

Before Independent Commissioners Appointed by the Canterbury Regional Council and Selwyn District Council

In the matter of The Resource Management Act 1991

And

In the matter of Applications by **Fulton Hogan Limited** for all resource consents necessary to establish, operate, maintain and close an aggregate quarry (**Roydon Quarry**) between Curraghs, Dawsons, Maddisons and Jones Roads, Templeton

SUPPLEMENTARY EVIDENCE OF ERIC ROLAND VAN NIEUWKERK ON BEHALF OF FULTON HOGAN LIMITED

RESPONSE TO COMMISSIONER MCGARRY REQUEST

DATED: 29 NOVEMBER 2019

Counsel Acting: David Caldwell
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Introduction

1. My name is Eric Roland Van Nieuwkerk. I hold the position of Senior Hydrogeologist at Golder Associates (NZ) Limited (Golder).
2. I have previously provided evidence, rebuttal evidence and a summary statement in relation to the Roydon Quarry Proposal. My primary evidence is dated 23 September 2019. I confirm my qualifications and experience as set out in paragraphs 4 to 8 of that evidence.
3. I also confirm I have read and agree to comply with those parts of the Environment Court Practice Note that bear on my role as an expert witness, in accordance with paragraph 9 of my earlier evidence.
4. During presentation of my evidence on Tuesday 19 November, Commissioner McGarry asked me:
 - (a) If the Total Suspended Solids (TSS) and Nitrate-Nitrogen results set out in paragraph 51 of my evidence were skewed by one of the wells tested; and
 - (b) For a breakdown of results from the four wells referred to.
5. I attached the breakdown of groundwater quality results per monitoring well, requested to this supplementary evidence. It includes the latest groundwater quality monitoring results from 7 November 2019.
6. With respect to my earlier paragraph 51 and the question from Commissioner McGarry, I consider the following:
 - (a) Median TSS level of all four wells is somewhat skewed by the results of monitoring well DRBH2, which are notably higher than the other three wells. The most likely explanation of this difference is poor well development of DRBH2. Loose sediments in and around the well's filter pack may continue to enter the water samples. This is not related to the presence of a TSS source in groundwater.
 - (b) Nitrate-Nitrogen levels are consistently near or above half the Maximum Acceptable Values (MAV) of the New Zealand Drinking Water Standards (i.e. 11.3 mg/L) in all four monitoring wells, although there are slight differences between the wells. Elevated Nitrate-Nitrogen levels are common in shallow groundwater beneath much of

the Canterbury Plains and reflects the influence of Nitrate-Nitrogen leaching from anthropogenic activities, such as farming.

7. This supplementary evidence has no implication to statements I have made previously in relation to the proposed Roydon quarry.

A handwritten signature in blue ink, appearing to read 'Eric van Nieuwkerk', with a horizontal line underneath.

Eric van Nieuwkerk

29 November 2019

Groundwater Quality Summary Statistics July 2018 - November 2019

Determinand (g/m ³ or units)	pH (pH units)	Alkalinity	Electrical Conductivity (mS/cm)	Total Suspended Solids	Dissolved Aluminium	Dissolved Arsenic	Dissolved Boron	Dissolved Cadmium	Dissolved Calcium	Dissolved Chromium	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Nickel	Dissolved Sodium	Total Ammoniacal Nitrogen	Nitrite-N	Nitrate-N	Nitrate-N + Nitrite-N	Sulphate
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DRBH1

Average	7.1	52.7	24.2	11.3	0.056	<0.0010	0.025	< 0.00005	23.4	<0.0005	<0.0005	<0.00010	<0.0005	< 0.0005	14.5	<0.010	<0.002	7.2	7.2	11.0
Min	6.8	50.0	23.2	4.0	0.028	<0.0010	0.022	< 0.00005	20.0	0.0006	<0.0005	<0.00010	0.0007	< 0.0005	13.6	<0.010	<0.002	6.6	6.6	10.1
Max	7.2	55.0	25.3	36.0	0.081	<0.0010	0.026	< 0.00005	25.0	0.0010	<0.0005	<0.00010	<0.0005	< 0.0005	15.7	<0.010	<0.002	7.5	7.5	13.5
Median	7.1	53.0	24.2	8.0	0.054	<0.0010	0.025	< 0.00005	24.0	<0.0005	<0.0005	<0.00010	<0.0005	< 0.0005	14.3	<0.010	<0.002	7.2	7.2	10.7

