Timaru District Council – Contract 2442

Project Number: 6-TTDA7.00

Pleasant Point - Stormwater Management Area

15 December 2022

FINAL FOR LODGEMENT

Discharge Permit Application and Assessment of Effects on the Environment

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APPLICATION FOR RESOURCE CONSENT

PRESCRIBED FORM 9 FOR SECTION 88 OF THE RESOURCE MANAGEMENT ACT 1991

To: Canterbury Regional Council

PO Box 345
Christchurch 8140

From: Timaru District Council - Water and Drainage

2 King George Place
PO Box 522
Timaru 7940
(Please note different address for service)

1. The Applicant applies for the following type(s) of resource consent:

   Discharge Permit – Duration 35 years

2. The activity to which the application relates (the proposed activity) is as follows:

   Discharge of stormwater and construction-phase stormwater to land and water from existing and future urban areas within the Stormwater Management Area of Pleasant Point. Noting that there are some land uses and larger scale activities that are excluded from the application

   For further details refer to the Description of the Proposal Section 5 of the Assessment of Effects on the Environment (AEE) Report.

3. The area at which the proposed activity is to occur is as follows:

   Pleasant Point, Timaru District.

   The site is within the Stormwater Management Area as shown in Figure 1-1 of the AEE Report.

4. The Applicant is the owner of the reticulated stormwater system and parts of the site including but not limited to the road reserves. There are various landowners and occupiers (other than the Applicant) within the Stormwater Management Area that utilise the reticulated network or have private stormwater systems to which the application relates.

5. No additional resource consents are needed for the proposal to which this application relates.

6. Attached is an assessment of the proposed activity's effect on the environment that—

   a. Includes the information required by clause 6 of Schedule 4 of the Resource Management Act 1991; and

   b. Addresses the matters specified in clause 7 of Schedule 4 of the Resource Management Act 1991; and

c. Includes such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

Refer Section 6, 7, 8 of the AEE Report.

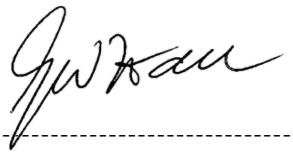
7. Attached is an assessment of the proposed activity against the matters set out in Part 2 of the Resource Management Act 1991.

Refer Section 10.8 of the AEE Report.

8. Attached is an assessment of the proposed activity against any relevant provisions of a document referred to in section 104(1)(b) of the Resource Management Act 1991, including the information required by clause 2(2) of Schedule 4 of that Act.

Refer Section 10 of the AEE Report.

Applicant/person authorised to sign on behalf of applicant



Dated: 15 December 2022

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ASSESSMENT OF EFFECTS ON THE ENVIRONMENT

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1 Introduction

1.1 Overview

Timaru District Council (TDC) provides urban stormwater collection and disposal for the township of Pleasant Point and is responsible for ensuring that the reticulated stormwater system provides an adequate level of service for this community.

TDC has prepared a Stormwater Management Plan (SMP) for the existing urban area of Pleasant Point and for future expansion of the township, primarily based on land-use zones within the current District Plan. These existing and future urban areas comprise the Stormwater Management Area (SMA) covered by the Pleasant Point SMP.

TDC's vision for managing stormwater in Pleasant Point is:

> *"Working together to value, protect and restore the mauri/lifeforce of the waterways for the benefit of all."*

The SMP, which is attached as Appendix 1, adopts a holistic and adaptive management approach for managing stormwater discharges from the Pleasant Point SMA. In preparing the SMP for the Pleasant Point SMA, TDC has been guided by the principles that underpin Te Mana o te Wai, which is the fundamental concept of the National Policy Statement for Freshwater Management 2020 (NPSFM) and "*refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment.*"

The SMP supports an application by TDC for a discharge permit (or resource consent) from Environment Canterbury (ECan) to authorise stormwater discharges from their reticulated stormwater network for existing and future urban areas of the Pleasant Point township. The consent will also include stormwater discharges from other existing and future individual residential and commercial properties (not discharging via TDC's network).

This resource consent application is made pursuant to Section 15 of the Resource Management Act 1991 (RMA) and is classified as a non-complying activity under the Canterbury Land and Water Regional Plan (LWRP). TDC is seeking a duration of 35 years.

1.2 Purpose of this Document

This report provides an Assessment of Effects on the Environment (AEE) in accordance with Section 88 and Schedule 4 of the Resource Management Act 1991 (RMA) to accompany the application for a discharge permit.

The report describes the proposal and provides an assessment of the requirements under the RMA, and the relevant statutory documents, including the Ōpihi River Regional Plan (ORRP) and the Canterbury Land and Water Regional Plan (LWRP). It also provides information on the nature of the receiving environment and an assessment of actual or potential effects that could occur as a result of the proposed discharges.

1.3 Stormwater Management Area

The township of Pleasant Point is located approximately 20 km north-west of Timaru on State Highway (SH) 8 and south of the junction of Te Ana-a-Wai (the Tengawai river) and the Ōpihi River. The SMA covered by this resource consent application includes both existing and future urban catchments of Pleasant Point as shown in Figure 1-1.

The area of the Pleasant Point SMA is approximately 150 hectares (ha) and consists of a mixture of residential, reserve, industrial, and commercial land uses.

The existing township of Pleasant Point has a limited piped reticulated network, with stormwater discharging to land via soak pits for much of the catchment. Stormwater west of Kyber Street and Halstead Road is reticulated and discharged into the Pleasant Point Stream. For the remainder of the catchment, south of SH8, stormwater is conveyed via open channels with culverts, prior to discharging into German Creek.

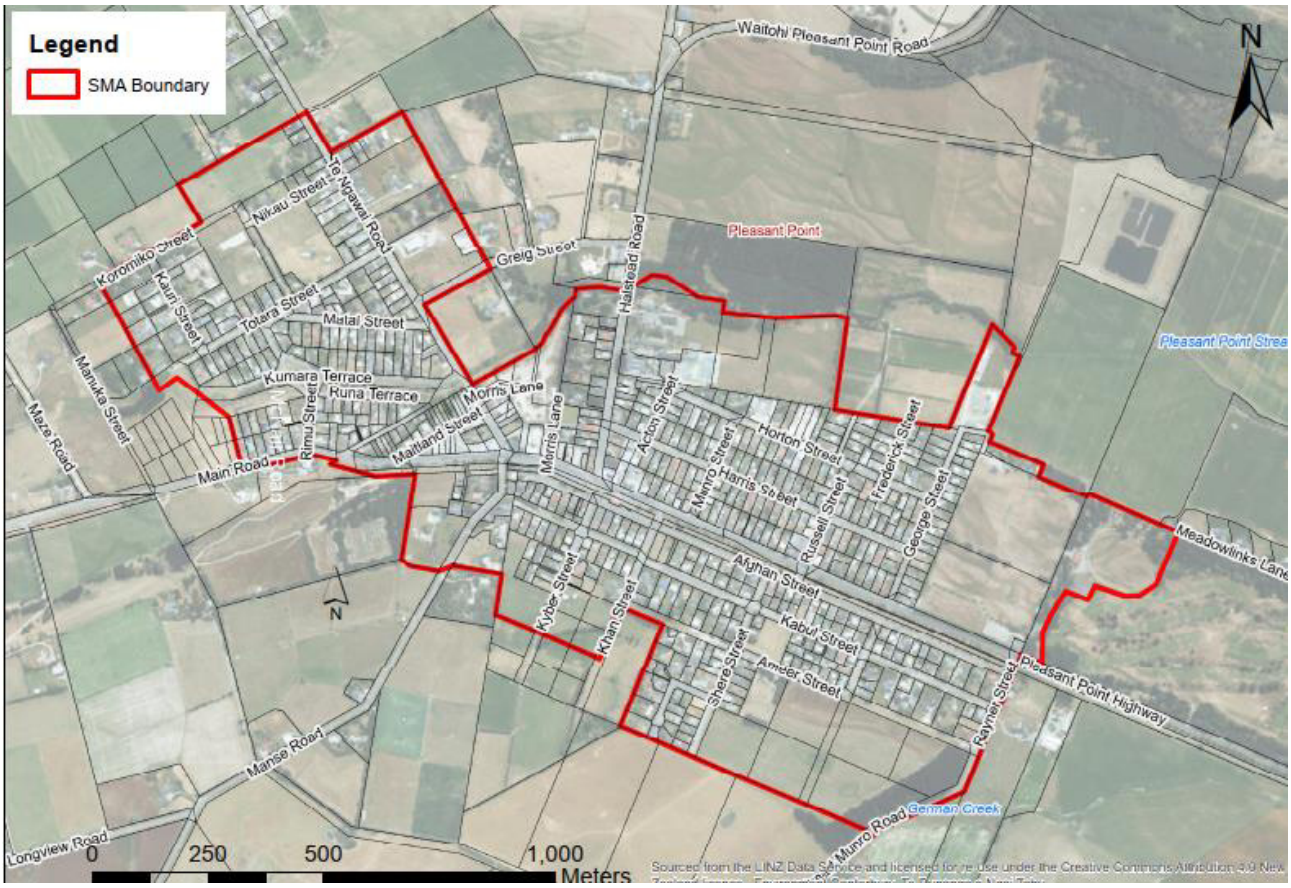

Figure 1-1: Pleasant Point SMA

2 Background

2.1 Reasons for Application

The majority of existing stormwater discharges from TDC's reticulated network and other minor discharges (otherwise not permitted or separately consented) from the SMA were previously lawfully established (permitted) under the Transitional Regional Plan (TRP) and the Natural Resources Regional Plan (NRRP) for Canterbury, that pre-dated the LWRP.

The LWRP became operative in 2015 and required all stormwater network operators to obtain comprehensive network consents for the discharges from their networks. The rationale for this was to achieve an integrated approach to stormwater management within catchments and to address the potential cumulative impacts of these discharges on the environment.

Under the LWRP, for a reticulated stormwater network discharge that existed prior to 11 August 2012, an application for a discharge permit was to be lodged by 30 June 2018, or at a later date as agreed to between the stormwater network operator and Environment Canterbury (ECan). ECan had previously granted TDC with an extension of timeframes to lodge the application for Pleasant

Point by 31 July 2022, however this date has not been met, and no further extension has been approved

While the LWRP only requires TDC to obtain consent for discharges from their reticulated network, TDC have opted to include discharges from residential (not rural residential) and commercial urban development within the SMA that do not connect to their network. This is anticipated to provide benefits to ratepayers (who may have had to apply for a separate discharge permit) whilst providing a more holistic approach to stormwater management within the catchment. However, industrial sites not connected to the network are to be excluded. Refer to Section 5.1 for a detailed description of the proposal.

2.2 Existing Stormwater Consents in the Pleasant Point SMA

Currently, individual stormwater discharge permits within the district are typically obtained by residential developers for new urban developments, with the exception of some major development areas, where these permits have been obtained by TDC. Following the completion of the development and the infrastructure being vested with TDC, the associated stormwater discharge permits are transferred to the TDC, providing a set defects period is completed and full resource consent compliance is achieved.

It should be noted however, that there has not been any significant greenfield development in Pleasant Point over the last 30 years. When smaller development has occurred the associated stormwater discharges (from <28 lots) were permitted under the 'General Authorisations' of the Canterbury Transitional Regional Plan (TRP).

An analysis of data obtained on 16 September 2022 from Environment Canterbury's (ECan) Canterbury Maps open data service was undertaken to determine the number of active stormwater discharge permits in the Pleasant Point SMA.

At the time there were:

- 1 privately held consent CRC102721 to discharge stormwater to land from hard standing areas associated with a nursery and preschool at 21 Halstead Road.
- 2 consents to discharge stormwater from Point Lumber Limited, a timber treatment yard at Morris Lane:
    - CRC920450.2 authorises discharges from the timber treatment yard to land. This consent expires on the 1 January 2028.
    - CRC203542 authorises the discharges of operational phase stormwater from roofs and buildings associated with a drip pad and hazardous storage area to land via a soakpit from the timber yard. The consent expires on 1 January 2028.

Potentially the privately held commercial activity discharge permit at 21 Halstead Road (CRC102721) could be surrendered by the consent holders.

Given that the consents for stormwater discharges from Point Lumber are to land from an industrial site and do not discharge into the network, the discharges from the site will not be authorised under TDC's SMA consent. The consent holder will need to apply to ECan for replacement consents for these discharges when the existing consents are due to expire.

3 Description of the Existing Stormwater Network

3.1 The Assets Overview

A significant proportion of the existing reticulated stormwater infrastructure in Pleasant Point relies on the conveyance of stormwater by kerb and channel, prior to direct discharges to soakpits, located within road reserves. The remaining conveyance network consists of underground stormwater pipes and open channels that convey stormwater to either Pleasant Point Stream or German Creek. It is estimated that 28% of stormwater in the Pleasant Point SMA is discharged to land, 30% is discharged to German Creek and 42% is discharged to Pleasant Point Stream.

The stormwater network in Pleasant Point is ageing and there is limited information on the condition of some of the existing infrastructure. This can contribute to localised nuisance flooding due to blockages or pipes with limited capacity.

TDC's Land Transport Unit manage the street infrastructure (i.e. sumps in the roads), the Drainage and Water team are generally responsible for all other stormwater infrastructure, while the Parks and Reserves team tend to maintain the planted areas (e.g. raingardens, stormwater basins, swales). A significant proportion of the swale/open drain network is located within private property which can make maintaining these sections challenging.

3.2 Infrastructure Summary

There is a total of five kilometres (km) of pipeline with their sizing detailed in Table 3-1. There are 73 TDC owned soak pits within the Pleasant Point SMA, as well as numerous private soak pits for discharging roof runoff to the ground. In addition to the soak pits, there are a total of seven stormwater outfalls within the SMA. The TDC pipelines, soakpits and outfalls are shown in Figure 3-1.

There are no existing proprietary treatment systems in the reticulated network. There are several grassed conveyance channels that are referred to as 'swales' in the existing urban area. These will provide varying degrees of stormwater treatment.

Table 3-1: TDC Stormwater Infrastructure Summary

Stormwater Infrastructure	Quantity
Stormwater pipe size	5,019 m total
<300 mm diameter	3,534 m
300 – 500 mm diameter	1,413 m
500 – 1,000 mm diameter	72 m
>1,000 mm diameter	0 m
Stormwater soakpits	73
Stormwater Swales	2,663 m
Stormwater outfalls total	7

Figure 3-1: Pleasant Point Stormwater Infrastructure

3.3 Network Capacity

The level of service currently adopted by TDC is that water will not inundate habitable floor spaces in the:

- 5-year Average Recurrence Interval (ARI) (or 20% Annual Exceedance Probability (AEP)) for urban residential areas
- 10-year ARI (or 10%AEP) for industrial and commercial areas

This means that ponding can be expected to occur in parks, roads, and private properties during the above rainfall events.

An assessment of the capacity of the piped stormwater network has been completed by WSP (2021) and is attached as Appendix 2. The assessment results are summarised in Table 3-2. The assessment did not report the associated land use for the pipes so a direct comparison of land use Level of Service (LoS) is not able to be undertaken.

The capacity assessment found that 32% of the pipe network is unable to convey 2-year ARI (50% AEP) peak flows. 66% of the network is able to convey up to 5-year ARI (20%AEP) peak flows and 54% can convey 10-year ARI (10%AEP) peak flows. However, where pipe capacity is exceeded, this does not immediately result in habitable floors being inundated, as ponding within roads and reserve areas can occur until flows within the network subside.

The assessment highlights the need to improve capacity within the Pleasant Point reticulated network to reduce the frequency of nuisance flooding in parks, roads and private properties.

Table 3-2: Level of service results by pipe length and percentage for Pleasant Point (WSP 2021 GIS assessment only).

Pipe length unable to convey 50% AEP peak flows (m)	Pipe Length able to convey 50% AEP peak flows (m)	Pipe Length able to convey 20% peak flows (m)	Pipe Length able to convey 10% AEP peak flows (m)	Total length of pipes assessed (m)
189 (32%)	404 (68%)	389 (66%)	320 (54%)	**593**

3.4 Flood Hazards

Pleasant Point is situated in remnant flood channels from the Te Ana-a-Wai and Ōpihi Rivers, which now form significant overland flow paths through Pleasant Point. German Creek and Pleasant Point Stream are two of these flow paths. Flooding outside of these watercourse channels is limited, typically occurring at shallow depths (< 100 mm).

WSP undertook an indicative flood mapping assessment (refer Appendix 2), to broadly understand the areas that could be exposed to a flooding hazard. The flood depth and flood hazard mapped in the assessment, represented a level of service scenario (10-year ARI) and an extreme event (200-year ARI) occurring across the SMA, but has some limitations. Notably the work does not show:

- The benefits of the underground pipe network on performance (although it must be noted that the network is not designed to a 200-year ARI level of service).
- The benefits of potential stormwater or flood defence infrastructure.

Buildings potentially affected by flooding have been mapped where the building footprint intersects flood depth greater than 150mm (NZBC minimum floor level). However, due to the location of the Pleasant Point Township within these significant historic flow paths, habitable floor levels are expected to be well above this level.

Table 3-3 shows the number and percentage of buildings potentially impacted during the 10 year and 200-year ARI events, mapped during the flood hazard assessment. This assessment was based on the LINZ buildings layer which includes non-habitable buildings such as sheds and garages.

Table 3-3: Buildings potentially at risk of flooding

Return Period	Number of buildings at risk	Percentage of total buildings at risk
10-year ARI	121	11%
200-year ARI	257	24%

3.5 Summary of Key Issues and Observations

The key issues associated with Pleasant Point's stormwater management and the wider environment have been identified through investigations undertaken to prepare the SMP and resource consent application, and through consultation with the community and key stakeholders, such as Te Rūnanga o Arowhenua. These issues are elaborated in more detail in other sections of this AEE and the attached Appendices containing the technical supporting documents and have been considered when preparing the SMP and resource consent application for the Pleasant Point SMA.

In summary, the key known issues with stormwater management, include:

- *Nuisance Flooding* – The network capacity assessment found no significant capacity issues with the stormwater network, largely due to the lack of stormwater pipes in the township. However, increasing the capacity of the network could reduce the frequency of nuisance flooding. Pleasant Point lies within historic overland flow paths however, it is anticipated that building floor levels are generally above the level of nuisance flooding.
- *Shallow Groundwater* - Shallow groundwater under some parts of Pleasant Point could constrain the use of infiltration and soakage-based stormwater treatment systems for new stormwater disposal infrastructure.
- *Stormwater Quality* – A considerable proportion of the stormwater discharges are untreated before entering the streams or groundwater under Pleasant Point. Sediment sampling within Pleasant Point Stream and to a lesser degree German Creek found elevated concentrations of heavy metals and hydrocarbons. This indicates that contaminants from stormwater are accumulating within the sediments in these ephemeral waterways. These waterways eventually flow into the Ōpihi River.
- *Groundwater Quality* - Several domestic drinking water supply wells draw water from shallow groundwater, with some of these wells located near existing stormwater soakage systems.
- *Future Development* - Land use zones indicate potential future increases in residential and industrial land use on the outskirts of Pleasant Point. Any development will likely increase impervious surfaces and the volume of runoff, putting pressure on any parts of the network that are currently under capacity. Additional stormwater runoff from these areas could also lead to an increase in stormwater contaminant loads, that could discharge into the environment unless appropriate treatment measures are included in stormwater infrastructure servicing these areas.
- *Ownership and maintenance* - Operations and maintenance responsibilities for stormwater related infrastructure are spread amongst multiple units and contractors. There is a need to ensure the stormwater assets are managed effectively and efficiently using industry best practice to meet the adopted level of service. In addition, the ownership and maintenance responsibility for several of the key waterways, as they flow through their urban reaches, needs to be clarified.

4 Description of the Environment

4.1 Overview

The RMA requires that an application for a resource consent is supported by an assessment of effects on the environment (Schedule 4). "Environment" is defined in the RMA as including:

(a) Ecosystems and their constituent parts, including people and communities; and
(b) All natural and physical resources; and
(c) Amenity values; and
(d) The social, economic, aesthetic, and cultural conditions which affect the matters stated in (a) to (c) or which are affected by those matters.

The following description of the environment that could potentially be affected by the discharges of stormwater from TDC's reticulated network has been compiled using the following sources of information:

- TDC's District Plan
- Census data for Pleasant Point
- Climate data from Timaru Airport
- Canterbury Maps;
- ECan's Wells Database;
- S-Map online
- Information obtained from site visits;
- Monitoring data collected as part of the project;
- Manawhenua cultural impact assessment (AEC, 2021; Appendix 3) and assessment of cultural effects. (Kitson, 2022; Appendix 4)

4.2 Pleasant Point

Pleasant Point is a service town for the surrounding farming district and is located inland of Timaru on SH8. The population numbers for the town were recorded at 1,371 during the 2018 census[1].

The current developed urban areas of Pleasant Point within the SMA boundary, total an area of approximately 100 ha.

4.3 Land Use in the SMA

The land use zoning in the operative Timaru District Plan (TDP) includes Rural, Recreational, Residential, Commercial, and Industrial Light and Industrial Heavy zone types. The land use zones from the District Plan do not separate roads from land. Figure 4-1 provides a map of the current zoning within the SMA based on the TDP.

The proposed district plan recently notified (pTDP) has introduced new zones 'Neighbourhood Centre' and 'Retail Zone' which for the purposes of the AEE and assessments on land use changes in the SMA have been described and modelled as 'commercial'. Roads are typically classified based on their Annual Average Daily Traffic (AADT) this can also be used to assess their contaminant generation potential.

[1] *Statistics New Zealand. March 2020. Pleasant Point (339200).* 2018 Census place summary: Pleasant Point

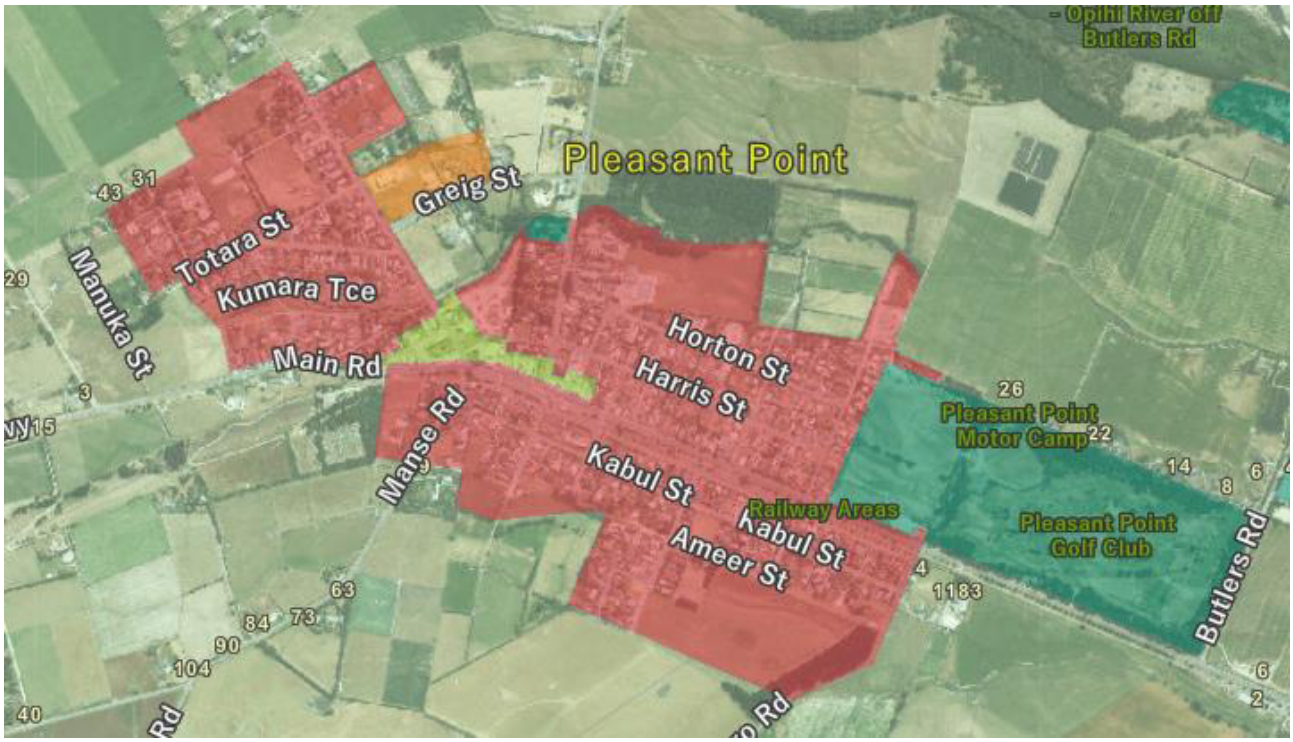

Figure 4-1: Current operative TDP land use zones (red -residential, light green – commercial, orange - industrial light, green – recreational 2). Note: the pTDP does not increase the urban extent of the township.

In line with the operative TDP, further urban development is envisaged for Pleasant Point, as presented in Figure 4-1. In addition, some inner rezoning is proposed in the pTDP to match the existing activity within the SMA. The pTDP does not actually rezone any material existing rural areas to urban uses.

Table 4-1 provides a summary of the areas of current urban land-use and a fully developed scenario within the SMA. Within the SMA a 34.4 ha increase in residential land-use is envisaged, similarly, reserve and industrial land-use will increase by 8.9 ha and 1.5 ha respectively. Land used for roads is expected to increase by some 1.5 ha as the residential zones are developed.

Table 4-1: Comparison of land use zoned in Pleasant Point SMA currently and proposed under the DPR (Source Appendix 5)

Land-Use Zone	Current Urban Area (ha)	Future Urban Area (ha)	Area Δ (ha)
Commercial	4.9	3.0	-1.9
Industrial	2.9	4.4	1.5
Pasture	45.8	1.5	-44.3
Reserve	5.4	14.3	8.9
School/Sport Facility	4.1	4.1	0.0
Residential	62.9	97.3	34.4
Roads	25.9	27.4	1.5
Rail Reserve	1.6	1.6	0.0

A full assessment of the assumptions and breakdown of the existing and future zoning areas can be found in The PDP Contaminant Load Model Report Appendix 5. There is an error in this report as it states it is assessing the change from current land use zoning to proposed land use zoning. This is incorrect as the PDP assessment is based on current contaminant loads from existing developed urban areas compared to the fully developed scenario. The fully developed scenario is all of the urban zoning extent envisaged in the operative TDP with the subtle change to zones under the pTDP. Note the future land use zones could be subject to change during the hearing on submissions process for the pTDP.

