



McWILLIAM'S
FAMILY WINEMAKERS

EPA ENVIRONMENTAL MONITORING

MANDATORY MONITORING												
EPA Identification point number	Type of Monitoring Point	Type of Discharge Point	How Monitored	Location Description	Detail	Volume	Pollutant					
<u>Point 1: Waste Water Treatment Tank. Influent.</u>	Volume monitoring. Influent quality monitoring.	Volume monitoring. Influent quality monitoring.	Volume: flowmeter & cont. logger. Quality: influent sample.	Inflow to WWTT EPA 1 on site map. [1a and 1b]	Test		BOD	COD	EC	N (total)	pH	P (total)
					unit of measure	kilolitres	mg/L	mg/L	µs/cm	mg/L	pH	mg/L
					frequency	continuous during discharge				every 6 months	SAR	mg/L
					sampling method	flow meter & cont. logger				representative sample	TDS	TSS
<u>Point 2: Waste Water Treatment. Effluent.</u>	Discharge to utilisation area. Volume monitoring. Effluent quality monitoring.	Discharge to utilisation area. Volume monitoring. Effluent quality monitoring.	Volume: flowmeter. Quality: effluent sample.	Outflow from WWTT - EPA 2 on site map.	Test		BOD	COD	EC	N (total)	pH	P (total)
					unit of measure	kilolitres	mg/L	mg/L	µs/cm	mg/L	pH	mg/L
					frequency	continuous during discharge				every 6 months	SAR	mg/L
					sampling method	flow meter				representative sample	TDS	TSS
<u>Point 3: Soil Sample Chardonnay 7</u>	Soil quality monitoring		Soil sample.	Soil control point "EPA 3" on site map.	Detail		Pollutant					
					Test		EC	Exch. Ca	Exch. Mg	Exch. K	Exch. Na	Nitrate
					unit of measure	µs/cm	cmol(+)/kg	cmol(+)/kg	cmol(+)/kg	cmol(+)/kg	cmol(+)/kg	mg/kg
					frequency					yearly	pH	P (total)
					sampling method					composite sample	K	SAR
<u>Point 4: Soil Sample Old Canada Muscat 11</u>	Soil quality monitoring		Soil sample.	Soil control point "EPA 4" on site map.	Detail		Pollutant					
					Test		EC	Exch. Ca	Exch. Mg	Exch. K	Exch. Na	Nitrate
					unit of measure	µs/cm	cmol(+)/kg	cmol(+)/kg	cmol(+)/kg	cmol(+)/kg	cmol(+)/kg	mg/kg
					frequency					yearly	pH	P (total)
					sampling method					composite sample	K	SAR
<u>Point 5: Soil Sample Red Frontignac 12</u>	Soil quality monitoring		Soil sample.	Soil control point "EPA 5" on site map.	Detail		Pollutant					
					Test		EC	Exch. Ca	Exch. Mg	Exch. K	Exch. Na	Nitrate
					unit of measure	µs/cm	cmol(+)/kg	cmol(+)/kg	cmol(+)/kg	cmol(+)/kg	cmol(+)/kg	mg/kg
					frequency					yearly	pH	P (total)
					sampling method					composite sample	K	SAR
EPA Identification point number	Type of Monitoring Point	Type of Discharge Point	How Monitored	Location Description	Detail		Pollutant					

Point 11: Soil Sample Old Chardonnay 5

Soil sample.	Soil control point "EPA 11" on site map.	Test	EC	Exch. Ca	Exch. Mg	Exch. K	Exch. Na	Nitrate	N (total)	pH	P (total)	K	SAR	P sorption capacity
		unit of measure	µs/cm	cmol(+)/kg	cmol(+)/kg	cmol(+)/kg	cmol(+)/kg	mg/kg	mg/kg	pH	mg/kg	mg/kg	SAR	mg/kg
		frequency; sampling method						yearly; composite sample					spec. freq 1	

EPA Identification point number	Type of Monitoring Point	Type of Discharge Point	How Monitored	Location Description	Detail	<u>Standing Water Level</u>	Pollutant										
							ammonia	Ca	EC	Mg	Nitrate N	N (total)	pH	P (total)	K	Na	
<u>Point 7: Piezometer Red Frontignac Row 1</u>	Groundwater quality monitoring. Standing water level monitoring		Groundwater sample. "EPA 7" on site map.	Soil control point metres frequency sampling method	Test		mg/L	mg/L	µs/cm	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	
					unit of measure	metres											yearly
					frequency	every 6 months											
					sampling method	inspection											representative sample

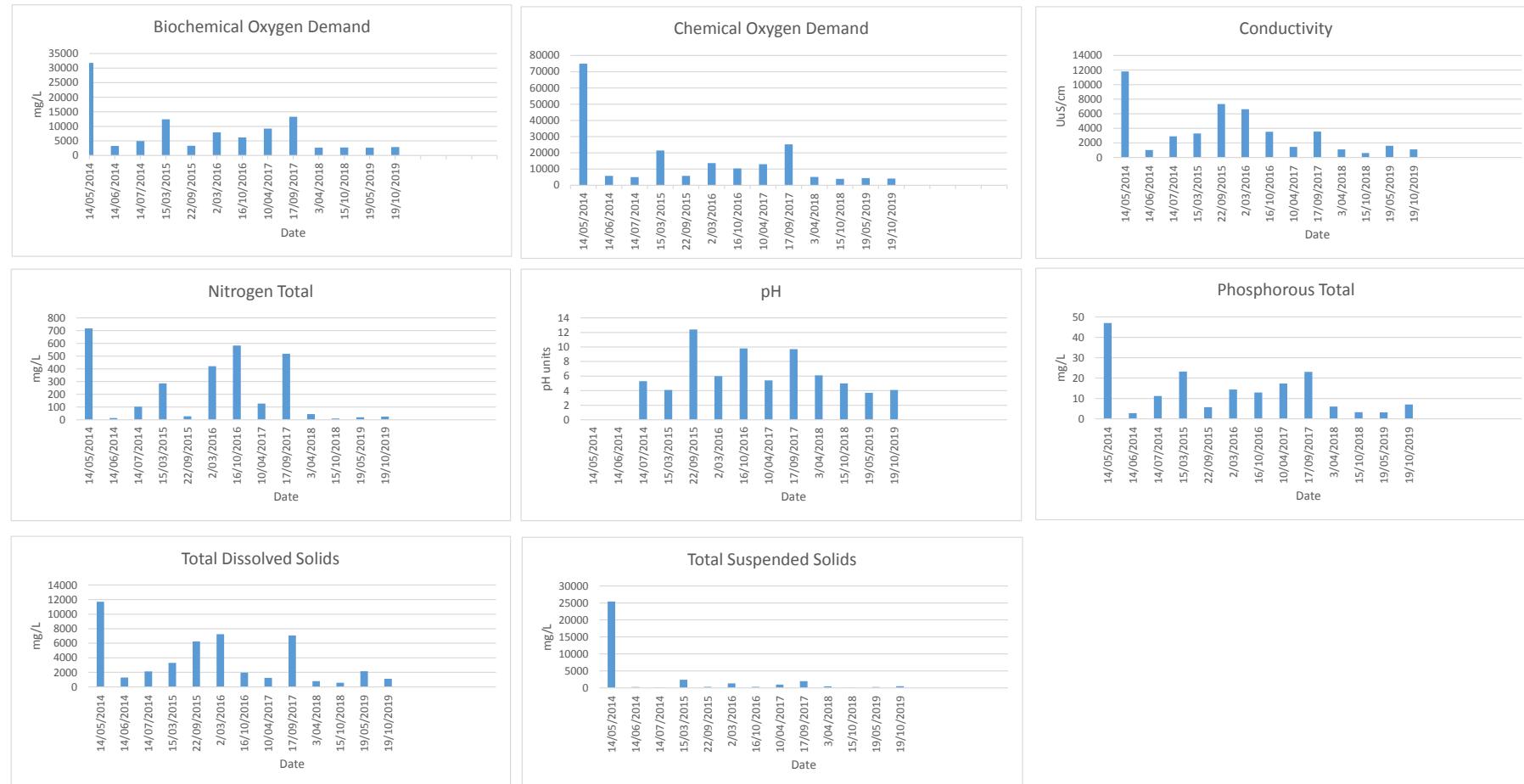
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							ammonia	Ca	EC	Mg	Nitrate N	N (total)	pH	P (total)	K	Na	
<u>Point 8: Piezometer South End Lined Dam</u>	Groundwater quality monitoring. Standing water level monitoring		Groundwater sample.	Soil control point "EPA 8" on site map.	Test		mg/L	mg/L	µs/cm	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	
			Groundwater level m'mnt.		unit of measure	metres											
					frequency	every 6 months											yearly
					sampling method	inspection											representative sample

