rev Number:	Prepared By:	Description:	Date:
Revision 0	Jamie Verstappen	For plan change submission	6/11/2020

Document Control

Action:	Name:	Signed:	Date:
Prepared By	Jamie Verstappen		6/11/2020
Reviewed By	Andy Hall		6/11/2020
Approved By	Andy Hall		6/11/2020

1. GENERAL

1.1. Introduction

This preliminary infrastructure report addresses the infrastructure upgrades required to service the proposed development of approximately 20 Ha of land located at West Melton, Canterbury. The land is located on the eastern side of the West Melton Township.

The proposed zoning for the site is Living West Melton – Medium Density. It is proposed to subdivide the site at a density of approximately 10 Lots/Ha, therefore infrastructure loadings will be based on a total of 200 new residential sites. The property is not currently connected to Selwyn District Council (SDC) drainage and water supply infrastructure.

The site is bounded by Halkett Road to the North, Gainsborough development on the west, West Coast Road (SH73) to the south and lifestyle blocks to the east. A site plan is attached as Appendix A.

Consultation has been undertaken with SDC staff in regard to the infrastructure requirements for the site. Consultation with service designers and service authorities has been undertaken to determine services requirements for the proposed development.

The proposed subdivision infrastructure construction will comply with the requirements of SDC's Code of Practice and all future consents relating to the site to ensure vesting in SDC upon completion.

The purpose of this report is to provide an assessment of the servicing of the proposed residential development with respect to road access, wastewater, water supply, stormwater, electricity and telecommunications infrastructure and to identify any issues that may prevent or substantially delay the efficient provision of this infrastructure.

1.2. Legal Description

The legal description for the site is Lot 1 DP34902 at 163 Halkett Road and Lot 2 DP 34902 at 1066 West Coast Road.

1.3. Topography

The topography of the site is relatively flat and level, with a slight fall towards the eastern side of the site. The maximum variation in ground level across the site is approximately 2.4m. There is an existing equestrian track located within the site and various rural access tracks across the land.

The existing site area is predominantly in pasture and is currently in use for rural purposes. Large mature hedges are located along the eastern and southern boundaries of the land. There is also a large amount of hedge line within the land, including along the internal boundary of the site.

Please refer to the enclosed Site Contour Plan in Appendix B of this report for existing contour levels

across the site.

1.4. Soils

Environment Canterbury data for the site and surrounding areas has been reviewed to determine the soil and groundwater conditions below the site. The data from 3 bores was reviewed, one from within the site and two from neighbouring land. The bore data was gathered between September 2003 and September 2007.

The data indicates that the site is underlain by sandy and claybound gravels to at least 78m. Ground water was encountered at between 22m and 24m below ground level. Please refer to Appendix C for bore log summaries and location plan.

It is recommended a comprehensive geotechnical investigation be undertaken at the site to confirm soil and groundwater conditions at consenting stage.

1.5. Site Contamination

Preliminary and detailed site investigations into potential contamination within the site have been undertaken by ENGEO for both the 1066 West Coast Road property and the 163 Halkett Road property. Contamination has not been found within the 1066 West Coast Road property however if the buildings within the site are to be demolished as part of any development work further testing will be required to determine the presence and management of asbestos. Potential contamination has been identified at four localised areas within the 163 Halkett Road property where burn pits have been located. The removal of the soil in these areas would be considered a permitted activity and would be undertaken prior to any development works within the site.

These investigation reports are attached to the main plan change application. Validation reports will be supplied following the removal of any contaminated material from within the site.

2. EARTHWORKS

2.1. Consent Requirements

Consent will be sought from SDC to undertake earthworks at the site for the purpose of residential development. Consent will also be sought from Environment Canterbury to enable discharge to ground of stormwater during the construction period.

2.2 Soil Conditions

Two geotechnical investigations have been undertaken for the proposed development area. These investigations were undertaken by ENGEO between July 2017 and July 2018 on each of the two existing properties. The investigations included a desktop study of existing data and site investigations consisting of boreholes, penetrometer testing and machine test pits to determine the soil profile and give an indication of the bearing capacity of soils beneath the site. Both reports indicate a consistent soil profile of up to 0.5m topsoil overlying silts and sands of between 0.1m and

1.8m thickness overlying interbedded sandy gravel and clay-bound gravel to at least 78m depth.

The ground water level in ECan boreholes in the vicinity of the site is between 21m and 24m below ground level. “Good ground” as described in NZS:3604 is typically encountered below 0.6m below ground level.

Due to the subsurface materials and depth to groundwater the potential for liquefaction and lateral spreading within the site is very low. The site is therefore considered equivalent TC1, where future land damage from liquefaction is unlikely and ground settlements are expected to be within normally accepted tolerances.

2.3 Construction

From the review of the completed geotechnical investigations we expect that all soil encountered within the site will be suitable for filling to residential development standards. It is also expected that the construction of the subdivision works will be possible in any season, however excavation over summer months in this area along with these soil conditions wind erosion may be an issue. Mitigation measures such as an onsite water cart will need to be employed to control dust.

It should also be noted that during the construction process the containment and disposal of potentially sediment laden stormwater flows would need to be carried out. To ensure this is managed appropriately an erosion and sediment control management plan must be implemented. This plan will also need to be submitted and approved by both SDC and Environment Canterbury.

It is anticipated that around 50,000 m^3 of soil will need to be cut and filled to establish building lots and roading within the site for the proposed development density. This will ensure building platforms are protected from surface water and flooding and allow adequate drainage of the development area.

All earthworks are required to be carried out in accordance with NZS4431:1989 and will involve the stripping of topsoil to stockpile, the bulk cut to fill earthworks and finally reinstatement of the topsoil and grass. We would expect that the earthworks will be a balanced cut and fill and no material will be removed from site unless it is of an unsuitable nature.

3. ROADING AND ACCESS

3.1 Road Network

The ODP for the site shows the roading links proposed, this is included in figure 1 below. A primary link will connect SH 73 to Halkett Road through the site. Several seconday roads within the site will provide access to the majority of new lots. Right-of-Ways will be used to service rear lots where road frontage is not available for access.

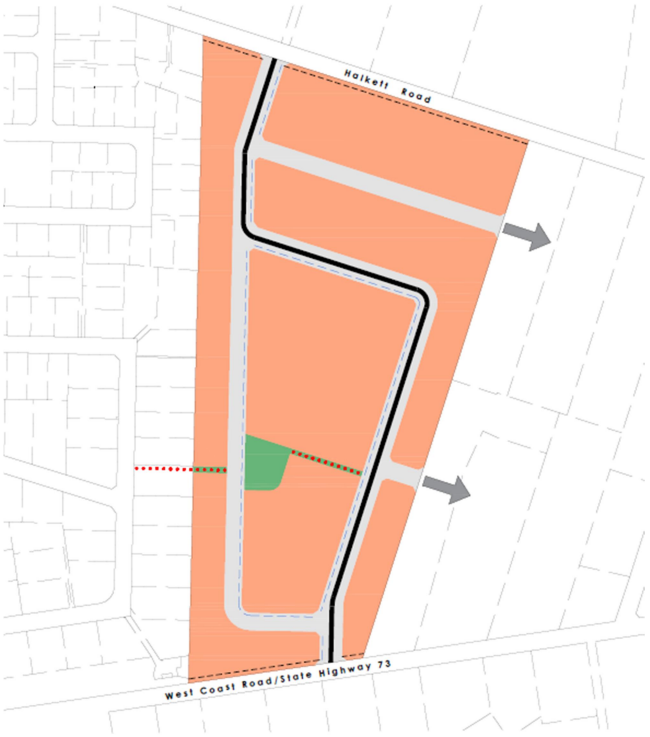

Figure 1 – Roading ODP for West Melton East

A traffic report has been undertaken by Novo Group to identify the effects on the surrounding road network as a result of the proposed development. Consultation has been undertaken with NZTA regarding the proposed road connection to SH 73. This report provides an assessment of the rezoning proposal and provides recommendations regarding roading and pedestrian linkages to be provided through future subdivision works. The key findings of the report can be summarised as follows:

- No crashes have been reported on roads fronting the site in the past 5 years.
- Pedestrian access across SH73 is provided approximately 300m west of the site. Pedestrian linkage to the town centre and this crossing point has been provided through existing development areas to the west. It is not preferable to provide any pedestrian linkage along SH73 from the site.
- A bus stop is located on Halkett Road approximately 260m west of the proposed road link.
- A direct road connection to SH73 is possible. A right turn bay at this intersection will provide adequate safety for the expected traffic loading. It is expected the current 60 km/h speed limit on SH73 will be extended beyond this intersection.
- A detailed intersection design for the Halkett Road link is not deemed necessary.
- Re-zoning of the land is supported from a transport perspective.

The current speed limit along the Halkett Road frontage is 80km/h. This speed limit is reduced to 60 km/h at the western side of the site. It is expected this speed restricted zone would be extended beyond any future development frontage, ensuring that direct access is a possibility for lots fronting Halkett Road.

A roading link to the site from SH 73 will also be sought to ensure adequate traffic permeability through the development. It is proposed to locate this road connection at one of the existing driveways to the site. Consultation with both SDC and NZTA will be undertaken in regards to this proposed access to determine design details and road upgrade requirements; these will likely include lane widening and a reduction in speed limit. The Novo Group traffic report includes a concept intersection layout which will form the basis of any future detailed design. No direct lot access will be provided from SH 73.

A development of this size will increase the traffic loading on Halkett Road and the surrounding road network. The intersection of Halkett Road and SH 73 has been identified as a high risk intersection and as such may require some upgrade work. As a minimum this work would likely include local carriageway widening to allow space for a right turn bay off SH 73 into Halkett Road. A merging lane for vehicles entering SH 73 from Halkett Road along with a speed restriction through the intersection may also be recommended. The scope and funding of any upgrade work will be agreed between NZTA, SDC and the developer.

3.2 Road Design

New roads constructed as part of the development works will be in accordance with the SDC District Plan (Township), in particular Table E13.8. The bearing capacity of foundation soils beneath the proposed roading are expected to be appropriate for road construction. Pavement depths within the development will be determined according to the tested bearing capacity as outlined in the SDC Engineering Code of Practice. All new roads will be sealed with asphalt. Some roading features such as thresholds, intersections and cul-de-sac heads may be surfaced with cobblestones or other suitable materials at the discretion of SDC. Footpaths will be provided on at least one side for all vested roads and a cycleway will be installed along the route identified in the ODP.

3.3 Gradients

Due to the flat site topography, road gradients will be minimal. To ensure the roads drain adequately, kerb and channel gradients will be no shallower than 1:500. The road levels will be set to ensure all flood flows are managed and directed away from building platforms within the road corridor. Secondary flow in the event of flooding is able to be directed off site.

4. STORMWATER

4.2 General

It is expected soil conditions on site will be suitable for stormwater disposal to ground. Stormwater emanating from roofs and hardstand areas on private lots will be directed to ground within the lot in accordance with the New Zealand Building Code.

All other stormwater from site will be directed to roadside kerb and channel by ground contour and collected in channel sumps. Stormwater can then be discharged to ground via soakage facilities. In some locations pre-treatment of stormwater may be required, this is likely to be through the use of a

swale, retention basin or infiltration basin. All flow over and above the 50 year ARI will need to be directed away from the development area by secondary flow channels.

All stormwater infrastructure is to be constructed in accordance with the SDC Code Of Practice to enable It to be vested upon completion of the construction defects period.

4.3 Environment Canterbury Requirements

Selwyn District council have indicated that once vested, the development area could be included in their global stormwater discharge consent for West Melton. This consent is labelled CRC167467 and is attached as Appendix D.