4.4 Cultural Landscape

Cultural landscapes represent the "*combined works of nature and man*" and the term embraces a diversity of manifestations of the interaction between humankind and the natural environment. Cultural landscapes often reflect specific techniques of sustainable land-use, considering the characteristics and limits of the natural environment they are established in, and a specific spiritual relation to nature.[2]

The Ōpihi and Te Ana-a-Wai (Tengawai) Rivers as well as the township of Pleasant Point lie within the takiwā of Te Rūnanga o Arowhenua. A Mana Whenua Impact Assessment (MWIA) for the discharges of stormwater from Pleasant Point was undertaken by Aoraki Environmental Consultancy Limited (AECL) in November 2020, on behalf of Te Rūnanga o Arowhenua. This is attached as Appendix 3.

Subsequent to the MWIA, an "*Assessment of effects on Te Rūnanga o Arowhenua values and interests by TDC Stormwater Management*" February 2022 was undertaken by Kitson Consulting Ltd (herein referred to as Cultural Values AEE) and this is attached as Appendix 4.

A full description of the cultural landscape for Pleasant Point and the connected environment can be found in these Appendices. This cultural landscape summary subsection uses content from these two reports.

The MWIA and Cultural AEE illustrates a rich cultural landscape that includes mahinga kai/taonga species, culturally significant waterways, settlements (kāinga, pā, nohoanga), Arowhenua marae (Te Hapa o Niu Tireni), wāhi tapu, wāhi taonga, Ōpihi Mātaitai Reserve, Māori Land, and traditional trails. Figure 4-2 gives an example of how extensive occupation was in the lower Ōpihi catchment.

Of particular significance in the Arowhenua Rūnanga rohe are the Mātaitai reserves for the Ōpihi and the Coast. Customary fisheries are a central element to Ngai Tahu identity and well-being. Arowhenua has been a stronghold for customary harvesting of tuna/eels, kanakana, whitebait, patiki and other species.

A mātaitai identifies an area that is a place of importance for customary food gathering and allows for the area to be managed by tāngata tiaki/kaitiaki nominated by the tangata whenua. These are areas that Mana whenua have spent considerable effort to have recognised through Fisheries (South Island Customary Fishing) Regulations 1999.

Established in 2016 the Ōpihi Mātaitai Reserve extends from the Ōpihi Lagoon up the Ōpihi River to a point to the south of Pearse Road, and includes the adjoining creeks, streams, and tributaries of the Ōpihi River. The Ōpihi Mātaitai extent and recent extension to the reserve is shown in a map in Figure 4-2.

[2] World Heritage Centre. 2013. Operational Guidelines for the Implementation of the World Heritage Convention

Figure 4-2: Ōpihi Mātaitai and recent extension area. Also illustrated are sites of settlement, pā, kāinga, nohoanga and Māori reserves, near the Ōpihi and Waitarakao Mātaitai Reserves. Reproduced by Kitson Consulting Ltd from the Ōpihi Mātaitai Extension Application – April 2021

Temuka is also another township in the Timaru district that has discharges of stormwater that eventually flow to the Ōpihi River / Mātaitai. Temuka township is subject to a separate SMA application, that has already been lodged with ECan.

An assessment of the thresholds expressed by Arowhenua for cultural use, with a particular focus on mahinga kai was undertaken by Kitson Consulting Ltd in February 2023 (Cultural Values AEE refer Appendix 4) using resources available including assessments undertaken by TDC for the

[3] Kitson Consulting. (2022). *Assessment of effects on Te Rūnanga o Arowhenua values and interests by TDC Stormwater Management*. Kitson Consulting Ltd.

township's stormwater. A high-level summary of the assessment of the state of the values, uses and associations for Pleasant Point is presented in Table 4-2 from the Cultural Values AEE. With the data available (that also included the PDP Baseline EA) it was considered that the current state fails to meet the cultural thresholds and restoration is required.

Table 4-2: Assessment of thresholds for cultural use - Ratings are: Pass, Poor or Fail

Threshold						
Mahinga kai resources present	Mahinga kai species in sufficient numbers and good condition	The ecosystem supports mahinga kai species and resources	Human health safety for gathering and consuming kai	Access to mahinga kai is available	Nitrate and Ammonia toxicity in A band	*E. coli* in A band
Poor	Poor	Poor	N/A	N/A	Pass	Fail

4.5 Climate

In general, Pleasant Point has a dry, moderate climate as it lies approximately 15 km inland from the coast, and the township is on average 65 m above sea level.

Table 4-3 provides monthly statistical climate data for the last 20 years for Pleasant Point based on the Timaru Airport weather station (NIWA Network# H414325). This station is located only 8 km from Pleasant Point. Based on the data from the table, Pleasant Point experiences a moderate range of mean monthly temperatures and a lesser range or mean monthly precipitation depth.

MfE (2018) climate change projections for Canterbury forecast an increase in temperature, an increase in the number of hot days, a decrease in the number of frost days and snow days and an increase in annual rainfall. Specifically, MfE (2018) predicted temperatures will likely be 0.7°C to 1.0°C warmer by 2040 and 0.7°C to 3.0°C warmer by 2090.

Table 4-3: Mean Climate data for Timaru Airport 2000 to 2021

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average °C	15.9	15.6	14.1	11.1	8.3	5.8	5.2	6.6	8.8	10.4	12.4	14.7	**10.7**
Rainfall mm	52	47	36	53	44	31	35	51	31	46	50	51	**548**
Wet Days *	7.6	5.9	5.9	6.2	5.5	5.0	4.5	5.9	5.5	7.4	7.1	7.7	**75.1**
* number of days with 1 mm or more of rain													

A recent update of climate change predictions by NIWA (2020) is forecasting rainfall to change by between +/-5 percent for most of the Canterbury region by 2040 and 2090. Winter rainfall is projected to increase considerably by 2090 in many eastern, western and southern parts of Canterbury, a 15 to 40 percent more rainfall is projected. Of most relevance, it is predicted that annual rainfall is projected to increase by 20 to 25 percent in eastern parts of South Canterbury near Timaru by 2090. [4]

As climate change predictions will increase the incidence and intensity of extreme and very extreme rainfall events, particularly for shorter duration events with associated larger floods.

[4] NIWA. 2020. Climate Change predictions for the Canterbury Region. Prepared for Environment Canterbury

4.6 Topography

The Pleasant Point SMA catchment is relatively flat with ground elevations generally around 62 m in the east rising to around 70 m in the west, but to the south of the state highway there is a slight plateau where the ground elevation raises to around 85m, as shown in Figure 4-3.

Figure 4-3: Catchment topography, 1 m contours created from LiDAR

4.7 Geology and Soils

The 1:250,000 scale geological map of the Pleasant Point area (Cox and Barrel, 2007) indicates that the surficial geology comprises mostly of Late Pleistocene-Holocene river deposits of the Springston/Nine Mile Formation. These river deposits are generally unweathered (Figure 4-4). A small area in the south of the SMA comprises Early to Mid- Pleistocene river deposits from the Woodland and Hororata Formation. These river deposits include slightly to moderately weathered mixtures of gravel, sand, and clay. Borelogs listed on ECan's well database for bores within and around the SMA area are consistent with the geological map, indicating that gravels extend to depth beneath the SMA. The borelogs also indicate some stratification with the presence of claybound gravels within the layers.

S-Map Online summarises the majority of Pleasant Point soils as moderately deep to shallow and imperfectly drained (Figure 4-5). Soils that are moderately deep and poorly drained, along with moderately deep to shallow and well-drained occupy small areas within the south and the south-west regions of the SMA, respectively. The soil profile typically has silty textures to around 0.5 m, after which a gravelly layer extends to 1 m bgl. Clay content of these soils typically ranges from 18 to 35%. Overall, the soil (upper soils) permeability is expected to be low.

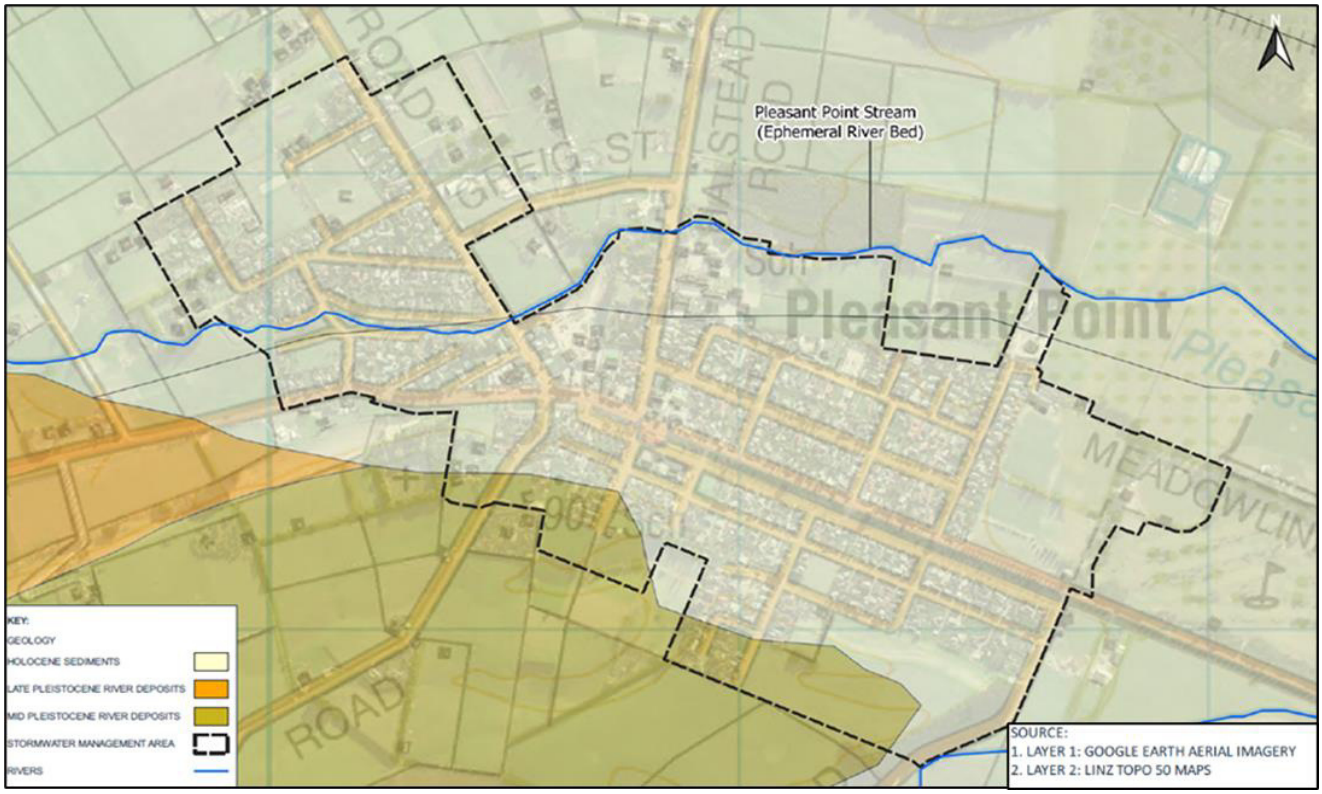

Figure 4-4: Geology of Pleasant Point (source GNS Geology[5])

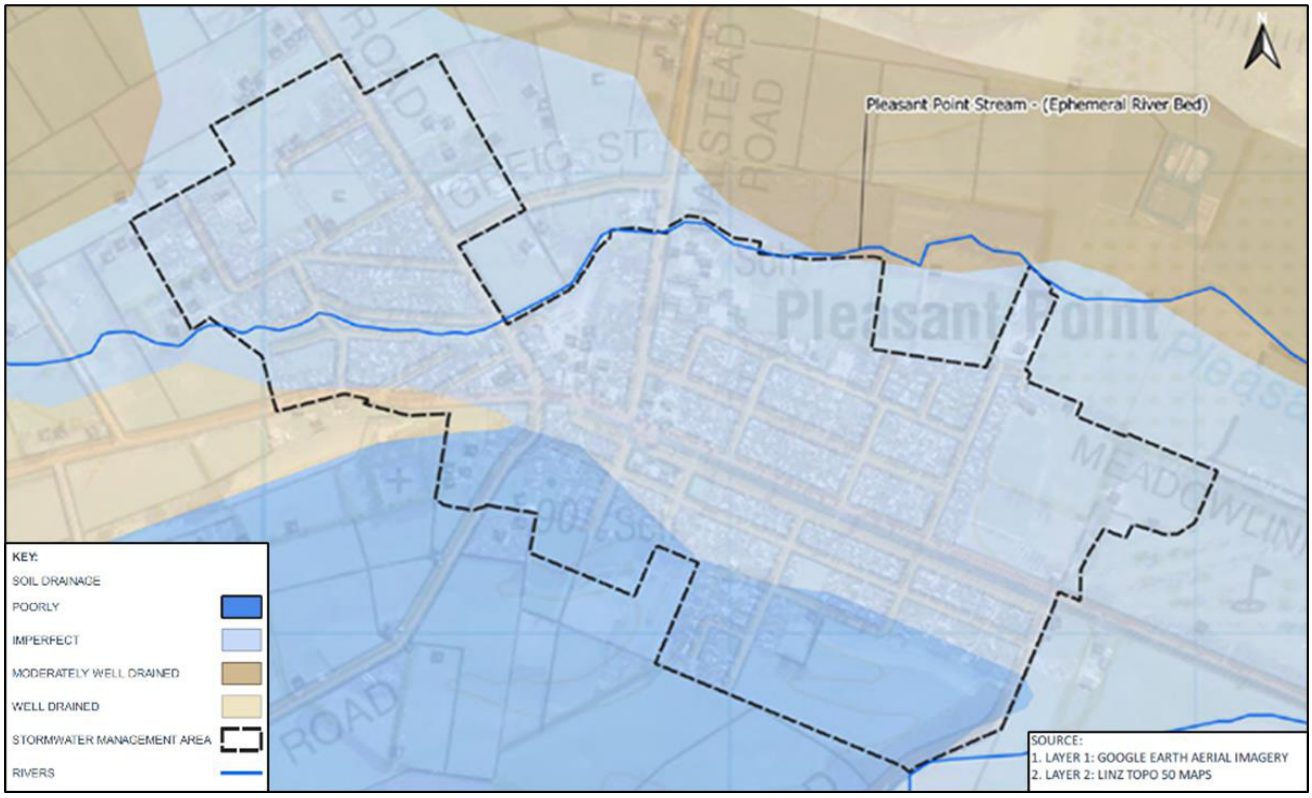

Figure 4-5: Soil Map of Pleasant Point (source S-Maps[6])

[5] Cox, S. & Barrell, D. (2007). *Geology of the Aoraki area*. Institute of Geological Nuclear Sciences 1:250 000 geological map 15. 1 Sheet + 71p. Lower Hutt New Zealand: GNS Science

[6] S-maps Online https://smap.landcareresearch.co.nz/

4.8 Groundwater

4.8.1 Hydrogeology

Figure 4-6 shows the piezometric contours measured in 1975 beneath Pleasant Point (https://mapviewer.canterburymaps.govt.nz/). These contours indicate that groundwater generally flows west to east toward the coast. Local variations in groundwater direction may occur where stream channels are present or due to topographical changes.

Information available on ECan's Wells database from eight bores within the SMA suggest groundwater typically ranges from 1.9 to 5.2 m below ground level (bgl), however this estimate is based upon very limited data. Only two of these bores had more than a single groundwater level measurement. Groundwater and adjacent surface water in the area are expected to be well connected hydraulically.

There is also insufficient data to conclusively characterise the permeability of the shallow strata within the SMA. However, the limited data available indicates soils may have low to moderate permeability.

Figure 4-6: Piezometric Contours

4.8.2 Groundwater Quality

There is very little data available to characterise the quality of groundwater beneath the Pleasant Point SMA. Groundwater quality data is only available for one bore in the catchment. Bore J38/0028 is 4.7 m deep and located towards the far east of the catchment boundary at the Pleasant Point Domain. Water quality sampling for nitrate-nitrogen, chloride and electrical conductivity was undertaken between 1994 and 1995 and the results are shown in Table 4-4.

Concentrations of nitrate-nitrogen are elevated but lower than the Drinking Water Standards of New Zealand (DWSNZ) 2022 MAV of 11.3mg/L. Chloride concentrations are well below the DWSNZ 2005 of 250 mg/L and values for Electrical Conductivity are also generally low.

No water quality data is available for *E.Coli* or typical stormwater contaminants such as heavy metals and hydrocarbons.

Table 4-4: Water quality data for bore J38/0028

Parameter Measured	Number of Measurements	Period	Median	Max
Nitrate-Nitrogen	4	1994-1995	7.95 mg/L	8.9 mg/L
Chloride	4	1994-1995	14.5 mg/L	16 mg/L
Electrical Conductivity	4	1994-1995	25.6 mS/m	26.4 mS/m

4.8.3 Groundwater Users

A review of ECan's well database, including wells on properties having a rated reticulated water supply, and those properties without registered wells but also not having access to a reticulated water supply was undertaken by PDP in March 2022 as part of a contaminant transport assessment for Pleasant Point (and Temuka). This Letter Report is attached as Appendix 6.

The PDP report (Section 3) provides details of the depths, uses and location of all groundwater bores within the SMA and within a 500 m buffer around the SMA and describes the sensitivity of these bores to stormwater discharges from the SMA. Bores within the SMA and surrounding buffer zone are recorded in ECan's Well Database as being used for domestic supply, water level monitoring, commercial/industrial use and irrigation.

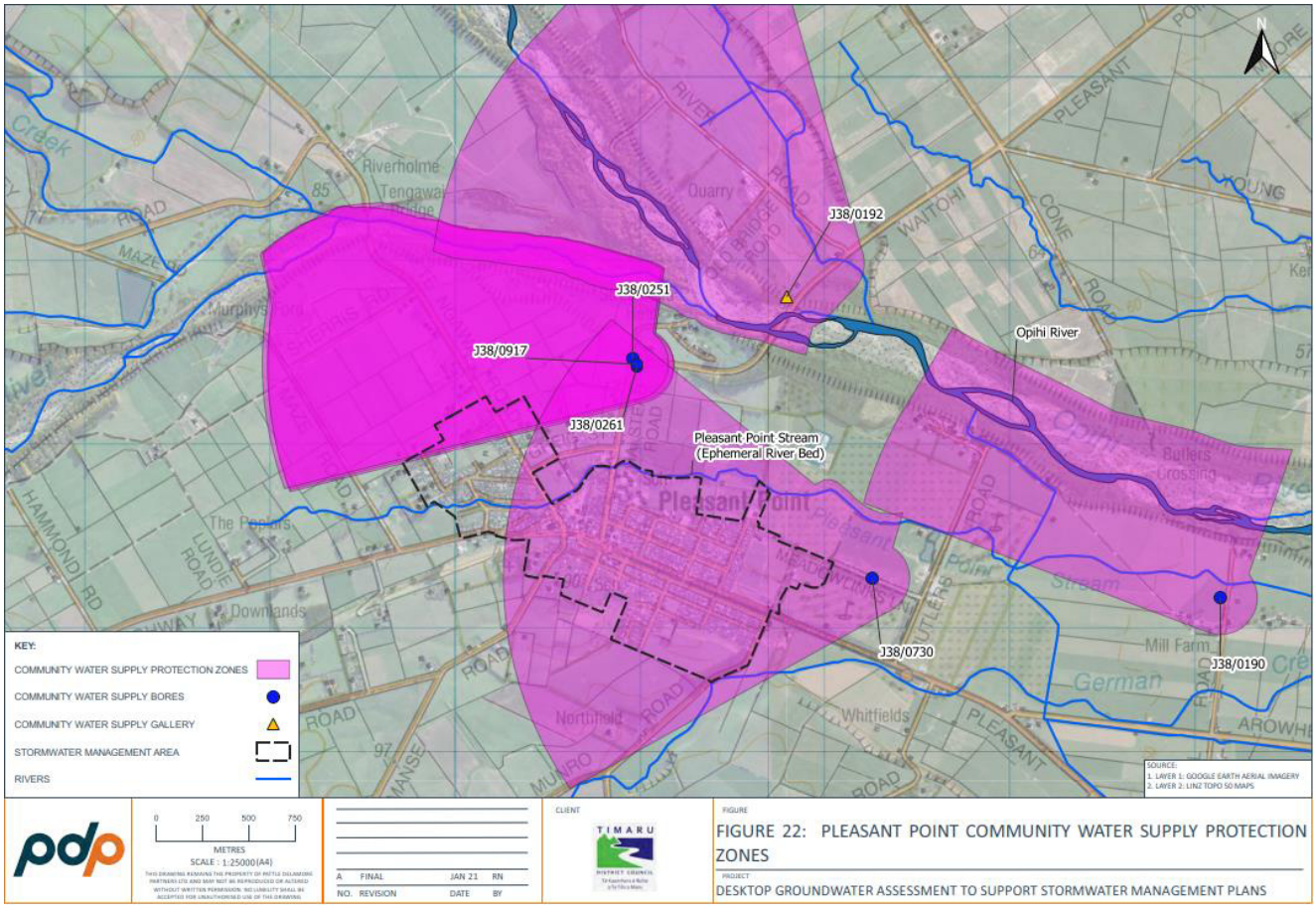

Figure 4-7: Community Water Supply Protection Zones (J38/0730 private group supply)

Based on this review, PDP have identified five registered (4 domestic and 1 group) drinking water supply wells within or downgradient of the SMA that could potentially be affected by stormwater discharges within the SMA (Table 3, Appendix 6). Subsequently TDC has investigated other properties that may have non-registered bores within or downgradient of the SMA. The full list of

the wells used for drinking water supply following TDCs further investigations and contact with property owners is discussed in Section 7.4.

There is one group/community supply well (J38/0730) located 226 m downgradient of the SMA and the well protection zone for this bore overlaps a large majority of the SMA. The shallow well (7.5m deep) is not owned by TDC and the well supplies potable water for a subdivision of 12 households. TDC was advised through consultation with the owner /operator of the group supply take that their water treatment plant includes UV disinfection.

There are also three overlapping community drinking water supply zones for bores J38/0261 (7.4m deep), J38/0251 (9 m deep) and J38/0917 (8.5 m deep) that cover a small north-western portion of the SMA. These wells are owned by TDC and used to supply water to the Pleasant Point township. Water abstracted from these bores are treated using UV disinfection and chlorination.

Figure 4-7 show the Community Drinking Water Protection Zones for these community and group supply bores.

4.9 Surface Water

4.9.1 Overview

Pleasant Point is located on the southern portion of the Canterbury Plains near the confluence of Te Ana-a-Wai (the Tengawai River) and the Ōpihi River. There also two small ephemeral streams that flow through and adjacent to the SMA that the TDC reticulated stormwater network discharges to.

4.9.2 Pleasant Point Steam and German Creek

Pleasant Point Stream is a minor ephemeral surface watercourse that flows west to east through the SMA. German Creek is another minor ephemeral watercourse that runs parallel to Pleasant Point Stream and along the southern boundary of the SMA. The two streams later connect prior to flowing into the Ōpihi River. The catchments are shown in Figure 4-8.

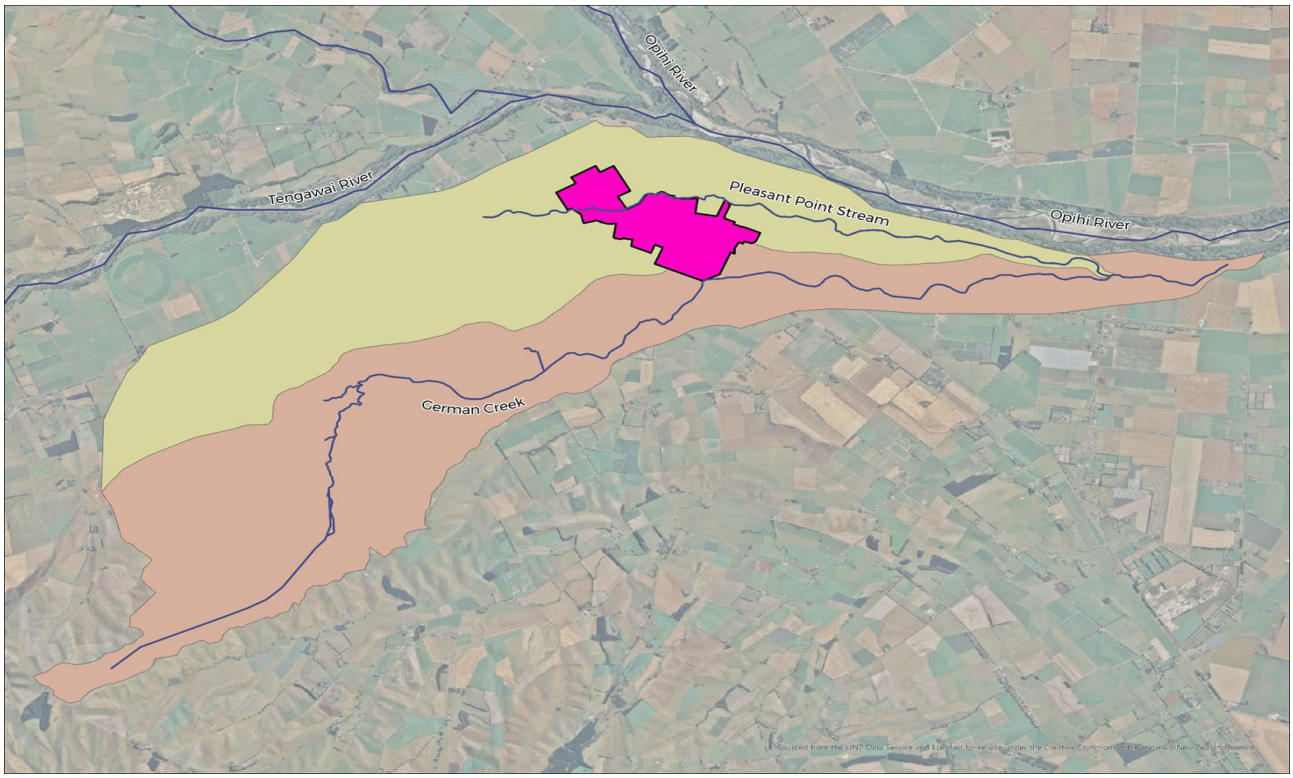

Figure 4-8: Pleasant Point and German Creek catchments

The Pleasant Point Stream Catchment covers approximately 15.9 km^2 and includes rural, residential, recreational, and commercial land use classes. The majority of the catchment is exotic grassland that is used for agriculture. Pleasant Point Stream is an ephemeral second-order watercourse as it passes through the Pleasant Point township. It has an approximate mean flow of 0.04 m^3/s, and generally only flows for short periods of time following rainfall.

