

**IN THE ENVIRONMENT COURT
AT CHRISTCHURCH**

**I TE KŌTI TAIAO O AOTEAROA
ŌTAUTAHU ROHE**

ENV-2018-CHC-290

UNDER	the Resource Management Act 1991 (RMA)
IN THE MATTER	of an appeal under Clause 14 of the First Schedule of the RMA in relation to the Proposed Second Generation Dunedin City District Plan (2GP)
BETWEEN	OTAGO REGIONAL COUNCIL Appellant
AND	DUNEDIN CITY COUNCIL Respondent

**AFFIDAVIT OF MICHELLE ELLEN MIFFLIN FOR THE APPELLANT IN
SUPPORT OF AN APPLICATION UNDER SECTION 293**

**ROSS DOWLING MARQUET GRIFFIN
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DUNEDIN**

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**AFFIDAVIT OF MICHELLE ELLEN MIFFLIN FOR THE APPELLANT IN
SUPPORT OF AN APPLICATION UNDER SECTION 293**

I, **MICHELLE ELLEN MIFFLIN**, of Alexandra, Central Otago, Manager Engineering, swear –

Introduction

1. I am the Manager Engineering for the Otago Regional Council.
2. I have held the position since July 2019.
3. I have I hold the qualifications of a Bachelor of Civil Engineering from the University of Southern Queensland, in Toowoomba, Queensland, Australia (formerly known as the Darling Downs Institute of Advanced Education up to 1990) and a Bachelor of Laws, from the Monash University, Melbourne, Victoria, Australia.
4. My experience includes:

I have over 20 years of engineering and management experience working in both local government and the private sector. During this time, I have been:

 - 4.1. Employed as the Manager of Engineering for the Otago Regional Council from July 2019 to present.
 - 4.2. Employed as the Project Manager for the feasibility investigations and management of Central Government (Crown Irrigation Investments Limited) funding for the upgrade to Falls Dam, by the Manuhierikia River Limited (2017– 2019).
 - 4.3. Employed as the South Island Operations Manager by PGG Wrightson, New Zealand for the delivery and installation of infrastructure, which included working on water delivery and storage schemes (2016 – 2017).
 - 4.4. Employed as the General Manager of Asplundh for the South Island, New Zealand for the strategic oversight and delivery of all aspects of the business (2015 -2016).
 - 4.5. Moved to New Zealand with my husband (2012 – 2015). During this time, I was an Associate Contracts Manager with Accenture Pty Ltd assigned to resources sector to manage client accounts, this role was a fixed term.
 - 4.6. Employed as the Global Contracts Delivery Manager for Sinclair Knight Merz, Australia, for where I had overall responsibility and authority for developing and managing the corporate contract function for project delivery in consulting and capital projects globally across the organisations business units (2010 – 2014).
 - 4.7. Employed as the Purchasers Representative for Carborough Downs Coal Mine, Australia, for the Supply of an integrated

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Longwall Mining System, valued at USD 330M. Responsible for the commercial delivery of the system including full financial delegation. (2007 – 2010).

- 4.8. Employed as Commercial Manager for United Group Infrastructure, Australia, for the commercial management of infrastructure projects in the construction sector (2004 – 2007).
- 4.9. Employed as the Senior Contracts Advisor for MIM Holdings, including internal Legal Counsel as a Lawyer for Oaky Creek Coal, Australia responsible for the delivery of projects relating to underground coal mining (2000 – 2004).
- 4.10. Employed as a Contract Engineer in the Coal Mining industry for MIM Holdings, Corporate based, Australia to work within Legal Counsel team preparing and managing contract drafting, negotiation, resolution including the delivery of contract delivery framework across coal mines (2000 – 1998)
- 4.11. Employed as Operations Engineer in the Coal Mining industry for BHP Coal, Australia at the Goonyella/Riverside Coal Mine for the purpose of providing operational engineering function to all activities relating to pit dewatering, reclamation, and rehabilitation of mining areas. This included looking after the coal mines fleet of pumping assets (1998 – 1994).
- 4.12. Employed as a Construction Engineer for John Holland Pty Ltd, Australia as a graduate engineering, working across major civil projects, including bridge builds, railway upgrades, dam construction, infrastructure plant building, underground coal mining civil works (1990 – 1994).