EPA Identification point number	Type of Monitoring Point	Type of Discharge Point	How Monitored	Location Description	Detail	<u>Standing Water Level</u>	Pollutant										
							ammonia	Ca	EC	Mg	Nitrate N	N (total)	pH	P (total)	K	Na	
Point 10: Piezometer	Groundwater quality monitoring.	Standing water level monitoring	Groundwater sample.	Soil control point "EPA 10" on site map.	Test		mg/L	mg/L	µs/cm	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	
					unit of measure	metres											
					frequency	every 6 months										yearly	
					sampling method	inspection										representative sample	

EPA Identification point number	Type of Monitoring Point	Type of Discharge Point	How Monitored	Location Description	Detail	<u>Standing Water Level</u>	Pollutant											
							ammonia	Ca	EC	Mg	Nitrate N	N (total)	pH	P (total)	K	Na		
<u>Point 13: Piezometer West</u> <u>End Old Chardonnay 6</u>	Groundwater quality monitoring. Standing water level monitoring		Groundwater sample. Groundwater level m'mnt.	Soil control point "EPA 13" on site map.	Test													
					unit of measure	metres	mg/L	mg/L	µs/cm	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L		
					frequency	every 6 months											yearly	
					sampling method	inspection											representative sample	

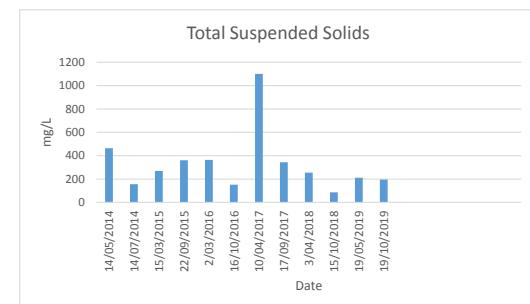
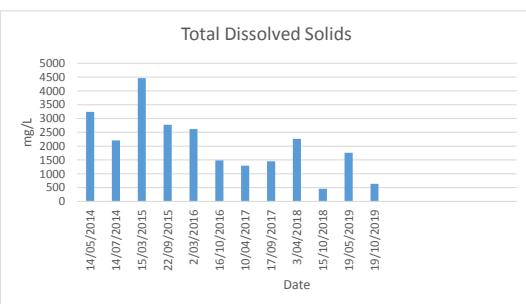
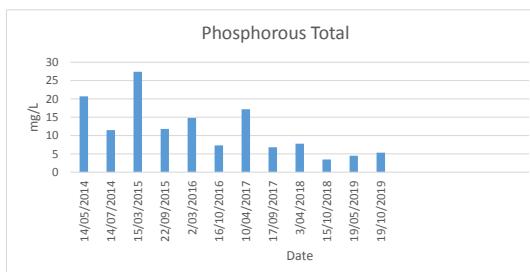
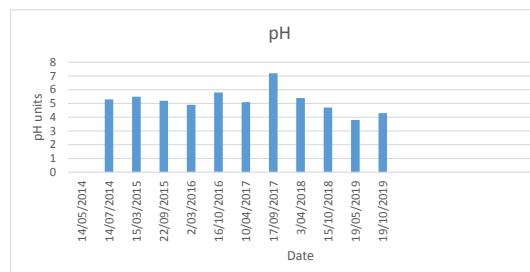
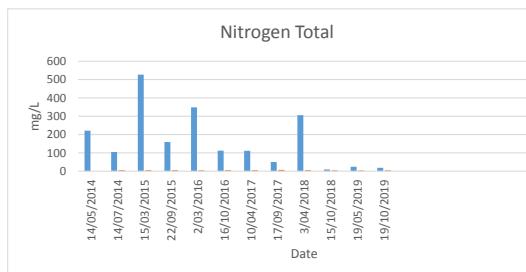
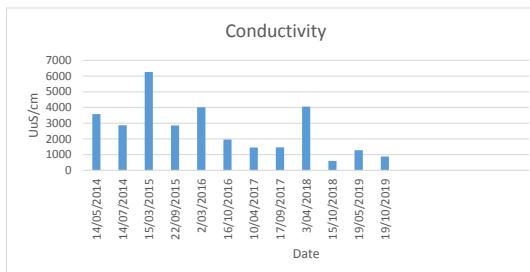
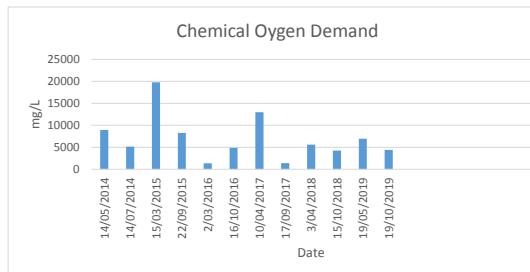
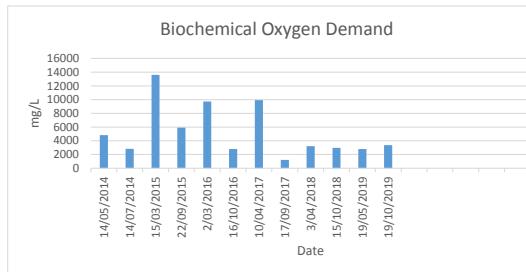
Point 1: Influent Quality Monitoring

Type of Test	Name of Test	Test	Units	Date								
				14/05/2014	14/06/2014	14/07/2014	14/08/2014	14/09/2014	14/10/2014	14/11/2014	14/12/2014	
Quality monitoring	Biological oxygen demand	BOD	mg/L	31800	3260	4950	12400	3320	7920	6190	9210	13300
Quality monitoring	Chemical oxygen demand	COD	mg/L	74900	5820	5060	21400	5850	13700	10400	13000	25200
Quality monitoring	Electrical conductivity	EC	µS/cm	11800	1020	2900	3290	7330	6610	3540	1450	3560
Quality monitoring	Nitrogen	N (total)	mg/L	717	13	103	286	27	420	582	127	518
Quality monitoring	pH	pH	pH	n/a	n/a	5.3	4.1	12.4	6	9.8	5.4	9.7
Quality monitoring	Phosphorus	P (total)	mg/L	47	2.8	11.2	23.2	5.69	14.4	12.9	17.3	23
Quality monitoring	Sodium absorption ratio	SAR	SAR	<1	2	2	1	2	2	3	2	1
Quality monitoring	Total dissolved solids	TDS	mg/L	11700	1280	2140	3310	6250	7240	1960	1240	7070
Quality monitoring	Total suspended solids	TSS	mg/L	25400	254	144	2410	322	1310	312	945	1980