The German Creek Catchment is located immediately south of the Pleasant Point Stream Catchment and consists of 18.5 km of rural, residential, and recreational land use zones. As with Pleasant Point Stream Catchment, the catchment consists of mostly exotic grassland used for agricultural purposes. German Creek is a third-order watercourse near the Pleasant Point township and has an estimated mean annual flow of 0.11 m^3/s. There is a discharge from the Pleasant Point stormwater network into German Creek at the northern end of Smart Munro Road.

Pleasant Point Stream and German Creek are ephemeral watercourses, only flowing following significant rainfall events. Consequently, the watercourses are expected to have low aquatic ecological values.

The LWRP classifies watercourses into Land Management Units. Pleasant Point Stream and German Creek fall within the "Spring-fed Plains" and "Hill-fed Plains" classes respectively. Both watercourses are subject to Class ŌPIHI water quality standards (being water managed for aquatic ecosystem, fishery, contact recreation, water supply and particular cultural and aesthetic purposes) in the Ōpihi River Regional Plan (ORRP).

A baseline assessment was undertaken by PDP in 2021 (herein referred to as PDP Baseline EA) which included sampling and reporting on sediment quality for the Pleasant Point SMA waterways. This report is attached as Appendix 7.

As part of the baseline monitoring programme for this consent application, sediments in both Pleasant Point Stream and German Creek were sampled and analysed for typical stormwater contaminants. Sediment sampling locations for both waterways are shown in Figure 4-9.

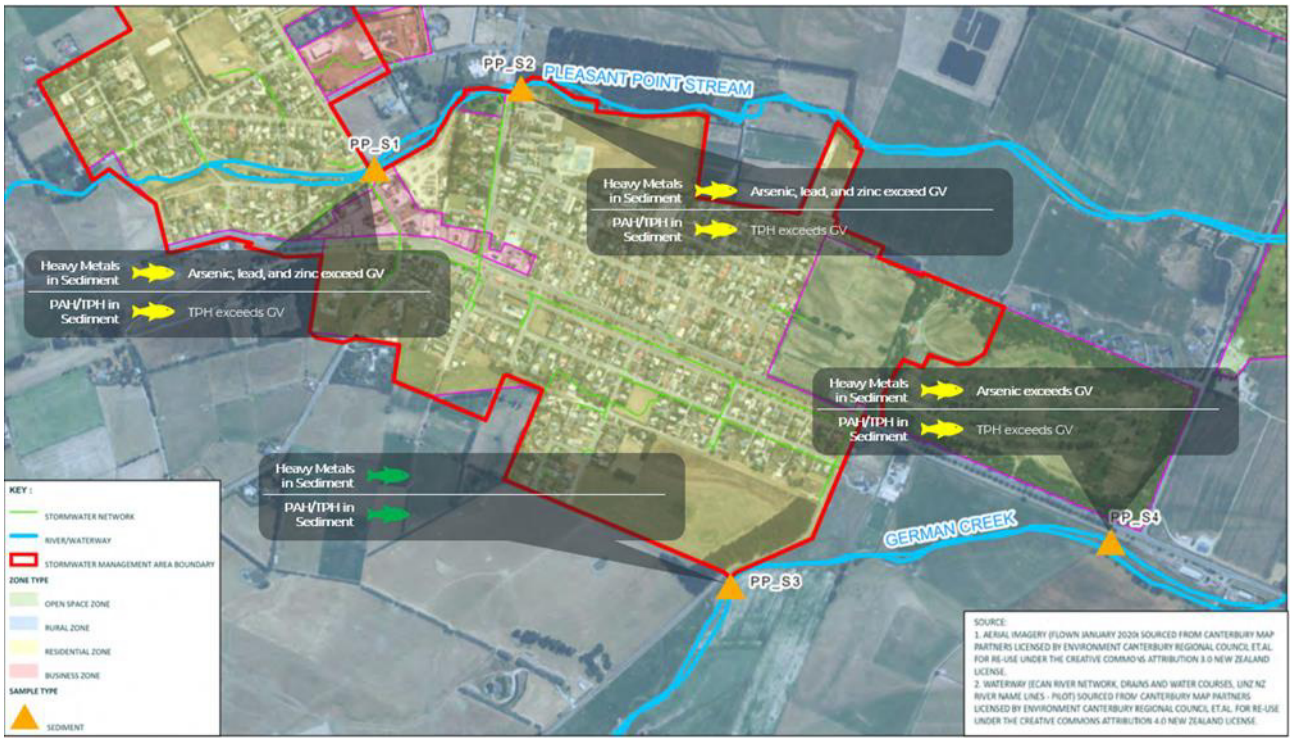

Figure 4-9: Pleasant Point SMA baseline assessment monitoring sites and sediment quality summary (source Appendix 1)

Sediment samples taken from Pleasant Point Stream indicated the presence of elevated concentrations of zinc, lead, arsenic and hydrocarbons. Contaminant concentrations in German Creek sediments were lower, however both watercourses could provide a source of stormwater contaminants to the Ōpihi River and Lagoon.

4.9.3 Ōpihi River Catchment

The closest major surface watercourse is the Tengawai River, which is located north of the SMA and flows into the Ōpihi River.

Agriculture is the predominant land use within the wider Ōpihi River catchment. Historically, wetlands and swampland were far more prevalent in the catchment (Scarf, 1984; cited in WSP, 2021a[7]) but these features have been significantly reduced through drainage and the ongoing pressure for such land to be made agriculturally productive (or altered for other reasons).

The Ōpihi riverbed (further downstream of Temuka) is characterised as a Land of National Significance and a Site of Special Wildlife Significance by the Department of Conservation (DoC). Approximately 3 km downstream of the confluence with the Te Uma kaha (Temuka River), the Ōpihi River forms the Ōpihi River Mouth Lagoon. This lagoon has been characterised as a highly significant and moderately threatened wetland, land of national significance (DoC), a site of special wildlife significance (DoC), and contains significant habitat for inanga spawning.

The Ōpihi River catchment (particularly at the coast) is also of very high value to Te Runanga o Arowhenua, being the locale of several historic settlements. As such, this area was gazetted a Mātaitai reserve in 2014. Ōpihi Mataitai includes the Ōpihi Lagoon, lowland Ōpihi River, Orakipaoa Creek and Temuka River. Pleasant Point Stream and German Creek are not included in the Ōpihi Mataitai.

4.9.4 Surface Water Users

A review by WSP of the Canterbury Maps 'Surface Water Take (Active) Consented' layer on 23 of November 2022 showed that there are currently no active or consented surface water takes from Pleasant Point Stream or German Creek or from the confluence of these rivers to the Ōpihi River.

4.9.5 Wetlands and Springs

The Pleasant Point SMA in its pre-European state, was largely dominated by herbaceous (fern/grass/herbs). There was a small wetland east of the SMA as digitised from the original 19th Century 'Black Maps', as shown in Figure 4-10: Black Map of pre-European vegetation and waterbodies (source Canterbury Maps)Some historic wetlands were mapped along the Tengawai River.

An extract from the Canterbury Wetlands GIS layer (CWGIS) was obtained from Environment Canterbury (in May 2022), using a 100 m buffer around the SMA. There were two potential wetlands located within this area as shown in Figure 4-11, one potential natural wetland immediately adjacent to the SMA, and another within the SMA.

Two springs have been recorded on ECan's spring database near the headwaters of Pleasant Point Stream as shown in Figure 4-11. These intermittently flow. Anecdotally they are thought to have flowed more frequently, although as shown in Figure 4 10 neither Pleasant Point or German Creek were recorded as having a defined bed or flowing continuously beyond the SMA to the Ōpihi River.

[7] WSP 2021a Pleasant Point Issues Summary: Discussion Document, prepared for TDC. September 2021

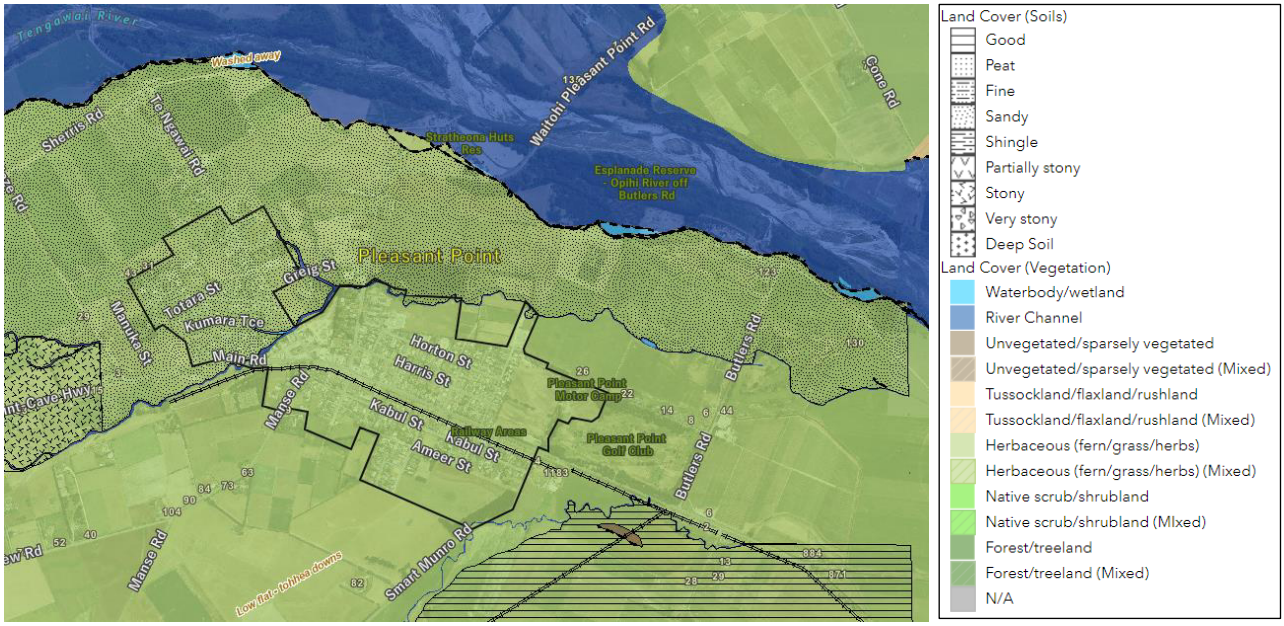

Figure 4-10: Black Map of pre-European vegetation and waterbodies (source Canterbury Maps)

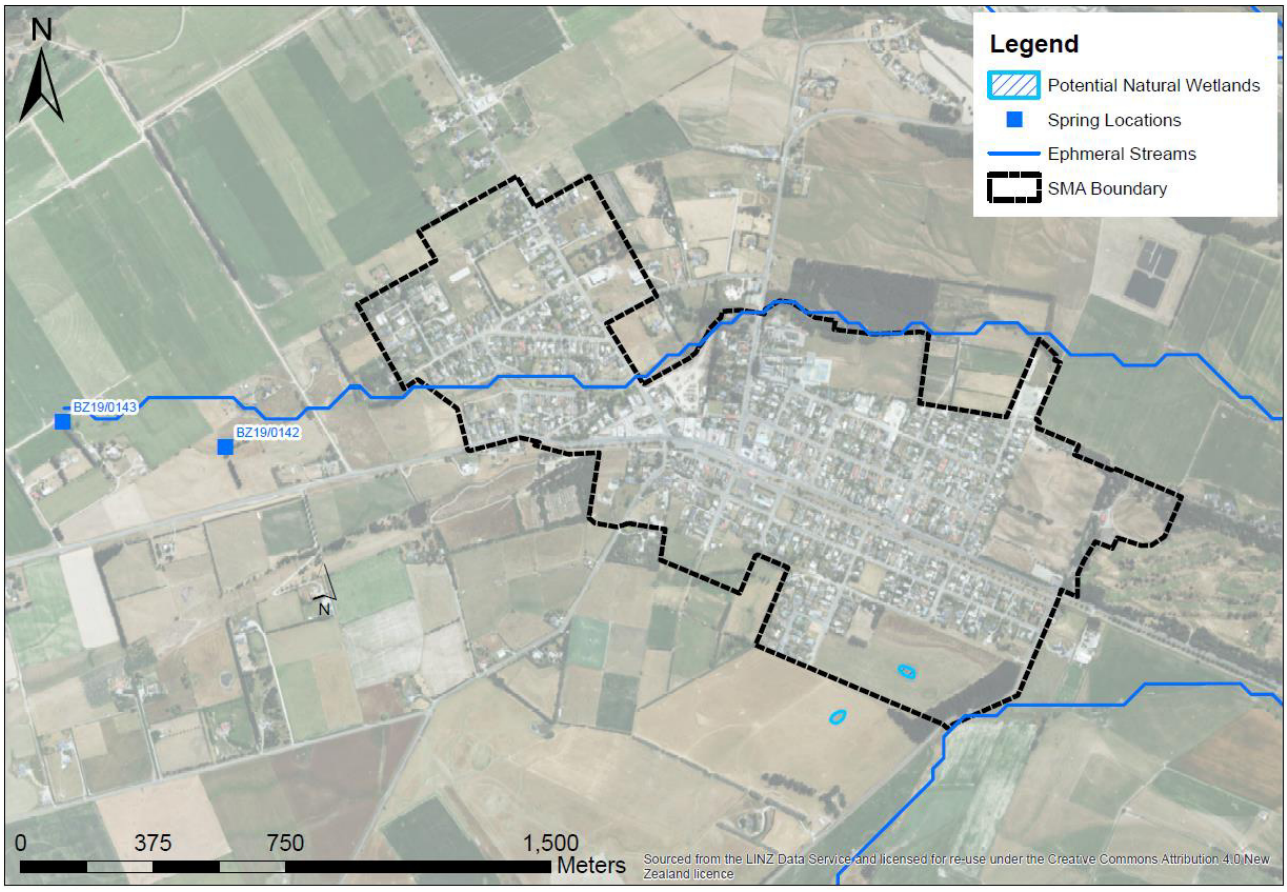

Figure 4-11: Potential Natural Wetlands within 100 m of SMA (source Canterbury Wetlands GIS - May 2022), and springs on ECan's Database

4.10 Recreational and Amenity Values

Pleasant Point Stream flows through the north-east of the township and along the northern boundary of the SMA. Along this boundary it flows through a Council reserve, next to a Primary School and playground. While the stream is not used for any contact recreation, it is visible and may be accessible to the public recreating in the reserve.

German Creek flows through pastural land adjacent to the south-east of the SMA and has no known recreational or amenity values.

Fish and Game (Central South Island Region) states that:

'The Ōpihi River has a long and distinguished angling history and despite reduced flows and water quality is still a valuable and locally important sport fishery.....The Tengawai River to the Ōpihi River mouth being the most popular fishing area..... The Ōpihi River supports good populations of both chinook salmon and brown trout. With the Opuha Dam now operating, higher summer flows ensure the river flows to the sea at most times.....(There is) good access to salmon, sea-run brown trout and the many diadromous indigenous species, whitebait, bullies, smelts, eels and lampreys."

The Ōpihi River swimming water quality is monitored at the Waipopo huts and the LAWA website reports this site as a 'Fair' long term grade.

The suitability for recreational use outcome set in the LWRP (PC7 decision version: Table 14(a)) for the Ōpihi River (Hill fed lower) is 'Good'.

4.11 Critical Infrastructure

4.11.1 River Flood Protection Assets

As shown in Figure 4-12. Pleasant Point is protected by stop-banks on the true right banks of the Tengawai and Ōpihi Rivers. These assets are operated and maintained by Environment Canterbury Regional River Engineers, as well as managing and maintaining the flood drainage capacity of the Pleasant Point Stream and German Creek under the Bylaw.

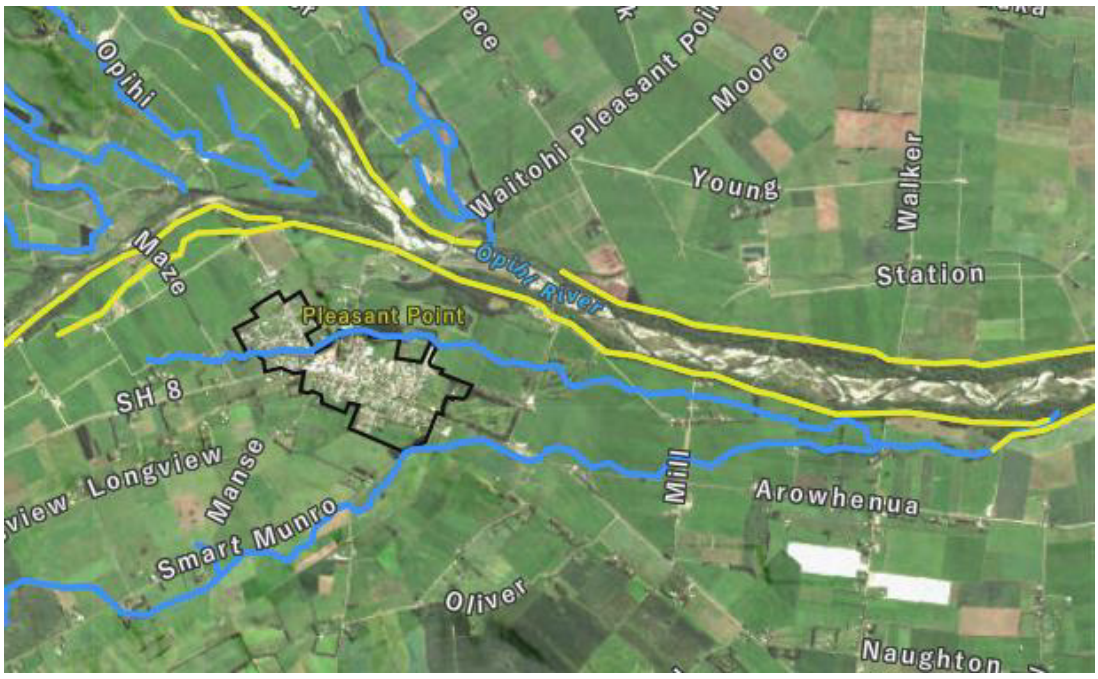

Figure 4-12: Environment Canterbury Stop-bank Infrastructure (yellow lines) at Pleasant Point that are part of the Ōpihi Flood Protection Schemes and watercourses (blue lines) managed under the Flood Protection Bylaw.

4.11.2 Pleasant Point Wastewater System

Pleasant Point has a reticulated wastewater network that services all of the existing urban area. The Pleasant Point Wastewater Treatment Plant (WTP) and associated ponds is located off Butlers Road immediately north of the SMA.

The primary treated wastewater is pumped to the Timaru Wastewater Treatment Plant at Aroangi Road, Washdyke and ultimately discharges via a coastal outfall out into the Pacific Ocean under discharge permit CRC101831.

In addition to the direct impacts of flooding such as ponding and sheet flow, the existing stormwater system also has an impact on the wastewater system in Pleasant Point.

Historically, high volumes of I&I had increased the flow of wastewater to the Pleasant Point Wastewater System. Works to resolve / reduce sewer overflows in Pleasant Point, commenced in 2016 and are ongoing.

There has been no wet-weather-associated overflows from the network recorded by the maintenance contractor in at least the last 7 years.

4.12 Summary of Sensitivity of the Environment

The following summarises the sensitivity of the environment based on the information presented in this section of the AEE:

- The shallow groundwater resource used for drinking water supply in Pleasant Point when abstracted water is not treated adequately will be moderately sensitive to the discharge of microbiological contaminants (*E.coli* and pathogens).
- Given the ephemeral nature of Pleasant Point Stream and German Creek and the lack of aquatic ecology values that they support, these surface waterways will have a low sensitivity to stormwater contaminants.
- The two streams however flow into the Ōpihi River, which due to its higher cultural and environmental values will be more sensitive to stormwater contaminants in the discharges from the SMA.
- The Ōpihi River also has a high recreational (fishery) and moderate amenity value.

5 Description of the Proposal

5.1 Scope of Application - Area and Activities

The Pleasant Point SMA boundary is defined by the area shown in Figure 1.1. The main activity relating to this discharge permit application is the discharges from TDC's reticulated stormwater network that services the existing and future urban areas.

Within the SMA area, the scope of the application includes the discharge of contaminants (stormwater) to land and water for the following activities:

- Existing and future industrial sites that are connected to the TDC stormwater network.
- Stormwater from residential and commercial roofs.
- Stormwater from residential and commercial hard stand areas and structures.
- Construction-phase stormwater from development construction areas with a phase of land disturbance of less than 5 ha.

Existing and future industrial sites that discharge on-site into land or via their own system to land or surface water are excluded from this application and those that have an existing individual consent will need to continue to hold and renew these stormwater discharge consents.

The following discharge activities (in relation to scale and nature of the discharges) are also excluded from the application:

- Construction-phase stormwater to land and water from a development construction area with a phase of land disturbance greater than 5 ha.
- Discharges of construction-phase stormwater or stormwater from a 'piece of land' associated with a development area or a facility where that land is contaminated above acceptable levels/guideline values.
- Construction-phase or stormwater from a developed site onto land or into surface water within a natural wetland
- Stormwater from sites (typically industrial but could include commercial) that represent an unacceptable risk to achieving the receiving environment objectives.

For the avoidance of doubt the discharges of stormwater from rural land use and associated buildings, hardstand areas and dwellings do not form part of this application.

A comprehensive description of the activities sought and excluded, with associated abbreviations and definitions are included in the proposed conditions in Appendix 8 of this AEE. The proposed conditions are also discussed further at the end of this section

The current active stormwater discharge permits within the Pleasant Point SMA were detailed in Section 2.2, potentially one commercial activity that discharged to land could be surrendered as it is within the scope of this SMA application.

5.2 Nature of the Discharge

5.2.1 Stormwater Quality

Potential contaminants arising from the developed areas within the Pleasant Point SMA include:

- Micro-organisms
- Nutrients
- Toxic organic compounds
- Hydrocarbons from vehicle exhaust fumes and oil leaks.
- Sediment from pavement wear, rainfall erosion, and vehicles.

- Heavy metals (including cadmium, nickel, copper, zinc and lead) from tyre wear, vehicle exhaust, vehicle moving parts, and roofs.
- Organic matter from plant material such as grass clippings and leaves.
- Litter.

A literature review on urban stormwater (residential, commercial and roading) (Schueler 1991, ARC 1992, Williams 1993, Kingett Mitchell 2001, Brough et al 2012, NIWA URQIS) [8] [9] [10] [11] [12] [13] has provided an indication of the expected types and concentrations of typical stormwater contaminants that may be entrained in stormwater from the Pleasant Point SMA. This data is presented in Table 5-1.

Table 5-1: Expected stormwater contaminants and untreated concentrations

Stormwater Parameter	Literature / URQIS - Stormwater Quality
Total Suspended Solids (g/m^3)	
Developed (unpaved)	<500
Developed Residential /Commercial	50 -170
Developed Industrial	<300
Construction	<4,000
pH (mean)	7.0
Turbidity (mean)	25
Dissolved Oxygen Saturation % (mean)	93
Hydrocarbons (g/m^3)	
TPH	0.5 - 5
PAH (mean)	0.007
Toxic Organics (g/m^3)	<0.004
Nutrients (g/m^3)	
Nitrate-Nitrogen	0.4 - 2.0
Total Nitrogen	1 – 2.5
Total Phosphorus	0.2 - 0.4
Total Metals (g/m^3)	
Zinc	0.1 - 0.8
Copper	0.015 - 0.02
Lead (mean)	0.007
Cadmium (mean	0.00011
Nickel (mean)	0.004
Faecal Coliform (fc/100 mL sample) - median	8,000

The main trace metals commonly measured in carparking and areas subject to vehicle movements are zinc, and copper. Recent studies have shown that the introduction of unleaded

[8] *Schueler, T. R. 1991. Stormwater Management Re-commendations for the Auckland, New Zealand Region. Prepared for: Rivers and Erosion Control, Auckland Regional Water Board, Auckland.*
[9] *Auckland Regional Council Technical Publication #10, "Stormwater Treatment Devices Design Guideline Manual" (TP10) October 1992*
[10] Kingett Mitchell and Associates Limited 2001. *Pre-liminary Examination of the Nature of Urban Runoff in New Zealand.* Kingett Mitchell and Associates Limited, Auckland.
[11] *Williams, R. B. 1993, Urban Runoff Data Book: A manual for the preliminary evaluation of urban stormwater impacts on water quality, Water Quality Centre Publication No. 20, National Institute of Water and Atmospheric Research, Hamilton*
[12] *Brough et al.2012 Stormwater quality – an analysis of runoff from modern subdivisions and the implications for stormwater treatment. Water New Zealand Stormwater Conference 2012*
[13] https://urqis.niwa.co.nz/#/report

petrol has contributed to a drop in lead levels nationwide. Cadmium and nickel concentrations in general urban runoff are also expected to be very low.

The leaching of contaminants from roofing material, particularly in older development areas is likely to be the main source and result in the highest concentrations of zinc. Roof renewal of older houses, commercial and industrial buildings with roof materials such as COLORSTEEL ® will result in reductions of zinc loads over time from these land uses.

New residential subdivisions that consist of new houses with COLORSTEEL ® roofs, and slower, low intensity traffic roading design would be expected to result in considerably lower levels of metals, suspended sediment than shown in Table 5-1 as these practices result in a substantial reduction in the contaminants being available for stormwater entrainment.

Microbiological contamination in stormwater is typically from animal faeces, mainly associated with dogs, terrestrial birds and waterfowl in reserves. Williamson (1993) reported median microbiological contaminant concentrations of 8,000 fc/100 ml, based on research from Australia, Auckland and the United States.

It should be noted that Auckland and most United States cities have combined wastewater and stormwater pipes, meaning human waste sources are present in stormwater flows. This will not be the case for Pleasant Point where wastewater flows do not routinely, enter a stormwater catchment or system. The risks of a newer wastewater infrastructure within new greenfield development having a catastrophic failure or being undersized, and subsequently entering stormwater catchments is very low.