This consent allows for potentially contaminated stormwater to be discharged to ground in accordance with consent conditions. A consent with ECAN with the same conditions will be sought by the developer in order to discharge stormwater during the construction defects period, generally 2 years from completion. Due to the local ground conditions and depth to the ground water table we do not anticipate any problems obtaining a consent as detailed above.

It is noted that there are several domestic supply wells located in the rural land to the east of the site in the direction of groundwater flow. Well depths range from 36m to 78m within 300m of the site.

4.4 Flood Flows

Selwyn District Council has with the help of Environment Canterbury identified land across the Selwyn District which may be susceptible to flooding. The proposed development site has been shown to be affected by flooding in both the 1 in 200 year and 1 in 500 year storm events.

An assessment of the existing flood flow channels within and surrounding the site has been undertaken by Davie Lovell-Smith Ltd to determine any works to mitigate these potential flood flows. Three flow channels were identified within the site and all are able to be fully mitigated by filling of lots and providing for secondary flow channels through road corridors and reserves. Secondary flow channels through the road and reserve network for flow over and above the 1 in 50 year event will be considered during detailed design. It is expected the roading links on the eastern and southern boundary will be used to convey flood flow away from the site.

5. WASTEWATER

5.1. Existing Wastewater System

An existing sewer pumping station is located at the south western corner of the site on Rossington Drive. This pumping station serves all existing residential areas in West Melton township. Initial consultation with SDC has indicated there is additional capacity available in the local sewerage system and rising main; however some changes may be required to ensure adequate downstream system capacity is available.

The current rising main conveying flow from the pump station is sized 225mm and has a pressure

rating of PN10. SDC has indicated that the pressure rating of the pipe is the limiting factor for sewer flow from the pump station. Upgrading the capacity of the wastewater pumps to a maximum of 70m pressure may be considered to ensure additional future flows can be accommodated. The rising main links the West Melton pump station to the Rolleston gravity wastewater network approximately 9km away.

We have been informed that the flow rate available through the rising main at maximum operating pressure is 44l/s. This equates to a catchment loading of 1276 households using the SDC Code of Practice flow calculation method.

There is currently 829 consented connections within this pump station catchment, therefore an additional 447 connections can be accommodated by the current pumping arrangement. The maximum sewerage flow for a development size of 200 lots is expected to be 6.875 l/s, or approximately 15.7% of the total available pump station flow.

SDC has also indicated that additional emergency wastewater storage may be required within the Rossington Drive pump station catchment as a result of further development. The volume of additional storage required will be determined at detailed design stage. It is likely the combination of pipework, structures, lift station and/or residential pump reservoirs installed in the new development will account for a large proportion of the storage.

A 225mm uPVC gravity sewer connection has been provided to the site area approximately mid-way along the western boundary for future connection. This pipe is located in an easement through Lot 109 DP 402313. It is anticipated a proportion of the wastewater from the development site will discharge into this pipe system.

5.2. Wastewater Design

Due to the flat contour of the site only a proportion of the development area will be able to drain via gravity to the existing network. Initial estimates are that approximately 50% of the proposed development site will be able to drain into the existing network via gravity; this area is located along the western boundary of the site. This will mean some form of wastewater pumping arrangement will need to be installed to enable the remainder of the development site to be serviced. The two options we will consider during detailed design are a low pressure sewer system and a small sewage pumping station which can be installed in the road reserve and vested in SDC.

Initial indications from Council are that the use of a low pressure sewer network to service the balance of lots that cannot use a gravity pipe system will be allowable. This low pressure sewer system would rely on small pump units at each property boundary that would pump to a common PE rising main located in the road berm that discharges to the gravity system at a point where an allowable pipe gradient can be achieved. The cost of operation and maintenance of the pump units would be the responsibility of the home owner. The cost of operation and maintenance of the pressure pipe located in the road reserve would be the responsibility of council. The majority of the construction cost in this solution is in the installation of boundary pumping kits.

Alternatively a small sewer pumping station could be utilised within the site to convey wastewater to

the existing pumping facility at the south western corner of the site. This will allow the eastern side of the site to be serviced via gravity sewer mains located in the road carriageways and laterals to within the property boundaries. It is expected the largest sewer main pipe required will be 150mm uPVC and all laterals to residential lots will be 100mm uPVC. This pumping station and gravity sewer network will be required to be built to SDC standards in order to be vested in Council upon completion.

5.3. Wastewater Rising Main Outfall

SDC has indicated that the existing gravity system which the West Melton rising main discharges to is nearing capacity. This outfall is located at Walkers Road on the north western side of Rolleston. Currently all sewerage pumped into this gravity pipeline flows to a pump station at Burnham School Road. Upgrade works of this gravity pipeline or an alternative point of discharge will need to be considered some time in future if flows into the system are increased. It is noted that proposed further development of Rolleston Prison will also increase flow through this system. Two alternative discharge options are currently being considered by SDC.

An alternative outfall into the gravity sewer system located at Hoskyns Road is being considered by SDC. This outfall location would be near the Maddisons Road intersection. SDC has indicated the gravity sewer system from here has adequate capacity to accommodate additional flow produced by future West Melton development; however this discharges to a pump station located at Jones road which is nearing capacity. This option would require the installation of approximately 1850m of new 225mm diameter sewer rising main along Hoskyns Road to connect with the existing rising main at West Melton Road.

SDC have indicated an extension to the existing sewer rising main which will convey sewage directly to the Pines treatment plan is also an option. This will require an additional 5750m of 225mm sewer rising main to be installed south along Walkers Road and beneath the railway and SH1. This option is favourable as it conserves capacity within the Jones Road pump station.

Each of the above options will likely require pump upgrades within the Rossington Drive pump station due to the increase in rising main length. SDC have indicated a portion of the costs associated with the above upgrade work will be recovered by development contributions split between all new lots within the West Melton sewer catchment. These costs will be determined when the district plan is reviewed.

6. WATER SUPPLY

6.1. Existing Water Supply Network

SDC has existing water supply reticulation in the area, supplied by several groundwater extraction wells. The Council well nearest to the site is located in the Gainsborough reserve located on Rossington Drive. This well is currently connected to a reservoir consisting of 10 above ground water tanks located at the south western boundary of the site on land currently owned by Hughes

Developments Ltd. The current flow reliably available from the Rossington Drive well is 9 l/s. SDC has indicated that the current local water pressures are at, or above the council suggested pressure range.

Council water supply is not currently provided to either of the lots within the proposed development area. One well is currently active within the site for domestic and stock water supply, this well is labelled M35/1013 and details have been provided in Appendix C. It is expected this well will be abandoned during development works.

6.2. Proposed Water Supply Network

The estimated water supply loading of the proposed development is 800 m^3/ day, this is based on a conservative average household usage of 4000 l/ day. This daily flow volume equates to 9.3 l/s, however during peak times this flow rate will be significantly higher.

It is understood that the proposed development will require more water than is currently available within the existing community water supply scheme. This can be managed by increasing the capacity of the reservoir. SDC has indicated they would like to remove the current multiple tank storage arrangement and replace this with a single steel tank reservoir with at least 400 m^3 of storage. Additional land for this new reservoir would be required and SDC has indicated there would be funding available for the purchase of land for this purpose. The most logical position for this reservoir facility would be adjacent to the current location of the tanks, within the proposed development area. If this option is pursued a utility reserve would be included in the survey plan for the site and vested in SDC. The dimensions and layout of this land parcel would be confirmed with SDC during the subdivision consent process.

In addition, SDC has recently been undertaking work to connect the Edendale and West Melton water networks. The Edendale well is capable of supplying approximately 35 l/s, with a local loading of approximately 10 l/s. This surplus capacity can then be transferred to the West Melton water network through a recently installed pipe connection between Edendale and West Melton. It is expected the cost for this pipe installation will be recovered through development contributions of the new connections which would benefit.

Water within the development will be supplied by a reticulated pipe system located within the road berms. This would be linked at all available locations into the existing system surrounding the proposed development area. Metered water connections will be required to each property boundary as per council standards. It is expected all water infrastructure will be vested in SDC upon completion of construction.

The water supply system will also be required to be sized to meet the flow and pressure required by the New Zealand Fire Service Code of Practice. Hydrants will also be placed in accordance with this standard.

7. ELECTRICITY AND STREETLIGHTING

The site is currently serviced by an overhead power connection to a pole located in the 163 Halkett Road property. This line will be removed during the development works.

Preliminary consultation with Design Net (power design engineer) has indicated all proposed sites can be serviced for power to the industry standards. The infrastructure will be laid underground in the roading reserve. It is estimated 4 or 5 new kiosks will be required for the proposed development density. Connection to the HV network is available at Halkett Road. All lots within the development will require a power supply connection at the lot boundary.

All power reticulation installed within the site will be taken over by Orion upon completion. A rebate will be given to the developer upon completion to cover a proportion of the installation costs. This value is to be determined through an agreement prior to installation.

Streetlighting will need to be installed to SDC standards as part of the proposed development works. Streetlighting would be serviced by the local LV power supply installed by the developer and be vested in council upon commencement of construction. All streetlighting will be located in the vested road reserve.

Correspondence with Design Net and existing power supply plans can be found in Appendix E.

8. TELECOMMUNICATIONS

The site is currently serviced by Chorus via their standard rural supply.

Enquiries have been made to Chorus in regards to the proposed development. Chorus have confirmed they are able to supply fibre reticulation to the development from Halkett Road. Connection is also available from the southern side of the site over SH 73, however Chorus has indicated this will be at some additional cost due to the road crossing.

Jamie Verstappen
Chartered Professional Engineer
Davie Lovell-Smith Ltd

APPENDIX A - Site Location Plan

AMENDMENTS :

AMENDMENT	DATE	DESCRIPTION

NOTES :

SEE O:\STD_DWG\Eng Notes\Standard Notes.dwg - Shortcut FOR RELEVANT NOTES.

NOTES :

1) ALL WORKS IN ACCORDANCE WITH CCC IDS AND CSS PARTS 1-7 CURRENT ISSUE.
2) ALL PLANS ARE TO BE READ AND DISTRIBUTED AS A COMPLETE SET. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION
3) ELECTRICITY & TELECOM SERVICES NOT SHOWN. REFER TO ELECTRICAL & COMMUNICATION PLANS FOR DUCT LOCATIONS.
4) TRENCHING AND INSTALLATION OF POWER AND TELECOM SERVICES TO BE PROVIDED IN ACCORDANCE WITH SERVICE PROVIDERS PLANS AND SPECIFICATIONS.
5) EXISTING SERVICES HAVE BEEN DIGITISED FROM SERVICE AUTHORITY PLANS; COMPLETENESS AND ACCURACY ARE NOT GUARANTEED. ALL SERVICES TO BE FULLY SEARCHED AND PILOTED PRIOR TO TRENCHING.
6) CONTROL OF SW, SEDIMENT AND DUST ON SITE IS THE RESPONSIBILITY OF THE CONTRACTOR
7) ALL ROW AND DRIVEWAYS ARE TO HAVE 50mm DUCTS INSTALLED FOR COMMUNICATIONS AND POWER SUPPLY.