- 5. I am responsible for the management of the ORC's flood control works.
- 6. I am familiar with the Gordon Road Spillway and Floodway and their operation.

Gordon Road Spillway

- 7. The spillway is on the true right bank of the Silver Stream immediately downstream of the Gordon Road bridge at Mosgiel.
- 8. Approximately 700 metres of the true right bank is lower than the left bank.
- 9. The purpose of the spillway is to allow water to spill preferentially to the true right when the Silver Stream is in flood to ensure that the area of Mosgiel on the true left is unlikely to be flooded by the river.
- 10. Water begins to flow over the spillway when flows at the Gordon Road spillway exceed approximately 120 - 130 cumecs.
- 11. The channel just upstream of the Gordon Road Bridge is designed¹ to carry approximately 340 cumecs and approximately 176 cumecs

¹ Revised East Taieri Internal Flood Control and Drainage Scheme, Volume 1, 2nd Edition, Otago Catchment Board, 1974

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downstream of the Gordon Road bridge. Up to approximately 164 cumecs can spill into the Gordon Road Floodway.

Floodway

12. Water spilt over the spillway generally flows overland from the spillway towards the cut-off bank as indicated by **Exhibit A**.
13. The floodway comprises of a mix of rural land, residential properties and roads.
14. The cut-off bank is the eastern margin of the “*Upper Pond*” a holding area for floodwater from the Taieri River. There are culverts through the cut-off bank to the Upper Pond.
15. However if there is sufficient water in the Upper Pond, the flap gates on the culverts will close preventing flood waters from the Floodway entering the pond.
16. Consequently, water from the Silver Stream will form a pond behind the cut-off bank, which results in some properties being rural residential, located between Dukes Road South, Riccarton Road West and the Silverstream being flooded.

Management

17. Properties in the floodway area will flood when the spillway operates if there are prolonged heavy rain events or the Upper Pond and M4 drain is at capacity. The M4 drain is part of the ORC’s scheduled drainage network. The drainage network consists of a combination of modified natural watercourses and artificial watercourses. The M4 is an artificial watercourse within the drainage network.
18. The operational philosophy of the drainage network is to provide efficient and effective land drainage to the East Taieri area. The M4 drains surface and substrate² water towards the Silver Stream Pump Station. Refer to **Exhibit B** for the location of this drainage network.
19. Once the Silver Stream spillway starts spilling water, the cut-off bank restricts the movement of overland flows from the spillway into the Upper Pond. There is no mechanical infrastructure used in or associated with the operation of the floodway or the spillway.
20. ORC provides specific flood alerts to some residents as set out in the Flood Procedures Manual.
21. In addition, ORC’s webpages provide near real-time rainfall and flow data associated with the Silver Stream catchment. There is a Gordon Road spillway residents group. Its members know the specific webpages to monitor during rainfall events.

² Substrate refers to the water below the surface of the soil that drains into the scheduled drains. This allows the surface to be used for rural and residential activities as compared to remaining waterlogged and of natural state. Natural state of the Taieri Plain can be described as “the two lower thirds can hardly be called ‘terra firma’, being in fact, an immense grass – tree swamp, through which canals of black sluggish water wind ... interspersed with stagnant lagoons ... its level is not above that of the sea” by Dr David Munro, politician, and speaker of the House of Representatives (1844).