A Christchurch study (Brough et al 2012) of stormwater quality from a modern (post-2000) residential subdivision focused on collected monitoring data of contaminants in untreated stormwater. This study, reported that *E.coli* concentrations from the residential subdivision ranged from 2 to 145 MPN / 100mL, significantly less than the median concentrations reported by Williamson (1993).

5.2.2 Contaminant Load Assessment

A contaminant load modelling (CLM) assessment tool was developed for Pleasant Point and the results are reported in Appendix 5. The CLM tool allows TDC to identify areas that contribute the highest contaminant loads and therefore areas that could benefit from treatment.

The CLM model splits the SMA into three catchments. The German Creek catchment to the south-east of Pleasant Point comprises 46.4 ha (30% of the SMA) and the Pleasant Point Stream catchment to the northwest, consists of 64.8 ha of land (42% of the SMA). Stormwater from the remaining 28% of the SMA, encompassing 42.3 ha predominantly discharges to land.

Two scenarios were modelled based on “current” land-use (this is defined by the existing urban areas, not existing planning zones as stated) and “future” fully developed land-use zoning (with defined land use zones in the proposed district plan). The change in land-use will effectively result in an increase in residential land and a decrease in pasture. The model predicts that this shift in land-use is likely to result in a reduction of TSS load from the township by 52%. However, this change is also likely to increase the load of TZn and TCu loads in stormwater.

Of the three catchments modelled, the Pleasant Point stream catchment is predicted to have the highest annual loads of contaminants discharging from the township, due to the prevalence of commercial and industrial properties and a large residential area within the catchment.

5.2.3 Stormwater Quantity

No comprehensive hydraulic modelling of the Pleasant Point stormwater system flows for individual catchments has occurred. Also estimating the urban volumes or peak flows for a range of storm events contributing to each discharge point (a soakpit or each surface water outfall)

cannot be currently undertaken accurately due to limitations of the information available, nor is it considered necessary.

As described in Section 3.3 and 3.4 network capacity and flood hazard assessments were undertaken to identify any issues related to the quantity of stormwater runoff generated from the township and limitations of the stormwater network. The issues identified and mitigation measures to address these issues are further discussed below in Section 8.

In relation to any further 'Greenfield' development within the Pleasant Point SMA, TDC will require the following measures, if these developments are to operate under their stormwater network discharge consent:

- Developments should as far as practicable incorporate low impact design to achieve hydraulic neutrality.
- Stormwater management facilities should include sufficient additional land to allow retrofitting in response to climate change/changing land use patterns.
- For areas greater than five hectares, hydraulic analysis (including computer modelling) will be required to support the design of the stormwater systems used.

5.3 Adaptive Management Approach

TDC is to apply an adaptive management approach to the management of the stormwater from the Pleasant Point SMA. Adaptive management is an investigational approach to management, often defined as 'structured learning by doing. It has three elements, (1) monitoring, (2) adapting and (3) learning, as presented in Figure 5-1.

The Monitoring Plan will assess the performance of Pleasant Point's stormwater management systems against the specified receiving environment Objectives and Targets (described in Section 5.4). Information gathered from monitoring will also feed into identifying projects or management actions that would progressively improve the management of stormwater or address a specific issue(s) (previously summarised in Section 3.5).

Adopting this type of approach will allow TDC to adapt its management approach in response to community concerns or changes in the environmental regulatory environment such as implementing Te Mana o te Wai.

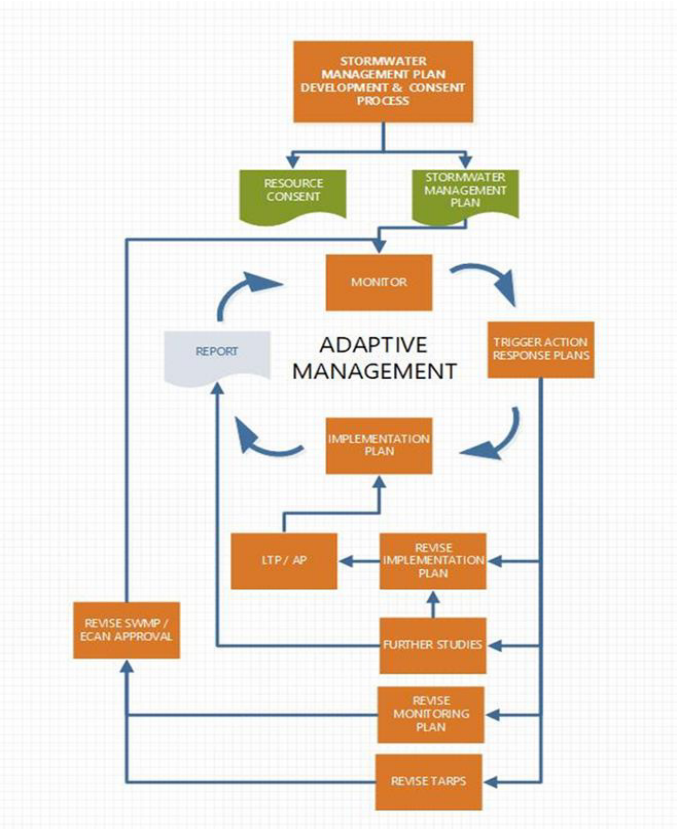

Figure 5-1: Pleasant Point Stormwater Management Plan Adaptive Management Approach

5.4 Stormwater Management Objectives and Targets

Section 2 of the SMP discusses the stormwater management hierarchy that lead to the development of the objectives and targets that are proposed to form part of the Pleasant Point stormwater discharge permit.

A vision for Pleasant Point stormwater management (that is likely to apply to other SMAs) and the objectives and targets were developed in collaboration with AECL/Arowhenua.

The vision statement for stormwater management in Pleasant Point is:

> *"Working together to value, protect and restore the mauri/lifeforce of the waterways for the benefit of all."*

Pleasant Point specific objectives and targets were then identified and are expressed in the context of the order of the three priorities of Te Mana o te Wai which is the key concept of the National Policy Statement for Freshwater Management 2020 (NPSFM), and "*...refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment.*" The combined objectives and targets are included in Appendix 8.

TDC in collaboration with Te Rūnanga o Arowhenua and other stakeholders will prioritise the best practicable options to meet the objectives for Pleasant Point's stormwater management and achieve the associated targets through the implementation phase of the process.

The 10 objectives for Pleasant Point's stormwater management are to:

A. First, the health and well-being of water bodies and freshwater ecosystems

1. Progressively reduce the mass of stormwater related contaminated sediment within Pleasant Point Stream flowing to the Ōpihi River.

2. TDC advocate for ki uta ki tai (from the mountains to the sea) in Te Uma Kaha catchment during TDC's involvement as a stakeholder and regulator in RMA and LGA processes
3. Where practicable prioritise addressing effects of stormwater quality and quantity at or close to their source rather than at the end of pipe into surface water or instream.

B. Second, the health needs of people (such as drinking water)

4. Stormwater impacted sediment in Pleasant Point Stream that is accessible in public areas does not pose a risk to human health.
5. Stormwater discharges do not cause or exacerbate the risk to human health where groundwater is abstracted from bores for drinking water.
6. Progressively reduce the acute and cumulative impacts of the stormwater network and stormwater discharges on waterbodies connected to and within the Ōpihi Mātaitai downstream of Pleasant Point so the habitat is healthy and suitable for safe mahinga kai harvesting, and the mahinga kai species are safe to eat.

C. Third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

7. Recognise and respect mana motuhake – the whakapapa and the relationship Kati huirapa have with water ecosystems in their rohe and actively involve them in stormwater management.
8. When investing in stormwater infrastructure environmental, social and cultural benefits are optimised.
9. Stormwater is managed so that run-off from urban areas, the primary stormwater network and overland flow paths, does not exacerbate the flooding, erosion or damage to property or infrastructure or cause risks to human safety.
10. Pleasant Point township is more resilient to the effects of flooding and the associated the adverse impacts of climate change.

The objectives will form part of the consent conditions, and the targets are proposed to be contained in an attached schedule to the consent. Given the adaptive management approach proposed, these targets may need to be updated as over the course of the consent in response to information collected through monitoring. Any changes to these targets will need to occur in collaboration with Te Rūnanga o Arowhenua and be certified by ECan to ensure that the targets will achieve the objectives, set by the consent.

5.5 Implementation

5.5.1 Stormwater Management Plan

This SMP (draft attached as Appendix 1) captures the long-term vision for the management of stormwater within Pleasant Point and outlines how the remedial and improvement programmes are to be identified and prioritised to achieve the community's goals and objectives for the management of stormwater from Pleasant Point. These objectives will govern the overall direction of the SMP and will form part of the stormwater network discharge permit, should consent be granted.

While the objectives will be included in consent conditions, the SMP will be a live document and able to be amended over the course of the consent to improve stormwater management practices, as more information becomes available over the period of consent. This will provide the required flexibility to ensure that the SMP can evolve without having to apply to change the conditions of consent, or for its evolution to be through a third-party approval process. Despite this, a proposed condition is proposed that will allow the consent authority to request a review of the SMP, in response to certain circumstances arising. Any revision will be required to be provided to key stakeholders.

5.5.2 Implementation Plan

Section 6 of the attached SMP describes the Implementation Plan that TDC will use to achieve the proposed objectives.

The Implementation Plan provides a summary of the schedule of projects or management actions that TDC will implement to progressively improve the management of stormwater in Pleasant Point. The plan includes indicative costing for each action or program (if the actions can be grouped into programs) as this is useful for planning and setting budgets in TDC Annual Plans and Long-term Plans; similarly, any funding limitations will be reflected in the scheduling of projects or actions.

The Implementation Plan defines who is responsible for implementing the actions and includes an implementation timeline from planning, design and implementation.

The Implementation Plan will be revised annually. During the year new potential projects or management actions will be identified, either as a result of information obtained from the Monitoring Plan programme or through other sources (e.g. council officers, working party recommendations).

Annually these potential projects or actions will be evaluated, along with the existing projects or actions in the Implementation Plan as detailed in Section 6 of the SMP. The Evaluation Report will be provided to AECL / Arowhenua for review. The evaluation considers how well the projects or actions will progressively improve the management of stormwater, specifically to achieve the Objectives and Targets of the discharge consent / SMP. Working within existing funding budgets the new and existing projects will be rescheduled, where the projects and actions with the greatest benefit being prioritised.

The annual review process will allow the schedule of projects and action to adapt to changes in, the environment or social issues, and regulatory changes during the life of the consent.

Similarly, whilst the schedule of projects or actions will be matched to budgetary restraints, the Implementation Plan can demonstrate and support the business case for possible increases in Annual Plan and Long-term Plan funding.

At this point in time TDC is working on the process to evaluate options and weightings (the criteria) in collaboration with AECL / Arowhenua. Given the implementation plan is to be adopted across all SMAs in the Timaru District this will take time.

As such the possible options and projects for the short term (next ten years) are yet to be identified. First year monitoring requirements that are extending from that considered during the baseline investigations are also likely considered to assist in project identification.

5.5.3 Implementation Mechanisms

Implementation methods or mechanisms are the internal processes that need to be in place to execute the SMP and achieve the objectives set. The implementation mechanisms are typically regulatory tools that will give TDC authority to enforce certain aspects of the SMP.

A Stormwater Bylaw under the Local Government Act 2002 is operative. Chapter 15 Part 1 General Conditions and Part 4 Stormwater drainage are applicable. The Bylaw Chapter 15 Part 1 allows power of entry to the Council and can require existing sites connected to the stormwater network to undertake improvements to stormwater management on site such as install interceptor traps (or proprietary devices, clause 1509.1).

The Bylaw Part 4 specifies what is considered prohibitive stormwater substances (clause 1529). The Council can also cancel (at any time) an approval to discharge to the stormwater network (clause 1530). Cancellation may occur for example, if a "*customer discharges any prohibited substance into the stormwater network infrastructure*" or "*the customer fails to comply with any condition*

of any approval to discharge to the stormwater network infrastructure which in the opinion of Council may cause Council to be in breach of any general authorisation or discharge consent."

The Bylaw will be the main tool to implement the non-residential site management assessments (refer Section 5.7).

The Timaru District Plan Review (DPR) will also further enable best practice stormwater management practices to be applied through objectives, polices, rules and land-use zones [14]. This will make the minimum requirements for stormwater management more transparent to the community, for any new development within the SMA. For example, there is a rule in the proposed plan (Rule SW-R5) that applies to all zones and makes, "*The use of any copper, galvanised metal, unpainted zincalume or any other unpainted metal, used in roof material, gutters, downpipes or external cladding of buildings or structures.*" A restricted discretionary activity.

It is acknowledged however, that the pTDP will be subject to change through the hearing of submissions and possibly appeals processes.

In addition, stormwater management practices can also be implemented through new or redevelopment connections that are required to obtain 'stormwater discharge certification' from TDC [15] in line with the Bylaw.

TDC is developing infrastructure design standards (IDS) that align with the stormwater management goals for the district. These standards will provide guidance on acceptable solutions that can be used to manage the effects resulting from the quantity and quality of stormwater runoff.

TDC has developed draft Stormwater Design Guidelines in collaboration with the Ashburton District Council (ADC). The purpose of this guide is to:

- Assist Council in meeting the objectives of their SMPs.
- Provide guidance on what a new development, or re-development, must achieve in order to be granted certification from Council to discharge stormwater to the Council stormwater network and design of systems to obtain subdivision consent.
- Provide a selection of methods and tools to mitigate the effects of stormwater runoff from developments.
- Outline and demonstrate the preferred approach for stormwater management in commercial / industrial and residential developments in the Timaru districts.

TDC is currently considering moving the Stormwater Design Guidelines content into the IDS being developed.

Education is a key component of improving stormwater management. The wider public may be unaware of the consequences of activities such as washing their vehicles or waste bins into the stormwater network or may not understand the steps they can take to improve the quality of stormwater in their neighbourhood. The TDC website[16] contains advice to its residents on how to protect waterways.

[14] https://timaru.isoplan.co.nz/eplan/#Rules/0/206/1/0/0

[15] https://www.timaru.govt.nz/services/environment/storm-water/stormwater-discharge-certification#:~:text=What%20is%20a%20Stormwater%20Discharge,with%20Environment%20Canterbury%20discharge%20requirements.

[16] https://www.timaru.govt.nz/services/environment/storm-water/stormwater-and-your-property

5.6 Drinking Water Supply Well Protection

It is proposed that at the concept stage of a new discharge to land being established, being a TDC stormwater network project, or private redevelopment or new development (within the scope of this consent), that an investigation of the existing active and proposed drinking supply wells that could be impacted is undertaken. A 500 m radius from the soakage system would be the extent of the initial screening for potentially affected domestic supply bores, and the protection zones of a group or community well, would be used.

It may be that a residential development less than five lots is excluded from this requirement as this is a permitted activity under the current rules in the regional plan. Potentially, roof discharges from commercial properties via sealed systems to specific roof water only soakpits could also be excluded.

This will identify the numbers (if any) of group, community and domestic drinking-water supply wells that exist at the time. These are potentially affected by the concept soakage mitigation facilities location. Should any existing group or community drinking water-supply well protection zones be intersected within a 500 m radius of a new discharge to land, and it is unlikely that water from the reticulated water supply will be made available via the TDC project or development or additional extension to the water network supply to these existing wells, then alternative locations or methods of discharge should be considered.

If a stormwater management facility is still proposed that intersects an active Group or Community drinking-supply protection zone or a captured domestic drinking well, unless the discharge is roof water or small-scale residential hardstand, the discharge shall not commence unless:

- In the case of domestic drinking water supply, the Consent Holder has made a reticulated water supply available to the property prior to the discharge commencing; or
- An assessment of site-specific information undertaken by the Consent Holder, and certified by the Canterbury Regional Council, Attention: Regional Leader – Monitoring and Compliance, demonstrates that the ability of the domestic and/or community drinking water supplier to meet the water quality standards for drinking water set out in the Drinking-Water Standards for New Zealand 2022 or any successor document is not compromised as a result of the stormwater discharge.

5.7 Non-residential Site Management

Non-residential site assessments (NRA) have been undertaken by PDP for Pleasant Point (and other Timaru district townships and Timaru city) in early 2021. The assessment involved and evaluation of properties within the SMA that have the potential to contribute to poor water quality in the stormwater discharges from the SMA. The evaluation was undertaken in two parts: a desktop study and a detailed assessment of an initial set of high-risk sites.

The NRA assessment identified only four sites within the Pleasant Point SMA that had the potential to contribute contaminants to the stormwater system. The desk top assessment concluded that these sites posed a 'low risk' due to the nature of the activities occurring at the sites and no further detailed audits or investigations were undertaken.

The full NRA is attached as Appendix 11.

Even though the industrial and commercial sites that would be authorised under TDC's stormwater network consent are expected to pose a low risk in relation to stormwater quality, TDC is proposing to include a condition of consent that will set out a process for excluding sites that pose an unacceptable risk to the environment. This will ensure that appropriate mechanisms are in place should the activities at the site change over the duration of the consent.

The exclusion process is based on site inspections to identify the activities at the site, the presence and adequacy of any stormwater management measures and to identify the risks to the environment from stormwater runoff from the site.

Following the site inspections, the site owners and/or occupiers will be notified by letter outlining whether:

- The site is not considered a high risk. This is on condition that the site continues to implement best practice environmental and stormwater controls as part of continuing improvement; or
- The site requires an assessment of stormwater quality to determine the relative risk that the site represents to surface waterways and/or groundwater via the network before the sites risk classifications can be confirmed; or
- The site is a high-risk site and poses a risk to surface water and or groundwater via discharging to the stormwater network. The site owners/occupiers will be advised of the requirement to implement measures to the satisfaction of TDC. The measures may consist of one or more of the following:

    - Reduce contaminants at source through improved site management practices or isolations measures.
    - Implement best practice environmental and stormwater management controls.
    - Implement best practice onsite stormwater treatment.

Where industrial sites are unable to meet the required standards for discharge into the network, the site will be removed from the consent by surrender of the respective land parcel.

It is expected that in most cases, TDC and industrial site owners/occupiers will be able to find the best solutions or appropriate level of stormwater and contaminant source controls.

New industrial sites are expected to have contaminant isolation and source controls as part of their building code and HSNO compliance requirements. However, all new development will need to be given approval to discharge to the stormwater network.

5.8 Operations and Maintenance

Currently the stormwater system mainly consists of sumps, kerb and channel, pipes, swales, outfalls and soakage pits. Any sophisticated treatment and attenuation systems that are designed by TDC or to be vested to TDC as part of a subdivision development would likely have an operation manual.

A standard maintenance schedule is attached to the proposed conditions in Appendix 8 that applies to a wide range of stormwater assets that is currently foreseeable in the near future.

5.9 Monitoring Plan

A Pleasant Point Stormwater Monitoring Plan is attached as Appendix 10. This includes the monitoring requirements that are recommended to be included in the resource consent as well as additional monitoring provided to assist TDC to manage their network discharges and gain a greater understanding of the environmental baseline.

The Monitoring Plan outlines the proposed frequency of monitoring, parameters to monitor, and monitoring locations for:

- Surface water quality
- Sediment quality
- Groundwater quality
- Flooding complaints

- Commercial and industrial site audits
- Stormwater network outfall inspections

The monitoring programme has been designed to monitor the performance and impact of the stormwater discharges on the environment and guide both reactive and proactive management and any additional maintenance of the stormwater infrastructure in Pleasant Point. Current adaptive management actions are detailed within the TARP (trigger, action, and response plan) that is included in the Monitoring Plan.

There are typically three levels of triggers depending on the level of effect measured. The higher the level of effect measured the greater the response and urgency required. For example, Trigger Level 3 is a limit where no action is required other than to continue monitoring in accordance with the Monitoring Plan. Trigger level 2 exceedances require a moderate level of action and Trigger Level 1 requires a high level of action.

The Monitoring Plan will be reviewed annually. The annual review shall identify the monitoring parameters that should be added, dropped or frequency changed, and if changes are considered necessary these have to be certified by the consent authority before adoption, but not including cultural aspects.

The Monitoring Plan is intended to be also a placeholder for basic cultural monitoring. More or a replacement cultural monitoring is in development with AECL / Arowhenua and Kitson Consulting Limited. This will also likely have elements of triggers, action and response requirements. This is being worked on initially at a high level now considering how it (as a framework) can apply to all the townships within the district currently being applied for or to be consented at a later date.

As such it is proposed to be an action to be competed after decisions are made. A tentative timeframe for its completion and integration into the TARP document within 6 months after commencement of the consent.

A certification process will occur with Arowhenua and once this has occurred, and any subsequent cultural monitoring amendments, the updated Monitoring Plan with respect to cultural aspects only will be provided to the consent authority for their information.

5.10 Proposed Conditions and Duration

A Proposed set of conditions for the Pleasant Point SMA stormwater and construction phase stormwater discharge permit is attached as Appendix 8

A duration of 35 years has been requested given:

- The level of established baseline information provided with the application, and the monitoring proposed means there will be reasonable certainty as to the current state of the environment to use as a baseline to detect future changes and trends.
- The adaptive management approach proposed and integrated into a range of certification and review consent conditions allows for:
    - Early adoption of changes to legislation (e.g. regional plans giving effect to Te Mana o te Wai).
    - Responding to changes to monitoring and emerging issues, triggers being exceeded or changes to any receiving environment standards.
    - Dealing with adverse effects in the broader receiving environment from other influences if they were to increase or vary during the term of the consent.
    - Flexibility to adopt new technology and practices to improve the treatment and management of stormwater from the SMA.
- The significant existing capital investment in the activity/assets.

- Given the existing urban area and associated stormwater discharges have previously formed part of the environment and the time required to address and reverse those legacy effects.
- The overall significant investment to prepare the application and that a longer duration would better achieve administrative efficiency.
- The smaller scale of the discharges compared to other stormwater network discharges within the Canterbury Region and the relatively lower rate of further development expected within the township.

6 Activity Classification

6.1 Resource Management Act 1991

Section 15 of the RMA places restrictions on discharges of contaminants to water or land where it may enter water. Section 15(1) states that:

> *No person may discharge any –*
>
> *(a) Contaminant or water into water*
>
> *(b) Contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water; or*
>
> *[…]*
>
> *Unless the discharge is expressly allowed by a national environmental standard or other regulations, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent.*

The proposed discharges of stormwater (developed and construction-phase) will involve discharges of contaminants into water, and onto and into land in circumstances that may result in that contaminant entering groundwater.

There are no national environmental standards (NES) that apply to the discharge activities sought so a NES does not expressly allow them (refer section below). Therefore, the discharge of stormwater needs to be expressly allowed either by a rule in a regional plan and a proposed plan or by a resource consent (discharge permit).

6.2 National Environmental Standard or Regulation

The NES-Freshwater 2020 (NES-F) has regulations that relate to construction and maintenance of specific infrastructure (which includes stormwater networks) within or near natural wetlands (Part 3 Sub-part 1).

The entire Part 3 Sub-part 1 - Natural wetlands of the NES-F has been deliberately drafted to not control 'a discharge of contaminants', unlike other NES-F Parts that do specifically refer to a 'discharge of contaminants' for example rainfall derived sediment laden runoff from winter grazing or increased nutrient losses in land drainage associated with intensification of agricultural land uses. As such the NES-F does not apply to actual stormwater discharges under the natural wetland provisions.

Within Part 3 Sub-part 1 - Natural wetlands, there are classifying regulations relating to the construction of and the maintenance and operation, of specified infrastructure. The activities regulated include vegetation clearance and earthworks, the taking, use damming, diversion or discharge of water. No existing parts of the stormwater network are within 10 m or within the

potential natural wetlands identified in Section 4.9.5. In addition, no s14 RMA restricted water related activities or discharge of water will occur within 100 m of these potential wetlands.

Potentially new stormwater infrastructure could be constructed near a potential natural wetland as part of a development or a TDC implementation project. If and when this is proposed a planning assessment would be undertaken by the developer or TDC and if required the appropriate national, regional and district resource consents would be sought.

There are no other relevant National Environmental Standards or Regulations apply to the proposal.

6.3 Ōpihi River Regional Plan

The Ōpihi River Regional Plan (ORRP) is still operative and relates to discharges to surface water. Plan Change 7 to the LWRP involves adding new Ōpihi River catchment provisions into sub-regional Section 14 (Orari-Temuka- Ōpihi-Pareora) and then withdrawing the ORRP. The decisions on PC7 have been appealed so this process has been delayed.

As the proposed activities are not permitted by another regional plan (i.e. the LWRP) the discharges do not qualify for an exemption from the relevant Rule 1 in the ORRP for the activity.

Rule 1 Discretionary Activity

The discharge of contaminants, other than treated or untreated human sewage, into the Ōpihi River or its tributaries, or onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering these water bodies is a discretionary activity.

The ORRP includes Class ŌPIHI Water Standards and Terms that apply to the activity of discharging stormwater to a river. These standards have been set to manage water quality for: the aquatic ecosystems, fishery values, contact recreation, water supply and the cultural and aesthetic purposes of the river.

The activity is therefore required to comply with the following standards after reasonable mixing, but in the event an activity does not comply, it does not change the activity status from discretionary.