AMENDMENTS:

AMENDMENT	DATE	DESCRIPTION

	NAME	SIGNED	DATE
DESIGNED BY			
CHECKED BY			

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

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JOB TITLE:

Hughes Developments Ltd

SHEET TITLE:

Site Plan

DRAWING STATUS

For Information

SCALE : 1:2000@A1 1:4000@A3

DATE : July 2018

CAD FILE : J:\19404\Preliminary investigation\SitePlan.dwg

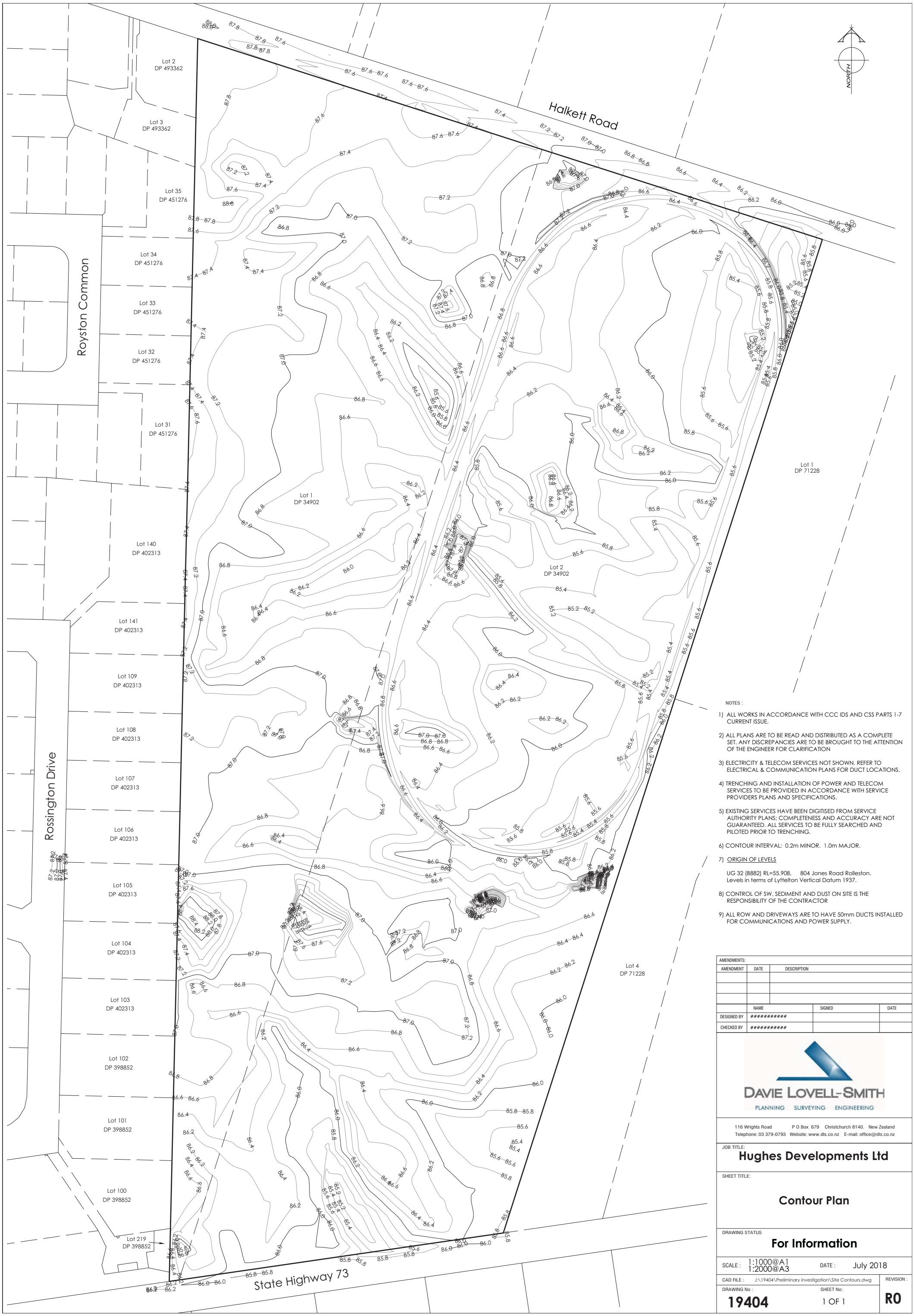
DRAWN : GAC

DRAWING No : **19404**

SHEET No:

REVISION : **R0**

APPENDIX B - Site Contours



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6) CONTOUR INTERVAL: 0.2m MINOR. 1.0m MAJOR.

7) ORIGIN OF LEVELS

UG 32 (B882) RL=55.908, 804 Jones Road Rolleston.
Levels in terms of Lyttelton Vertical Datum 1937.

8) CONTROL OF SW, SEDIMENT AND DUST ON SITE IS THE RESPONSIBILITY OF THE CONTRACTOR

9) ALL ROW AND DRIVEWAYS ARE TO HAVE 50mm DUCTS INSTALLED FOR COMMUNICATIONS AND POWER SUPPLY.

AMENDMENTS:		
AMENDMENT	DATE	DESCRIPTION

	NAME	SIGNED	DATE
DESIGNED BY	###########		
CHECKED BY	###########		

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JOB TITLE:
Hughes Developments Ltd

SHEET TITLE:
Contour Plan

DRAWING STATUS
For Information

SCALE : 1:1000@A1 1:2000@A3 DATE : July 2018

CAD FILE : J:\19404\Preliminary investigation\Site Contours.dwg REVISION :

DRAWING No : **19404** SHEET No: 1 OF 1 **R0**

APPENDIX C - ECAN Bore Data

Canterbury Maps

Information has been derived from various organisations, including Environment Canterbury and the Canterbury Maps partners. Boundary information is derived under licence from LINZ Digital Cadastral Database (Crown Copyright Reserved). Environment Canterbury and the Canterbury Maps partners do not give and expressly disclaim any warranty as to the accuracy or completeness of the information or its fitness for any purpose.

Information from this map may not be used for the purposes of any legal disputes. The user should independently verify the accuracy of any information before taking any action in reliance upon it.

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0 0.045 0.09 0.135 0.18 Kilometres

Scale: 1:3,000 @A3

Map Created by Environment Canterbury on 7/5/2018 at 10:05:58 AM

Bore or Well No	M35/10751
Well Name	Weedons Ross Road
Owner	Selwyn District Council

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M35/10751	**File Number**	CO6C/23232
Owner	Selwyn District Council	**Well Status**	Active (exist, present)
Street/Road	Weedons Ross Road	**NZTM Grid Reference**	BX23:49567-81486
Locality	West Melton	**NZTM X and Y**	1549567 - 5181486
Location Description		**Location Accuracy**	< 50m
CWMS Zone	Selwyn - Waihora	**Use**	Public Water Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	78.00m	**Water Level Count**	1
Diameter	300mm	**Initial Water Level**	24.00m below MP
Measuring Point Description		**Highest Water Level**	24.00m below MP
Measuring Point Elevation	89.17m above MSL (Lyttelton 1937)	**Lowest Water Level**	24.00m below MP
Elevation Accuracy	< 5 m	**First reading**	07 Sep 2007
Ground Level	0.00m above MP	**Last reading**	07 Sep 2007
Strata Layers	7	**Calc Min 95%**	
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	3
Drill Date	07 Sep 2007	**Max Tested Yield**	22 l/s
Driller	East Coast Drilling	**Drawdown at Max Tested Yield**	27 m
Drilling Method	Rotary Rig	**Specific Capacity**	1.10 l/s/m
Casing Material	STEEL	**Last Updated**	02 Apr 2015
Pump Type		**Last Field Check**	07 Sep 2007
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	Stainless steel	74	77				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
07 Sep 2007	1	12	158.3782	10.9	0.05
07 Sep 2007	2	18	237.5673	25	0.05
07 Sep 2007	3	21.5	283.760956	26.6	0.166666672

Comments

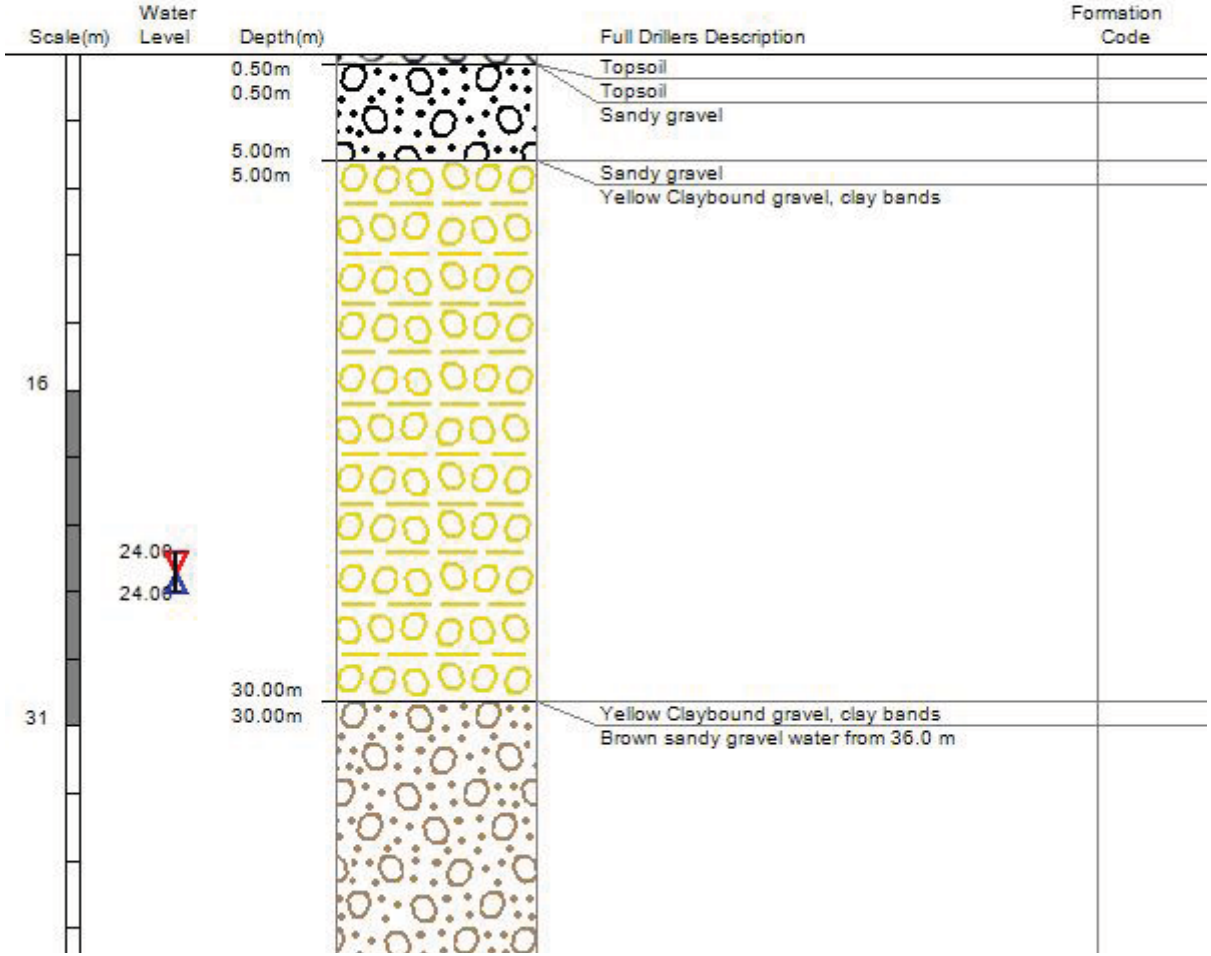
Comment Date	Comment
27 Apr 2010	Set status to active, this is a community supply for SDC. Added well name, added to community water supply database