DRBH2

Average	7.0	49.6	22.2	50.4	0.062	<0.0010	0.027	< 0.00005	20.9	<0.0005	<0.0005	<0.00010	<0.0005	< 0.0005	14.6	<0.010	<0.002	6.0	5.8	12.0
Min	6.8	46.0	20.5	4.0	0.028	<0.0010	0.024	< 0.00005	18.7	0.0007	<0.0005	<0.00010	0.0010	< 0.0005	12.4	<0.010	<0.002	5.1	5.1	11.0
Max	7.2	52.0	24.2	85.0	0.166	<0.0010	0.030	< 0.00005	24.0	0.0008	0.0016	<0.00010	0.0162	< 0.0005	16.4	<0.010	<0.002	7.1	6.7	13.9
Median	6.9	50.0	21.6	51.0	0.043	<0.0010	0.028	< 0.00005	21.0	<0.0005	<0.0005	<0.00010	<0.0005	< 0.0005	14.7	<0.010	<0.002	5.8	5.8	11.6

DRBH3

Average	7.0	54.7	23.7	14.2	0.052	<0.0010	0.024	< 0.00005	22.7	<0.0005	<0.0005	<0.00010	<0.0005	< 0.0005	14.7	<0.010	<0.002	6.9	7.0	10.8
Min	6.8	53.0	22.5	4.0	0.030	<0.0010	0.022	< 0.00005	21.0	0.0005	<0.0005	<0.00010	0.0006	< 0.0005	14.0	<0.010	<0.002	6.3	6.3	10.3
Max	7.2	56.0	24.9	46.0	0.075	<0.0010	0.025	< 0.00005	24.0	0.0007	<0.0005	<0.00010	0.0010	< 0.0005	15.4	<0.010	<0.002	7.3	7.3	11.4
Median	7.0	55.0	23.8	9.5	0.046	<0.0010	0.024	< 0.00005	23.0	<0.0005	<0.0005	<0.00010	<0.0005	< 0.0005	14.5	<0.010	<0.002	7.0	7.1	10.7

DRBH4

Average	6.8	52.3	25.8	18.3	0.074	<0.0010	0.026	< 0.00005	23.1	<0.0005	<0.0005	<0.00010	<0.0005	< 0.0005	17.0	<0.010	<0.002	7.8	7.8	15.2
Min	5.8	50.0	22.2	4.0	0.037	<0.0010	0.023	< 0.00005	22.0	0.0005	<0.0005	<0.00010	0.0006	< 0.0005	13.3	<0.010	<0.002	6.4	6.4	10.2
Max	7.2	55.0	27.3	42.0	0.104	<0.0010	0.028	< 0.00005	25.0	0.0008	0.0127	0.00011	0.0017	< 0.0005	18.6	<0.010	<0.002	8.4	8.4	17.1
Median	6.9	52.0	26.5	15.5	0.078	<0.0010	0.027	< 0.00005	23.0	<0.0005	<0.0005	<0.00010	<0.0005	< 0.0005	17.6	<0.010	<0.002	8.2	8.1	15.9

All four wells

Average	7.0	52.3	23.9	24.3	0.062	<0.0010	0.026	< 0.00005	22.5	0.0007	<0.0005	<0.00010	0.0023	< 0.0005	15.2	<0.010	<0.002	6.9	7.1	12.3
Max	7.2	56.0	27.3	85.0	0.166	<0.0010	0.030	< 0.00005	25.0	0.0010	0.0127	0.00011	0.0162	< 0.0005	18.6	<0.010	<0.002	8.4	8.4	17.1
Min	5.8	46.0	20.5	4.0	0.028	<0.0010	0.022	< 0.00005	18.7	0.0005	<0.0005	<0.00010	0.0006	< 0.0005	12.4	<0.010	<0.002	5.1	5.1	10.1
Median	7.0	52.5	24.1	10.5	0.055	<0.0010	0.025	< 0.00005	23.0	0.0007	<0.0005	<0.00010	0.0008	< 0.0005	14.8	<0.010	<0.002	7.1	7.1	11.3