Standards and Terms

1. *The maximum cover of stream or river-beds by periphyton as filamentous growths or mats (greater than 3 millimetres thick) shall not exceed 40%, as a result of any discharge of a contaminant.*
2. *Bacterial or fungal slime growths shall not be visible to the naked eye as plumose growths or mats, as a result of any discharge of a contaminant.*
3. *BOD^5 of GF/C-filtered water shall not exceed 2 grams per cubic metre, as a result of any discharge of a contaminant.*
4. *The visual clarity of the water shall not be rendered so low as to be unsuitable for bathing, by the presence of contaminants.*
5. *The concentration of dissolved oxygen shall be not less than 80% of saturation concentration, as a result of any discharge of a contaminant.*
6. *Fish or other aquatic organisms shall not be rendered unsuitable for human consumption by the presence of contaminants.*
7. *There shall be no significant adverse effect on aquatic life as a result of any discharge of a contaminant.*

8 *The natural temperature of the water shall not be changed by more than 3˚Celsius and shall not exceed 25˚Celsius, and the temperature of the water shall not adversely affect the spawning of trout or salmon during the spawning season.*

9 *The median faecal coliform concentration, based on not less than five samples taken within any 30 day period, shall not exceed 200 faecal coliforms per 100 millilitres.*

10 *The water shall not be rendered unsuitable for treatment (equivalent to coagulation, filtration, and disinfection) for human consumption by the presence of contaminants.*

11 *The water shall not be tainted or contaminated by the presence of contaminants, so as to make it unpalatable or unsuitable for consumption by humans after treatment (equivalent to coagulation, filtration, and disinfection), or unsuitable for irrigation.*

Assessment:
Both German Creek and Pleasant Point Stream are ephemeral waterways where the discharges from the reticulated stormwater network enters the receiving environment, and only flow after heavy rainfall events. Due to the ephemeral nature of these watercourses many of the values that the Class ŌPIHI standards are designed to protect are not present. For example, the water from these waterways is not taken for consumption by farm animals (Standard 10) or for drinking water supply (Standard 11). These ephemeral reaches also do not provide any contact recreation opportunities (Standard 4)

Baseline ecological assessments undertaken to support the preparation of this resource consent application and the SMP have identified that both streams have low ecological values due to their ephemeral nature. Stormwater discharges from the network therefore are unlikely to result in Standards 7, 8 and 9 being breached. Visual assessments of these waterways also did not identify any periphyton or slime growths (Standards 1 and 2).

Given the nature of stormwater quality as reported in the literature it is unlikely that Standards 3 and 5 will be breached. Mean Dissolved Oxygen Concentrations reported in the literature (see Table 5-1) are 93% and stormwater from the township is predominantly residential and therefore unlikely to contain significant quantities of organic material that can affect BOD[5].

Compliance with Standard 9 is difficult to assess. Stormwater from the network during a rainfall event will combine with runoff from rural parts of the catchment and therefore concentrations of faecal coliforms could be quite high until the flows within these waterways subside. It is not known how long these waterways flow after a rainfall event, therefore compliance with this standard will depend on when the five samples are taken within a 30-day period, the frequency of rainfall and flows within these streams.

6.4 Land and Water Regional Plan

6.4.1 Overview

The LWRP operates at two levels, region-wide and zone specific (i.e. sub-regional). The region-wide policies and rules act as the holding position and apply across the region unless a sub-regional section of the plan contains a more specific policy or rule.

The operative sub-regional Section 14 and the still proposed PC7 (decision version being appealed) changes to Section 14 Orari-Temuka-Ōpihi-Pareora of the LWRP does not contain any sub-regional rules relating to stormwater system discharges.

Initially there are three separate regional rules to consider in the LWRP to establish the classification of the stormwater discharges (operatively into land, and the PC7 decision version that has legal effect into surface water) sought for the Pleasant Point SMA:

- Rule 5.93 - The discharge of stormwater and construction phase stormwater from a reticulated stormwater system
- Rule 5.95 - The discharge of stormwater into a river, lake, wetland or artificial watercourse
- Rule 5.96 - The discharge of stormwater onto or into land where contaminants may enter groundwater

6.4.2 Reticulated Stormwater System

The LWRP provides a definition of a reticulated stormwater system as:

> ***Reticulated stormwater system*** *means a system of pipes, swales, drains, kerbs and channels owned or operated by a network utility operator that collects stormwater within areas used or proposed to be used for urban-residential, commercial or industrial purposes and conveys that stormwater to any device, wetland, retention or detention pond or infiltration basin for the treatment of stormwater, prior to a discharge to land, groundwater or surface water. It excludes any drainage system that has been constructed for the primary purpose of collection, conveyance or discharge of drainage water.*

The existing and proposed TDC stormwater system is consistent with the LWRP reticulated stormwater system definition. The relevant rule for reticulated systems in the LWRP is:

> *5.93 The discharge of stormwater or construction-phase stormwater from a reticulated stormwater system onto or into land or into or onto land in circumstances where a contaminant may enter water, or into groundwater or a surface water body is a restricted discretionary activity provided the following conditions are met:*
>
> *1. For a discharge that existed at 11 August 2012, an application for a discharge permit is lodged prior to 30 June 2018, or at a later date as agreed between the reticulated stormwater system operator and the CRC; and*
>
> *2. A stormwater management plan has been prepared to address the management of stormwater in the catchment and is lodged with the application; and*
>
> *3. The discharge will not cause a limit in Schedule 8 to be exceeded.*

TDC was previously granted an extension of timeframes until 30 June 2022 to lodge their stormwater network consent applications for Temuka, Pleasant Point, Washdyke and Timaru. The application for Temuka was lodged by this date, however, due to the amount of work required to prepare the applications and recognising the implications for the ECan team (including consent officers and technical staff) needing to process these applications, TDC submitted a request to ECan for a further extension of timeframes based on a staggered programme for lodgement.

TDC was recently informed that this request had been declined, therefore the application does not meet Condition 1 of this rule. The implications of this, is that the activity automatically defaults to Rule 5.94 of the LWRP and has a status of 'non-complying'. For completeness, compliance with the other conditions of this rule have also been assessed.

A SMP has been prepared and attached to the application lodged so the requirement of Condition 2 has been met.

The relevant table from Schedule 8 described in Condition 3 has been copied and inserted as Table 6-1.

Table 6-1: Schedule 8: Region-wide water quality limits for certain rivers, and groundwater (tables extracted from LWRP)

Rivers

River type	Parameter	Measurement	Limit
Spring-fed plains Spring-fed plains urban	Nitrate toxicity	annual median	3.8 mgN/L

Groundwater

Contaminant	Measurement	Limit
Nitrate-N	Maximum concentration	<11.3 mg/L
Nitrate-N	Annual average concn	<5.65 mg/L
E.coli	95% of samples	<1 organism/100 millilitres
Other contaminants[2]	any sample	<50% MAV[3]

[2] Other contaminants of health significance as listed in NZ Drinking-water Standards.

[3] Maximum acceptable value (as listed in [2] above)

Rivers (surface water)

German Creek is classified Hill-fed Lower, so does not have a region wide water quality limit.

Pleasant Point Stream is classified as Spring-fed Plains. Monitoring of the stream was undertaken on two occasions, in winter after a moderately sized rainfall event (approximately 15.2 mm in 48 hours) and in summer. The stream was dry on both occasions and therefore surface water quality data is unavailable to determine compliance with the water quality standard for Nitrate-N.

Nitrate-N concentrations in urban stormwater however typically range between 0.4 and 2.0 mg/L (refer Table 5-1). While there is the potential for nutrients discharged to groundwater to enter Pleasant Point Stream, direct discharges of stormwater from TDC's network arise from 42% of the Pleasant Point SMA and will occur for a small percentage of time each year. It is therefore considered that the contribution of Nitrate-N from stormwater compared to nitrate inputs from surrounding agricultural land drainage, is unlikely to be the cause of the limit being exceeded in Pleasant Point Stream.

Groundwater

The maximum Nitrate –N concentration in Table 6-1 is the Maximum Allowable Value (MAV) in the Drinking Water Standards for New Zealand 2022. The annual average concentration limit is half the MAV. The DWSNZ are applicable to water intended for drinking by the public, the extract with respect to Groundwater from the DWSNZ revision that applied refers to '*any sample taken from a drinking supply well abstraction*'.

LWRP Policy 4.14 for discharges of contaminants into land provides direction on how to apply the Schedule 8 groundwater quality limits with respect to each type of contaminant. The policy requires discharges to meet groundwater quality limits (4.14(c)(i)) and implies that these limits need to be met at the point of discharge to land.

The current background concentrations of Nitrate–N in groundwater beneath the Pleasant Point SMA can be reasonably be assumed to be above the annual average of 5.65 mg/L, but no conclusions can be drawn with the limited information used in this AEE as to if the maximum limit of 11.3 mg/l is being exceeded.

Nitrate-Nitrogen in urban stormwater typically ranges between 0.4 and 2.0 mg/L (refer Table 5-1). Given the intermittent nature of these discharges, it is unlikely that stormwater discharges would cause of any exceedances of the nitrate nitrogen limits.

Metals and hydrocarbons (classed as 'other contaminants' in the LWRP) bind strongly to sediments and are likely to be removed from the discharge via passage of stormwater through swales and soakpits. Residual contaminant concentrations therefore are unlikely to result in exceedances of the limits in Table 6-1.

PDP have assessed the microbial risk from stormwater discharges to land (Appendix 6) and estimated that the limit of <1 *E.coli* cfu/100ml would be met at approximately 82 m from Pleasant Point. Based on this assessment there are four bores within the SMA that could be potentially affected by the discharges. On this basis, the proposed discharges may not be able to comply with Condition 3 of Rule 5.93.

The proposed discharges from the Pleasant Point SMA are therefore classified as 'non-complying' under Rule 5.94 of the LWRP.

5.94 The discharge of stormwater or construction-phase stormwater from a reticulated stormwater system onto or into land or into or onto land in circumstances where a contaminant may enter water, or into groundwater or a surface waterbody that does not meet the conditions of Rule 5.93 is a non-complying activity.

6.4.3 Individual Sites to Surface Water

With respect to the discharges to surface water (not via the TDC stormwater network) from individual residential or commercial properties covered by this application the following rule applies:

5.95 The discharge of stormwater, other than into or from a reticulated stormwater system, into a river, lake, wetland or artificial watercourse or onto or into land in circumstances where a contaminant may enter a river, lake, wetland, or artificial watercourse water is a permitted activity provided the following conditions are met:

1. *The discharge is not from, into or onto contaminated or potentially contaminated land; and*

2. *The discharge is not into:*

   (a) a water race, as defined in Section 5 of the Local Government Act 2002; or

   (b) a wetland, unless the wetland is part of a lawfully established stormwater or wastewater treatment system; or

   (c) a water body that is Natural State, unless the discharge was lawfully established before 1 November 2013; and

3. *The discharge does not result in an increase in the flow in the receiving water body at the point of discharge of more than 1% of a flood event with an Annual Exceedance Probability of 20% (one in five-year event); and*

4. *The discharge meets the water quality standards in Schedule 5 after reasonable mixing with the receiving waters, in accordance with Schedule 5; and*

5. *The concentration of total suspended solids in the discharge shall not exceed:*

   (a) 50 g/m^3, where the discharge is to any spring-fed river, Banks Peninsula river, or to a lake except when the background total suspended solids in the water body is greater than 50 g/m^3 in which case the Schedule 5 visual clarity standards shall apply; or

(b) 100 g/m³ where the discharge is to any other river or to an artificial watercourse except when the background total suspended solids in the water body is greater than 100 g/m³ in which case the Schedule 5 visual clarity standards shall apply; and

6. The discharge to water is not within a Group or Community Drinking-water Protection Zone as set out in Schedule 1; and

7. The discharge does not occur where there is an available reticulated stormwater system.

Does Not Comply: Given that both Pleasant Point and German Creek are both ephemeral waterways, the following standards may not be able to be complied with:

- Condition 3 – Runoff from both the SMA and rural runoff contribute flows to these waterways and therefore stormwater may increase flows within them by more than 1% in a one in five-year event so will not meet Condition; and
- Condition 4 - Concentrations of metals (i.e. zinc from older roof materials and from untreated commercial carparking areas) in the discharge may exceed the standards in Schedule 5 of the LWRP.
- Condition 5(a) - TSS concentrations may be greater than 50 g/m³.

Note: even best practice stormwater treatment swales, wetlands, or attenuation basins may never achieve these TSS standards if the condition is not interpreted to be an on average concentration.

Given that discharges to, contaminated land have been excluded from the activity, and the discharges will not be into a water race, natural wetland or natural classed river, or within a Group or Community Drinking-water Protection Zone it is considered that the other conditions and sub-clauses of Rule 5.95 will be met.

6.4.4 Individual Sites to Land

With respect to the discharges onto and into land (not via the TDC stormwater network) from individual residential and commercial properties covered by this application the following rule applies:

5.96 The discharge of stormwater, other than into or from a reticulated stormwater system, onto or into land where contaminants may enter groundwater is a permitted activity provided the following conditions are met:

1. *The discharge is not from, into or onto contaminated or potentially contaminated land; and*

2. *The discharge:*

(a) does not cause stormwater from up to and including a 24 hour duration 2% Annual Exceedance Probability rainfall event to enter any other property; and;

(b) does not result in the ponding of stormwater on the ground for more than 48 hours, unless part of the stormwater treatment system; and

(c) is located at least 1 m above the seasonal high water table that can be reasonably inferred for the site at the time the discharge system is constructed; and

(d) is only from land used for residential, educational or rural activities; and

(e) does not occur where there is an available reticulated stormwater system, except where incidental to a discharge to that system; and

(f) is not from a system that collects and discharges stormwater from more than five sites.

Does Not Comply: As commercial land use is part of this application; the proposal will not comply with Condition 2(d).

Given that discharges to contaminated land have been excluded from the activity, and implementation methods will require only suitable ground conditions to be used for soakage facilities, it is considered that the other conditions and sub-clauses of the Rule 5.96 will be met.

6.4.5 Individual Sites - Final Classification

Individual sites that do not meet one or more of the conditions of Rules 5.95 and 5.96, are classified by the Rule quoted below:

5.97 The discharge of stormwater, other than from a reticulated stormwater system, into a river, lake, wetland or artificial watercourse or onto or into land in circumstances where a contaminant may enter water that does not meet one or more of the conditions of Rule 5.95 and Rule 5.96; and the discharge of stormwater or construction-phase stormwater into a reticulated stormwater system that does not meet the condition of Rule 5.93A; is a discretionary activity except that within the boundaries of Christchurch City it is a non-complying activity.

Under Rule 5.97 the existing and future individual properties discharges would be classified as a *discretionary activity*.

6.5 All Activities Classification Summary

Table 6-2 summarises the activity classifications for the range of stormwater activities sought. The proposal is considered to have an overall non-complying activity classification.

Table 6-2: Activity classification summary

Activity	Plan	Rule	Classification
TDC stormwater network to land and to surface water	LWRP	5.94	Non-complying
TDC stormwater network to surface water	ORRP	1	Discretionary
Individual Properties to Land	LWRP	5.97	Discretionary
Individual Properties to Surface Water	ORRP	1	Discretionary
	LWRP (PC7)	5.97	Discretionary
		Overall Classification:	**Non-complying**

7 Consultation

7.1 Overview

Schedule 4 Clause 6(f) of the RMA indicates that an AEE should identify: "*those persons affected by the proposal, the consultation undertaken and any response to the views of those consulted*".

TDC has consulted with potentially affected stakeholders. the wider Pleasant Point community and the likely interested parties to this application. They have also collaborated extensively with Te Rūnanga o Arowhenua throughout the development of the SMP and resource consent application.

7.2 General Public Consultation - Stormwater Management Plans

General public consultation for all the urban areas that SMPs were being developed for (including Pleasant Point) was undertaken in October 2021 with drop-in sessions where members of the public could either meet in person at an advertised venue or via a survey (both online and published in the Courier).

Four drop-in sessions were held including an evening at the Pleasant Point Town Hall on the 27 October 2021.

TDC received 51 submissions (online or via hardcopy, or at the open houses), of which only 11 related to Pleasant Point. The key findings for all responses (including other townships) were: [17]

- Of the total number of survey respondents, the most commonly experienced stormwater issues were flooding and pollution (both affecting 57% of respondents), followed by lack of maintenance (55%), poor stream health and climate change (51% each).
- When stormwater issues were rated in terms of the most critical, the two top issues identified were: loss of aquatic life/habitat, followed by polluted stormwater entering waterways.
- All survey respondents identified some usage of their local waterways and surrounding areas, including for running/walking, relaxing, fishing, food gathering and kayaking.
- Survey respondents reported low overall levels of satisfaction with the quality of our waterways. Timaru and Temuka waterways scored higher than the quality of Pleasant Point and Washdyke waterways (Washdyke was the lowest).
- 25% of survey respondents perceived Timaru District Council's management of stormwater in their area as being either very good or excellent, 45% perceived it to be average, whereas 30% of respondents thought Council's stormwater management to be either poor or very poor.
- The greatest threats identified to local waterways by survey respondents were: fertilisers/pesticides (highest) and rubbish/litter and industrial pollution (second equal). Car/house washing and animal waste were perceived to be the lowest overall threats.

Specific comments received from Pleasant Point submitters are summarised below:

- Better litter management and maintenance of overgrown trees and bushes along the Main Road.
- Concerns relating to timber treatment practices and contribution of contaminants from these sites.
- Blockages and obstructions of channels leading to flooding
- Wastewater overflows

[17] https://www.timaru.govt.nz/services/environment/storm-water/stormwater-management-plan

- Flooding from Sutherland stream
- Ponding of stormwater
- Consideration should be given to holding more water back at the Manse Road Dam to settle out sediment.
- Concern about whether the flooding would eventuate if the stormwater inlet at Manse Road was damaged.

The general responses to the specific comments are:

- TDC is developing an effective maintenance programme to prevent debris blockages and sediment build-up.
- It is noted that Point Lumber Limited operate a timber treatment facility at a site adjacent to Pleasant Point Stream. Stormwater discharges are authorised by a consent held by the company. It is expected that the regional consent authority will be undertaking compliance monitoring of this site. Despite this, and the site being excluded from the initial NRA undertaken to prepare this application, TDC intend to include the site as part of their auditing process for high-risk sites. This is primarily due to the risk of historical and current leaching of timber preservation chemicals such Copper, Chromium and Arsenic (CCA) being entrained in stormwater, infiltrating into land or entering the TDC network via secondary flow paths
- One instance of wastewater overflows has bene reported since 2013. Measures to prevent or reduce substantially the risk of this reoccurring has been undertaken.
- Some swales with flat inverts will probably pond stormwater in places.
- Sunderlands Stream is not a known waterway near the SMA or within it.
- A review of the Manse Road Dam operation should be undertaken during the planned hydraulic modelling to see if the design parameters could be reconsidered to provide more quantity and quality benefits.

TDC sent a thank you letter on 8 March to all persons who made a formal submission during SMP consultation in October and November last year (excluding those people whose submission said they did not want us to contact them).

7.4 Collaboration with Te Rūnanga o Arowhenua

TDC and AECL (on behalf of Te Rūnanga o Arowhenua (Arowhenua)) have entered into an agreement to collaborate on the preparation of SMPs and associated resource consents required for Timaru, Washdyke, Temuka and Pleasant Point. This agreement was documented and signed off in May 2021. The purpose of the agreement was to establish clear expectations around engagement and information required for the preparation of the SMPs and applications.

During development of the SMP and this application, the following consultation with AECL / Arowhenua has occurred:

- AECL representatives have collaborated with TDC to develop the vision for stormwater management for the townships and also the objectives and targets for Pleasant Point (that form part of the application).
- Cultural site walkovers of Pleasant Point waterways attended by Arowhenua cultural advisors, TDC and WSP or PDP. This was to assist in understating the cultural landscape and monitoring locations.
- AECL worked with TDC to develop the issues assessment.
- Arowhenua cultural advisors supported TDC in public engagement drop-in sessions and a presentation to Councillors at a workshop on the SMP development and resource consents process.

- AECL has also collaborated on the development of the implementation plan process, and Monitoring Plan.
- AECL were provided early drafts of the SMP for comment and have been given drafts of the AEE and proposed conditions for comment.
- The SMP outlines TDCs intention to continue collaborating with Arowhenua by ensuring that Arowhenua are included in a working group that will be set up to identify, prioritise and evaluate projects for Pleasant Point's stormwater management and the achievement of environmental objectives.

It is TDC's understanding that AECL / Arowhenua are generally supportive of the application, and that during the processing of the application, they will be working in partnership with TDC to enable their views to be taken into account as part of ECan's decision making process.

7.3 ECan River Engineers

ECan's River Engineers are the managers of the Ōpihi River and have been consulted with throughout the pre-application phase for the TDC stormwater network consents.

Pre-application engagement has mainly occurred through providing issues summary documents for ECan to review, including for Pleasant Point. These reports were provided to the ECan River Engineers for comments in addition to copies of the WSP's network capacity and flooding assessments for the township.

A video call meeting was subsequently held between TDC, ECan River engineering representatives, Nick Reuther (ECan Consent Planner and WSP who undertook the network assessments on the 2 November 2021. The main topics discussed were 'Flooding Issue Summaries' and 'Waterway Ownership/Responsibility'.

The key matters highlighted by the River Engineers for Pleasant Point are summarised as follows:

- The reports provided to ECan for comment correctly identify that the management of overland flow paths through the township is key to mitigating flooding hazards within Pleasant Point. These flowpaths may have already been altered by development and therefore may have reduced functionality.
- In Pleasant Point, floor levels are generally governed by flooding from the river (as opposed to localised stormwater flooding) and a high percentage of buildings in Pleasant Point, particularly to the north and north east of the state highway have been built up. Most if not all since the mid-1990s (when legislation came in requiring setting of floor levels relative to flood risk). Therefore it is expected that there would be relatively few buildings sitting at Building Code minimum height so the mapped 'at risk buildings' in the issues report are over-representing the risk.
- In theory, Pleasant Point shouldn't be flooded from the Te Ana Wai River until floods exceeding around a 60-70 year ARI event. The Ōpihi River has a 50-year ARI capacity, but the SMA boundary area is unlikely to be floodable from that river with expected Ōpihi flooding being to the north/northwest of SMA.
- General:- Where a stream is identified as being a Bylaw waterway, ECan generally operate on an urban = TDC and Rural = ECan divide regarding responsibility for waterway maintenance.
- General – consideration of access for maintenance and impact on flood risk in regard to water quality / restoration work.

TDC is working with ECan River Engineers as to whether in the TDC district, TDC take on any other responsibilities for Bylaw waterways within urban areas.

At the time of completion of the AEE, TDC is not in any active process of seeking written approval of the ECan River Engineer Section. It is expected that once lodged the ECan Consent Section will

engage internally with the ECan River Engineering Section to determine if there are any specific concerns.

7.4 Pleasant Point Drinking-Water Supply Wells

Based on a risk assessment conducted by PDP on the potential effects on domestic drinking water bores from stormwater discharges to land within the SMA, four bores within the SMA and were considered to have the potential to be affected by stormwater. In addition, there is one shallow group supply bore not owned by TDC that is located 230 metres downgradient of the SMA that is used to provide supply to 12 residential dwellings. While the assessment indicated that effects resulting from stormwater discharges were only likely to extend up to 82 metres from the SMA, this bore was included in the list of bores that could be potentially affected by the discharges from the SMA, probably due to its use, location down-gradient from the SMA, shallow depth and the lack of information relating to any treatment provided.

TDC has made contact with registered well owners and properties that probably have unregistered wells within and downgradient of the Temuka SMA. Through TDC making contact via phone those wells no longer used for drinking supply were established as well as the sources of drinking supply for properties that had neither registered wells or reticulated supply. Following this initial contact letters were sent to remaining active drinking water supply well owners informing them of urban area stormwater discharge permit was being sought, and that the discharges of stormwater to land via soakpits were part of the application.

This initial contact was followed up by face to face meetings with the parties individually where a written summary of the PDP Contaminant Transport Assessment was provided included a plan that showed the SMA boundary. A summary tables of the wells property owners contacted is included in Appendix 9 .Table 1 is those drinking wells that considered potentially affected and those not likely affected but within 500 m buffer of the SMA. Table 2 is those other wells identified or not identified that were determined to be not in use, or not used for drinking water. . Also attached in Appendix 9 is the TDC's letter content and the information summary provided to the well owners.

The summary table includes: the confirmed use of the wells or not for drinking water; where owners volunteered information if their supply water was treated or not; and whether or not they intended to provide written approval or were unlikely to provide written approval. No written approvals received by TDC to date.

Ongoing engagement is occurring only with those parties that have indicated verbally they are willing to sign the affect parties form, which includes the group supply bore owner /operator that is used to provide supply to 12 residential dwellings.

7.5 Other Key Stakeholders

7.5.1 SMP General

The following key stakeholders were sent letters informing them that TDC, with the support and guidance from Te Rūnanga o Arowhenua were developing stormwater management plans (SMPs) for Timaru, Washdyke, Temuka and Pleasant Point to improve stormwater management within the townships and reduce the impacts these discharges were having on the environment.

- Waka Kotahi NZ Transport Agency
- Department of Conservation
- Fish and Game (F&G)
- Orari-Temuka-Ōpihi-Pareora Zone Committee (OTOP)
- KiwiRail
- Otipua-Saltwater Creek Catchment Group
- Waitarakao Taskforce

- Pleasant Point Museum and Railway
- Timaru District Council Parks and Land Transport Unit

These stakeholders were initially informed about the process being undertaken in a letter from TDC on 3 August 2020, and subsequently of the issues identified for each township on 13 October 2021.

Stakeholders were encouraged in the second letter to provide feedback that could potentially influence how the SMP would address issues in the future or raise any concerns about stormwater management within the townships. Options for providing feedback included one-to-one meetings in person or via video calls or by completing a survey form found via a link on the TDC website.

No responses from the above external organisations or parties were provided for the Pleasant Point SMP / SMA proposal.

7.6 Interested Land Development Parties

The following interested land development parties (Developers, Surveyors, Consultants) in the Timaru district were sent TDC letters informing them of the development of stormwater management plans (SMPs) for Timaru, Washdyke, Temuka and Pleasant Point.

- Paul Smith Earthmoving Timaru
- Rooney Earthmoving
- Jennians Homes Mid & South Canterbury
- Stonewood Homes
- Lone Pine Building Ltd
- Nolan Building Ltd
- Trident Homes Timaru
- Milward Finlay Lobb Ltd
- Davis Ogilvie (Aoraki) Ltd
- Land Services Group
- Argyle Holdings
- Ryan De Joux

As for the other key stakeholders, these parties were first informed about the process in a letter dated 3 August 2020 and subsequently of the issues identified for each township in a letter dated 13 October 2021.

The parties were encouraged in the second letter to provide feedback on how the SMP could address issues in the future or if they had any concerns about stormwater management within the townships. Attendance at either the drop-in sessions for each township or completion of the survey form found at a TDC website link was encouraged.

For Pleasant Point, none of the above parties indicated they would be attending the drop-in session, nor did they attend the session on 27 October 2021 held at the Pleasant Point Town Hall.