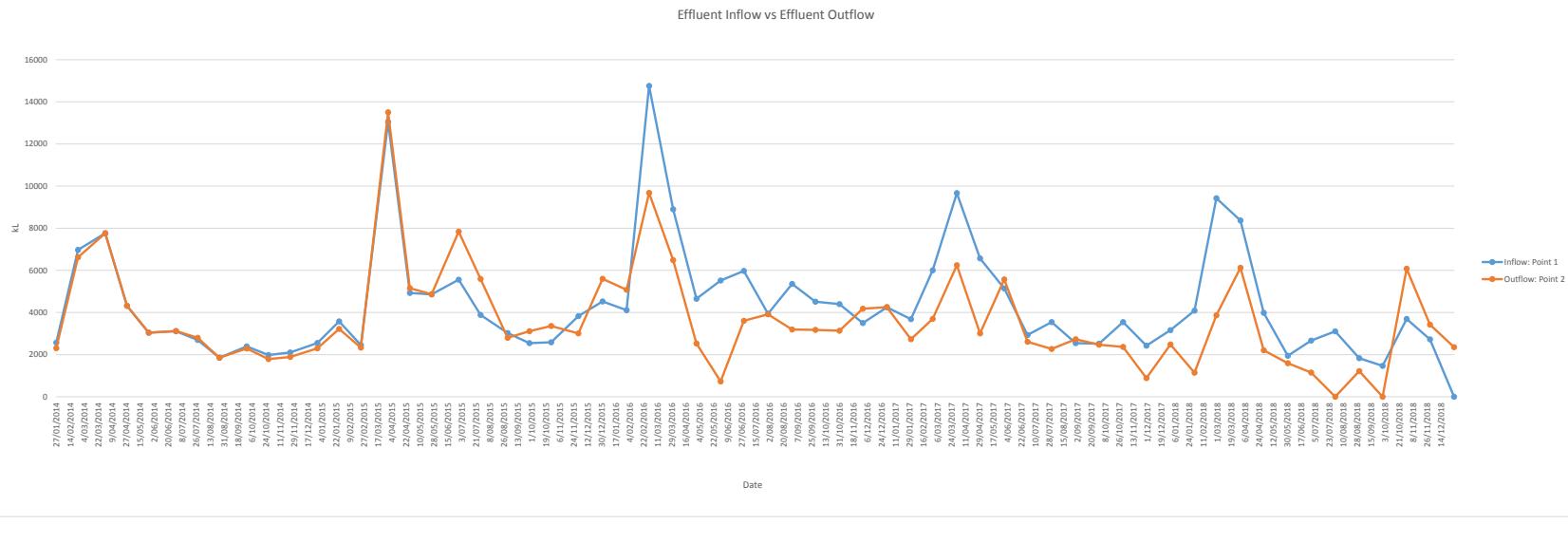
Point 2: Effluent Quality Monitoring

Type of Test	Name of Test	Test	Units	Date										
				14/05/2014	14/07/2014	15/03/2015	22/09/2015	2/03/2016	16/10/2016	10/04/2017	17/09/2017	3/04/2018	15/10/2018	
Quality monitoring	Biological oxygen demand	BOD	mg/L	4830	2820	13600	5920	9730	2800	9930	1220	3220	2970	2800
Quality monitoring	Chemical oxygen demand	COD	mg/L	8940	5160	19800	8260	1350	4860	13000	1410	5620	4250	6950
Quality monitoring	Electrical conductivity	EC	µS/cm	3580	2870	6260	2860	4010	1960	1450	1460	4060	600	1280
Quality monitoring	Nitrogen	N (total)	mg/L	221	105	527	159	348	112	111	50	306	9	24
Quality monitoring	pH	pH				5.3	5.5	5.2	4.9	5.8	5.1	7.2	5.4	4.7
Quality monitoring	Phosphorus	P (total)	mg/L	20.7	11.5	27.4	11.8	14.8	7.33	17.2	6.79	7.79	3.47	4.49
Quality monitoring	Sodium absorption ratio	SAR	SAR	1	2	1	1	2	6	2	4	1	1	1
Quality monitoring	Total dissolved solids	TDS	mg/L	3240	2210	4460	2770	2620	1480	1290	1450	2260	458	1760
Quality monitoring	Total suspended solids	TSS	mg/L	464	156	269	360	363	152	1100	343	255	86	211



Influent (Inflow) vs Effluent (Outflow)

Date	Inflow: Point 1	Outflow: Point 2
27/01/2014	2566	2309
24/02/2014	6970	6622
31/03/2014	7760	7760
28/04/2014	4315	4316
26/05/2014	3043	3044
30/06/2014	3110	3122
28/07/2014	2698	2798
25/08/2014	1854	1854
29/09/2014	2391	2290
27/10/2014	1979	1787
24/11/2014	2100	1890
29/12/2014	2554	2300
26/01/2015	3578	3220
23/02/2015	2451	2330
30/03/2015	13047	13503
27/04/2015	4927	5155
25/05/2015	4858	4865
29/06/2015	5558	7839
27/07/2015	3882	5593
31/08/2015	3027	2800
28/09/2015	2543	3110
26/10/2015	2584	3360
30/11/2015	3826	3010
31/12/2015	4524	5600
31/01/2016	4110	5080
29/02/2016	14760	9680
31/03/2016	8900	6490
30/04/2016	4651	2530
31/05/2016	5115	730
30/06/2016	5971	3610
31/07/2016	3942	3914
31/08/2016	5354	3190
30/09/2016	4515	3174
31/10/2016	4398	3135
30/11/2016	3497	4176
31/12/2016	4249	4253
31/01/2017	3685	2728
28/02/2017	6000	3692
31/03/2017	9669	6242
30/04/2017	6570	3010
31/05/2017	5140	5567
30/06/2017	2932	2610
31/07/2017	3546	2270
31/08/2017	2543	2730
30/09/2017	2518	2472
31/10/2017	3546	2364
30/11/2017	2422	886
31/12/2017	3165	2484
31/01/2018	4089	1141
28/02/2018	9422	3867
31/03/2018	8370	6126
30/04/2018	3984	2207
31/05/2018	1944	1595
30/06/2018	2669	1146
31/07/2018	3107	0 went to winter storage
31/08/2018	1827	1219
30/09/2018	1465	0
31/10/2018	3696	6080 had to pump out of winter storage
30/11/2018	2724	3421
31/12/2018	0	2357

Effluent Inflow vs Effluent Outflow


Inflow: Point 1

Outflow: Point 2

Date

went to winter storage

had to pump out of winter storage

Point 3: Soil Test Results Chardonnay 7

Type of Test	Name of Test	Test	Units	12/08/2014	1/09/2015	8/08/2016	17/09/2017	15/10/2018	1/10/2019	12/08/2014	1/09/2015	8/08/2016	17/09/2017	15/10/2018	1/10/2019	12/08/2014	1/09/2015	8/08/2016	17/09/2017	15/10/2018	1/10/2019	12/08/2014	1/09/2015	8/08/2016	17/09/2017	15/10/2018	1/10/2019	
Quality monitoring	Electrical conductivity	EC	$\mu\text{s}/\text{cm}$	70	100	70	115	7	135																			
Quality monitoring	Exchangeable calcium	Exch. Ca	$\text{cmol}(+)/\text{kg}$	10	12	11	15.2	3.6	12.2																			
Quality monitoring	Exchangeable magnesium	Exch. Mg	$\text{cmol}(+)/\text{kg}$	3.5	4	4.1	4.35	1.17	3.88																			
Quality monitoring	Exchangeable potassium	Exch. K	$\text{cmol}(+)/\text{kg}$	1.6	2.5	1.1	0.49	0.92	3.49																			
Quality monitoring	Exchangeable sodium	Exch. Na	$\text{cmol}(+)/\text{kg}$	0.1	0.12	0.11	0.12	0.04	0.16																			
Quality monitoring	Nitrate nitrogen	Nitrate	mg/kg	2.5	3	13	13	<5	10																			
Quality monitoring	Total nitrogen	N (total)	mg/kg	1	2	1	3580	458	1380																			
Quality monitoring	pH	pH	pH	7.2	6.6	6.9	7.2	7	6.9																			
Quality monitoring	Total phosphorus	P (total)	mg/kg	130	170	100	472	132	900																			
Quality monitoring	Potassium	K	mg/kg	640	960	440	3760	563	4800																			
Quality monitoring	Sodium absorption ratio	SAR	0.04	0.04	0.04	<1	<1	<1	<1																			
Quality monitoring	P sorption capacity	P sorption capacity	mg/kg	72	74	59	80	132	214																			

Conductivity

Date	Conductivity ($\mu\text{s}/\text{cm}$)
12/08/2014	70
1/09/2015	100
8/08/2016	70
17/09/2017	115
15/10/2018	7
1/10/2019	135

Exchangeable Calcium

Date	Exchangeable Calcium ($\text{cmol}(+)/\text{kg}$)
12/08/2014	10
1/09/2015	12
8/08/2016	11
17/09/2017	14.5
15/10/2018	2
1/10/2019	13

Exchangeable Magnesium

Date	Exchangeable Magnesium ($\text{cmol}(+)/\text{kg}$)
12/08/2014	4
1/09/2015	4.5
8/08/2016	4.5
17/09/2017	4.5
15/10/2018	1
1/10/2019	3.5

Exchangeable Potassium

Date	Exchangeable Potassium ($\text{cmol}(+)/\text{kg}$)
12/08/2014	1.5
1/09/2015	2.2
8/08/2016	1.2
17/09/2017	0.5
15/10/2018	0.8
1/10/2019	3.5

Exchangeable Sodium

Date	Exchangeable Sodium ($\text{cmol}(+)/\text{kg}$)
12/08/2014	0.1
1/09/2015	0.12
8/08/2016	0.11
17/09/2017	0.12
15/10/2018	0.05
1/10/2019	0.18

Nitrate

Date	Nitrate (mg/kg)
12/08/2014	2
1/09/2015	2
8/08/2016	12
17/09/2017	12
15/10/2018	8
1/10/2019	9

Nitrogen Total

Date	Nitrogen Total (mg/kg)
12/08/2014	0
1/09/2015	0
8/08/2016	0
17/09/2017	3500
15/10/2018	1000
1/10/2019	1500

pH

Date	pH
12/08/2014	7.2
1/09/2015	6.8
8/08/2016	6.9
17/09/2017	7.3
15/10/2018	6.9
1/10/2019	6.8

Phosphorous Total

Date	Phosphorous Total (mg/kg)
12/08/2014	0
1/09/2015	100
8/08/2016	100
17/09/2017	300
15/10/2018	100
1/10/2019	800

Potassium

Date	Potassium (mg/kg)
12/08/2014	0
1/09/2015	100
8/08/2016	100
17/09/2017	3500
15/10/2018	100
1/10/2019	4500