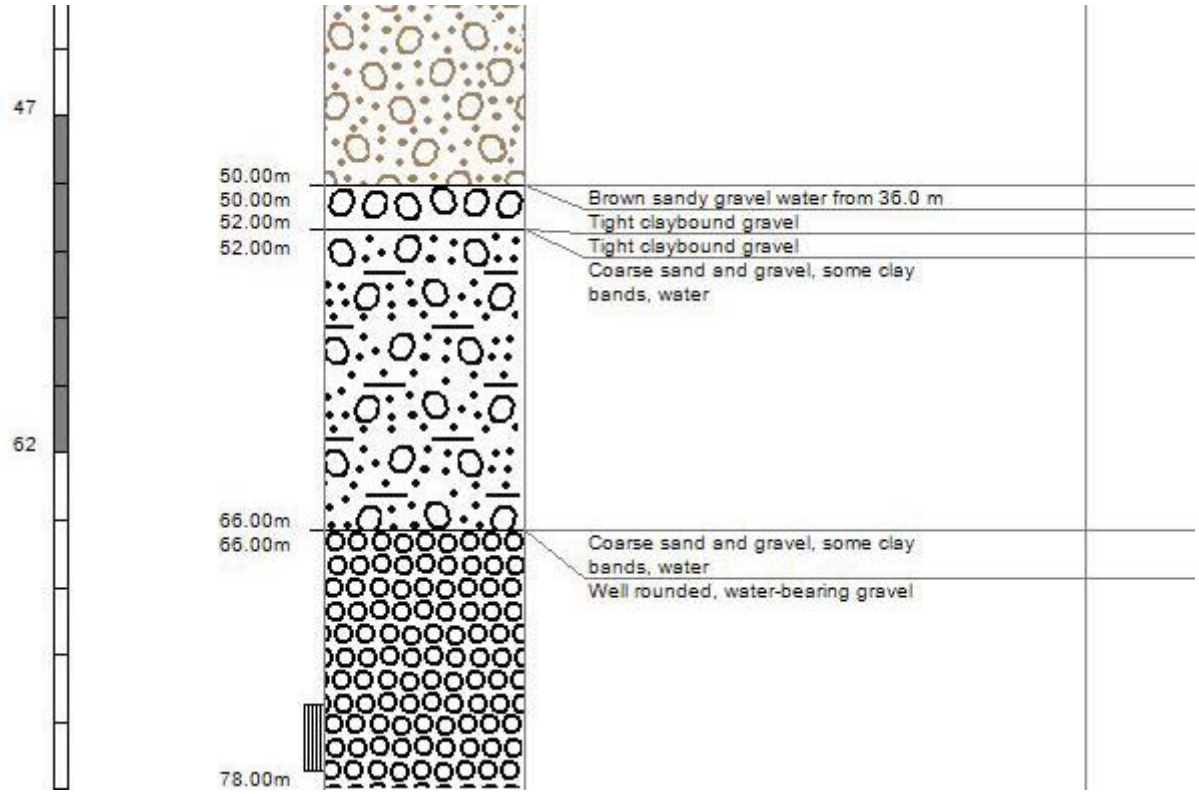
Bore Log

Borelog for well M35/10751

Grid Reference (NZTM): 1549567 mE, 5181487 mN
Location Accuracy: < 50m
Ground Level Altitude: 89.2 m +MSD Accuracy: < 0.5 m
Driller: East Coast Drilling
Drill Method: Rotary Rig
Borelog Depth: 78.0 m Drill Date: 07-Sep-2007

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha




47
62
50.00m
50.00m
52.00m
52.00m
66.00m
66.00m
78.00m
Brown sandy gravel water from 36.0 m
Tight claybound gravel
Tight claybound gravel
Coarse sand and gravel, some clay bands, water
Coarse sand and gravel, some clay bands, water
Well rounded, water-bearing gravel

APPENDIX D - Flood Assessment

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

Davie, Lovell-Smith Ltd
116 Wrights Road, Addington
PO Box 679, Christchurch 8140
New Zealand
Telephone (03) 379-0793,
E-mail: office@dls.co.nz

2nd May 2020

Selwyn District Council
Benjamin.Rhodes@selwyn.govt.nz

Attn: Mr Ben Rhodes

RE: Future Development Area, Halkett Road, West Melton – Flood Assessment

Dear Ben

As part of the identification of future development areas in West Melton, Council require us to assess the effects of flooding on potential sites and how it may be mitigated. In this case we are investigating a site owned by Hughes Developments on the existing Urban Edge between Halkett Road and State Highway 73.

Selwyn District Council has with the help of Environment Canterbury (ECan) identified land across the Selwyn District which may be susceptible to flooding. Please refer to the two attached plans of the proposed development area. These two plans depict the modelled flood effects on the development site. Please note that all flows up to a 1 in 50 year event will be disposed of on site by infiltration to ground.

Plan A describes the channelization and water depth for a 1 in 200 year critical storm event.
Plan B describes the channelization and water depth for a 1 in 500 year critical storm event.

These clearly show channelized flow through and around the site. To better locate these channels, please refer to the attached plan of the site with overlaid LIDAR contours. The key flow channels have been superimposed over the LIDAR and they fall into distinct contour channels.

From this investigation there appear to be four main flow routes and these are described on the plan as Flows A – D. What is also apparent is that the site is quite flat but generally slopes towards the southeast at a gradient of

Flow A crosses Halkett Road and just touches the north-eastern corner of the site. This corner will be filled to ensure that flood flows remain in the roadway and continue past the site to the adjacent rural land.

Flow B enters the site in the north-eastern corner and flows south to a point half way along the eastern boundary. It is proposed that a road entry will be located at the point on Halkett Road where the flow enters the property and a road connection will also be located at the point where it exists. The flows derived from the channels within the site will be relocated to the proposed road network with gradients towards the outlet point.

Flow C is derived from drainage from within the site and discharges onto State Highway 73. The flows within the site will once again be contained within a future road network and will be directed to this existing discharge point via either a reserve link or a Road Link. Please note that there is an existing entry into the site at or close to this location.

DAVIE LOVELL-SMITH

Flow D is the overflow from the basin associated with the Gainsborough subdivision. It enters onto State Highway 73 at the southwestern corner of the site. As with Flow A, the new sites will be filled to ensure that flood flows do not enter into the site.

By adhering to this ass3ssment, the effects of significant flood events will be fully mitigated. The actual final floor levels in relation to these events will be determined as part of the Detailed Design and subdivision process.

Should you have any queries, please do not hesitate to call.

Kind Regards

Andy Hall
Director
CPEng

AMENDMENTS :

AMENDMENT	DATE	DESCRIPTION

NOTES :

1. Areas and dimensions are approximate only and are subject to final survey and deposit of plans.
2. Service easements to be created as required.
3. This plan has been prepared for subdivision concept & discussion purposes only. No liability is accepted if the plan is used for any other purposes.
4. Contours shown are from Christchurch City Council Lidar Data at 0.25m Contour Intervals and interms of LINZ Vertical Datum 2016.

Halkett Road

RL87.50

RL85.00

RL85.75

RL86.50

FLOW A

FLOW B

FLOW C

FLOW D

Lot 1
DP 34902
8.3170

Lot 2
DP 34902
12.3700

State Highway 73

Rossington Drive

NORTH

Total Area :

Comprised in:

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

116 Wrights Road P O Box 679 Christchurch 8140. New Zealand
Telephone: 03 379-0793 Website: www.dls.co.nz E-mail: office@dls.co.nz

JOB TITLE:

West Melton

SHEET TITLE:

Existing Secondary Flowpaths over Lots 1 & 2 DP 34902

DRAWING STATUS

For Discussion Purposes

SCALE : 1:1250@A1
1:2500@A3

DATE : May 2020

CAD FILE : J:\19404\Flooding\E19404 West Melton Lidar.dwg

REVISION :

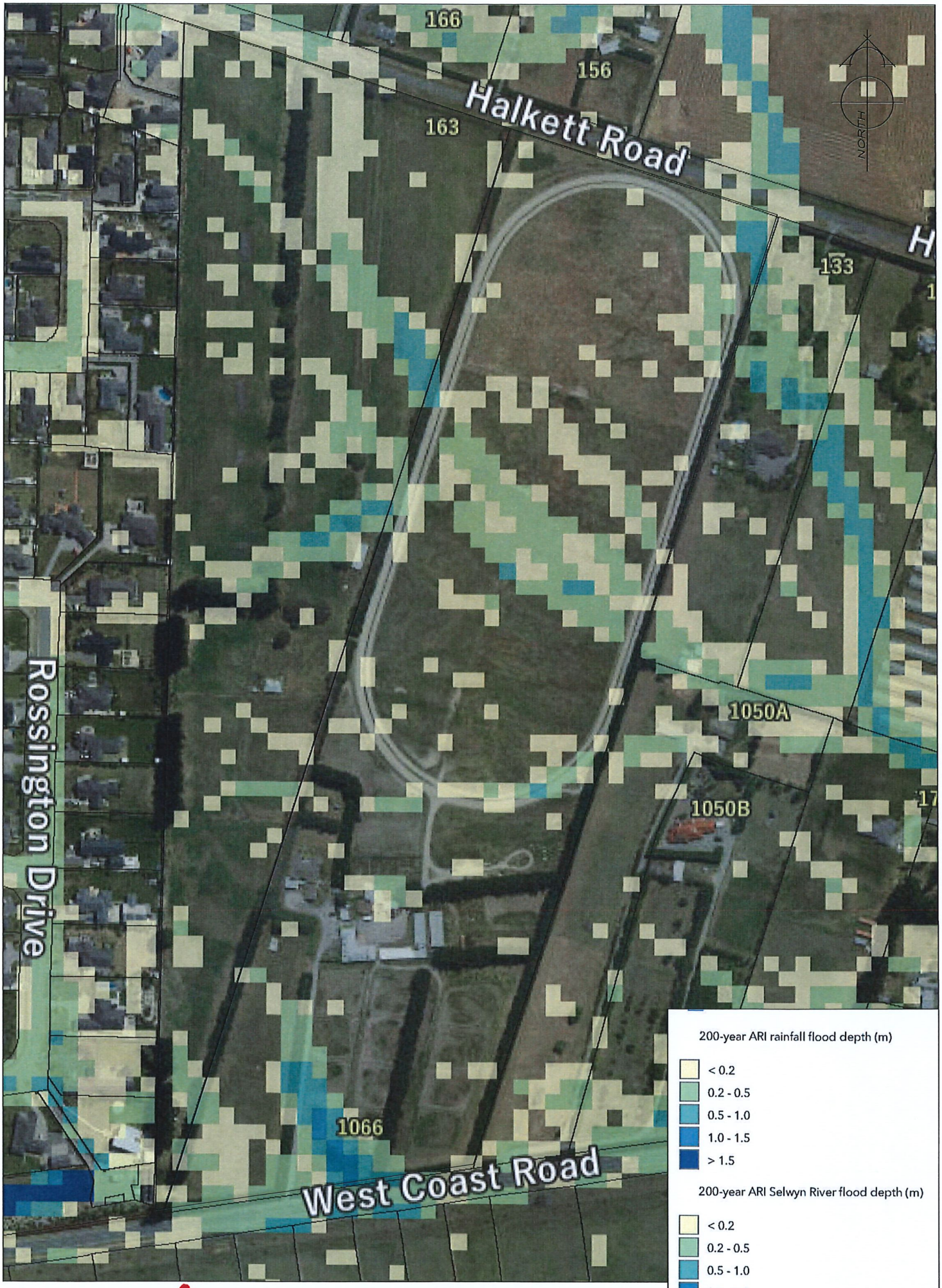
DRAWING No :

E19404

SHEET No:

1 OF 1

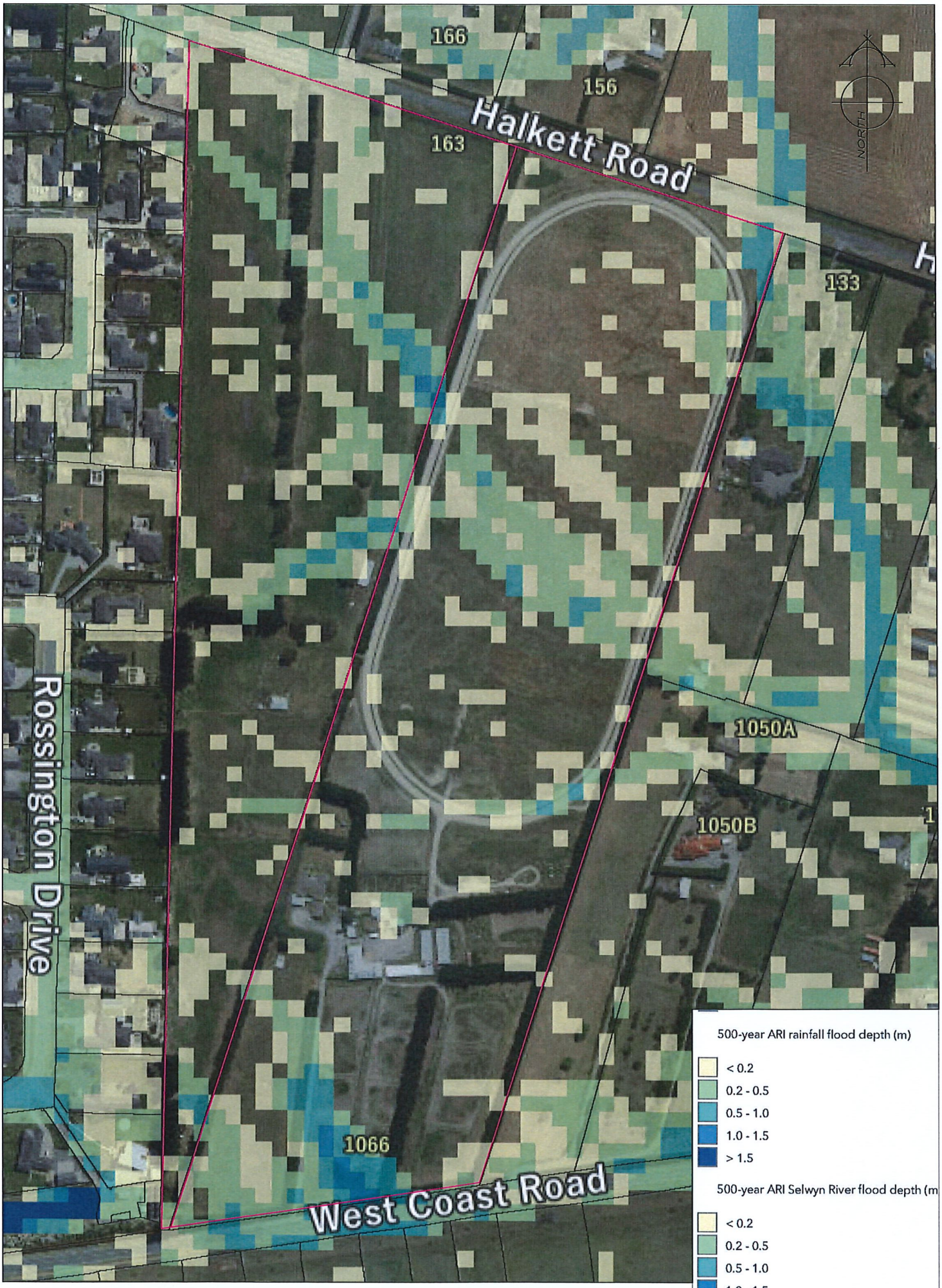
R0



Plan A

1 in 200 year Flood Event
Scale 1:3000@A4

J:\18727\West Melton\H18727 West Melton Lidar.dwg



Plan B

1 in 500 year Flood Event
Scale 1:3000@A4

J:\18727\West Melton\H18727 West Melton Lidar.dwg

APPENDIX E- ECAN Consent CRC167467

12 April 2017

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Customer Services
P. 03 353 9007 or 0800 324 636

PO Box 345
Christchurch 8140

P. 03 365 3828
F. 03 365 3194
E. ecinfo@ecan.govt.nz

www.ecan.govt.nz

Selwyn District Council
Attn: Joanne Golden
PO Box 90
Rolleston 7643

Dear Sir/Madam

Notice of Resource Consent Decision

Record Number(s): CRC167467
Applicant Name: Selwyn District Council
Activity Description: to discharge contaminants into and onto land
Decision: Granted

Decision

The decision of Environment Canterbury is to grant your application on the terms and conditions specified in the attached resource consent document. The reasons for the decision are:

1. The activity will achieve the purpose of the Act.
2. The activity is consistent with the policies of the regional plan or national policy statement.

Commencement of consent

Your resource consent commences from the date of this letter advising you of the decision.
If you object to or appeal this decision, the commencement date will then be the date on which the decision on the appeal is determined.

Lapsing of consent

This resource consent will lapse if the activity is not established or used before the lapse date specified on your consent document. Application may be made under Section 125 of the Resource Management Act 1991 to extend this period.

Your rights of objection and appeal

- **Objection to Decision**
  If you do not agree with the decision of the consent authority, you may object to the whole or any part in accordance with Section 357A(1)(g) of the Resource Management Act 1991 (RMA). Notice of any objection must be in writing and lodged with Environment Canterbury **within 15 working days** of receipt of this decision in accordance with Section 357C(1) of the RMA.

- **Right to Appeal**
  You may appeal the decision of the consent authority to the Environment Court in accordance with section 12 of the RMA. , The notice of appeal must be lodged with the Court within 15 working days of receipt of this decision, at PO Box 2069, Christchurch. A copy of the appeal should also be forwarded to Environment Canterbury within the same timeframe.

If you are in any doubt about the correct procedures, you should seek legal advice.

- **Objection to Costs**
  Section 357B of the RMA allows you to object to costs. Your objection must be received **within 15 working days** of the date on which you receive your invoice. Your objection must be in writing and should clearly explain the reasons for your objection as detailed in section 357C of the RMA.

Monitoring of conditions

It is important that all conditions of consent are complied with, and that the consent holder continues to comply with all conditions, to ensure that the activity remains lawfully established.
You can find online Information regarding the monitoring of your consent at www.ecan.govt.nz/monitoringconsent.pdf.

Charges, set in accordance with section 36 of the Resource Management Act 1991, shall be paid to the Regional Council for the carrying out of its functions in relation to the administration, monitoring and supervision of resource consents and for the carrying out of its functions under section 35 of the Act.

Further information about your consent

For some activities a report is prepared, with officer recommendations, to provide information to the decision makers. If you require a copy of the report please contact our Customer Services section. You can find online information about your consent document at www.ecan.govt.nz/yourconsent.pdf.

Queries

For all queries please contact Customer Services Section quoting your CRC number noted above.

Thank you for helping us make Canterbury a great place to live

Yours sincerely

Consents Planning Section

cc:

RESOURCE CONSENT CRC167467

Pursuant to Section 104 of the Resource Management Act 1991

The Canterbury Regional Council (known as Environment Canterbury)

GRANTS TO:	Selwyn District Council
A DISCHARGE PERMIT (S15):	to discharge contaminants into and onto land
COMMENCEMENT DATE:	12 Apr 2017
EXPIRY DATE:	12 Apr 2052
LOCATION:	West Melton, Selwyn

SUBJECT TO THE FOLLOWING CONDITIONS:

0 **Definitions**

For the purpose of this consent the following definitions and abbreviations shall apply to all conditions and attached Schedules:

'Annual Exceedance Probability (AEP)' is the chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. For example, if a peak flood discharge of 40 cubic metres per second has an AEP of 2%, it means there is a 2% chance (i.e. one-in-fifty) of a peak flood discharge of 40 cubic metres a second or larger occurring in any one year. AEP is the inverse of return period expressed as a percentage.

'Best practicable option' means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to:
(a) the nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; and
(b) the financial implications, and the effects on the environment, of that option when compared with other options; and
(c) the current state of technical knowledge and the likelihood that the option can be successfully applied.

'Commercial Development' means a business providing personal, property, financial, household, private or business services to the general public as a commercial activity.

'Community Drinking Water Supply Protection Zone' means the protection zone for a drinking-water supply that is recorded in the drinking-water register maintained by the Chief Executive of the Ministry of Health (the Director-General) under section 69J of the Health Act 1956 that provides no fewer than 25 people with drinking-water for not less than 60 days each calendar year.

'Construction' means all earthworks associated with the maintenance of the SDC

stormwater network.

'Critical duration' means the time taken during a storm event for peak water levels to be reached in the receiving waters as determined by the most up-to-date information and modelling.

'Design storm' means the theoretical rainfall event that the analysis is based on for a particular probability. The design storm is based on certain assumptions, including rainfall distribution and intensity, and the storm rainfall profile shape for the critical duration.

'**Earthworks'** means the disturbance of land surfaces by blading, contouring, ripping, moving, removing, placing or replacing soil and earth, or by excavation, or by cutting or filling operations.

'Existing site' means any site that discharges its stormwater into the SDC stormwater network at the date of commencement of this resource consent.

'Key sump' means any sump which directly discharges to the final stormwater management device i.e. where the discharge has no other form of primary treatment.

'Recognised Design Guidelines' refers to the Auckland Regional Council, Stormwater Management Devices: Design Guidelines Manual, May 2003, Technical Publication No.10; and/or Christchurch City Council, Waterways, Wetlands and Drainage Guide, Part B: Design, February 2003; and/or the On-Site Stormwater Management Guideline, October 2004, New Zealand Water Environment Research Foundation, or any updates to these documents.

'Re-development' means a change to a developed site or a site activity that results in a stormwater discharge that is not the same in scale, intensity or character to the discharge that existed prior to the commencement of this consent.

'SDC' means Selwyn District Council.

'Stabilised' means an area inherently resistant to erosion such as rock (excluding sedimentary rocks), or rendered resistant to erosion by the application of aggregate, geotextile, vegetation or mulch. Where vegetation is to be used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once 80 percent vegetation cover has been established.

'Stormwater' means runoff water and entrained contaminants arising from precipitation on the external surface of any structure or any land modified by human action, and that has been collected, channelled, diverted, intensified or accelerated by human intervention. This definition excludes discharges of spilled or deliberately released hazardous substances and/or washdown activities.

Advice Note: With respect to sites or collection areas where stormwater is sourced from land not in the ownership of the Consent Holder (being the SDC), the point of discharge is where the contaminant or water leaves the effective control of the discharger, which includes but is not limited to the point of entry into the SDC stormwater network. It is therefore the responsibility of individual owners and/or occupiers of land, for example

private industrial sites, to ensure that their discharge of stormwater into the SDC stormwater network complies with the above definition of stormwater.

'Stormwater network' 'means the reticulated piped and open network, including kerb and channel, sumps, pipes, swales and manholes; and any stormwater conveyance and mitigation system for which SDC are responsible for operation, maintenance, and upgrade.

'Stormwater treatment system' means a constructed or proprietary device which by function attenuates, detains or treats stormwater.

'Surface water' means water above the ground surface and within a lake, river, artificial watercourse or wetland, but does not include water in the sea, snow or rain or water vapour in the air.

'Tangata Whenua' means representatives of Te Ngai Tuahuriri Runanga, Te Taumutu Runanga and Te Runanga o Ngai Tahu.