8 Actual and Potential Effects

8.1 Overview

Section 88 of the RMA requires that an applicant make an assessment of any actual or potential effects that the proposed activity may have on the environment, and the ways in which any adverse effects may be avoided, remedied or mitigated

In accordance with Section 104(1)(a) and (ab) of the RMA, when considering an application for a resource consent, the consent authority must, subject to Part 2, have regard to:

- *any actual and potential effects on the environment of allowing the activity.*
- *any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity.*

In the RMA, unless the context requires otherwise, the term effect includes—

(a) any positive or adverse effect; and

(b) any temporary or permanent effect; and

(c) any past, present, or future effect; and

(d) any cumulative effect which arises over time or in combination with other effects—

regardless of the scale, intensity, duration, or frequency of the effect, and also includes—

(e) any potential effect of high probability; and

(f) any potential effect of low probability which has a high potential impact.

The effects in relation to this application include the past, present, and future effect given it involves the stormwater reticulated network activity that has occurred for decades and is still occurring and given the scale and duration of consent sought, any cumulative effect which arises over time, or in combination with other effects. Temporary effects could be considered to apply to construction-phase discharges when managed appropriately.

Section 104(2) of the RMA states that:

> *When forming an opinion for the purposes of subsection (1)(a), a consent authority may disregard an adverse effect of the activity on the environment if the plan permits an activity with that effect.*

Case law has determined that the existing environment is a component in considering permitted baseline effects, extracts from the relevant caselaw is quoted below.

> *"Existing activities carried out under [...] existing use rights are not part of the statutory baseline (because it only applies to activities permitted by rules). However, they are likely to be part of the existing environment against which effects must be assessed at least for the purposes of s95D which uses the word "environment".*
>
> *The Court of Appeal in Queenstown Lakes DC v Hawthorn Estate Ltd (2006) 12 ELRNZ 299; [2006] NZRMA 424 (CA), considered that the "environment" embraces the future state of the environment as it might be modified by [..] the implementation of resource consents which have been granted at the time a particular application is considered, where it appears that those resource consents will be implemented."*

To add further clarity to the case law quoted above it is noted that "environment", as defined in the RMA, includes amongst other resources and values, and "people and communities".

The majority of the existing stormwater network and minor discharges sought (otherwise not permitted or separately consented) were previously lawfully established under the Transitional Regional Plan and the Natural Resources Regional Plan for Canterbury that pre-dated the LWRP. The effects of these previously lawfully established discharges could therefore be considered to form part of the existing baseline environment. This provides a useful starting point for assessing the potential adverse cumulative effects relating to the increase in stormwater discharges from future development (at expected better quality than the existing discharges), in combination with improvements to existing discharges over a longer period of time.

Stormwater discharge via the stormwater reticulated systems is a long existing activity. It is actually not feasible for TDC to cease these existing network discharges, nor can private individuals for the other minor discharges sought. The applicant cannot prevent rainfall coming into contact with these urban impervious surfaces and pervious surfaces, nor can it block up its network pipes to prevent a discharge as this would cause damage to property and discharges would occur via secondary flow paths to either the same receiving environment or another receiving environment.

The LWRP recognises this need and promotes disposal of stormwater by way of a reticulated system to improve the management of stormwater quantity and quality in order to reduce the impacts of these discharges on the environment.

Within this context, the following effects are considered relevant to the proposed activities:

- Effects on soil quality
- Effects of slow entry into land
- Effects of groundwater quantity (recharge and mounding)
- Effects on groundwater quality and human health
- Effects on surface water quality and aquatic ecology
- Effects on cultural values and use
- Effects on flood carrying capacity and hazards
- Effects on amenity and recreational values
- Effects on wider community

These effects listed above are assessed in the subsections below.

8.2 Effects on Soil Quality

Stormwater contaminants such as heavy metals (zinc and copper) and hydrocarbons adsorb strongly to sediment and soil particles. These contaminants do not degrade readily and can therefore accumulate in soil along stormwater flowpaths through settling (e.g. in swales as runoff velocities decrease) and at points where stormwater is discharged into land (e.g. soakpits or infiltration basins).

The rate of accumulation will depend on the concentrations of the contaminants in stormwater. It is expected that some business and industrial catchments will include higher levels than some residential areas.

Over time, the accumulation of contaminants can lead to effects on vegetation growth resulting in bare, patchy cover and human health effects if these contaminants accumulate to high concentrations in areas accessed by the public (e.g. recreational reserves).

There are currently no formalised or constructed infiltration systems within the Pleasant Point SMA. Given the very flat nature of the SMA and high potential groundwater levels, the potential to use centralised infiltration systems to manage stormwater from larger developments is somewhat limited. The stormwater network for Pleasant Point however does include swales that convey runoff to other parts of the network and to discharge points.

No periodic soil monitoring within these swales is proposed in the monitoring programme, attached as Appendix 10. However, vegetation health can be used as an indicator of soil contamination. In addition, contamination concentrations that causes stress in plants are lower than those that pose a risk to human health for some stormwater contaminants.

One of the targets proposed to achieve Objective 1 (Progressively reduce the mass of stormwater related contaminated sediment within Pleasant Point Stream flowing to the Ōpihi River) is to ensure that all vegetated swales are maintained to ensure that vegetation is in a healthy and uniform state. To meet this target, TDC will need to actively inspect and remediate swales with bare, patchy soil as part of their maintenance regime.

On this basis, it is considered that the discharges of stormwater from the SMA will result in no more than minor adverse effects on soil quality.

8.3 Effects of Slow Entry into Land

8.3.1 Overview

Infiltration systems and in particular soil lined basins have had reasonably high failure rates in Canterbury in the past. This has often been due to poor construction and a lack of understanding of the environmental constraints of the site.

Discharge of stormwater onto or into land can cause ponding or localised flooding if the disposal system has been insufficiently sized or has not been maintained adequately. Ponding stormwater can cause damage to neighbouring properties, affect amenity values, and cause odour from decomposition of organic material under anaerobic conditions.

It should also be noted that in particular cases increased duration of ponding will also increase the risk that a significant rainfall event will bypass or cause overflows to secondary flow paths designed, thus increasing stormwater quantity effects.

There are three main components to consider in relation to causes of slow entry into land – clogging of treatment media, subsoil permeability, and shallow water tables.

8.3.2 Soil Treatment Media and Soakpit Clogging

For future development, a critical consideration for the suitability of infiltration (biofiltration) practices is how to avoid clogging of the constructed soil treatment media used to line a basin or raingarden (if used). Usually, the treatment media is constructed with native soil (depending on clay and silt content) and combined with sand and/or peat to achieve the desired infiltration rates.

Pre-treatment devices such as a swale, sediment forebay or at the very least submerged outlet collection sumps could be used where constructed media is used in a communal system, to remove larger solids. Pre-treatment of stormwater prior to discharge to a biomediafiltration device or soakpit could also reduce the long-term maintenance requirements for the system.

Stormwater from 28% (approximately 42 ha) of land within the SMA currently discharges to land via 73 soakpits. Blinding of soak pits inverts and walls (typically lined with a geotextile) can occur over time reducing infiltration rates to be less than the design the soakpit was sized to. TDC is proposing to undertake soakpit testing and rehabilitation of soakpits that are not performing effectively or resulting in ponding of stormwater, as part of their maintenance programme.

8.3.3 Subsoil Permeability

Sub soil permeability is the most critical consideration for the suitability / feasibility of infiltration devices. For infiltration systems to function, free draining gravel strata has to be present immediately below a basin invert or the soakage device (infiltration trench, soakage pit or raingarden). It is noted that:

- Auckland Regional Council's TP10[18] states that the soil should not have more than 30 percent clay or more than 40 percent clay and silt combined.
- Christchurch City Council's WWDG[19] states soakage rates of the underlying strata needs to be greater than 50 mm/hr.

Mitigation of poor or imperfectly drained soils within an area used for stormwater disposal can be achieved for example by either:

- Removing the poorly or imperfectly draining strata (usually only practical or cost effective if <1.5m deep) and replacing with clean free draining material; or
- Constructing under drainage below the soil treatment media to collect filtered stormwater and discharge it into a soakage chamber located either in an area where free draining strata is present or drilled to a depth such that free draining material is encountered.

CCC's WWDG states that when soakage systems for public utilities are used, free draining gravel strata needs to be within 5 m of the ground surface.

Developers seeking to use these types of systems to treat runoff from new development will be required to provide TDC with validation of the permeability of sub-soils via a soakage test undertaken in accordance with the ADC/TDC Stormwater Design Guidelines. This should occur regardless of information provided by bore logs in the area or test pits undertaken at the location of the disposal area as vertical and lateral changes in strata thickness can occur over short distances.

8.3.4 Shallow Groundwater

The performance of an infiltration basin, soakage pit or trench will also depend on the depth to groundwater. The shallower the water the slower the drainage from the basin, soakage pit or chamber will be. Depth to groundwater below the ground surface provided by data from ECan's Wells database, indicates that groundwater depth varies from approximately 1.9 to 5.2 m below ground level (bgl) across the SMA.

Developers seeking to use infiltration or land disposal options for managing stormwater from future development, will need to consider groundwater levels when selecting and designing systems. TDC will also need reliable information on water levels when considering long term strategies for managing stormwater within the SMA.

Groundwater levels monitoring using water loggers is proposed in the Monitoring Plan which will provide information on seasonal changes in water levels, trends over longer periods of time and the response of the shallow water table to rainfall events.

8.3.5 Summary

It is considered that with the proper understanding of the site constraints informing the design and the use of appropriate media in biofiltration systems for new systems, combined with the testing and rehabilitation of failing soakage systems, the adverse effects resulting from the slow entry of stormwater into land can be adequately mitigated to be less than minor.

[18] Auckland Regional Council, 2003. *Stormwater Treatment Devices: Design Guidelines Manual*. Technical Publication 10 (TP10).
[19] Christchurch City Council, 2003. *Waterways, Wetlands Drainage Guide – Part B: Design*.

8.4 Effects on Groundwater Quantity

8.4.1 Recharge

Shallow groundwater beneath the Pleasant Point SMA is likely to be recharged by rainfall and seepage from surface waterways. A review of soil maps and borelog information also indicated that upper soil permeability in the area appeared to be low. Given that 28% of the SMA currently discharges stormwater to land into underlying gravels, thereby contributing recharge to groundwater, combined with the low permeability of the soils over much of the SMA area, the impacts on groundwater levels from the existing township may be considered to be minor.

Based on land zoning, there could be a further 34 ha of land developed within the SMA area. The conversion of pasture to hard-standing areas associated with development has the potential to reduce infiltration and recharge to the underlying water table. To mitigate these potential effects, TDC is proposing to adopt a 'green infrastructure' approach to stormwater management for new development. This approach seeks to encourage treatment of stormwater at source and encourages discharging stormwater to land, where conditions permit.

On this basis, it is considered that the impacts from future development on groundwater levels will be no more than minor. TDC are proposing to monitor water levels in bores within the SMA as part of the monitoring plan. Data collected can be used to provide a greater understanding of the relationship between rainfall and groundwater levels within the SMA.

8.4.2 Mounding

The collection and discharge of stormwater into land at centralised locations can result in a localised increase in groundwater levels (i.e. mounding). Currently within the Pleasant Point SMA, there are no large, centralised stormwater infiltration systems, however, stormwater is discharged into land via 73 soakpits.

The TDC / ADC Stormwater Management Guidelines specifies the use of a flooded pit test where groundwater separation is less than 2 m. The test can also be used for communal systems to account for the effects of groundwater mounding when correctly carried out.

Given the shallow depth to groundwater within the SMA, groundwater mounding will need to be considered and assessed during the design process for any new stormwater management system proposed in the SMA. More accurate information on water levels may be available in future, as TDC is proposing to monitor water levels as described in the Monitoring Plan. Measures such as underdrainage to manage the groundwater mounding impact or limiting the amount of infiltration required by only discharging first flush runoff to land, could be used to reduce the impacts in areas where mounding was an issue.

The proposed conditions include a requirement to consider mounding and a general performance standard to avoid adverse effects.

8.4.3 Summary

Overall, it is considered that the adverse effects associated with slow entry to land will be less than minor.

8.5 Effects on Groundwater Quality and Human Health

8.5.1 Overview

The use of soakage facilities has the potential to affect groundwater quality in the immediate area, as infiltrated stormwater may introduce contaminants found in stormwater runoff into groundwater. These contaminants can subsequently affect the aesthetic qualities of groundwater or pose a risk to human health, if this groundwater is abstracted for drinking water.

Stormwater from just over a quarter of the Pleasant Point SMA is discharged to land via existing soakpits. Groundwater from relatively shallow bores is also abstracted for drinking water within and just downgradient of the SMA, with groundwater protection zones for these wells covering a significant area of the SMA. While only a portion of runoff from the SMA is discharged to land and shallow groundwater is also likely to be affected by inputs of contaminants from other sources (e.g. rural land, on-site wastewater discharges), the shallow groundwater resource beneath Pleasant Point is considered to be moderately sensitive to discharges of stormwater to land from the SMA.

Consequently, TDC has invested in a programme to first assess and evaluate the risk to groundwater, in particular drinking water supply bores, and then to develop objectives and targets designed to avoid any impacts on these drinking water supply bores that may occur as a result of stormwater discharges from the SMA.

The objectives and targets relating to this effect is supported by the Monitoring Plan, which includes monitoring of shallow groundwater quality for a range of parameters including cooper, lead and zinc and *E.coli.* Results from monitoring will be linked to trigger values based on current drinking water standards and responses that will be implemented if these values are exceeded.

Conditions have also been proposed to ensure that the effects on groundwater quality and drinking water supply bores are considered when any new stormwater management system that ultimately discharges stormwater to land is being designed or proposed for future development.

The following sections provide further discussion on the assessment of this effect and how the mitigation measures proposed will ensure that the effects on groundwater quality can be avoided and mitigated.

8.5.2 Discharge Quality

Table 8-1 provides estimates of the concentrations of typical contaminants in stormwater prior to and after contaminant removal occurs within a stormwater treatment (infiltration basin) or disposal system (soakpit). Residual contaminant concentrations are also presented along with aesthetic and health protection guideline values reported in the New Zealand Drinking Water Standards (MoH, 2005 (revised 2018)).

A comparison of discharge concentrations to the standards indicated that only PAH and E.coli are likely to exceed a MAV.

Table 8-1: Estimated discharge quality to land compared to guideline values

Determinand	**Concentration Generated** (g/m^3 unless otherwise stated) [a]	**Treatment System Efficiency** [b - c]	**Discharge Concentration** (g/m^3)	**NZDWS** (g/m^3 unless otherwise stated)
Turbidity	25	95	1.25	2.5 (GV)
NO_3	2	0 - 75	2 - 0.5	11.3 (MAV)
TP	0.4	0 - 75	0.4 - 0.1	-
Copper	0.02	25 - 75	0.015 – 0.005	2 (MAV), 1 (GV)
Zinc	0.8	25 - 75	0.6 - 0.2	1.5 (GV)
PAH	0.007	25 - 75	0.0053 - 0.0017	0.0007 (MAV) d
Microbiological	8,000 fc/100 ml (median)	0 - 75	8, 000 - 2,000	*E.coli* <1 MPN/100 ml (MAV)
Table Notes:				

[a] Highest values taken from Table 5-1 unless stated otherwise.

[b] Soakage pit only, efficiency based on ability for contaminants to be in-solid form (i.e. bound to suspended sediment) and contained in blinding of soakage pit's gravels.

[c] Except TSS, based on mid-range value treatment efficiency for an infiltration basin (US EPA (1993), Stormwater Center (2002), Watershed Protection Techniques (1997)). A swale and raingarden will also have a similar efficiency

[d] There is no PAH DWSNZ limit, as benzo (a) pyrene is the main PAH compound of interest this limit has been used and it has been assumed conservatively that all the PAH concentration is benzo (a) pyrene

(MAV) Maximum Acceptable Value for inorganic determinands of heath significance/ for microbiological determinands, NZ Drinking Water Standards, MoH, 2005 (Rev 2008)

(GV) Guideline Value for aesthetic determinands, NZ Drinking-Water Standards MoH, 2005 (Rev 2008)

8.5.3 Local Groundwater Quality

The individual contaminants presented in Table 8-1 are discussed further below.

TSS / Turbidity

Turbidity is related to the presence of sediment and material in water that can affect the taste and aesthetics of drinking water. Suspended solids in stormwater runoff will generally be filtered out when stormwater passes through soils within the unsaturated and saturated layers beneath the soakpits (used currently in the SMA) or as stormwater flows through the infiltration media of any land disposal systems that may be used in future. Further removal of sediment may also occur if stormwater runoff flows through vegetated swales, is treated in a proprietary device or settlement of sediment occurs in kerb-side sumps, prior to discharge to land.

For these reasons, it is highly unlikely that sediments will have an impact on the quality of groundwater as a result of stormwater discharges from the SMA.

Organic and Inorganic Contaminants

The MAVs for organic and inorganic determinands (e.g. hydrocarbons and heavy metals) are based on the risk to the health of a person who consumes two litres of that water a day over their lifetime (usually taken as 70 years).

Organic and inorganic substances that are dissolved or dissolve in groundwater will mix with groundwater flowing beneath the SMA. Advection, dilution and dispersion will occur, as the movement caused by the flow of groundwater causes a gradual dilution of the contaminant plume.

Once in groundwater, contaminants such as metals and hydrocarbons are subject to other reductions in concentrations due to:

- Adsorption: when contaminants interact with and adsorb tightly onto aquifer particles, a process which acts to retard some of the contaminant migration.
- Transformation, decay and biodegradation: Chemical transformation, natural decay and biodegradation are processes that modify contaminants during the course of their groundwater transport. They result from the chemical environment in the groundwater, and the presence of bacteria that cause chemicals from a contaminant source to be changed once they are in the groundwater environment. It is recognised however, that some contaminants such as heavy metals do not degrade easily and can persist in the environment for a long period of time.

In addition, due to the highly adsorptive properties of hydrocarbons and heavy metals, any sediment that is removed by filtration through swales, proprietary devices or sumps will effectively reduce the contaminant load prior to discharge.

At present there is limited data on groundwater quality beneath the SMA to determine whether stormwater contaminants such as heavy metals and hydrocarbons are entering groundwater. Groundwater quality monitoring will be undertaken as part of the monitoring programme. Concentrations of copper, zinc and lead will be compared to values that will trigger a response, if these values are exceeded.

Given the low concentrations expected in the discharges, the intermittent nature of the discharges and the natural processes in the groundwater environment, combined with groundwater quality monitoring and actions that will be undertaken if a risk to drinking water bores are identified, the effects on local groundwater from organic and inorganic contaminants are considered to be minor.

Micro-biological

PDP have modelled the transport of microbial organisms in groundwater using a three-dimensional analytical model that allows for analytical solution of equations for contaminant transport (Appendix 6). Pang (2009)[20] presents information on removal processes that occur in groundwater such as adsorption based on data obtained from field testing. Schijven et al. (1999), Pang, and Ying (2017) also report similar removal rates recorded by Pang (2009). While microbial die-off has been accounted for in the model, other microbial removal processes such as adsorption have been ignored, thereby providing a relatively conservative assessment of the extent of microbial migration within groundwater beneath the SMA.

The Maximum Acceptable Value (MAV) for *E. coli* within drinking water is less than 1 cfu/100 ml and this is the standard against which the modelling results were assessed.

The results from this modelling assessment, indicate that the concentrations of *E.coli* are likely to exceed the standard of 1 cfu/100 ml at a distance of no more than 82 m from the Pleasant Point SMA. A sensitivity analysis using very high *E. coli* concentrations (based on national and international stormwater studies) and highly permeable aquifer conditions (e.g. preferential flow paths) as observed elsewhere in alluvial gravel aquifers on the east coast of New Zealand, indicates that the extent of microbial effects from stormwater discharges could be up to a maximum of 126 m from Pleasant Point.

To provide some context around the acceptability of the extent of this effect, the permitted baseline level under the LWRP for stormwater discharges to land equates to the discharges from up to five properties discharging stormwater from 1,500m^2. Conservative modelling of the worst-case scenario estimates that the standard of 1 cfu/100ml would be exceeded at distances greater than 200 m (e.g. compared to 126 m for Pleasant Point).

It is important to note that bores identified in the vicinity of the SMAs, particularly shallow bores, will be vulnerable to microbial pathogens from a number of other sources, such as onsite wastewater discharges, agricultural land use and river water recharge. Differentiating between these sources and intermittent stormwater would be inherently difficult.

Nutrients

Unlike other typical stormwater contaminants such as hydrocarbons and heavy metals, Nitrate=-N occurs in solution and therefore can readily leach into groundwater. Nitrate-N concentrations were measured in bore J38/0028 between 1994 – 1995. Results indicated a median concentration of 7.95 mg/L and a maximum concentration measured at 8.9 mg/L. Both these concentrations are above 5.65 mg/L (or half the MAV).

In addition to stormwater discharges, Nitrate-N concentrations in groundwater can occur as a result of agricultural land uses and on-site wastewater discharges. While it is difficult to separate

[20] Pang L. 2009. *Microbial Removal Rates in Subsurface Media Estimated From Published Studies of Field Experiments and Large Intact Soil Cores*. Published in J. Environ. Qual. 38:1531–1559 (2009).

the contributing effects on Nitrate-N concentrations in groundwater from these different sources, it is expected that the impacts resulting from stormwater are likely to be minor for the following reasons:

- Nitrate-N concentrations in urban stormwater are typically low and range between 0.4 and 2.0 mg/L (refer Table 5-1).
- The discharge to land via soakpits from the Pleasant Point SMA make up a relatively small area of the catchment.
- The discharges are intermittent; and
- Rainfall recharge could potentially provide a diluting effect to baseline concentrations in groundwater given the relatively low concentrations of Nitrate-N in stormwater.

8.5.4 Effects on Drinking Water Wells

The following objective and targets are proposed with respect to drinking water quality:

- **Objective**: Stormwater discharges do not cause or exacerbate the risk to human health where groundwater is abstracted from bores for drinking water.
- **Target**: No recorded incidents of E.coli concentrations in abstracted water that is not treated confirmed as being related to stormwater discharges

A recognised practice to ensure that the quality of groundwater abstracted from wells used for drinking water supply are not compromised by the potential effects of land use and discharge activities, is to apply a protection zone to a community or group supply well. This practise has been adopted for this application (refer Section 5.6).

The community supply protection zones for wells J38/0917, J38/0261, J38/0251 (Ministry of Health Source Number: G00198) that are managed by TDC and provide reticulated drinking water for Pleasant Point, overlap the SMA. The PDP Letter Report (Appendix 6) indicated that these supply bores "*appear to be over 500 m cross-gradient from the SMA and are not considered to be at risk of contamination from stormwater discharges within the SMA, which is supported by the modelling undertaken.*"

All three bores are currently being used to service a population of 1200 people. Water abstracted from these bores is treated by UV disinfection and chlorination. Concentrations of bacteria, protozoa and chemical determinands (e.g. Nitrate-N) are monitored and results have all complied with current limits set out in the New Zealand Drinking Water Standards.

With respect to single household domestic supply wells, a capture zone of 500 m radius around the SMA was applied (refer Section 5.6) which is considered to be conservative based on modelling results (refer to the PDP report, Appendix 6).

The groundwater contaminant modelling assessment undertaken by PDP identified four drinking water supply bores within the SMA that could potentially be affected by stormwater discharges to land (refer Table 8-2). While the modelling assessment indicates that microbial effects are unlikely to occur beyond 126 m from the SMA, the fifth bore J38/0730 (Group supply) is included in this list as it is within the 500 m capture zone, down-gradient of the SMA and its protection zone extends within the SMA.

Regardless of the impacts resulting from stormwater discharges, shallow domestic bores like these are classified as unsecured Drinking Water Sources, in accordance with the NZ Drinking Water Supply Guidelines (2019) and should not be relied upon for potable supply unless a reliable level of treatment is provided.

As part of the Monitoring Plan groundwater quality is proposed to be monitored in any domestic supply bore (e.g. those listed in Table 8-2) where the owners have given permission for monitoring to occur. Contaminants including *E.coli* and heavy metals will be monitored and trigger responses when guideline values are exceeded.

Table 8-2: Potentially affected bores and properties without rated connection (Source Appendix 6)

Distance Downgradient from SMA (m)	Well Number	NZTMX	NZTMY	Address	Listed Owner
0	J38/0027	1450445	5097885	Tengawai Road	Cycle Makers Group
0	J38/0028	1451813	5097360	State Highway 8	Timaru District Council (Parks Unit)
0	J38/0668	1451096	5097175	47 Kabul Street	Martin, L N
0	J38/0042	1451546	5096885	Ameer Street	William T G
228	J38/0730	1452256	5097266	Butlers Road	Howey A C

The reticulated network is available within the SMA and therefore an alternative drinking water source could be provided for any affected bores within the SMA. J38/0730 is outside the area of service and the network would need to be extended to provide drinking water via TDC's reticulated supply.

Very little information is available regarding this bore and whether water abstracted from it is treated. As stated above, TDC will offer to monitor groundwater quality from this bore. Modelling results however have indicated that the risks to this bore from stormwater discharges from the SMA are expected to be less than minor as the extent of microbial transport within groundwater is only expected to extend between 82 m (likely scenario) to 126 m (worst-case scenario) from the SMA. The 12 dwellings that are connected to this group supply will also have roof soakpit discharges to land within their section, that are adjacent to the bore in the private Meadows Lane right of way.

As described in Section 5.6 and proposed as a condition of consent, where new stormwater management facilities that discharge to land are proposed, assessments of the risk to any existing drinking water supply bore within 500 m of the discharge will be undertaken. Based on this risk assessment measures will be implemented to avoid effects on these bores and may include the provision of alternative water supply or relocating discharge locations to minimise risk.

8.5.5 Cumulative and Summary Effects

The discharge of stormwater from the Pleasant Point SMA into land in combination with other existing and future consented or passive discharges in the area, has the potential to result in the cumulative degradation of groundwater quality. Existing discharges of stormwater from the township have previously been lawfully established and therefore any effects resulting from these discharges form part of the existing environment.

The intention of this resource consent and the SMP for Pleasant Point however, is to implement measures that will minimise the effects of these discharges on groundwater quality. Objectives and targets have been set to protect drinking water supplies that could be affected by the discharges of stormwater from the SMA. In addition, TDC is seeking to implement stormwater management practices for future development (e.g. stormwater treatment at source, non-residential site assessments process) that will result in a higher quality of stormwater discharged into land.