22. Members also express concern about flooding and have made suggestions for activities which ORC can undertake to reduce the impact of the spillway operating, such as gravel extraction from or deepening of the Silver Stream.
23. An investigation by the ORC was carried out in 2010 to identify options to reduce the flooding hazard in on East Taieri Plain, including in the Gordon Road Floodway. The results of the investigation report were presented to ORC Engineering and Hazards Committee on April 2010³.
24. The investigation concluded that the preferred approach to additional flood mitigation consists primarily of small-scale, physical works supported by land-use planning and control measures. Large-scale structural works are not preferred for mitigating flood hazard to the north side of the Silver Stream (including the Gordon Road floodway area), due to the difficulty in adequately mitigating all sources of flood risk in this area, and the high cost.
25. ORC holds occasional public drop-in sessions which residents attend.
26. Some residents who have moved into the area since 2017 have advised that they were unaware there is a flooding risk in this area.
27. Flood events are times of high emotional tension. People who live within the floodway will reach out to ORC's engineering and natural hazard staff requesting information and expressing concerns.
28. Generally, people who occupy properties in the floodway have to be prepared to manage their own situations, including self-evacuation. ORC staff did however deliver sandbags to a house located at 115 Dukes Road South (below the Gordon Road Spillway) during the 2017 event. The provision of sandbags⁴ in this instance was an exception at the time in response to an urgent request for assistance by that landowner. It is not usual for ORC, Engineering to provide sandbags to landowners during a flood event, as the role and priority of ORC, Engineering during a flood event is to protect the integrity of ORC Infrastructure which in turn provides a level of protection to landowners and property.
29. The 2017 flood event was a 30-to-40-year flood event. The flows over the Gordon Road Spillway were in the magnitude of 100 cumecs during the July 2017 flood event. Please note this flow is an estimate based on hydraulics modelling which ORC is currently having peer reviewed. The flows in Silver Stream during the July 2017 event, peaked on the 22nd July 2017 at just over 220 - 230m³/s.

Conclusion

30. It is not desirable to allow further residential development in the floodway in particular downstream of critical infrastructure that will be activated to release flows during weather and/or flood events where activation levels

³ *East Taieri Flood Mitigation Options*, Engineering and Hazards Committee, Otago Regional Council, 2010. Report No. 2010/1438

⁴ Michelle Ellen Mifflin was not an employee of ORC during the 2017 flood event and has relied on engineering staff accounts of the event at that time.

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are triggered. In this case the Gordon Road Spillway does not have any mechanical intervention to prevent flows over spillway.

31. It will put more people and property at risk in severe flooding. Severe flooding is generally considered as rainfall greater than 100mm within a 24-hour period. Where rainfall causes rivers to overflow banks or drainage systems to reach capacity and overflow onto land or streets, this is considered severe flooding. This level of intensity can also create a significant effect over a short period that can lead to severe flooding which increases risk to people, property, and other hazards such as river created debris.
32. Development can also impede overland flows and reduce the extent of natural state surfaces that provide important flow paths and ponding function.