Sodium Adsorption Ratio

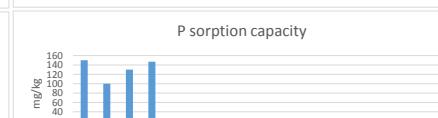
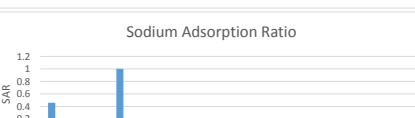
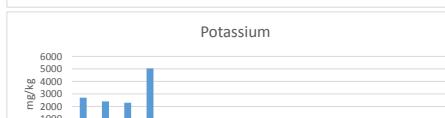
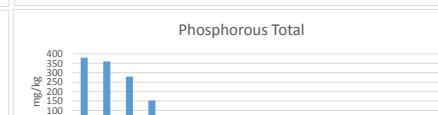
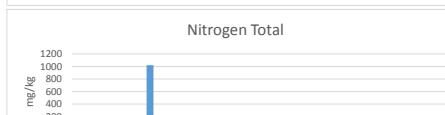
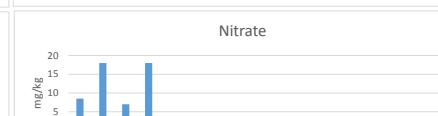
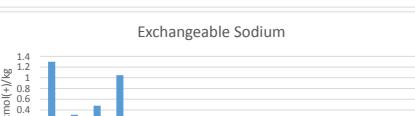
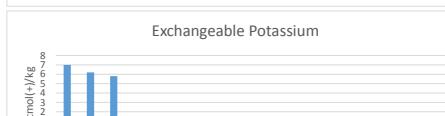
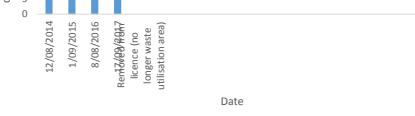
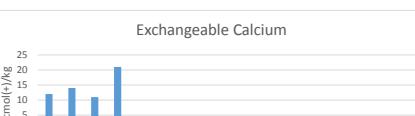
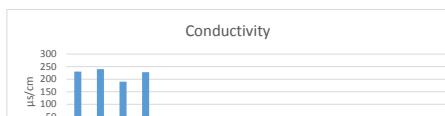
Date	SAR
12/08/2014	0.04
1/09/2015	0.04
8/08/2016	0.04
17/09/2017	0.04
15/10/2018	0.04
1/10/2019	0.04

P sorption capacity

Date	P sorption capacity (mg/kg)
12/08/2014	0
1/09/2015	100
8/08/2016	100
17/09/2017	100
15/10/2018	100
1/10/2019	200

Point 4: Soil Test Results Canada Muscat 11

Type of Test	Name of Test	Test	Units	17/08/2014	1/09/2015	8/09/2016	17/09/2017	Removed from licence (no longer waste utilisation area)				
Quality monitoring	Electrical conductivity	EC	µs/cm	230	240	190	228					
Quality monitoring	Exchangeable calcium	Exch. Ca	cmol(+)/kg	12	14	11	21					
Quality monitoring	Exchangeable magnesium	Exch. Mg	cmol(+)/kg	3.8	3.9	3	7.72					
Quality monitoring	Exchangeable potassium	Exch. K	cmol(+)/kg	7	6.2	5.8	0.78					
Quality monitoring	Exchangeable sodium	Exch. Na	cmol(+)/kg	1.3	0.31	0.48	1.05					
Quality monitoring	Nitrate nitrogen	Nitrate	mg/kg	8.5	18	7	18					
Quality monitoring	Total nitrogen	N (total)	mg/kg	1.5	4	2	1020					
Quality monitoring	pH	pH	pH	7.9	6.2	7.8	8					
Quality monitoring	Total phosphorus	P (total)	mg/kg	380	360	280	153					
Quality monitoring	Potassium	K	mg/kg	2700	2400	2300	5040					
Quality monitoring	Sodium absorption ratio	SAR	SAR	0.46	0.1	0.18	1					
Quality monitoring	P sorption capacity	P sorption capacity	mg/kg	150	100	130	147					



Point 5: Soil Test Results Red Frontignac 12

Type of Test	Name of Test	Test	Units	12/08/2014	1/09/2015	8/08/2016	12/08/2014	1/09/2015	8/08/2016	17/09/2017	Removed from Licence (no longer waste utilisation area)
Quality monitoring	Electrical conductivity	EC	$\mu\text{s}/\text{cm}$	230	180	200	176				
Quality monitoring	Exchangeable calcium	Exch. Ca	$\text{cmol}(+)/\text{kg}$	11	14	15	12.8				
Quality monitoring	Exchangeable magnesium	Exch. Mg	$\text{cmol}(+)/\text{kg}$	4.4	4.1	4.5	5.34				
Quality monitoring	Exchangeable potassium	Exch. K	$\text{cmol}(+)/\text{kg}$	5.4	4.2	2.5	0.78				
Quality monitoring	Exchangeable sodium	Exch. Na	$\text{cmol}(+)/\text{kg}$	0.48	0.11	0.08	0.1				
Quality monitoring	Nitrate nitrogen	Nitrate	mg/kg	30	4	33	21				
Quality monitoring	Total nitrogen	N (total)	mg/kg	1.9	3	3	2110				
Quality monitoring	pH	pH	pH	7.8	7	7.3	6.9				
Quality monitoring	Total phosphorus	P (total)	mg/kg	380	240	260	722				
Quality monitoring	Potassium	K	mg/kg	2100	1700	980	4400				
Quality monitoring	Sodium adsorption ratio	SAR	SAR	0.17	0.04	0.03	<1				
Quality monitoring	P sorption capacity	P sorption capacity	mg/kg	140	110	80	92				

Conductivity

Date	Conductivity ($\mu\text{s}/\text{cm}$)
12/08/2014	230
1/09/2015	180
8/08/2016	200
17/09/2017	176

Exchangeable Calcium

Date	Exchangeable Calcium ($\text{cmol}(+)/\text{kg}$)
12/08/2014	11
1/09/2015	14
8/08/2016	15
17/09/2017	12.8

Exchangeable Magnesium

Date	Exchangeable Magnesium ($\text{cmol}(+)/\text{kg}$)
12/08/2014	4.4
1/09/2015	4.1
8/08/2016	4.5
17/09/2017	5.34

Exchangeable Potassium

Date	Exchangeable Potassium ($\text{cmol}(+)/\text{kg}$)
12/08/2014	5.4
1/09/2015	4.2
8/08/2016	2.5
17/09/2017	0.78

Exchangeable Sodium

Date	Exchangeable Sodium ($\text{cmol}(+)/\text{kg}$)
12/08/2014	0.48
1/09/2015	0.11
8/08/2016	0.08
17/09/2017	0.1

Nitrate

Date	Nitrate (mg/kg)
12/08/2014	30
1/09/2015	4
8/08/2016	33
17/09/2017	21

Nitrogen Total

Date	Nitrogen Total (mg/kg)
12/08/2014	1.9
1/09/2015	3
8/08/2016	3
17/09/2017	2110

pH

Date	pH Units
12/08/2014	7.8
1/09/2015	7.2
8/08/2016	7.3
17/09/2017	6.9

Phosphorous Total

Date	Phosphorous Total (mg/kg)
12/08/2014	380
1/09/2015	240
8/08/2016	260
17/09/2017	722

Potassium

Date	Potassium (mg/kg)
12/08/2014	4400
1/09/2015	1700
8/08/2016	980
17/09/2017	2100