Groundwater monitoring over the course of the consent will provide baseline data on the quality of groundwater beneath the SMA. This data may also be used in the longer term for assessing the

effectiveness of stormwater management practices within the SMA and to confirm the extent of effects of stormwater contaminants on groundwater quality.

Overall, it is considered that the proposal will have only minor adverse effects on groundwater quality within and downgradient of the SMA. It is also considered that the effects on any persons using shallow groundwater for drinking water supply will be no more than minor for the following reasons:

- The contaminant modelling results undertaken as part of this application indicate that the risk of contamination (microbial) would extend to between 82 – 126 m from the SMA; and
- The monitoring and trigger responses proposed by TDC will ensure that any risk is identified and allow measures to be implemented to address this risk (including the provision of an alternative water supply, if required).

Pursuant to Section 95E (2)(a) in assessing an activity's adverse effects on a person the consent authority may disregard an adverse effect of the activity on the person if a rule or a national environmental standard permits an activity with that effect (referred to as 'permitted baseline'). In this case the proposal is expected to have the same adverse microbiological adverse effects on groundwater quality as would be permitted by Rule 5.96.

8.6 Effects on Surface Water Quality and Aquatic Ecology

8.6.1 Overview

The effects on surface water quality and aquatic ecology for this application include the past, present, and future effect; and any cumulative effect which arises over time or in combination with other effects. Stormwater contaminants discharged into a surface waterway have the potential to alter the physical (e.g. colour, temperature) and chemical (quality) properties of water within a receiving surface waterway with subsequent effects on the ecological values present.

Stormwater from the Pleasant Point SMA discharges into Pleasant Point Stream and German Creek, which join together before flowing into the Ōpihi River. PDP was engaged by TDC to investigate the impacts of stormwater discharges from the SMA on these watercourses. The investigation included a baseline ecological assessment (Appendix 7) and a contaminant load modelling (CLM) assessment (Appendix 5.) The CLM provided a broad estimate of the mass of contaminants discharging into each receiving environment and comparison of the loads between each catchment.

The information obtained from these assessments indicated that:

- Pleasant Point Stream and German Creek are ephemeral watercourses;
- Due to the ephemeral nature of these watercourses, they are expected to have low aquatic ecological values;
- Sediment sampling from Pleasant Point Stream indicate elevated concentrations of zinc, lead, arsenic and hydrocarbons. Concentrations of these contaminants were lower in German Creek.
- Pollutants accumulated in the sediment are a potential source of contaminants for the Ōpihi River when mobilised during significant flood events.

This information highlighted the key issues associated with the discharges of stormwater from the SMA and was used to guide the development of objectives and targets to avoid, minimise and mitigate the impacts on surface water quality.

On this basis and in line with the hierarchy of obligations required by Te Mana o te Wai, the primary objective that has been set for the proposal is to "*Progressively reduce the mass of stormwater related contaminated sediment within Pleasant Point Stream flowing to the Ōpihi River*".

Other objectives related to this effect include:

- Objective 3 - Where practicable prioritise addressing effects of stormwater quality and quantity at or close to their source rather than at the end of pipe into surface water or instream.
- Objective 4 - Stormwater impacted sediment in Pleasant Point Stream in public areas is not a risk to human health; and
- Objective 6 - Progressively reduce the acute and cumulative impacts of the stormwater network and stormwater discharges on waterbodies connected to and within the Ōpihi Mātaitai downstream of Pleasant Point so the habitat is healthy and suitable for safe mahinga kai harvesting, and the mahinga kai species are safe to eat.

The Monitoring Plan (Appendix 10) sets out how surface water quality and sediment quality in Pleasant Point Stream and German Creek will be monitored to determine whether these objectives and their corresponding targets are being achieved.

8.6.2 Discharge Quality and Loads

Table 8-3 presents an estimation of the discharge quality for the main stormwater contaminants from developed urban areas to surface water via no treatment or via a treatment system that could apply to new or redeveloped sites. Also considered is the amount of dilution in the receiving environment that would need to occur to meet the ANZG 2018 21 (or LWRP Standards), assuming that no contaminants occur in its baseflows.

Results from the contaminant load model assessment indicated that progressive development in line with the district plan zoning would result in a decrease in TSS concentrations due to development of pastural land. This change in land-use however would also result in an increase in Zn, Cu and TPH concentrations due to an increase in residential and industrial areas within the SMA.

For the purposes of the model the SMA was split into three distinct catchments: Pleasant Point Stream Catchment, German Creek and Land-East Pleasant Point Catchment. The modelling results for these catchments indicated that the Pleasant Point Stream Catchment is predicted to discharge the greatest mass of contaminants due to the prevalence of commercial and industrial land-use and a large residential development within this catchment.

Table 8-3: Estimated stormwater discharge quality from developed urban areas or sites to surface water, and the number of fold dilution compared to guideline values /standards

Determinand	**Concentration Generated** (g/m^3 unless otherwise stated) [a]	**Treatment System Efficiency** [b - c]	**Discharge Concentration** (g/m^3)	**Approx. # Fold Dilution Required to achieve DGV**	**ANZG 2018 90% DGV (g/m^3)** (unless otherwise stated)
TSS	170	0	170	3.4	50 [d]
NO_3	2	0 – 75	2 - 0.5	10 – 2.6	0.195 [e]
TP	0.4	0 – 75	0.4 - 0.1	17 – 4.3	0.023 [e]
Copper	0.02	0 – 75	0.02 – 0.005	11 – 2.8	0.0018
Zinc	0.8	0 - 75	0.8 - 0.2	53 – 13.3	0.015

[21] ANZG 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines

Determinand	Concentration Generated (g/m^3 unless otherwise stated) [a]	Treatment System Efficiency [b - c]	Discharge Concentration (g/m^3)	Approx. # Fold Dilution Required to achieve DGV	ANZG 2018 90% DGV (g/m^3) (unless otherwise stated)
PAH	0.007	0 - 75	0.007 - 0.0017	5 – 1.2	0.0014 [f]
Microbiological	8,000 fc/100 ml (median)	0 - 75	8, 000 - 2,000	8 - 2	≤1000 [g]

Notes:

DGV = Default Guideline Value

a Highest values taken from Table 5-1 unless stated otherwise.

b no formal treatment.

c Except TSS, based on mid-range value treatment efficiency for an infiltration basin (US EPA (1993), Stormwater Center (2002), Watershed Protection Techniques (1997)). A swale, wetland or raingarden will also have a similar efficiency

d LWRP Permitted activity rule value for stormwater

e ANZG 2018 stressor Warm Dry Low-elevation 80th percentile

f There is no total PAH value, as Fluoranthene has a DGV value and was the highest recorded PAH parameter in Pleasant Point sediment (PP_S2 Winter) this value has been used and it has been assumed conservatively that all the PAH concentration is Fluoranthene

g LWRP PC7 outcome 95th percentile *E.coli* / 100 mL

8.6.3 Effects from Construction

Poorly managed construction sites with respect to erosion and sediment control have the potential to discharge high loads of suspended sediment to water ways affecting water clarity and water colour impacting fish function, movement and spawning activities. Deposited sediment can also persist in low-gradient spring fed streams, resulting in poor quality aquatic habitat and long-term ecological effects.

Large scale development areas (> 4ha) are excluded from this application to enable the effects and the erosion and sediment control methodology to be assessed by the ECan via a separate discharge consent application process.

Those smaller scale development sites that are no more than 4 ha of disturbance will be managed by the subdivision or building consent application and compliance process undertaken by TDC.

The main factors influencing sediment loss from earthworks sites and mobilisation in runoff are:

- **Climate** - Precipitation intensity, duration and frequency, temperature and wind
- **Soils** - Soil texture and other soil characteristics affect the soil's potential for erosion.
- **Slope** – Erosion increases as the slope steepens and lengthens
- **Size of disturbance** - The size of disturbance also impacts on sediment yield.

With the exception of cold temperatures in winter affecting grass growth and thus the stabilisation of disturbed soils, these factors are unlikely to result in significant loss of sediment from construction areas within the Pleasant Point SMA, provided appropriate sediment control measures are implemented.

With effective erosion and sediment controls the risk to surface water quality aquatic ecology is considered low. Whilst no TSS limits are proposed for short term construction-phase stormwater it

is in the interest of TDC to effectively regulate these sites as poor practices will mean achieving objectives and targets for the health of the water bodies (including reducing sediment cover) will be compromised.

Construction-phase stormwater runoff will be discharged to the TDC stormwater network and as such will be mixing with cleaner stormwater prior to entering the receiving surface water environment. These discharges are therefore not expected to result in a significant change in the clarity and colour of surface water. It should also be noted that during rainfall events, the receiving waterways will also be subject to runoff from rural land within the catchment and therefore water flowing within these waterways may already be affected by high sediment loads and reduced water clarity.

8.6.4 Effects from Operational Discharges

Nutrients

High nutrient loads in New Zealand streams and rivers are typically associated with agricultural practices within catchments. Major sources include nitrate and phosphorus leaching following the land application of fertiliser or effluent and leaching and/or direct inputs from stock excreta. In contrast, sources of nutrients in stormwater include garden fertilisers, pet and yard waste.

Nutrient concentrations in stormwater as shown in Table 8-3 are generally above DGVs. However, the toxic effects associated with Nitrate-N in stormwater is expected to be negligible as stormwater discharges are intermittent and the discharges are into ephemeral waterways, with low ecological values at the points of discharge from the network. This limits the potential for exposure of aquatic organisms to toxic levels of nutrients.

High nutrient concentrations combined with warm wate temperatures and high light levels can result in the proliferation of filamentous algal blooms. Given the relatively low concentrations of nutrients in stormwater compared to other contributing sources and the intermittent nature of these discharges during rainfall events, it is unlikely that the stormwater discharges will result in this effect occurring.

Hydrocarbons

TPH may enter stormwater mainly due to accidental spills on land, accidents on roads, leaking vehicle engines when in motion or leakages from engines in parked cars, typically from older vehicles. There is no aquatic ecology water quality guideline value for TPH compounds.

PAHs are generated from the incomplete combustion of organic materials (e.g., coal, oil, gas and wood). Anthropogenic sources include residential heating, asphalt, coal-tar based sealcoats, and motor vehicle exhaust. With the clean air regulations in Canterbury the use of coal and wood as a residential heating method has dramatically reduced, therefore deposition onto hard standing surfaces in urban areas is expected to be less than it was historically.

The main source of PAHs at present is likely to be from vehicle emissions, which over time could be reduced as alternatives to hydrocarbon fuel burning vehicles to meet New Zealand's carbon reduction goals become more prevalent. It is considered that PAHs in stormwater is less likely to be a significant toxicity issue compared to some metals as illustrated in Table 8-3.

Heavy Metals

The PDP Baseline Environmental Assessment Report (Appendix 7) discusses the toxicity of all metals in freshwater and the impacts on aquatic ecology based on international and Australia and New Zealand studies, and in relation to reported chronic Default Guideline Value (DGVs).

As discussed in Section 5.2 the metals coper and zinc are the main contaminants of concern in present day stormwater. Copper is expected to be mostly sourced from wear of brake pads in vehicles, and untreated concentrations represent the highest toxicity risk. Copper spouting,

downpipes and cladding material will be present in Pleasant Point but this has not been quantified.

Zinc measured from urban surface water originates from vehicle tyres and brake pads, galvanised roofs, roadside fittings, and pipes. Zinc is released to the environment and ultimately to stormwater during the daily wear and tear and/or corrosion of these sources.

The draft District plan is attempting to make the use of any copper or high zinc leaching materials for buildings and structures a non-complying activity, to discourage new sources being added to the urban area.

It is expected (without any regulation) that over time the like for like replacement of the existing older galvanised iron building roofs in Pleasant Point will occur with COLORSTEEL™ or other roof products which will reduce Zinc leaching and loads to the environment. Education and incentives could make this transition more rapid and reliable.

Toxicity of Stormwater Contaminants

Stormwater is inherently "flashy" – both in relation to flows and concentrations of contaminants. Occasionally concentrations will have very high peaks, however these flush through quickly and could have limited effect on biota as stormwater discharges are intermittent and exposure to high concentrations will be temporary.

Schedule 5 of the LWRP includes standards associated with the protection of species from metal toxicants. These standards are based on the ANZECC 2000 guideline default values (without adjustment of hardness). The guidelines have been updated and have become ANZG 2018. A report commissioned by ECan and prepared by the National Institute for Water and Atmospheric Research (NIWA 2017 [22]) contains advice on the proposed changes and the application of the guidelines with respect to stormwater management.

Section 4 of the NIWA 2017 report advises:

- The ANZECC guidelines [now ANZG 2018] are most appropriate for assessing long-term risk because they are based on chronic toxicity data. There are currently no New Zealand guidelines to protect against short-term effects (acute toxicity).
- Stormwater discharges are intermittent and therefore represent an acute risk, so the chronic-based ANZECC guidelines may not always be appropriate for stormwater management). However, the potential exists for the discharges to increase chronic risks because a) the repeated nature of the discharges means that organisms may not be able to fully recover from one event before the next event occurs and b) metals from the stormwater can build-up in sediment, representing an on-going source to the water column, exacerbated under low oxygen conditions.

Given the ephemeral nature of both Pleasant Point Stream and German Creek, the discharge of heavy metals in stormwater from the SMA is unlikely to result in toxic effects within these waterways. Of more relevance however is that metals accumulated in sediment within these waterways can represent an on-going source to the water column and in particular the Ōpihi River, if these contaminants are mobilised during large rainfall events. The effects on sediment quality are discussed further below.

In order to meet the SMP objectives to manage urban stormwater for improved ecosystem health and the outcomes set for the receiving streams, mitigation measures, such as first flush treatment for all new developments will be required. This will likely use a combination of treatment devices to achieve a general 75 % contaminant removal efficiency.

[22] NIWA (2017). *Copper and zinc aquatic toxicity: Frequently Asked Questions.* Prepared for Environment Canterbury May 2017

There is expected to be some benefits in a reduction of loadings, associated with the industrial site auditing programme and improvements in industrial site management.

Retrofitting treatment in redevelopment, improvements in industrial site management and roof renewals will all contribute to improving water quality however it is difficult to provide more than a qualitative assessment of these benefits.

In evaluating capital works projects the existing CLM can be utilised to estimate load reduction benefits where source control or treatment systems are being considered. It may be the case that other capital projects are evaluated as achieving greater gains towards targets and a wider range of the objectives for Pleasant Point.

The monitoring plan includes monitoring of wet weather surface water quality. Baseline monitoring is proposed, and data collected will be used to set numerical trigger values and to further assess the impacts of stormwater contaminants on surface water quality. This will ultimately assist TDC to prioritise projects and set aside funding to achieve the SMP objectives.

Overall, it is considered that the proposed management of existing and future discharges from the SMA will result in an improvement in stormwater quality from the SMA and the measures proposed by TDC should result in reducing the impacts on surface water quality in the long term.

Sediment Quality

Sediments provide habitat for many benthic and epibenthic organisms, and they also influence the environmental fate of many chemical substances in aquatic ecosystems by acting as both sinks and sources of substances that have entered the aquatic environment.[23] Many substances form associations with particulate matter and are eventually incorporated into bed sediments[24]; consequently, sediments may also act as long-term sources of these substances to the aquatic environment.[25] [26] [27]

Sediments can have a profound influence on the health of aquatic organisms, which may be exposed to toxicants through their immediate interactions with bed sediments, e.g., sediment-associated contaminants may cause acute and chronic toxicity to aquatic organisms and may inhibit the presence and health of benthic biota that would otherwise inhabit these sediments.

Sediments from Pleasant Point Stream and German Creek were analysed for a range of typical stormwater contaminants at two sites within each watercourse, during summer and winter. The location of the monitoring sites, methodology used, the results and a discussion of these results is presented in the PDP Baseline Environmental Assessment report (attached as Appendix 7).

The analysis of sediment quality was based on measuring concentrations of contaminants in sediment to ANZG (2010) toxicant Default Guideline Values (DGVs) and Guideline Values - High (GV - Highs).

Results for German Creek indicated that only exceedances of the DGVs occurred at the downstream monitoring site for arsenic (in winter) and Total Petroleum Hydrocarbons (in summer).

For Pleasant Point Stream, arsenic concentrations exceeded DGVs at the upstream site in both winter and summer and at the downstream site only in winter. It is noted that the upstream site is

[23] Canadian Council of Ministers of the Environment (CCME) 1995: Protocol for the Derivation of Canadian Sediment Quality Guidelines for the Protection of Aquatic Life. CCME EPC-98E.
[24] Allan, R. J. 1986: *The role of particulate matter in the fate of contaminants in aquatic ecosystems*. Sci. Ser. 142. Inland Waters Directorate, National Water Research Institute, Burlington, Ontario.
[25] Larsson, P. 1985: *Contaminated sediments of lakes and oceans act as sources of chlorinated hydrocarbons for release to water and atmosphere*. Nature 317:347–349.
[26] Salomons W.; De Rooij N.M.; Kerdijk H.; Bril J. 1987: *Sediments as a source for contaminants*. Hydrobiologia 149.
[27] Loring, D. H.; Rantala, R.T.T. 1992: *Manual for the geochemical analysis of marine sediments and suspended particulate matter*. Earth-Science Rev. 32: 235.

located close to a timber treatment facility and discharges from this site may be resulting in elevated concentrations at this site. Lead concentrations at both sites were recorded above DGVs during both winter and summer. Zinc concentrations was the only metal above GV-High at both sites in winter as well as summer, with concentrations highest at the upstream site. TPH concentrations were above GV-High at both sites in summer and winter.

As part of the proposed Monitoring Plan, sediment in both Pleasant Point Stream and German Creek mainly during dry weather with a wet weather comparison will be monitored for a range of stormwater contaminants including hydrocarbons and heavy metals. Aquatic sediment quality-based trigger levels have been set, in light of the sensitive downstream Ōpihi river, that will require actions to be taken if these trigger levels are exceeded. These actions include establishing the extent of the contamination, potential sources and remedial actions that could be implemented to reduce the impacts resulting from these contaminants.

8.6.5 Cumulative and Summary Effects

The baseline assessments, contaminant load model and analysis of the effects of stormwater contaminants on surface water quality have identified that the key issue with these discharges relates to the discharge and deposition of contaminated sediments in the receiving waterways. In particular, contaminant loads from the Pleasant Point Stream Catchment produce the highest loads within the SMA and consequently high concentrations of metals in sediments within the bed of this stream have been detected through baseline monitoring.

While the impacts of these contaminants on Pleasant Point Stream and German Creek are considered to be less than minor due to the ephemeral nature of these waterways and the low ecological values that they support, accumulated contaminants in the beds of these waterways can become mobilised during larger rainfall events and therefore could act as a source of contaminants to the Ōpihi River.

The key objectives and targets of the SMP have been designed to address this risk, while information obtained from monitoring will inform decisions about actions that may be needed to manage this effect. Mitigation measures proposed in the SMP (e.g. site risk assessments, adopting source control measures, stormwater bylaw and design guidelines for stormwater systems) are also likely to improve the quality of discharges from the SMA and reduce the amount of contaminants discharging into the environment over time.

On this basis, it is considered that the discharges from the SMA are likely to have no more than minor adverse effects on surface water quality and aquatic ecology.

8.7 Effects on Natural Wetlands

There are no existing discharges to natural wetlands within the Pleasant Point SMA. One potential natural wetland is located within the SMA. This application does not seek to discharge either construction phase stormwater or stormwater from the network directly to any natural wetlands, therefore the effect on wetlands is considered to be negligible.

8.8 Effects on Te Rūnanga o Arowhenua Values and Use

8.8.1 Overview

The association of Te Rūnanga o Arowhenua to the Pleasant Point area and greater Ōpihi catchment has been acknowledged in Section 4.4 of the AEE. Of particular significance is its history for mahinga kai area which today includes the Ōpihi Mātaitai Reserve status.

Te Rūnanga o Arowhenua consider the waterbodies in the Ōpihi river catchments are degraded and that contaminants from stormwater discharges are contributing to this degradation. Fundamentally, it is considered that the SMP should ensure that further decline in water quality

and ecological health of these waterways is avoided amidst further development within the catchment.

The ability to safely consume mahinga kai species like Tuna (eel) is of significance to Arowhenua, with the health of the water directly affecting the health of the species and in turn those who might eat them. This is evidenced by NIWA 2010a [28] who undertook an analysis of organochlorine concentrations and heavy metals; on fish tissue, watercress, and sediments in catchments throughout the Arowhenua rohe. This included three sites on the Ōpihi River (upsteam of SH1 Downstream of SH1 And at the river mouth (horseshoe bend) and one on the Te Uma kaha (Temuka River). The following are two just two extracts from the NIWA conclusions:

- Contaminant analysis indicated differential uptake of specific contaminants by different species. For example, watercress recorded much higher levels of cadmium, nickel, chromium, lead, zinc and copper than fish. Eel tissue had the highest concentrations of DDT, PCBs and mercury, whereas arsenic levels were highest in trout tissue;
- Sediment metal concentrations were below ANZECC guidelines, with one exception. Doncaster recorded a value of 220 mg/kg for zinc, just above the low ISQG low guideline value of 200 mg/kg;

Following the investigation NIWA 2010b [29] undertook a risk assessment based on available contaminant data and using established US EPA formulae to assess the risk of harvesting contaminated kai within the catchment. Furthermore, a risk assessment was performed for each species harvested from each site to gain an understanding of potential "hotspots" in the catchment. Contaminants found to be contributing most to this risk were p,p'-DDE, dieldrin arsenic and mercury.

NIWA 2010b stated in the executive summary that in terms of the whole catchment, if harvesting was carried out randomly across all sites and consumption rates were as calculated from the questionnaire data, then there is no significant risk to those consuming the species. However, if harvesting were to occur predominantly at the most contaminated sites and consumption rates were as calculated from the questionnaire data, then a significant risk exists for consumption of eel. Trout are also a probable cause for concern with safe consumption limit being virtually the same as the consumption rate. The risk of eating eels was greater than other species, with 8 out of 10 eels sampled allowing for less than 4 meals per month, which is less than 1 meal per week.

The Cultural Values AEE (refer Appendix 4) states that management and planning going forward will require restoration and sensitivity to the environment and cultural needs to protect and enhance the Mauri of the waterbodies in the Pleasant Point and wider Ōpihi catchment.

TDC has collaborated with Arowhenua on establishing a vision, objectives and targets for stormwater management and the receiving environment for this application. These have been included in the Stormwater Management Plan accompanying this AEE.

8.8.2 Mahinga Kai - Resources, Consumption and Access

The following objective is proposed for the consent:

- Objective: Progressively reduce the acute and cumulative impacts of the stormwater network and stormwater discharges on waterbodies connected to and within the Ōpihi Mātaitai downstream of Pleasant Point so the habitat is healthy and suitable for safe mahinga kai harvesting, and the mahinga kai species are safe to eat.

[28] NIWA 2010a. *Contaminants in Kai – Arowhenua rohe Part 1: Data Report*. Prepared for Te Runanga o Arowhenua & Health Research Council of New Zealand
[29] NIWA 2010b. *Contaminants in kai – Arowhenua rohe Part 2: Risk Assessment*. Prepared for Te Runanga o Arowhenua & Health Research Council of New Zealand

The other targets to improve and maintain the health of the waterways associated with the SMA such as sediment cover and quality, macroinvertebrate and fish communities, and riparian margin improvements will also contribute to meeting this objective.

With respect to the above objective this includes a specific target of "No human source incidents of E.coli concentrations entering waterways via the stormwater network (e.g. through cross connections or wastewater overflows)" This is set from the commencement of the consent. The Monitoring Plan includes E.coli sampling during wet weather sampling, and faecal source tracking for the first 2 years. TDC has recognised that there may be a need to add further cultural indicators and that these will be developed with Te Rūnanga o Arowhenua over time.

8.8.3 The Relationship and Ki Uta Ki Tai

As well as the vision, objectives and targets to improve and maintain the health of the waterways associated with the SMA, the following objectives have been included in the consent conditions:

> *Recognise and respect mana motuhake – the whakapapa and the relationship Kati huirapa have with water ecosystems in their rohe and actively involve them in stormwater management.*
>
> *TDC advocate for ki uta ki tai (from the mountains to the sea) in Te Uma Kaha catchment during TDC's involvement as a stakeholder and regulator in RMA and LGA processes*

The first objective does not have a target, rather its specifies that proposed consent conditions need to secure Arowhenua involvement in revisions to the SMP, Monitoring Plan and the targets that will form part of the consent or its implementation (i.e. SMP).

The second objective does not have a target either. However, it is recognised that there may be a role for TDC in decisions around wider management of the catchment in which the water flows and that this will be looked at in the SMP process but also wider in matters such as RMA planning processes. Such as TDC advocating in wider matters to improve the environment to better sustain mahinga kai so it is generally at or closer to a state of hauora (robust and healthy enough to take knocks).

The SMP implementation plan project identification process for TDC's stormwater management LTP / Annual plan budgets includes the opportunity for projects of importance to Arowhenua as part of a working group to be put forward. Cultural weightings will be part of the evaluation criteria and review of all projects by Arowhenua.

8.8.4 Summary

In summary the effects of the past, and present stormwater discharges within the catchment on the values of Arowhenua are considered to be significant.

TDC has collaborated with Arowhenua, through AECL over the last year on the development of SMPs and processes to allow ongoing active participation of Arowhenua in the future management of stormwater in Pleasant Point.

The SMP assumes an improvement over time in order to meet the objective and visions. It is considered that should the consent and accompanying SMP process be implemented this will mean that over time the issues raised by Arowhenua will be diminished or addressed.

8.9 Effects on Flood Carrying Capacity and Hazards

No significant flooding issues have been identified in the Pleasant Point SMA that require immediate addressing or retrofitting of large scale attenuation systems.

The network capacity assessment highlighted the potential need for increased capacity in the Pleasant Point stormwater network to reduce the frequency of predominantly nuisance flooding in parks, roads, and private properties.