Sworn at Alexandra DC
this 16 day of December 2022
before me:-



Andrea Burdett
Deputy Registrar
District Court

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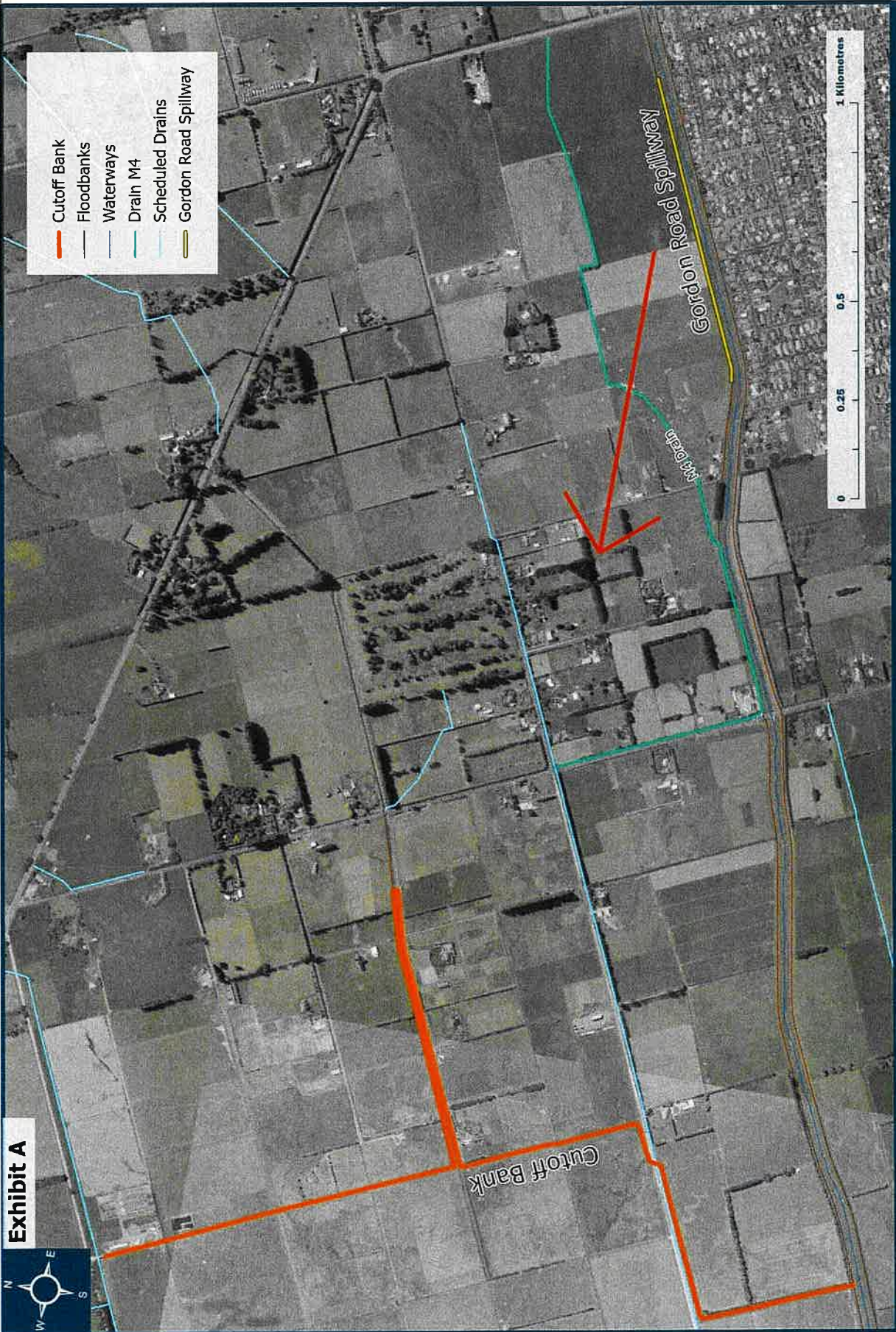
Michelle Ellen Mifflin

~~A Solicitor of the High Court of New Zealand~~

..A

annexed affidavit of MICHELLE ELLEN MUFFLIN of Alexandra, Centre
Otago, Manager Engineering, sworn at Alexandra this 16th day
of December 2022 before me:

Andrea Burdett
Deputy Registrar
District Court
A Solicitor of the High Court of New Zealand