Sodium Adsorption Ratio

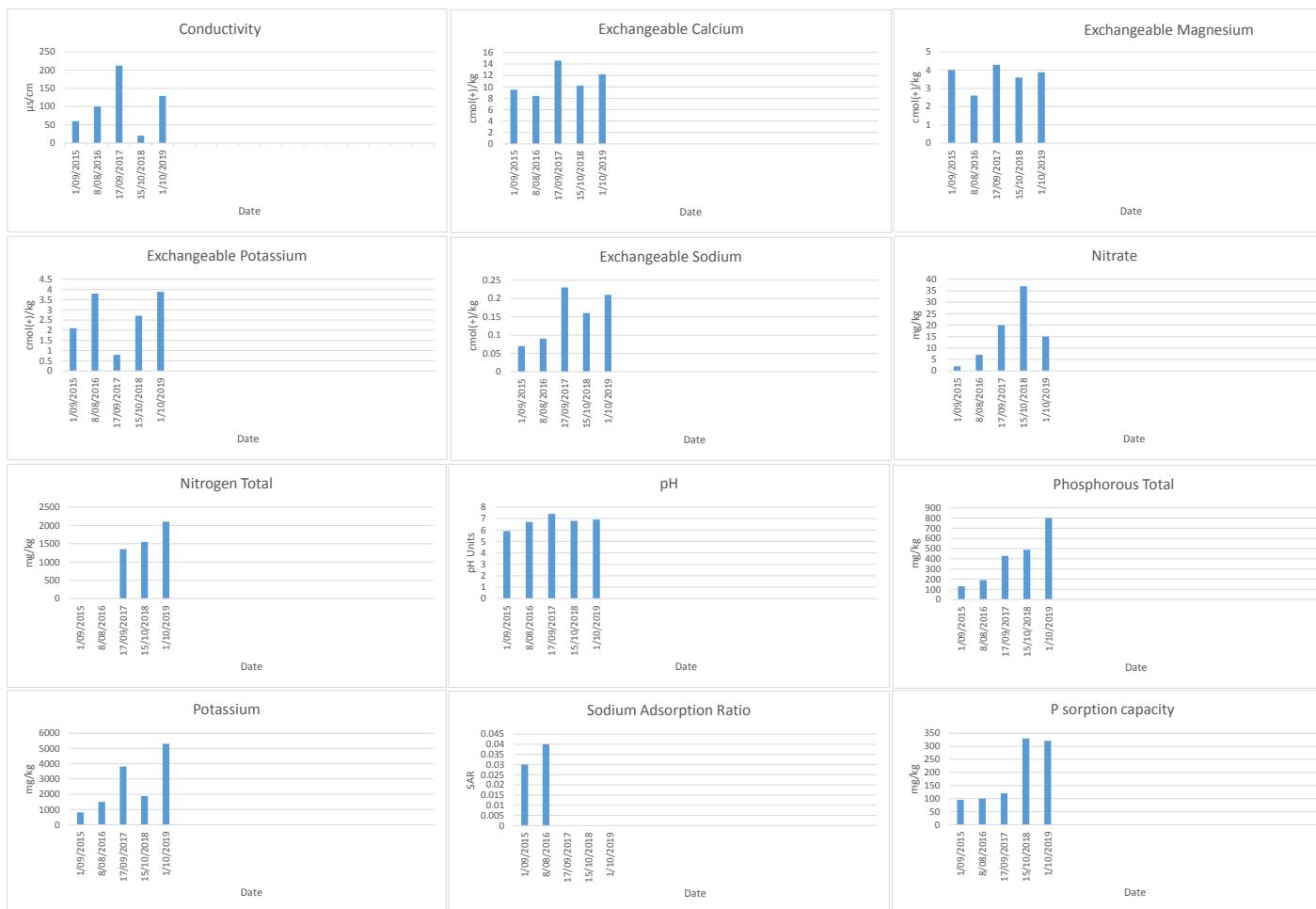
Date	SAR
12/08/2014	0.17
1/09/2015	0.04
8/08/2016	0.03
17/09/2017	<1

P sorption capacity

Date	P sorption capacity (mg/kg)
12/08/2014	140
1/09/2015	110
8/08/2016	80
17/09/2017	92

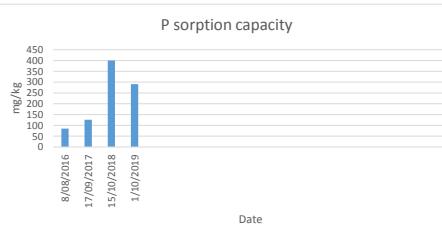
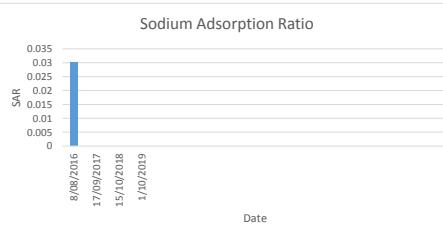
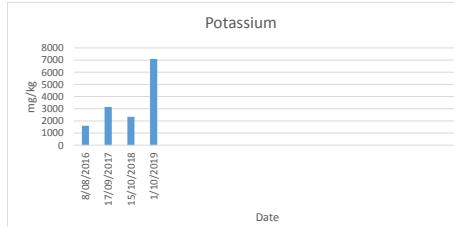
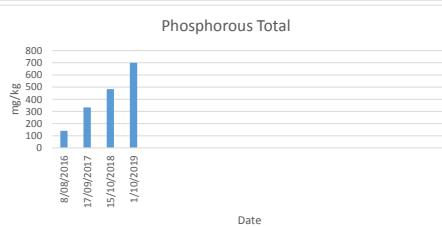
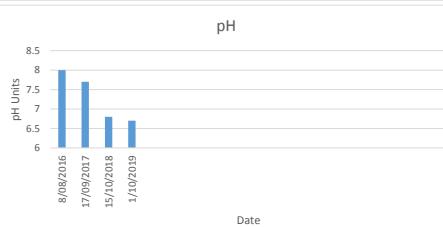
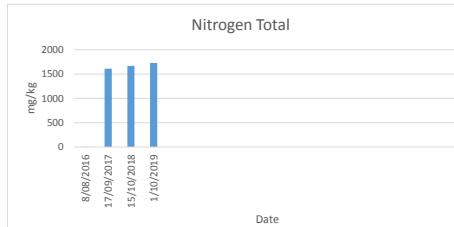
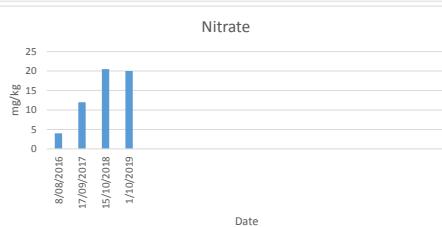
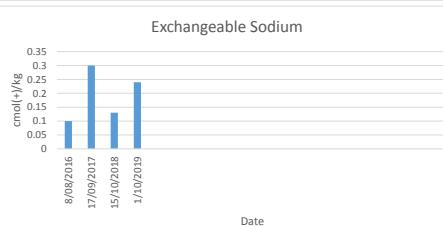
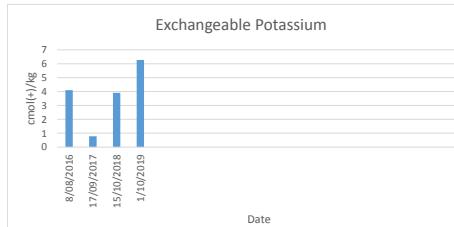
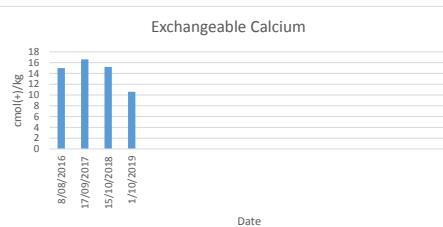
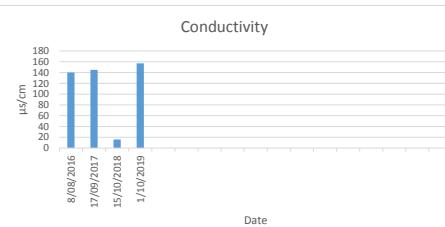
Point 11: Soil Test Results Old Chardonnay 5

Type of Test	Name of Test	Test	Units	1/09/2015	8/08/2016	17/09/2017	15/10/2018	1/10/2019
Quality monitoring	Electrical conductivity	EC	$\mu\text{s}/\text{cm}$	60	100	212	20	129
Quality monitoring	Exchangeable calcium	Exch. Ca	$\text{cmol}(\text{+})/\text{kg}$	9.5	8.4	14.6	10.2	12.2
Quality monitoring	Exchangeable magnesium	Exch. Mg	$\text{cmol}(\text{-})/\text{kg}$	4	2.6	4.29	3.59	3.88
Quality monitoring	Exchangeable potassium	Exch. K	$\text{cmol}(\text{-})/\text{kg}$	2.1	3.8	0.79	2.71	3.89
Quality monitoring	Exchangeable sodium	Exch. Na	$\text{cmol}(\text{-})/\text{kg}$	0.07	0.09	0.23	0.16	0.21
Quality monitoring	Nitrate nitrogen	Nitrate	mg/kg	2	7	20	37	15
Quality monitoring	Total nitrogen	N (total)	mg/kg	2	5	1350	1550	2100
Quality monitoring	pH	pH		5.9	6.7	7.4	6.8	6.9
Quality monitoring	Total phosphorus	P (total)	mg/kg	130	190	428	488	800
Quality monitoring	Potassium	K	mg/kg	810	1500	3810	1880	5300
Quality monitoring	Sodium absorption ratio	SAR		0.03	0.04	<1	<1	<1
Quality monitoring	P sorption capacity	P sorption capacity	mg/kg	95	100	120	330	321