The following objective and targets is proposed to form part of the consent with respect to stormwater quantity management:

- **Objective:** Stormwater is managed so that run-off from urban areas, the primary stormwater network and overland flow paths, does not exacerbate the flooding, erosion or damage to property or infrastructure or cause risks to human safety.
- **Target 1:** Zero flooding for rain events up to a 1 in 5 year return for residential zones, and a 1 in 10 year return for commercial and industrial zones.
- **Target 2**: Zero deaths and notified injuries from stormwater runoff

TDCs approach to managing future long-term flooding risks and meeting Targets 1 and 2 is yet to be developed but is likely to include but not be limited to:

- Incorporating hydraulic neutrality in the design of new stormwater systems to match pre-developed runoff rates.
- Requiring the allowance for climate change to be built into designs and groundwater level assessment.
- Development of an effective maintenance programme to prevent debris blockages and sediment build-up.
- Develop an accurate hydraulic model of the townships network and interactions with waterways to identify areas and evaluate options/solutions for improvements to address nuisance flooding effects and any downstream impacts, and to ensure that mitigation for new development and any other implementation improvement projects are effective.
- Identify, define and protect overland flow paths.

The development of a hydraulic model for the SMA is a proposed condition of the consent and part of the target for dealing with climate change.

With the implementation of the above stormwater management measures, it is considered that there are no significant actual adverse effects or potential cumulative effects on the flood carry capacity of either German Creek or Pleasant Point Stream as a result of the proposed stormwater discharges from the urban areas.

Overall, it is considered that with the investigations and implementation methods proposed the proposal will have no more than minor adverse effects on flood carrying capacity and hazards within the SMA and downstream.

8.10 Effects on Social (Amenity and Recreational) Values

Stormwater management systems can impact on the amenity of an area, as they are generally associated with engineered structures, which can be visually unappealing. In addition, stormwater management systems have been known to create odour in locations where stagnant pools form.

Stormwater from the Pleasant Point SMA currently either discharges to land via informal swales and soakpits or to Pleasant Point Stream and German Creek from a number of outfalls. German Creek predominantly flows through privately owned farmland, except where it flows through a golf course. Pleasant Point Stream however does flow alongside a primary school and through a recreation reserve and playground.

While both waterways are ephemeral and dry except during heavy rainfall events, access to the Pleasant Point Stream through the reserve area, could result in the public coming into contact

with accumulated stormwater contaminants in bed of the stream when it is dry. Monitoring of stream bed sediments is proposed to determine the extent and risk resulting from these deposited sediments.

An objective has been set that requires that "*Stormwater impacted sediment in Pleasant Point Stream in public areas is not a risk to human health*". Trigger levels have been set using nationally recognised parks/recreational soil contaminant standards. Other measures, such as riparian planting have also been considered and may be implemented to limit access to the stream bed.

The surface waterways will also be visually inspected during monitoring to determine if the discharges are having any visual or aesthetic effects (e.g. changes to water clarity and colour, the presence of oil, grease, floatables, scum or suspended solids).

While both Pleasant Point Stream and German Creek are subject to Class ŌPIHI standards, these waterways are not used for either fishing or contact recreation due to their ephemeral nature.

8.10.1 Summary

Given the objectives set for the Pleasant Point SMP focus on reducing contaminant loads discharging to the receiving waterways and on mitigating any risks to public health from contaminated sediment within the bed of Pleasant Point Stream, it is considered that the proposal will have less than minor effects on amenity and recreational values.

8.11 Effects on Wider Community

The management of stormwater undertaken by TDC for Pleasant Point has provided and will continue to provide social benefits as the network reduces flooding of properties and avoids flooding of habitable dwellings, and heritage buildings. The network service to the community is in line with TDC jurisdictional functions under the Local Government Act.

The proposal to implement integrated stormwater management practices through this network consent will result in the following social benefits for the residents of Pleasant Point, the wider community and key stakeholders within the community:

Reduction in Financial Costs

- Removing the need for multiple resource consents, will reduced compliance costs and administration costs for TDC and ECan respectably.
- Reduced consenting costs to developers who will gain approval to be authorised by the discharge permit.
- Reduced costs to key stakeholders by not having to review and comment or submit on individual applications lodged.
- Reduced ad-hoc development and stormwater system development, through consistency of stormwater design, opportunities to centralise stormwater systems for multiple small development, which can lead to reduced operational and maintenance costs.
- Overall reduction of costs by linking the processes required under the RMA with those required under the LGA, thereby reducing duplication of effort.

Management

- Assists the TDC in recognising the stormwater related impacts of land-use activities within catchments and on their reticulated system.
- SMP's provide an important source of consolidated information for long term asset management and land use planning and for financial programming.
- Assists in developing 'best practice' management strategies and programmes to address those impacts at the catchment level.

- Providing greater flexibility for the management of each 'system' to enable innovation and adoption of improvements to stormwater management and design and knowledge of impacts.
- Providing greater security and certainty for administration by giving Territorial Authorities the overall control of stormwater discharges within catchments.

It is considered the social effects on the wider community of having a reticulated stormwater network and a more inclusive scope (some activities not connected to the network) is overwhelmingly positive.

9 Consideration of Alternatives

9.1 Overview

Schedule 4 (6)(1)(d) of the RMA requires for discharges of any contaminant, the AEE must also consider the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and any possible alternative methods of discharge, including discharge into any other receiving environment.

9.2 Alternative Receiving Environments

Considering alternative receiving environments for the existing development within the SMA is not a feasible option due to the amount of investment in the existing stormwater network asset, the lack of greenspace flat catchments, and soil permeability and groundwater level site constraints

Where areas of new greenfield development occur, and is considered suitable for long term land disposal, discharging to surface water would be discouraged.

9.3 Alternative Mitigation Methods

Source control can provide significant reductions in existing urban areas metal loads to improve surface water quality. The objectives have a focus on source control rather than specifying treatment at the point of discharge.

The proposed district plan has provisions to require a resource consent for zinc and other metal leaching materials. This is still subject to a district plan notification and decision process. The NRA identification and audit process is expected to achieve some gains in contaminants load reduction.

Also targeting specific problem catchments for treatment which have been identified by the CLM assessment is seen as the best approach to achieve the objectives set for the SMA. Particular measures such as remediating contaminated stream sediments could reverse some of the impacts on the receiving environment leading to achievement of the set objectives and targets.

10 Statutory Planning Matters

10.1 Overview

Section 104(1) of the RMA sets out those matters in addition to the actual and potential effects on the environment that the consent authority must have regard to when considering an application for resource consent as follows:

> *Subject to Part 2*
>
> *[..]*
>
> *(b) any relevant provisions of—*
>
> *(i) a national environmental standard:*
>
> *(ii) other regulations:*
>
> *(iii) a national policy statement:*
>
> *(iv) a New Zealand coastal policy statement:*
>
> *(v) a regional policy statement or proposed regional policy statement:*
>
> *(vi) a plan or proposed plan; and*
>
> *(c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.*

In relation to the statutory instruments referred to in 104(1)(b), the following are considered to contain provisions relevant to this application (in order of precedence):

- National Policy Statement for Freshwater Management 2020 (NPSFM)
- Canterbury Regional Policy Statement 2013 (RPS)
- Ōpihi River Regional Plan 2000 (ORRP)
- Canterbury Land and Water Regional Plan 2017 (LWRP including PC7)

For the avoidance of doubt, it is considered that the:

- NES for Freshwater 2020 does not apply to the proposal to discharge construction phase stormwater and stormwater as the wetland subpart does not control the 'discharge of contaminants". No existing stormwater infrastructure is located within 100 m of or within a natural wetland. Potentially if future specified infrastructure relating to stormwater management may be located near potential natural wetlands, a planning assessment would determine the applicability of the NESFW for construction and maintenance activities when and if required.
- NES for Sources of Human Drinking Water 2007 does apply as the Community Drinking Water Protection Zones (CDWPZ) for four community supply bores overlap the SMA. Three of these bores are owned by TDC and are located over 500 m cross-gradient of the SMA. The contaminant transport modelling assessment conducted by PDP indicated that these bores are unlikely to be at risk from stormwater discharges from the SMA. In addition, TDC has advised that water abstracted from these bores are treated by UV and chlorination. Wate quality is monitored and is fully compliant with the NZDWS. The modelling assessment by PDP also indicated that the risks to the down-gradient bore not owned by TDC were negligible as the extent of microbial contamination from stormwater discharges to land within the SMA

would only extend to between 82 – 126 m from the SMA. This bore is located approximately 226 m from the SMA. It is therefore considered that the risks to community supply bores from stormwater discharges from the SMA have been adequately assessed and shown to comply with the requirements of the NES for Sources of Human Drinking Water 2007.

In relation to the 'any other matter' referred to in 104(1)(c), the following documents are considered to contain provisions (objectives and policies), relevant to this application:

- Te Rūnanga o Ngāi Tahu Freshwater Policy Statement 1991 (NTFPS)
- Iwi Management Plan of Kati Huirapa for the area Rakaia to Waitaki 1992
- Draft Kati Huirapa Iwi Management Plan (2020)
- Timaru District Stormwater Management Strategy 2018 -
- Canterbury Water Management Strategy

In determining this application that includes a discharge activity the following sections of the RMA are applicable

- Section 104B/D
- Section 104G
- Section 105
- Section 107

The relevant statutory instruments, other documents, and Part II in relation to the proposal is discussed in the subsections below.

10.2 National Policy Statement for Freshwater Management 2020

The NPSFM 2020 is a replacement of the NPSFM-2017 that applied at the time of the applications lodgement. The NPSFM-2020 took effect on the 3rd of September 2020.

The NPSFM-2020 now provides the most up to date direction to local authorities on how they should manage freshwater under the RMA 1991.

Underpinning the NPSFM 2020 is the "fundamental concept" of Te Mana o te Wai. There is a hierarchy of obligations in Te Mana o te Wai and Objective 2.1 which is to ensure that natural and physical resources are managed in a way that prioritises first, the health and well-being of water bodies and freshwater ecosystems. It then priorities second, the health needs of people, and third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

The regional LWRP provisions have been drafted to give effect to the NPSFM 2017 and its predecessors. The provisions of the regional LWRP have not yet commenced review as to how they do or do not give effect to the NPSFM-2020. This includes the consent authority needing to:

- Engage with communities and tangata whenua to determine how Te Mana o te Wai applies to the waterbodies and freshwater ecosystems
- Develop long term visions for freshwater
- Actively involve tangata whenua (to the extent they wish to be involved) in freshwater management; and
- Adopt a ki uta ki tai, integrated approach

The necessary plan changes to give effect to the NPSFM require the Consent Authority by way of a notified plan change by 2024.

The LWRP PC7 decision on submissions released on the 17 November 2021 includes changes to the sub-regional Chapter 14 for the Orari-Temuka-Ōpihi-Pareora (OTOP). This decision was prepared under the NPSFM 2017, the NPSFM being only in draft. PC7 did include (but not limited to) provisions for managing freshwater quality; and for protecting of sites of cultural significance., including mahinga kai sites. This decision has been appealed by several parties including Te Rūnanga o Ngāi Tahu and Te Rūnanga o Arowhenua. The Ngā Rūnanga appeal was for various reasons but fundamentally that the decision did not provide for Te Mana o te Wai

This consent application is prepared in advance of both Environment Canterbury giving full effect to the NPSFM-2020 through a notified plan change, and also the appeals to the PC7 decisions being resolved. This means substantive decisions on this application the consent authority must have regard to the objectives and policies of the NPSFM-2020. It is suggested, this should be focused on the direction of the NPSFM-2020 and the concept of Te Mana o te Wai.

In looking at this application with Arowhenua it has been understanding whether the water bodies in the catchment are at or close to a state of hauora (typically health but also expressed by Ngā Rūnanga as being robust and healthy enough to take knocks) and if not what that state looked like previously and the stepped level of change over time to achieve this status. This approach is considered also key to giving effect to the first priority being the health and well-being of water bodies is or can be provided for. It should be acknowledged that it may be the case that achieving hauora (and therefore provide for the mana of the water body) may not be possible over the duration of the consent sought. It is also recognised that the discharges from the Pleasant Point stormwater catchment is also not the only source of contaminants affecting the receiving water environment and the health of the waterbodies that these waterways flow into.

An assessment of the proposal against the NPSFM each of the relevant policies is provided in Appendix 12.

It is recognised that the waterways within the wider Opihi River catchment including German Creek and the Pleasant Point Stream are not in a state of hauora. Within this context, the proposal needs to be considered on the basis of what is occurring within the wider catchment and the nature and scale of the discharges from the SMA. The application also applies an adaptive management approach, with TDC continuing to work collaboratively with Te Runanga o Arowhenua and the wider community to improve stormwater management practices, thereby reducing the impacts of stormwater from the Pleasant Point SMA. It is therefore considered that overall, this proposal is consistent with the objective of the NPSFM, and generally gives effect to the policies of the NPSFM.

10.3 Canterbury Regional Policy Statement 2013

The RPS was made operative on 15 January 2013. Subsequent amendments and insertions have occurred since. The current version is dated October 2020.

An assessment of the relevant land-use and infrastructure, and freshwater, objectives and policies of the RPS to this application are provided in Appendix 12.

It is considered that the implementation of the SMP and associated discharge consent (if granted) will allow consistency with the identified RPS land-use and infrastructure objectives and policies, and that the proposal is consistent with the freshwater objectives and policies of the RPS.

10.4 Regional Plans

The Ōpihi River Regional Plan (ORRP) is still operative and relates to discharges to surface water. Plan Change 7 to the LWRP involves adding new Ōpihi River catchment provisions into sub-regional Section 14 (Orari-Temuka- Ōpihi-Pareora) and then withdrawing the ORRP. The decisions on PC7 have been appealed so this process has been delayed.

The LWRP plan has been operative since 2017 and the operative components apply to discharges to land. Chapter 14 Orari-Temuka-Ōpihi-Pareora (OTOP) sub-region (being the sub-regional for this application) has been subject to a Plan Change #7 which will apply to the discharges to surface water.

The LWRP PC7 decision for OTOP would insert new provisions for managing land use; for managing freshwater quality and quantity (including abstractions, allocation of freshwater, and minimising nutrient losses from farming activities); and for protecting of sites of cultural significance in that sub-region (including certain rock art sites (tuhituhi neherā) and waipuna (springs)). The decision would divide the OTOP sub-region into six freshwater management units (FMUs). There are FMUs specifically for the Temuka River, and the Ōpihi River, and their tributaries. This version has legal weight but is subject to appeals.

An assessment of the proposal against the relevant individual objectives and policies of the ORRP and LWRP are provided in Appendix 11.

The application sets objectives and targets to be generally consistent with the objectives policies of the LWRP and PC7 version that is under appeal.

Policy 4.16 is particularly relevant to this application as it requires stormwater network operators such as TDC to adopt a holistic and integrated approach to managing stormwater discharges within stormwater catchments to meet water quality outcomes and objectives. The policy also recognises that discharges into the receiving environment from existing networks have resulted in effects on these environments and states that network operators should demonstrate a commitment to progressively improve the quality of discharges to achieve water quality outcomes.

TDC is proposing to manage stormwater from the SMA in an integrated manner by providing a reticulated network to manage stormwater quantity and quality for the community. The proposal including the SMP is based on an adaptive management approach to achieving objectives developed through consultation and engagement with the community and key stakeholders, such as Te Runanga o Arowhenua. The approach will allow TDC to prioritise actions and projects and monitor the effectiveness of any measures implemented over time. On this basis, it is considered that the proposal is consistent with the requirements of this guiding policy.

10.5 Iwi Management Plans

Iwi Management Plans (IMPs) must be taken into account when preparing or changing regional policy statements and regional and district plans (sections 61(2A)(a), 66(2A)(a), and 74(2A). Iwi Management Plans (IMPs) can be used in the resource consent process to provide guidance to decision makers in particular the relevant Part 2 matters pertaining to Māori cultural values and interests (section 104(1)(c)) and highlight any other matters important to the tangata whenua of the district/region that may be relevant and necessary to determining the application. [30]

At the time of preparing the AEE, Kāti Huirapa had prepared a proposed IMP. As this has not been lodged with the relevant council(s) this has not been taken into account. This consent application has been prepared in collaboration with Arowhenua and the information and analysis that they have indicated that the information and analysis that they have provided has been cognisant of the proposed IMP.

An assessment of the proposal against the Te Rūnanga o Ngāi Tahu Freshwater Policy, and the current Iwi Management Plan of Kati Huirapa (1992) and draft Proposed Kati Huirapa Iwi Management Plan (2020) is provided in Appendix 12.

[30] https://www.qualityplanning.org.nz/node/1015

Overall given the collaboration, SMP implementation processes and the setting of consent objectives and targets this means that the proposal is generally consistent with the IMPs.

10.6 Strategies

10.6.1 TDC Stormwater Strategy

The stormwater strategy aims to provide direction to TDC's decision-making on stormwater using an integrated management approach. The Strategy establishes TDC's stormwater management vision and goals for the next 30 years and beyond; and what TDC will do to achieve those goals. The Strategy includes objectives which are the detailed, measurable statement of the goals

Potentially the vision and other objectives developed with AECL for Pleasant Point and other townships will be used in an update to this Strategy document.

An assessment of the proposal against the Strategy objectives is provided in Appendix 12.

The application is considered to be consistent with the objectives of the strategy.

10.6.2 Canterbury Water Management Strategy

The CWMS is not a policy statement or plan prepared under the RMA, and it cannot override the provisions of the RMA or the statutory policy statements and plans prepared under that Act. However, the Council may have regard to other relevant strategies or plans in preparing the Regional Policy Statement and any regional plans and this could include Regional and Zone Implementation Plans. The CWMS vision, principles and targets are integral to promoting the sustainable management of water under the RMA, and as such have been incorporated into the objectives and policies of this chapter of the CRPS, where they meet the requirements of the RMA.

In addition, the Zone Implementation Plans (ZIP) prepared by the CWMS committee may identify matters which that committee would like to be addressed in a plan prepared under the RMA. An addendum to the OTOP ZIP was released in time for the PCA process in December 2018. [31]

The Canterbury Regional Council PC7 will also have considered components of the ZIP by where the council agrees it is necessary to achieve the purpose of the RMA and the request complies with the other statutory requirements of the RMA.

It is considered that the RPS and more recent PC7 decision in principle has considered the requests of the CWMS Committees as such an assessment against

10.7 Part II

The overriding purpose of the RMA is "to promote the sustainable management of natural and physical resources" (Section 5). The broader principles (Sections 6 to 8) are to inform the achieving of that purpose.

When considering an application for a resource consent and any submissions received, the consent authority, must subject to Part 2, have regard to those matters listed under Section 104 of the RMA.

With regards to the application of the subject to Part 2' under Section 104, case law findings have directed that decision makers / Commissioners may now only have recourse to Part 2 of the RMA if it is determined that one of three exceptions apply:

1 If any part or the whole of the relevant plan(s) are invalid;

[31] Orari-Temuka-Opihi-Pareora Water Zone Committee. *Orari-Temuka-Opihi-Pareora Zone Implementation Programme Addendum*, December 2018.

2 If the relevant plan(s) did not provide complete coverage of the Part 2 matters;

3 If there is uncertainty of the meaning of provisions as they affect Part 2

In essence what this means is that decisions makers only need to 'go back to' Part 2 of the Act if the relevant planning documents have not fully addressed the Part 2 matters. If a Regional or District Plan has not fully addressed the Part 2 matters, then decision makers can 'go up the tree' to the RPS and then any relevant NPS in relation to any Part 2 matters.

Plans, which have to "give effect" to the higher order statutory planning documents (RPS and NPSs), should have appropriately addressed Part 2 of the RMA.

With the exception of possibly the ORRP (given it is 20 years old and has not been subject to previous amendments), it is considered that none of the three exceptions listed above apply and that the Part 2 matters have adequately been addressed through the RPS, and LWRP. Based on the assessment of the proposal being consistent with the RPS and LWRP as per above, the proposal is considered to be consistent with Part 2 of the RMA.

Considering PC7 and fundamentally giving effect to the NPSFM 2020 would deal with any inadequacies to the ORRP.

10.8 Determination of Applications

10.8.1 Section 104/B/D

Section 104B of the RMA relates to the determination of applications for discretionary or non-complying activities and directs that Council may grant or refuse the application and may impose conditions under Section 108 of the RMA.

Section 104D of the RMA sets out particular restrictions for non-complying activities and provides that a consent authority may only grant a resource consent for a non- complying activity if it is satisfied that either of the tests provided for in sections 104D(1)(a) or (b) is met.

Section 104D(1)(a) and (b) have been described by the Environment Court as "gateways". If neither gateway is satisfied, the application fails. If the application satisfies either gateway, then the application is considered under Section 104 of the RMA. The gateways of Section 104D(1)(a) and (b) are disjunctive, meaning that in order to satisfy section 104D it is necessary to satisfy only one of these gateways, not both.

With respect to Section 104D(1)(a), the adverse effects of the activity on the environment are described in this AEE Report. With respect to Section 104D(1)(b), the relevant objectives and policies have been assessed in this AEE Report.

It should be noted that the case law regarding whether a proposal is "not contrary to" objectives and policies means that a proposal is not "repugnant to" or opposed to the relevant objectives and policies[32]. It is also important to note that those objectives and policies in plans need to be read collectively rather than individually[33]. In other words, the objectives and policies are not a series of hurdles each of which must be cleared.

The regional plan statutory assessment shows that overall the proposal is generally consistent with the objectives and policies.

[32] Monowai Properties Ltd v Rodney DC A215/03
[33] NZ Rail Ltd v Marlborough DC (1993) 2NZLR 641

10.8.2 Section 104G

Under Section 104G of the RMA when considering an application for a resource consent, the consent authority must have regard to

- the actual or potential effect of the proposed activity on the source of a drinking water supply that is registered under section 55 of the Water Services Act 2021; and
- any risks that the proposed activity may pose to the source of a drinking water supply that are identified in a source water risk management plan prepared in accordance with the requirements of the Water Services Act 2021.

The Community Drinking Water Protection Zones (CDWPZ) for four wells overlap the SMA. These zones are based on microbiological risk which is expected in this case to be considerably higher compared to the toxicant risks in stormwater discharges (as demonstrated in Table 8:1). Three of these bores are owned by TDC. Drinking water from these bores is treated and monitoring of water quality indicates compliance with water quality standards. As discussed previously, the contaminant transport modelling indicates that the risk of contamination of a privately owned group/community drinking water bore located 226 m from the SMA is negligible.

10.8.3 Section 105

Under section 105 of the RMA, the consent authority must also have regard to:

- The nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
- The applicant's reasons for the proposed choice; and
- Any possible alternative methods of discharge, including discharge into any other receiving environment.

These matters have been addressed in the 'Consideration of Alternatives' in Section 9 of this AEE report.

10.8.4 Section 107

Under Section 107 of the RMA, the consent authority must not grant a discharge permit allowing the discharge of a contaminant into water, or a discharge of a contaminant into land in circumstances that may result in that contaminant entering water, if, after reasonable mixing, the contaminant discharged is likely to give rise to all or any of the following effects in the receiving waters:

The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;

- Any conspicuous change in the colour or visual clarity;
- Any emission of objectionable odour;
- The rendering of fresh water unsuitable for consumption by farm animals;
- Any significant adverse effects on aquatic life.

None of the above effects will occur in the groundwater or a downgradient surface water body.

11 Conclusion

TDC provides an integrated reticulated network for the safe collection and disposal of stormwater from Pleasant Point and is responsible for ensuring the urban stormwater system provides an adequate level of service for the community.

TDC has prepared a Stormwater Management Plan (SMP) for these existing urban areas and a future urban growth scenario (the Pleasant Point Stormwater Management area (SMA)) which is primarily based on the operative District Plan extent with an update to the zoning associated with the prosed district plan. The SMP details an integrated and adaptive approach to the management of stormwater discharges from a catchment-wide perspective.

In association with the development of the Stormwater Management Plan (and supporting Implementation Plan and Monitoring Plan) TDC is applying for a discharge permit (or resource consent) to authorise the discharges from their reticulated stormwater network for these urban areas, and for any existing and future discharges from individual residential and commercial properties within the SMA (subject to risk and design criteria).

TDC has identified of current and foreseeable issues with stormwater management and the impacts on the environment in collaboration with AECL / Arowhenua. Consultation to flesh out these issues and concerns with stormwater management within the SMA has also been undertaken with the greater Pleasant Point community.

A vision and associated objectives and targets for Pleasant Point stormwater management and receiving environment have subsequently been developed by TDC in collaboration with AECL / Arowhenua. The Implementation Plan process that is to gives effect to Te Mana o te Wai and achieve the objectives is still being developed in collaboration with Arowhenua.

The assessment of adverse effects with respect to the discharges sought has been undertaken and concluded that, the effects on the environment excluding cultural values are no more than minor.

In summary the effects of the past, and present stormwater discharges within the wider Opihi River catchment, of which German Creek and Pleasant Point Stream are a part of, on the values of Arowhenua are considered to be significant. It is considered that should the consent and accompanying SMP process be implemented this will result in addressing the issues raised by Arowhenua.

With respect to adverse effects on shallow domestic drinking supply users impacted by the discharges could be also minor should they not have appropriate treatment. Ongoing engagement is occurring with well owners who have indicated that they are willing to provide a written approval.

In accordance with section 104(1)(b) of the RMA, regard has been given to all relevant objectives and policies for this application. It is considered that the granting of this resource consent will not compromise any of the relevant sections of the RMA (Part II, s105 and s107), National Environmental Standards, National Policy Statements or the Canterbury Land and Water Plan. Other matters including cultural policy have also been given consideration pursuant to section 104(1)(c).

It is considered that the application for a discharge permit can be granted, subject to the proposed conditions.

A duration of 35 years has been requested given the improvements sought and diminishing effects, the level of investment the former permitted status of the bulk of the discharges sought, the lack of alternatives and that the discharges cannot be ceased, it would seem appropriate to grant the maximum duration available under the RMA, namely 35 years.

Appendix 1
Pleasant Point Stormwater Management Plan

Appendix 2
WSP Network Capacity and Flood Mapping Assessment

Appendix 3
AECL Mana Whenua Impact Assessment

Appendix 4
Kitson Consulting Cultural Values

Appendix 5
PDP Contaminant Load Model Report

Appendix 6
PDP Contaminant Transport Assessment for Temuka (and Pleasant Point)

Appendix 7
PDP Baseline Environmental Assessment

Appendix 8
Proposed Conditions and Targets Schedule

Appendix 9
Drinking Water Supply Well Owners Consultation

A: Summary Tables - 1. Bores Potentially Affected and 2. Other bores / properties not in use, not domestic

B: TDC Consultation Material

Appendix 10
Pleasant Point Monitoring Plan

Appendix 11
PDP Non-residential Site Assessment

Appendix 12
Objectives and Policies Assessment

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