Limits

1 The discharge shall be only:

a. Stormwater generated from roofs, roads and hardstand areas (impervious areas) and pervious areas associated with:

i. development that existed prior to the commencement of this consent ('existing sites');

ii. re-development of 'existing sites';

iii. new residential development; and

iv. new commercial development; and

b. Sediment laden discharges generated during maintenance of any Selwyn District Council stormwater infrastructure;

located within the West Melton Stormwater Management Area, as shown on Plan CRC167467 and Schedule CRC167467A, attached to and forming part of this consent.

Advice Note: Selwyn District Council approval is required prior to any activity operating under this consent. Approval is subject to evidence being provided to satisfy Selwyn District Council that the activity will meet the conditions of this consent.

2 Stormwater shall be discharged onto or into land within the Stormwater Management Area shown in Schedule CRC167467A.

Exclusions

3 Notwithstanding Condition (1), discharges from sites in one or more of the following categories are excluded from this consent:

a. Industrial or trade premises as defined in Section (2)(1) of the Resource Management Act 1991;

b. Sites on which activities or industries listed, and which are not excluded by the criteria set out in Schedule CRC167467D, attached to and forming part of this consent;

c. Sites on which the quantity of hazardous substances listed below are stored or handled in a quantity of substance that exceed the following volumes:

   i. Diesel, Petrol, Kerosene 5,000 litres; and

   ii. All other specified hazardous substances 1,000 litres;

d. Sites that have been registered by the Canterbury Regional Council on its Listed Land Use Register (LLUR) as 'not investigated', 'below guideline values for', 'managed for', 'partially investigated', 'significant adverse environmental effects' or 'contaminated for';

e. Sites which hold an existing stormwater discharge consent with current non-compliances;

f. Sites that are located on, or adjacent to, land that has been historically used as a landfill; and

g. Sites for which another stormwater consent is currently held, including the State Highway network.

Advice notes:
(1) Although discharges from the sites listed above may not discharge under this consent, discharges from sites listed above may discharge via the system authorised under this consent provided that a separate resource consent for the site is obtained and the SDC has authorised the discharge into the system.
(2) For the avoidance of doubt, 'industrial and trade premises' excludes those activities defined as a 'commercial service' in the Selwyn District Plan.

Stormwater Management Area

4 If the Consent Holder accepts consented operational stormwater discharges from stormwater networks located outside of the Stormwater Management Area, the Consent Holder shall update Schedule CRC167467A and provide a revised version to the Canterbury Regional Council, Attention Regional Leader - Monitoring and Compliance within 20 working days of acceptance of the discharge.

5 The Consent Holder shall review the Stormwater Management Area shown in Schedule CRC167467A at least every five years from commencement of the consent to ensure that it accurately shows:

a. The Stormwater Management Area boundary;

b. The stormwater treatment and disposal systems that discharge operational stormwater under this consent; and

c. All Community Drinking Water Supply Protection Zones within the Stormwater Management Area boundary.

6 If an update to Schedule CRC167467A is required to meet Condition (5), the Consent Holder shall revise and provide the updated Schedule CRC167467A to Canterbury Regional Council, Attention Regional Leader - Monitoring and Compliance within 20 working days of the review.

Advice note: An operational stormwater network may be accepted by the Consent Holder after a maintenance period. The Consent Holder holds the right not to accept the stormwater network based on historical compliance, design or at its own discretion, so is not automatically transferred without the written approval of Selwyn District Council.

Stormwater System Design

7 The stormwater network constructed before the commencement of this consent shall be maintained to ensure that stormwater generated under the authority of this consent from all rainfall events up to and including a 24 hour duration 2 percent exceedance probability rainfall event does not enter a habitable building.

8 Stormwater systems designed and constructed after the commencement of this consent shall:

a. Have the capacity to convey and discharge stormwater to land from the contributing catchment for all rainfall events up to and including a critical duration 10 percent annual exceedance probability (AEP) event;

b. Be designed to ensure that stormwater for all rainfall events up to and including a 24 hour duration two percent AEP event does not enter a habitable building as a result of stormwater generated under the authority of this consent; and

c. Not exacerbate flooding on existing sites.

9 Stormwater systems designed and constructed after the commencement of this consent that receive runoff from roads, hardstand areas and/or commercial sites, and that have a stormwater infiltration/discharge system located within any Community Drinking Water Supply Protection Zone or within 50 metres of any well used for domestic supply purposes shall:

a. Include at least one of the following stormwater treatment devices which shall be designed in accordance with recognised New Zealand design guidelines and with Schedule CRC167467B, which forms part of this consent:

i. Treatment swale;

ii. Infiltration basin; and

iii. Detention basin; and

b. Not discharge stormwater to land within 50 metres of any well used for community drinking water supply, and within 20 metres of any other bore used for water abstraction.

Advice notes:
(1) For the purposes of this condition, runoff from commercial sites includes stormwater generated from all areas including pervious areas and roof runoff.
(2) For the purposes of this condition, a stormwater infiltration/discharge system includes but is not limited to treatment swales, infiltration basins, detention basin and soakage pits.
(3) This condition does not apply to residential roof runoff that discharges directly to a soakpit via a sealed system that excludes all other stormwater.

10 At least one month prior to commencement of construction of a stormwater system under this consent within any Community Drinking Water Supply Protection Zone, excluding those located on private property, the Consent Holder shall submit to the Canterbury Regional Council Attention: Regional Leader – Monitoring and Compliance, design plans of the stormwater system to be installed. The design of the stormwater system shall demonstrate compliance with conditions the relevant treatment requirements of Schedule CRC167467B of this consent.

Stormwater Management Plan

11 The Consent Holder shall prepare a Stormwater Management Plan for the West Melton Stormwater Management Area, as shown in Schedule CRC167467A, to demonstrate how the catchments, watercourses, and stormwater infrastructure within the Stormwater Management Area will be managed to avoid, remedy or mitigate adverse effects on the environment, and to ensure the continued and efficient operation of the stormwater network. The Stormwater Management Plan shall include, but not be limited to:

a. Stormwater management objectives;

b. A description of the Stormwater Management Area, including catchment details, watercourses, Community Drinking Water Supply Protection Zones and existing and future land use;

c. Consideration of cultural values;

d. Information on quantity and quality of existing and future stormwater discharges to land and water;

e. A description of the existing stormwater system, including waterways, drainage systems and network infrastructure;

f. A stormwater management strategy, that includes but is not limited to:

    i. Level of Service requirements and design standards for new development;

    ii. Treatment method preferences;

    iii. Mitigation measures;

    iv. Consideration of construction discharges; and

    v. Contingency measures;

g. Plans or processes for implementation of the Stormwater Management Plan;

h. Operations and Maintenance Schedules;

i. Design requirements for new and replacement stormwater systems;

j. Details of the monitoring programmes required by Condition (17); and

k. Reporting requirements and review procedures.

12 The Stormwater Management Plan shall be submitted to Canterbury Regional Council, Attention: Regional Leader - Monitoring and Compliance, for certification that it complies with Condition (11) within six months of the commencement of this consent.

13 The Consent Holder shall review the Stormwater Management Plan at least every five years from the date of initial certification under Condition (12), and at any other time deemed necessary as a result of changes to legislation or regional rules that may affect the management of stormwater.

14 Any amendments to the Stormwater Management Plan shall not replace the certified version until the amended Stormwater Management Plan has been submitted to Canterbury Regional Council, Attention: Regional Leader - Monitoring and Compliance, for certification that it complies with Condition (11).

Engagement with Tangata Whenua

15 The Consent Holder shall provide Tangata Whenua an opportunity to contribute to the development and review of the Stormwater Management Plan undertaken in accordance with Condition (13). The Consent Holder shall:

a. Allow at least 30 working days for Tangata Whenua to provide feedback, and shall communicate this timeframe to Tangata Whenua at the start of the process; and

b. Provide Tangata Whenua and Canterbury Regional Council a written response to all Tangata Whenua feedback within 20 working days.

Advice note: 'Tangata Whenua' means the representative(s) of Te Ngai Tuahuriri Runanga, Te Taumutu Runanga and Te Runanga o Ngai Tahu.

Maintenance

16 Stormwater systems within the Stormwater Management Area, excluding those located on private property, shall be maintained in accordance with the SDC Stormwater Maintenance Schedule, Schedule CRC167467C, which forms part of this consent. All swales shall be maintained at the minimum frequency specified for 'urban' swales in the Stormwater Maintenance Schedule. In addition to the maintenance undertaken in accordance with Schedule CRC167467C the following maintenance shall occur:

a. Swales, infiltration basins, and detention basins shall be:

   i. Maintained so that vegetation and/or grass is in a healthy and uniform state, with the exception of seasonal browning off;

   ii. Replanted where erosion or die-off has resulted in bare or patchy soil cover; and

   iii. Where grassed, mown to ensure grass is generally at a length between 40 and 150 millimetres.

b. Hydrodynamic separators shall be inspected at least once annually, and:

   i. Cleaned at least annually or when filled to a depth of at least 200 millimetres with sediment and/or floating hydrocarbons, whichever is the most frequent;

   ii. Cleaned out following any spills; and

   iii. Maintained in accordance with the manufacturers' instructions.

c. Oil interceptors shall be:

   i. Cleaned at least annually;

   ii. Cleaned out following any spills; and

   iii. Maintained in accordance with the manufacturers' instructions.

Monitoring and Performance Standards

17 Where a Community Drinking Water Supply Protection Zone exists within the Stormwater Management Area, the Consent Holder shall prepare a soil and stormwater monitoring programme in accordance with the requirements of Conditions (20) to (26), to investigate the effects of stormwater discharges on groundwater quality and soil quality. The monitoring programme shall assess for and discuss any trends in soil and stormwater quality.

18 The monitoring programme shall be submitted to Canterbury Regional Council, Attention: Regional Leader - Monitoring and Compliance for certification that it complies with Condition (17) of this consent within six months of the commencement of this consent.

19 The monitoring programme may be amended at any time. Any amendments to the monitoring programme may not replace the certified version until the amended programme has been certified by Canterbury Regional Council, Attention: Regional Leader - Monitoring and Compliance as complying with the requirements of Condition (17).

20 Soil samples shall be taken from representative infiltration basins, detention basins and swales within each Community Drinking Water Supply Protection Zone, as shown on Schedule CRC167467A:

a. At least once every five years;

b. From a depth of between zero and 50 millimetres below the ground surface at the point of lowest elevation;

c. By a person who has at least a tertiary science or engineering qualification that required the equivalent of at least one year of full-time study and has at least two years environmental investigation professional work experience post-qualification; and

d. In general accordance with Ministry for the Environment (2004) 'Contaminated Land Management Guidelines - Site Investigation and Analysis of Soils'.

21 Soil samples shall be analysed by a laboratory accredited for that method by International Accreditation New Zealand or an equivalent accreditation body:

a. For the following contaminants in milligrams per litre (mg/L) using the United States Environmental Protection Agency method 1312, Synthetic Precipitation Leaching Procedure (SPLP), using reagent water:

i. Copper;

ii. Lead; and

iii. Zinc; and

b. For the following contaminants in in milligrams per kilogram (mg/kg) using total matrix method:

i. Benzo(a)pyrene;

ii. Naphthalene; and

iii. Pyrene.

22 The analyses undertaken in accordance with Condition (21) shall be carried out with detection limits of a maximum of 10 percent of the trigger levels set out in Condition (23).