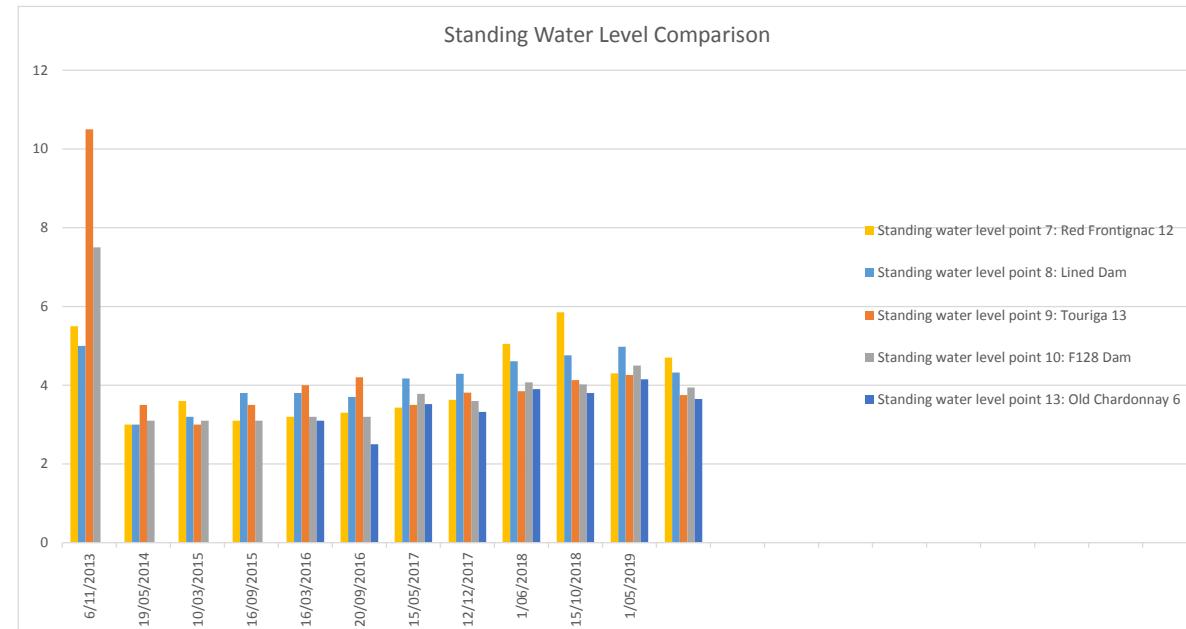


Point 12: Soil Test Results Old Chardonnay 6

Point 12: Soil Test Results Old Chardonnay 6		Date												
Type of Test	Name of Test	Test	Units	9/08/2016	27/09/2017	15/10/2018	2/10/2019							
Quality monitoring	Electrical conductivity	EC	µs/cm	140	145	16	157							
Quality monitoring	Exchangeable calcium	Exch. Ca	cmol(+) /kg	15	16.6	15.2	10.6							
Quality monitoring	Exchangeable magnesium	Exch. Mg	cmol(+) /kg	3.3	4.24	5.24	3.68							
Quality monitoring	Exchangeable potassium	Exch. K	cmol(+) /kg	4.1	0.78	3.91	6.27							
Quality monitoring	Exchangeable sodium	Exch. Na	cmol(+) /kg	0.1	0.3	0.13	0.24							
Quality monitoring	Nitrate nitrogen	Nitrate	mg/kg	4	12	20.5	20							
Quality monitoring	Total nitrogen	N (total)	mg/kg	2	1610	1670	1730							
Quality monitoring	pH	pH	pH	8	7.7	6.8	6.7							
Quality monitoring	Total phosphorus	P (total)	mg/kg	140	333	483	700							
Quality monitoring	Potassium	K	mg/kg	1600	3140	2340	7100							
Quality monitoring	Sodium absorption ratio	SAR	SAR	0.03	<1	<1	<1							
Quality monitoring	P sorption capacity	P sorption capacity	mg/kg	85	126	400	291							



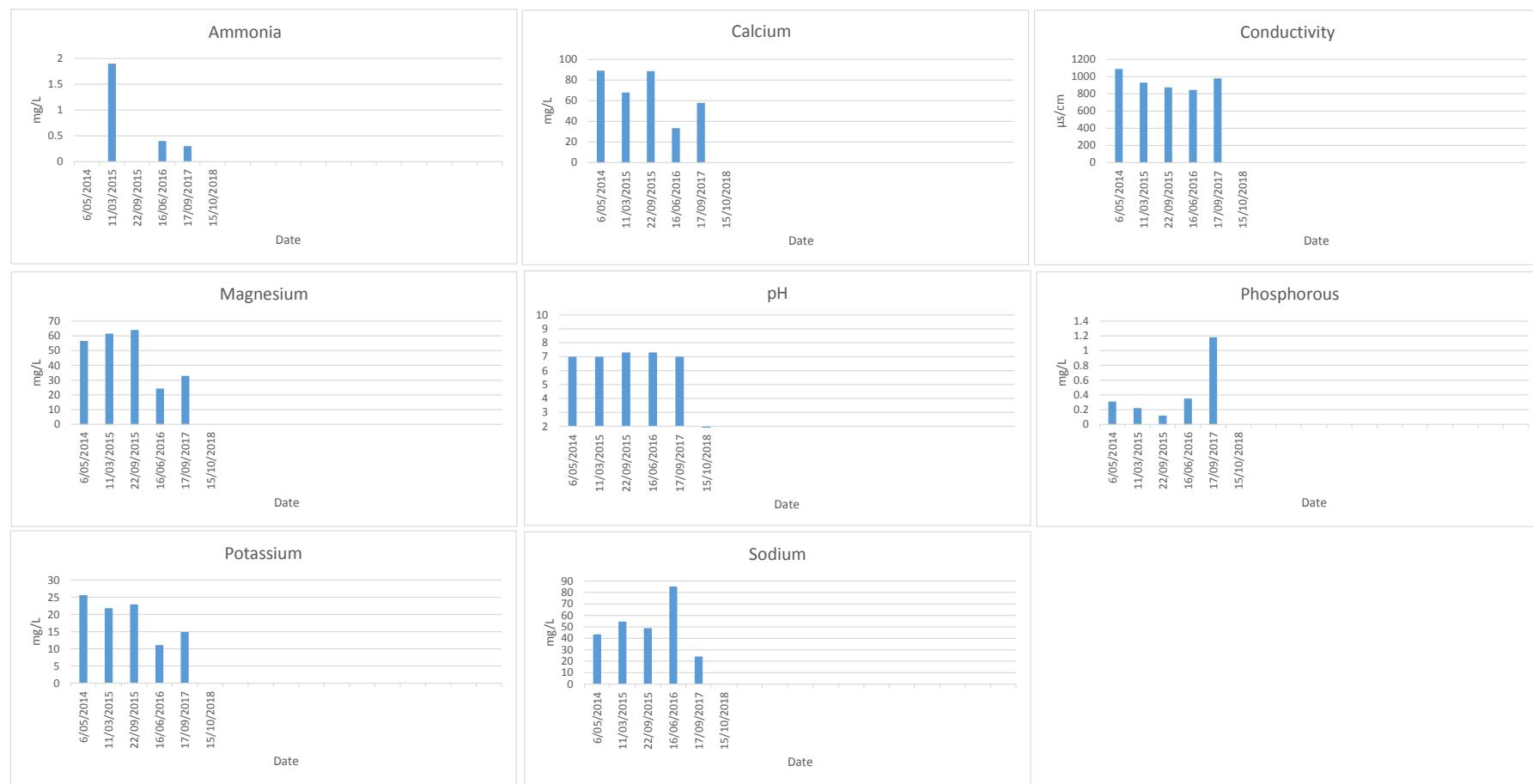
Piezometer Standing Water Levels: depth in metres below surface