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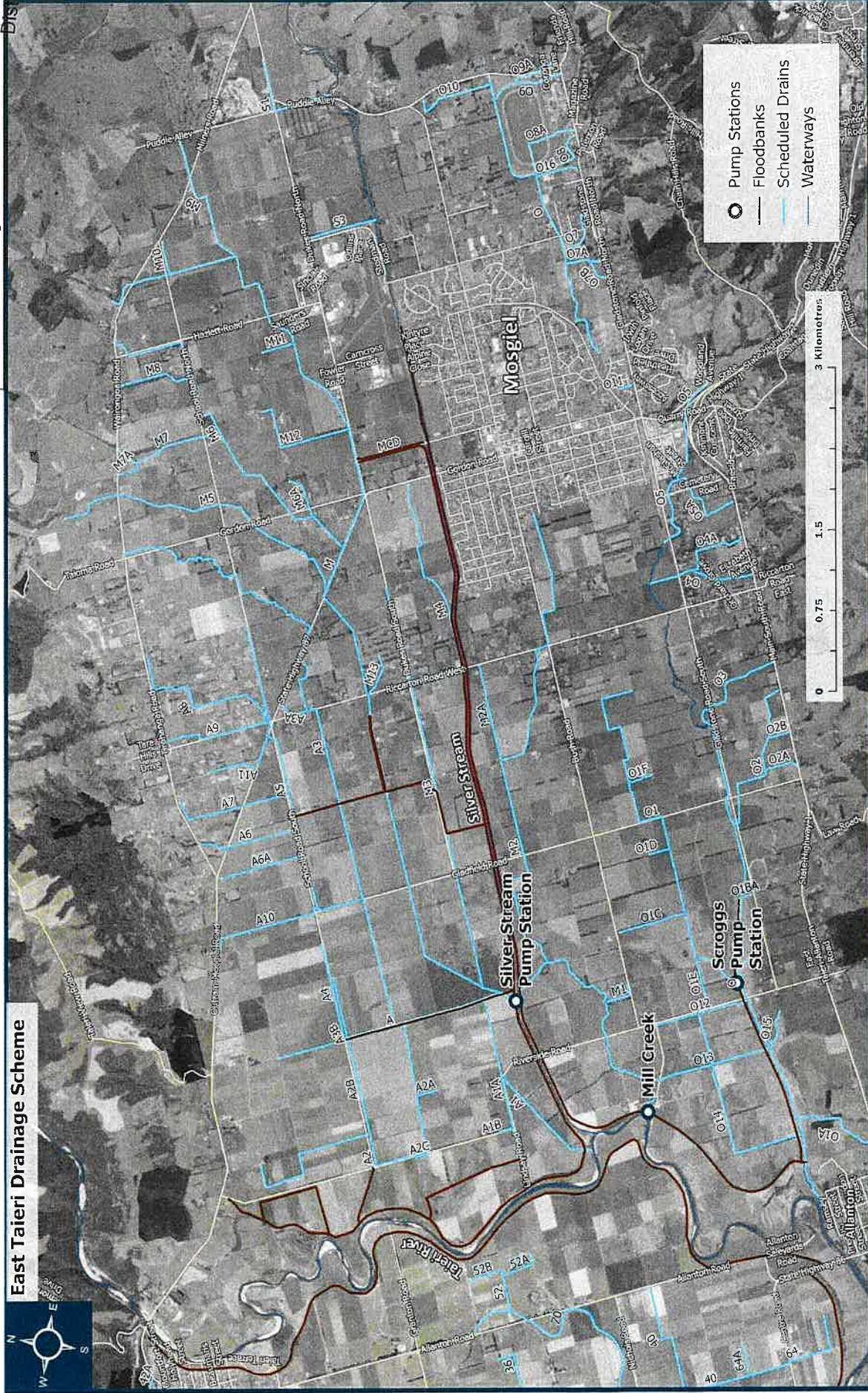
"B"

annexed affidavit of MICHELLE ELLEN MIFFLIN of Alexandra, Central Otago, Manager Engineering, sworn at 16 November 2022 before me:

Exhibit B: East Taieri Drainage network

Andrea Burdett
Deputy Registrar
District Court

A Solicitor of the High Court of New Zealand



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Centre Coordinates: 170°19'16"E 45°52'15"S

Map Scale: 1:31,375

Date: 26/10/2022 9:16 a.m.



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