23 The results of analyses undertaken in accordance with Condition (21) shall be compared against the following trigger concentrations:

Contaminant	Leachate Trigger Concentration (milligrams per litre)	Trigger Concentration (milligrams per kilogram)
Copper	40[1]	
Lead	0.2[1]	
Zinc	30[2]	
Naphthalene		>10,000[3]
Pyrene		>10,000[3]
Benzo(a)pyrene		>10,000[3, 4]

Table references:

(1) 20 x MAV (Maximum Acceptable Value) for determinand of health significance

(2) 20 x GV (Guideline Value) for aesthetic determinand

(3) Guideline value from MfE Oil Industry Guidelines 1999 (Table 4.20)

(4) Benzo[a]pyrene refers to Benzo[a]pyrene only (not Benzo[a]pyrene equivalent concentration).

24 If any of the trigger concentrations listed in Condition (23) are exceeded, the soils shall be considered to be contaminated. Within 60 working days of the Consent Holder receiving the results of analyses showing contaminated soils:

a. Additional sampling shall be carried out to determine the lateral and vertical extent of contamination, with respect only to the contaminant(s) that exceeded a trigger concentration;

b. Additional sampling of two other devices within the same Community Drinking Water Supply Protection Zone shall be carried out in accordance with Conditions (20) to (23), with respect only to the contaminant(s) that exceeded a trigger concentration;

c. All soils identified as contaminated shall be removed; and

d. The affected infiltration basin(s) and/or retention basin(s) and/or attenuation swale(s) shall be reconstructed.

25 Stormwater samples shall be taken from a representative urban road, within the Stormwater Management Area, every five years and test for the following contaminants:

a. Total Suspended Solids;

b. Total Copper;

c. Total Lead;

d. Total Zinc;

e. Total Nitrogen; and

f. Total Petroleum Hydrocarbons

26 The results of analyses undertaken in accordance with Condition (25) shall be compared against previous sampling and any trends discussed in the Annual Report in accordance with Condition (29).

Construction Phase Stormwater Discharges

27 Discharges of sediment laden water during earthworks shall be via best practicable erosion and sediment control measures undertaken to minimise the discharge of sediment-laden stormwater into surface water and private property; and

a. All erosion and sediment control measures shall be constructed and maintained in accordance with Environment Canterbury's Erosion and Sediment Control Guidelines or an equivalent New Zealand industry guideline; and

b. All exposed surfaces shall be stabilised once earthworks are complete or if earthworks of exposed areas is not to be undertaken for a period of 14 days or more.

Disposal of Material

28 Any contaminated material removed, including sediment and hydrocarbons, in the exercising of this consent shall be disposed of at a facility authorised to receive such material.

Recording and Reporting

29 The Consent Holder shall provide an Annual Report to Canterbury Regional Council, Attention: Regional Leader - Monitoring and Compliance, and to representatives of Te Ngai Tuahuriri Runanga and Te Taumutu Runanga. The report shall detail the following from monitoring undertaken within the prior 12 month period, and shall include:

a. Maintenance works undertaken in accordance with Condition (16);

b. Updates to the monitoring programme developed in accordance with Condition (17);

c. Results of monitoring carried out each year, including;

   i. The name of the person(s) who collected the samples, the date and time the samples were collected;

   ii. The rainfall data associated with stormwater sampling events, including, but not limited to, date, time, duration and rainfall depth of the storm event;

   iii. The laboratory analysis results;

   iv. An interpretation of trends including comparisons to previous years' monitoring; and

   v. Documentation of trigger value exceedances and further action taken in response to exceedances;

d. A summary of any remedial or improvement works carried out to improve the quality of stormwater discharges from each year;

e. A description of any future stormwater system proposals, including retrofitting of existing stormwater systems, to improve the management of stormwater within the Stormwater Management Area as shown on Schedule CRC167467A;

f. Any updated information as a result of further site investigations, including but not limited to the extent of the Stormwater Management Area boundaries, groundwater levels, and a discussion of the implications of the updated information.

Administration

30 The Canterbury Regional Council may, on any of the last five days of September each year, serve notice of its intention to review the conditions of the consent for the purposes of:

a. Dealing with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage;

b. Requiring the Consent Holder to adopt the best practicable option to remove or reduce any adverse effect on the environment; or

c. Requiring the Consent Holder to carry out monitoring and reporting instead of, or in addition to that required by the consent.

Issued at Christchurch on 12 April 2017

Canterbury Regional Council

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Plan CRC167467

N

0 1 2 3 4 Kilometres

Scale: 1:100,000 @A4

Map Created by Environment Canterbury on

Schedule CRC167467A –Stormwater Management Area for West Melton

Schedule CRC167467B – Design of Stormwater Systems

Stormwater Design Parameters

DEVICE	REQUIREMENTS FOR DESIGN AND CONSTRUCTION
Key sump	Shall be fitted with submerged or trapped outlet capable of trapping hydrocarbons
Treatment swale	Shall have a hydraulic residence time of at least nine minutes during design rainfall intensity of 10 millimetres per hour
Infiltration basin	Shall contain and treat all stormwater generated from the first 20 millimetres of rain on in the contributing catchment.
	Shall detain and dispose of all stormwater generated from a 2 percent annual exceedance probability rain event of any duration
	Shall have an infiltration rate not exceeding 112 millimetres per hour and not less than 18 millimetres per hour as determined using a double ring infiltrometer test, or not exceeding 75 millimetres and not less than 12 millimetres per hour as determined using a flooded basin test
	Shall be designed to minimise groundwater mounding where necessary, by oversizing the basin, or constructing multiple basins or other methods
	Shall not have stormwater ponding within it for longer than 72 hours following the cessation of a rainfall event.
Detention basin (including an attenuation swale)	Shall contain and treat all stormwater generated from the first 20 millimetres of rain on the contributing catchment.
	Shall, either alone or in combination with other devices, attenuate flows so that the post development flows do not exceed pre-development flows for events up to a 2 percent annual exceedance probability rain event of any duration.
	Shall be designed to minimise groundwater mounding where necessary, by oversizing the basin, or constructing multiple basins
	Shall not have stormwater ponding within it for longer than 72 hours following the cessation of a rainfall event.
Treatment wetland	Shall attenuate flows, either alone or in combination with other devices, so that the post-

	development peak discharge rate does not exceed the pre-development discharge rate for the 50 percent, 10 percent and 2 percent annual exceedance probability design storm events for durations up to and including 12 hours.
	Shall contain and treat all stormwater generated from the first 20 millimetres of rain on hardstand and roading in the contributing catchment.
	Shall provide an average hydraulic residence time of at least 24 hours
Hydrodynamic separator	Shall be capable of treating at least the flows generated by rainfall of 10 millimetres per hour on the contributing catchment before bypassing
Oil interceptor	Shall be an API or Coalescing Plate type Interceptor, or similar device capable of removing the same or greater amounts of hydrocarbons from stormwater
	Shall be capable of treating at least the flows generated by rainfall of 10 millimetres per hour on the contributing catchment before bypassing
	Shall reduce the concentration of total petroleum hydrocarbons in the discharge to below 15 milligrams per litre averaged over a rainfall event
Outlet structure	Shall minimise scour and erosion
Soakpit	Shall have the base sunk into free draining substrate
	Roof soakpits shall have the capacity as a minimum to dispose of stormwater generated on the contributing catchment by the ten percent annual exceedance probability one hour duration storm.
	Roof soakpits shall have the base no deeper than the highest groundwater level reasonably expected at the site.

Selwyn District Council STANDARD STORMWATER MAINTENANCE SCHEDULE

Task	Minimum frequency of maintenance visit					
	Sumps			Swales		Infiltration and dry basins
	Key sumps	Non-key sumps	To soakage chambers	Urban	Rural-residential	
Removal of debris, and litter likely to adversely affect the operation of the system, within 10 working days of the maintenance visit	Yearly	Two Yearly	Yearly	6 monthly	Yearly	6 monthly
Removal of sediment likely to adversely affect the operation of the system, within 10 working days of the maintenance visit	Yearly	Two Yearly	Yearly	N/A	N/A	N/A
Removal of hydrocarbons that are visible over a total area of greater than 0.5 square metres (swales and basins) or a layer greater than 5 millimetres thick (sumps), within 10 working days of the maintenance visit	N/A	N/A	6 monthly	6 monthly	Yearly	6 monthly
Repair or stabilisation of erosion and scour, within 20 working days of the maintenance visit	N/A	N/A	N/A	6 monthly	Yearly	6 monthly
Replanting, where bare or patchy soil cover or sediment build up is greater than 10 square metres, or a total of five percent of the area of the device, whichever is the lesser, within 10 working days of the maintenance visit	N/A	N/A	N/A	6 monthly	Yearly	6 monthly
Weed control	N/A	N/A	N/A	6 monthly	Yearly	6 monthly

Schedule 3 Hazardous Industries and Activities

A. Chemical manufacture, application and bulk storage

1. Agrichemicals including commercial premises used by spray contractors for filling, storing or washing out tanks for agrichemical application
2. Chemical manufacture, formulation or bulk storage
2. Commercial analytical laboratory sites
3. Corrosives including formulation or bulk storage
4. Dry-cleaning plants including dry-cleaning premises or the bulk storage of dry-cleaning solvents
5. Fertiliser manufacture or bulk storage
6. Gasworks including the manufacture of gas from coal or oil feedstocks
7. Livestock dip or spray race operations
8. Paint manufacture or formulation (excluding retail paint stores)
9. Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds
10. Pest control including the premises of commercial pest control operators or any authorities that carry out pest control where bulk storage or preparation of pesticide occurs, including preparation of poisoned baits or filling or washing of tanks for pesticide application
11. Pesticide manufacture (including animal poisons, insecticides, fungicides or herbicides) including the commercial manufacturing, blending, mixing or formulating of pesticides
12. Petroleum or petrochemical industries including a petroleum depot, terminal, blending plant or refinery, or facilities for recovery, reprocessing or recycling petroleum-based materials, or bulk storage of petroleum or petrochemicals above or below ground
13. Pharmaceutical manufacture including the commercial manufacture, blending, mixing or formulation of pharmaceuticals, including animal remedies or the manufacturing of illicit drugs with the potential for environmental discharges
14. Printing including commercial printing using metal type, inks, dyes, or solvents (excluding photocopy shops)
15. Skin or wool processing including a tannery or fellmongery, or any other commercial facility for hide curing, drying, scouring or finishing or storing wool or leather products
16. Storage tanks or drums for fuel, chemicals or liquid waste
17. Wood treatment or preservation including the commercial use of anti-sapstain chemicals during milling, or bulk storage of treated timber outside

B. Electrical and electronic works, power generation and transmission

1. Batteries including the commercial assembling, disassembling, manufacturing or recycling of batteries (but excluding retail battery stores)
2. Electrical transformers including the manufacturing, repairing or disposing of electrical transformers or other heavy electrical equipment
3. Electronics including the commercial manufacturing, reconditioning or recycling of computers, televisions and other electronic devices

4. Power stations, substations or switchyards

C. Explosives and ordinances production, storage and use

1. Explosive or ordinance production, maintenance, dismantling, disposal, bulk storage or re-packaging
2. Gun clubs or rifle ranges, including clay targets clubs that use lead munitions outdoors
3. Training areas set aside exclusively or primarily for the detonation of explosive ammunition

D. Metal extraction, refining and reprocessing, storage and use

1. Abrasive blasting including abrasive blast cleaning (excluding cleaning carried out in fully enclosed booths) or the disposal of abrasive blasting material
2. Foundry operations including the commercial production of metal products by injecting or pouring molten metal into moulds
3. Metal treatment or coating including polishing, anodising, galvanising, pickling, electroplating, or heat treatment or finishing using cyanide compounds
4. Metalliferous ore processing including the chemical or physical extraction of metals, including smelting, refining, fusing or refining metals
5. Engineering workshops with metal fabrication

E. Mineral extraction, refining and reprocessing, storage and use

1. Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition
2. Asphalt or bitumen manufacture or bulk storage (excluding single-use sites used by a mobile asphalt plant)
3. Cement or lime manufacture using a kiln including the storage of wastes from the manufacturing process
4. Commercial concrete manufacture or commercial cement storage
5. Coal or coke yards
6. Hydrocarbon exploration or production including well sites or flare pits
7. Mining industries (excluding gravel extraction) including exposure of faces or release of groundwater containing hazardous contaminants, or the storage of hazardous wastes including waste dumps or dam tailings

F. Vehicle refuelling, service and repair

1. Airports including fuel storage, workshops, washdown areas, or fire practice areas
2. Brake lining manufacturers, repairers or recyclers
3. Engine reconditioning workshops
4. Motor vehicle workshops
5. Port activities including dry docks or marine vessel maintenance facilities
6. Railway yards including goods-handling yards, workshops, refuelling facilities or maintenance areas
7. Service stations including retail or commercial refuelling facilities
8. Transport depots or yards including areas used for refuelling or the bulk storage of hazardous substances

G. Cemeteries and waste recycling, treatment and disposal

1. Cemeteries
2. Drum or tank reconditioning or recycling
3. Landfill sites
4. Scrap yards including automotive dismantling, wrecking or scrap metal yards
5. Waste disposal to land (excluding where biosolids have been used as soil conditioners)
6. Waste recycling or waste or wastewater treatment

H. Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment.

I. Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment.

Exercising of resource consent CRC167467

It is important that you notify Environment Canterbury when you first start using your consent.

GRANTED TO: Selwyn District Council
A DISCHARGE PERMIT (S15): to discharge contaminants into and onto land
LOCATION: West Melton, Selwyn

Even if the consent is replacing a previous consent for the same activity, you need to complete and return this page.

Providing this information will:

- Validate your consent through to its expiry date
- Minimise compliance monitoring charges
- Help provide an accurate picture of the state of the environment.

If consent CRC167467 is not used before 30 Jun 2022 this consent will lapse and no longer be valid.

Declaration:

I have started using this resource consent.

Action taken: (e.g. pasture irrigated, discharge from septic tank/boiler/spray booth etc).

_____

Approximate start date (***Note: this may be different to the date the consent was granted)***: _____

Signed: _____ **Date:** _____

Full name of person signing (please print**):** _____

Please return to:

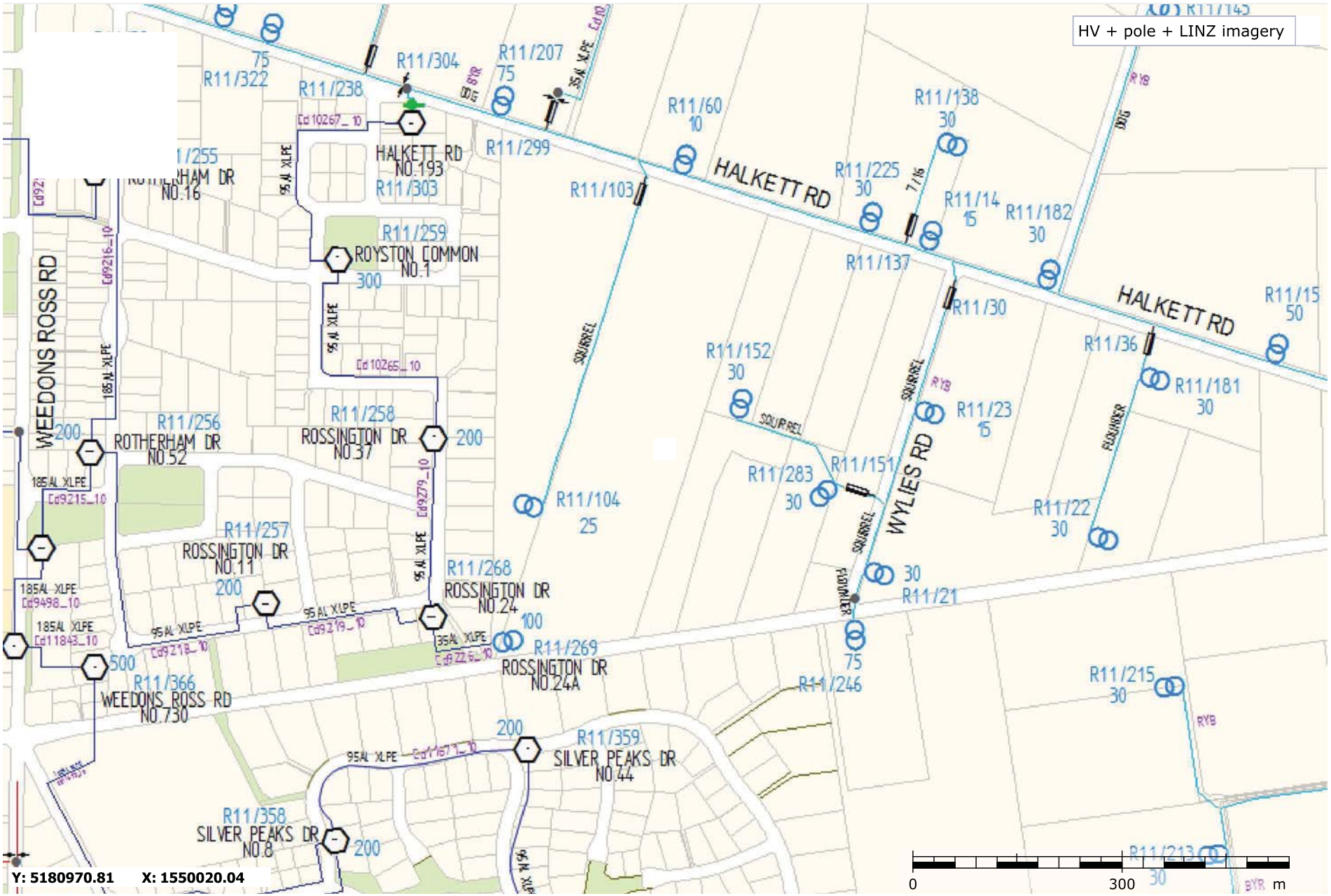
Environmental Protection - Administration
Environment Canterbury
PO Box 345
Christchurch 8140

File: CRC167466

APPENDIX F -Power Supply Plan and Correspondence

1: 7200

1066 West Coast Road West Melton



Jamie Verstappen

From: David Wear <davidwear@xtra.co.nz>
Sent: Monday, 25 June 2018 3:53 p.m.
To: Jamie Verstappen
Subject: Fw: 1066 West Coast Road Inquiry
Attachments: West Coast Rd 1066 ex HV supply.pdf

Hi Jamie
Should not be a problem.
200 lots=1MVA of load 4-5 kiosks on new roads (standard res. size lots similar to adj Rossington Dr Rotheram Dr they did).

The HV conductors(DOG large CSA) are on the north side of Halkett Rd so HV cable network, in & out would be required from these to kiosks.

If you need formal confirmation (later on), Orion will provide this.

The Farm presently has an OH HV line to a 25kVA pole sub (to be removed).

Regards Dave Wear
Design-Net Ltd
Ph3799937

From: Jamie Verstappen
Sent: Monday, June 25, 2018 3:23 PM
To: davidwear@xtra.co.nz
Subject: FW: 1066 West Coast Road Inquiry

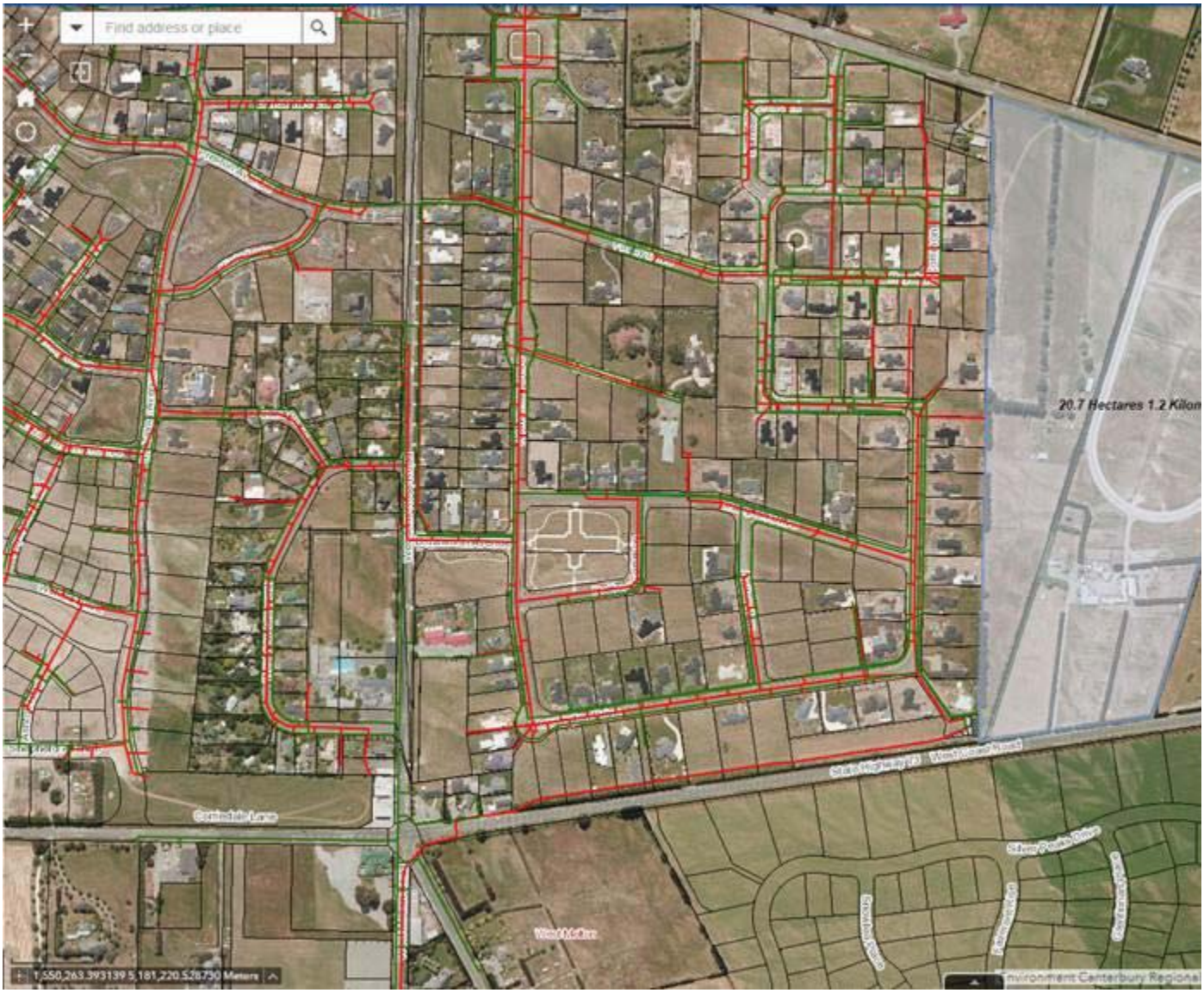
Hi Dave

Hughes are looking at the block of land below for development.

Can you have a quick look into the local power supply and provide comment on the installation/upgrade work required for a development density of 10 lots/ha (200 Lots total).

No layout available yet.

Regards
Jamie



Jamie Verstappen | Civil Engineer

Davie Lovell-Smith Ltd
Planning Surveying Engineering
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