Point 7: Piezometer Water Quality Test Results Red Frontignac 12 Row 1

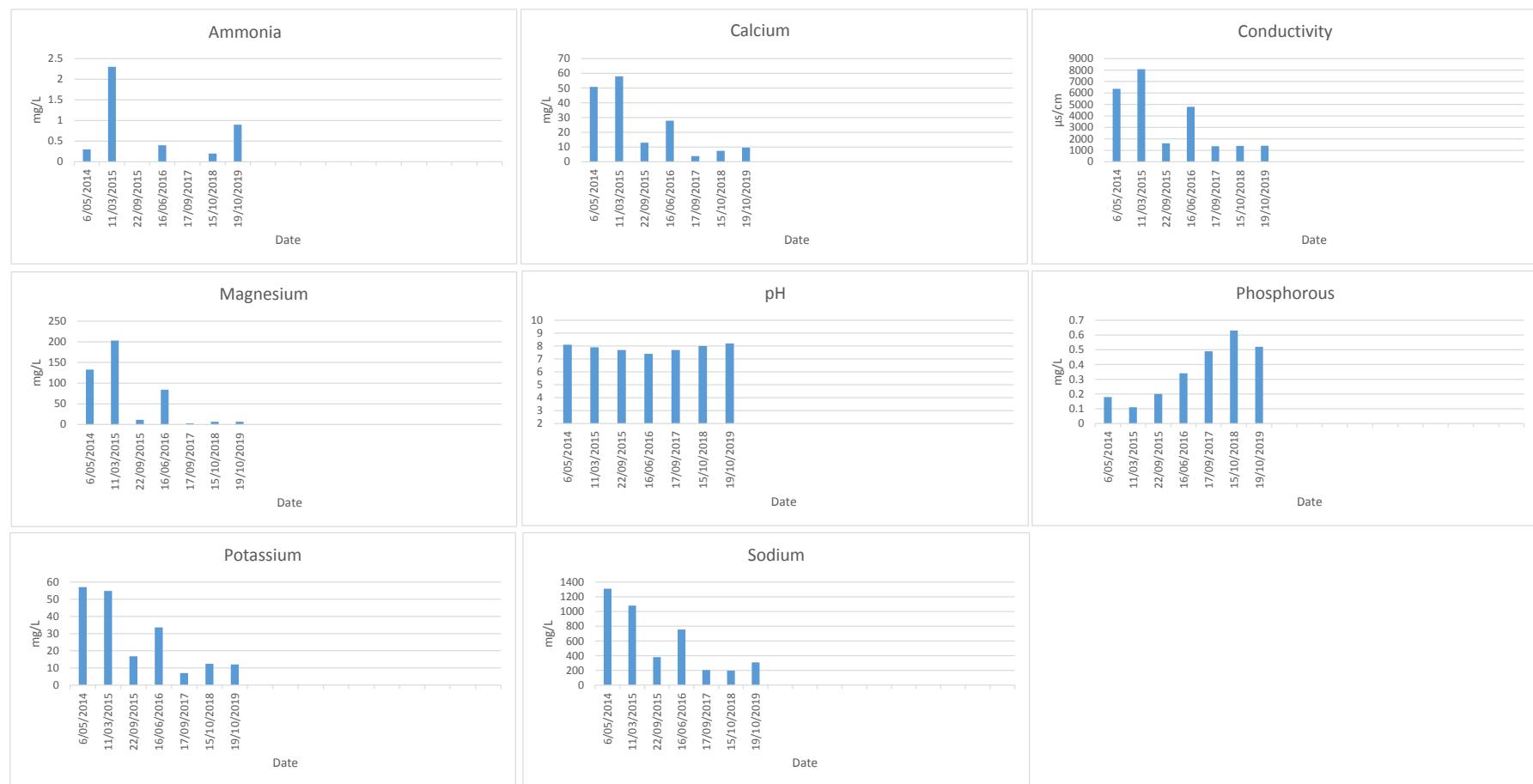
Date

Type of Test	Name of Test	Test	Units	6/05/2014	11/03/2015	22/09/2015	16/06/2016	17/09/2017	15/10/2018	17/09/2017	15/10/2018	17/09/2017	15/10/2018	17/09/2017	15/10/2018	17/09/2017	15/10/2018	17/09/2017	15/10/2018
Quality monitoring	Ammonium nitrogen	ammonia	mg/L	<0.2	1.9	<0.2	0.4	0.3	n/a										
Quality monitoring	Calcium	Ca	mg/L	89.1	67.9	88.6	33.5	57.9	n/a										
Quality monitoring	Electrical conductivity	EC	µs/cm	1090	931	874	845	980	n/a										
Quality monitoring	Magnesium	Mg	mg/L	56.5	61.5	64	24.3	32.9	n/a										
Quality monitoring	Nitrate nitrogen	N(nitrate)	mg/L	<0.5	<1	<0.5	<0.1	4.4	n/a										
Quality monitoring	Total nitrogen	N(total)	mg/L	2	<2	2	2	6	n/a										
Quality monitoring	pH	pH	pH	7	7	7.3	7.3	7	n/a										
Quality monitoring	Phosphorus	P	mg/L	0.31	0.22	0.12	0.35	1.18	n/a										
Quality monitoring	Potassium	K	mg/L	25.6	21.8	22.9	11.1	14.9	n/a										
Quality monitoring	Sodium	Na	mg/L	43.4	54.6	48.9	85.2	24.1	n/a										

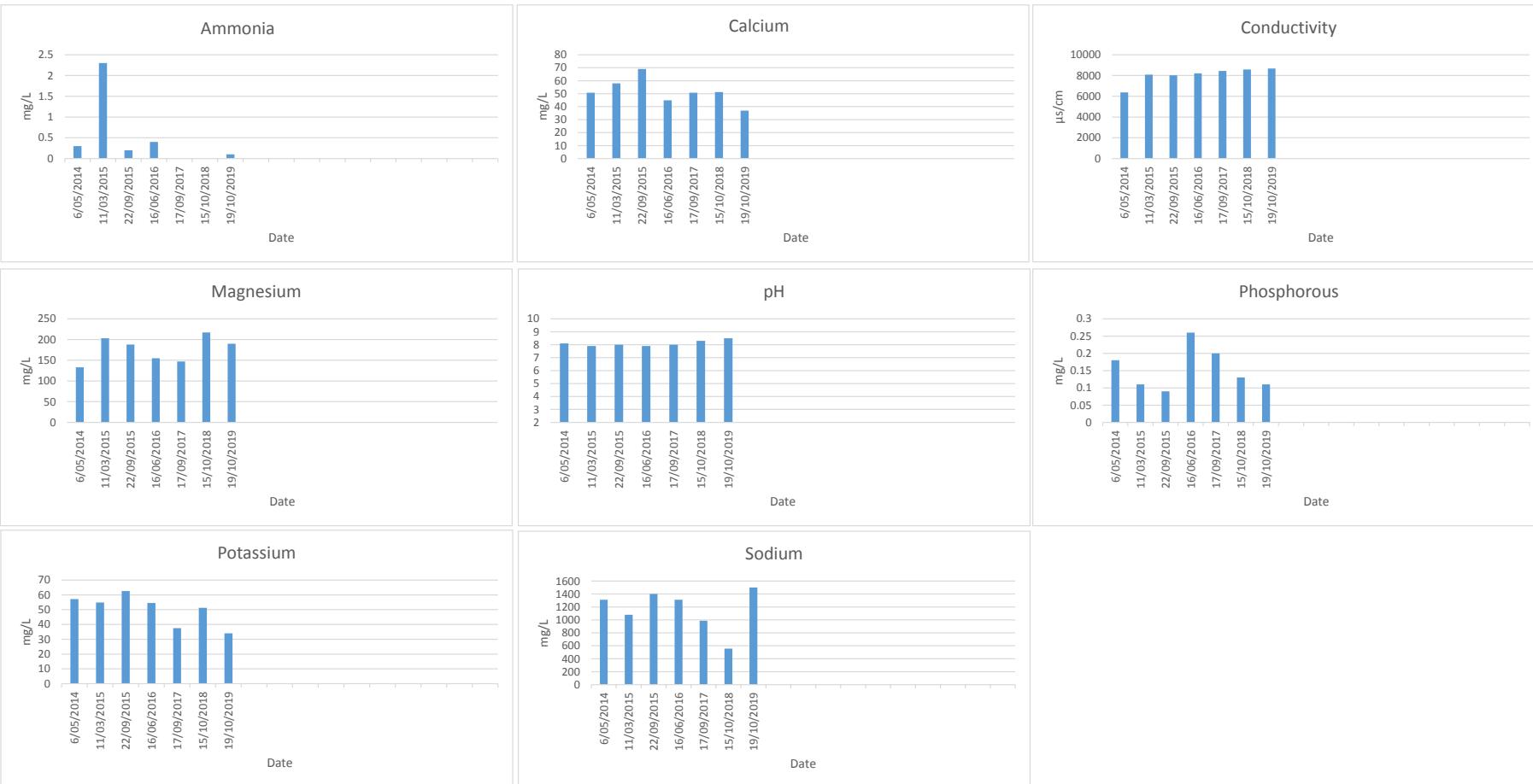


Point 8: Piezometer Water Quality Test Results Lined Dam SW End

Type of Test	Name of Test	Test	Units	Date							
				6/05/2014	11/03/2015	22/09/2015	16/06/2016	17/09/2017	15/10/2018	19/10/2019	
Quality monitoring	Ammonium nitrogen	ammonia	mg/L	0.3	2.3	<0.2	0.4	<0.1	0.2	0.9	
Quality monitoring	Calcium	Ca	mg/L	50.8	58	12.9	27.9	3.81	7.37	9.6	
Quality monitoring	Electrical conductivity	EC	µs/cm	6370	8080	1600	4790	1360	1390	1400	
Quality monitoring	Magnesium	Mg	mg/L	133	203	11.4	84	2.85	6.43	6.7	
Quality monitoring	Nitrate nitrogen	N(nitrate)	mg/L	<0.5	<1.0	<0.5	1.1	<0.1	0.2	<1	
Quality monitoring	Total nitrogen	N(total)	mg/L	2	<2	2	3	2	5	52	
Quality monitoring	pH	pH	pH	8.1	7.9	7.7	7.4	7.7	8	8.2	
Quality monitoring	Phosphorus	P	mg/L	0.18	0.11	0.2	0.34	0.49	0.63	0.52	
Quality monitoring	Potassium	K	mg/L	57.1	54.8	16.8	33.6	7	12.4	12	
Quality monitoring	Sodium	Na	mg/L	1310	1080	380	756	206	196	310	



Point 9: Piezometer Water Quality Test Results Touriga SW End



Point 10: Piezometer Water Quality Test Results F128 Dam SW Point									
Type of Test	Name of Test	Test	units	22/09/2015	16/06/2016	17/09/2017	15/10/2018	19/10/2019	Date
Quality monitoring	Ammonium nitrogen	ammonia	mg/L	<0.2	0.2	<0.1	<0.1	<0.1	
Quality monitoring	Calcium	Ca	mg/L	38	18.9	15	21.8	19	
Quality monitoring	Electrical conductivity	EC	µs/cm	3250	2780	3630	3690	3720	
Quality monitoring	Magnesium	Mg	mg/L	32.2	20.8	24.2	37.1	36	
Quality monitoring	Nitrate nitrogen	N(nitrate)	mg/L	1.6	<0.1	<0.1	0.2	<1	
Quality monitoring	Total nitrogen	N(total)	mg/L	4	<2	<2	<2	<2	
Quality monitoring	pH	pH		7.8	8.3	8.4	8.5	8.5	
Quality monitoring	Phosphorus	P	mg/L	0.47	0.22	0.16	0.09	0.07	
Quality monitoring	Potassium	K	mg/L	43.8	24.7	23.8	34.9	27	
Quality monitoring	Sodium	Na	mg/L	661	466	436	355	790	

Ammonia

Date	Ammonia (mg/L)
22/09/2015	~0.20
16/06/2016	~0.20
17/09/2017	~0
15/10/2018	~0

Calcium

Date	Calcium (mg/L)
22/09/2015	~38
16/06/2016	~20
17/09/2017	~15
15/10/2018	~22

Conductivity

Date	Conductivity (µs/cm)
22/09/2015	~3250
16/06/2016	~2780
17/09/2017	~3630
15/10/2018	~3690

Magnesium

Date	Magnesium (mg/L)
22/09/2015	~32
16/06/2016	~20
17/09/2017	~25
15/10/2018	~38

pH

Date	pH
22/09/2015	~7.8
16/06/2016	~8.3
17/09/2017	~8.4
15/10/2018	~8.5

Phosphorous

Date	Phosphorous (mg/L)
22/09/2015	~0.47
16/06/2016	~0.22
17/09/2017	~0.16
15/10/2018	~0.09

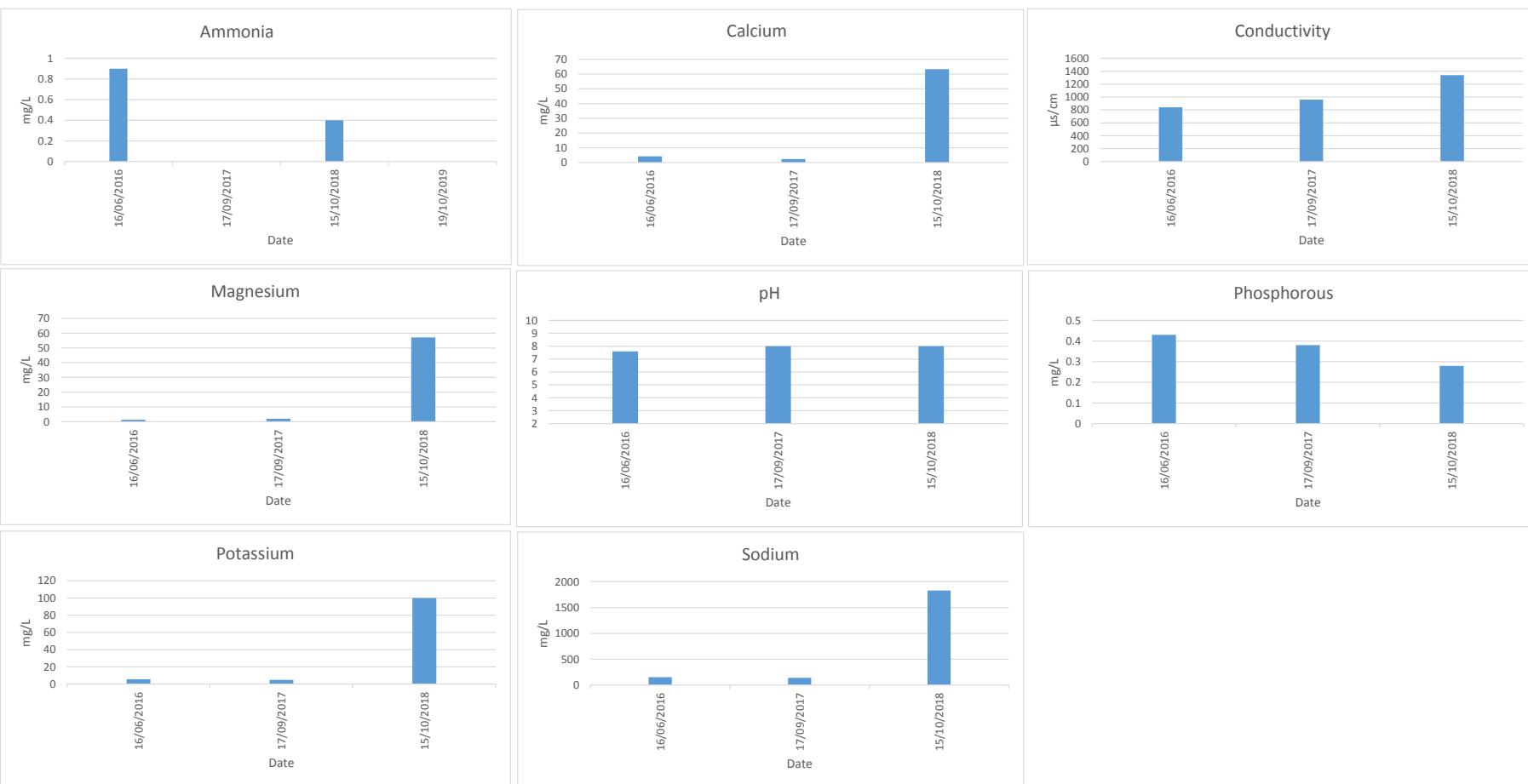
Potassium

Date	Potassium (mg/L)
22/09/2015	~43.8
16/06/2016	~24.7
17/09/2017	~23.8
15/10/2018	~34.9

Sodium

Date	Sodium (mg/L)
22/09/2015	~661
16/06/2016	~466
17/09/2017	~436
15/10/2018	~355

Point 13: Piezometer Water Quality Test Results Old Chardonnay 6 SW End



EPA ENVIRONMENTAL MONITORING			
Type of Monitoring Point	How Monitored	Location Description	Frequency
Odour	Odour Intensity and Descriptor Sheet; observation.	Boundary of evaporation ponds "EPA 21" & "EPA 22" on site map.	Daily (working days)

Type of Monitoring Point	How Monitored	Location Description	Frequency
Weather conditions other than rainfall - temperature, wind speed, wind direction, humidity	Handheld weather meter	Boundary of evaporation ponds "EPA 21" & "EPA 22" on site map.	Daily (working days)

Type of Monitoring Point	How Monitored	Location Description	Frequency
Rainfall	Rain gauge	Boundary of evaporation ponds "EPA 21" & "EPA 22" on site map.	Daily (working days)

Type of Monitoring Point	How Monitored	Location Description	Frequency
Biosolids Cake	Biosolids sample, laboratory analysis	Evaporation ponds sludge	As required

Test Type	EPA Reference Points	Frequency of Monitoring	Next Sample Date
Soil quality monitoring	3, 4, 5, 6, 11	Annual	September
Groundwater quality monitoring	7, 8, 9, 10	Annual	September
Groundwater standing level	7, 8, 9, 10	6 monthly	March & September
Effluent quality monitoring: inflow and outflow	1, 2	6 monthly	March & September
Effluent volume monitoring: inflow and outflow	1,2	Monthly	Monthly