



Remediation (NZ) Ltd.
Think of it as a State of the Art Fertiliser Production Facility

Taranaki Regional Council Presentation

17 October 2018



www.revitalfert.co.nz

Site Monitoring

- **Purchased YSI hand held Multi Meter & YSI Photometer**
 - Sample monitoring bores, streams and ponds every week
 - Update the sampling graphs weekly
 - Download the rainfall data weekly
 - Walk the streams weekly



Irrigation Pond Management

Irrigation Model

- **Proactive management** of the pond volume/level
- Default Rainfall & Evaporation data –Uruti Site Virtual Climate Station
- Predicted rainfall data
 - WeatherWatch (professional weather forecasters)
 - 14 & 30 day and 3 month predicted rainfall data
 - Data updated daily
- Model updated every Monday morning
 - Calculated hours of pumping required to lower pond level to cope with predicted rainfall for next week

Uruti Irrigation Model		Month	May	June	July	August	September	October	November	December	January	February	March	April	April	
	Days in Month		31	30	31	31	30	31	30	31	31	28	31	30	30	
Uruti Virtual Climate Station	Evaporation mm	Average	31.12	21.41	25.43	39.04	57.48	85.05	109.32	126.01	124.46	107.97	88.65	52.65	52.65	878.60
Uruti Virtual Climate Station	Rainfall mm	Average	181.20	189.51	181.83	178.04	175.35	188.38	149.39	149.04	120.00	107.02	119.22	151.25	151.25	1,890.22
																1,011.62

13 Month Calander

			1	2	3	4	5	6	7	8	9	10	11	12	13	
Predicted Rainfall	mm/day		5.85	6.32	5.87	5.74	5.85	6.08	4.98	4.81	3.97	3.82	3.85	5.04	5.04	
	Week1	Predicted	41.03	44.34	41.17	40.31	41.03	42.65	34.95	33.75	27.17	26.83	26.99	35.39	35.39	
	Week2	Predicted	41.03	44.34	41.17	40.31	41.03	12.72	34.95	33.75	27.17	26.83	26.99	35.39	35.39	
	Week3	Predicted	41.03	44.34	41.17	40.31	41.03	0.60	34.95	33.75	27.17	26.83	26.99	35.39	35.39	
	Week4	Predicted	41.03	44.34	41.17	40.31	41.03	42.65	34.95	33.75	27.17	26.83	26.99	35.39	35.39	
Rainfall falling onto the pond & percolating	Week1		164.11	177.36	164.68	161.25	164.11	98.62	139.81	134.99	108.68	107.31	107.98	141.55	141.55	1,912.02
	Week2		164.11	177.36	164.68	161.25	164.11	170.62	139.81	134.99	108.68	107.31	107.98	141.55	141.55	1,894.01
	Week3		450.15	481.70	451.51	443.33	450.15	465.64	292.29	390.79	318.16	314.89	316.48	396.42	396.42	5,257.95
	Week4		450.15	481.70	451.51	443.33	450.15	190.53	292.29	390.79	318.16	314.89	316.48	396.42	396.42	4,972.84
	Week4		1,900.61	1,926.78	1,806.03	1,773.31	1,800.61	1,176.89	1,569.16	1,523.17	1,272.64	1,259.58	1,265.93	1,585.69	1,585.74	20,346.13
Less evaporation and amount to be	Week1		(412.81)	(456.00)	(420.99)	(396.48)	(381.17)	(343.57)	(261.10)	(229.58)	(156.81)	(185.32)	(210.11)	(333.24)	(333.25)	(4,140.45)
	Week2		(412.81)	(456.00)	(420.99)	(396.48)	(381.17)	(78.46)	(261.10)	(229.58)	(156.81)	(185.32)	(210.11)	(333.24)	(333.25)	(3,855.34)
	Week3		(412.81)	(456.00)	(420.99)	(396.48)	(381.17)	36.98	(261.10)	(229.58)	(156.81)	(185.32)	(210.11)	(333.24)	(333.25)	(3,739.90)
	Week4		(412.81)	(456.00)	(420.99)	(396.48)	(381.17)	(343.57)	(261.10)	(229.58)	(156.81)	(185.32)	(210.11)	(333.24)	(333.25)	(4,140.45)
	Week4		(1,651.25)	(1,924.01)	(1,683.97)	(1,585.92)	(1,524.70)	(768.63)	(1,044.41)	(918.31)	(627.23)	(741.30)	(840.44)	(1,332.94)	(1,333.01)	(15,876.13)
Planned irrigation	Month		1,860.00	1,860.00	1,823.00	1,745.00	1,823.00	1,906.00	1,482.00	1,412.00	861.00	1,060.00	919.00	1,557.00	1,557.00	19,747.00
	Week		465.00	465.00	459.25	436.25	455.75	451.50	363.25	393.25	215.25	265.00	229.75	389.25	389.25	4,934.75
Volume irrigated	Week1	Entered	412.81	456.00	420.99	396.48	381.17	343.57	261.10	229.58	156.81	185.32	210.11	333.24	333.25	4,140.45
	Week2	Entered	412.81	456.00	420.99	396.48	381.17	78.46	261.10	229.58	156.81	185.32	210.11	333.24	333.25	
	Week3	Entered	412.81	456.00	420.99	396.48	381.17	(36.98)	261.10	229.58	156.81	185.32	210.11	333.24	333.25	
	Week4	Entered	412.81	456.00	420.99	396.48	381.17	343.57	261.10	229.58	156.81	185.32	210.11	333.24	333.25	
	Week4		1,651.25	1,924.01	1,683.97	1,585.92	1,524.70	768.63	1,044.41	918.31	627.23	741.30	840.44	1,332.94	1,333.01	15,876.13
Pumping hours required per week	Week1	Pumping	13.8	15.2	14.0	13.2	12.7	12.1	8.7	7.7	5.2	6.2	7.0	11.1	11.1	
	Week2	Pumping	13.8	15.2	14.0	13.2	12.7	2.6	8.7	7.7	5.2	6.2	7.0	11.1	11.1	
	Week3	Pumping	13.8	15.2	14.0	13.2	12.7	(1.2)	8.7	7.7	5.2	6.2	7.0	11.1	11.1	
	Week4	Pumping	13.8	15.2	14.0	13.2	12.7	12.1	8.7	7.7	5.2	6.2	7.0	11.1	11.1	
	Week4		55.04	60.80	56.13	52.86	50.82	25.62	34.81	30.61	20.91	24.71	28.01	44.43	44.43	529.20
																(529.20)
Pond freeboard storage (M³) at 1st day of month		1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	
Surplus liquid		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Pond vol at end of month		1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	
Pond vol per metre		1,200.0	1,200.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	
Pond depth (at beginning of month)		-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	
Pond depth (at end of 4 week month)		-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	

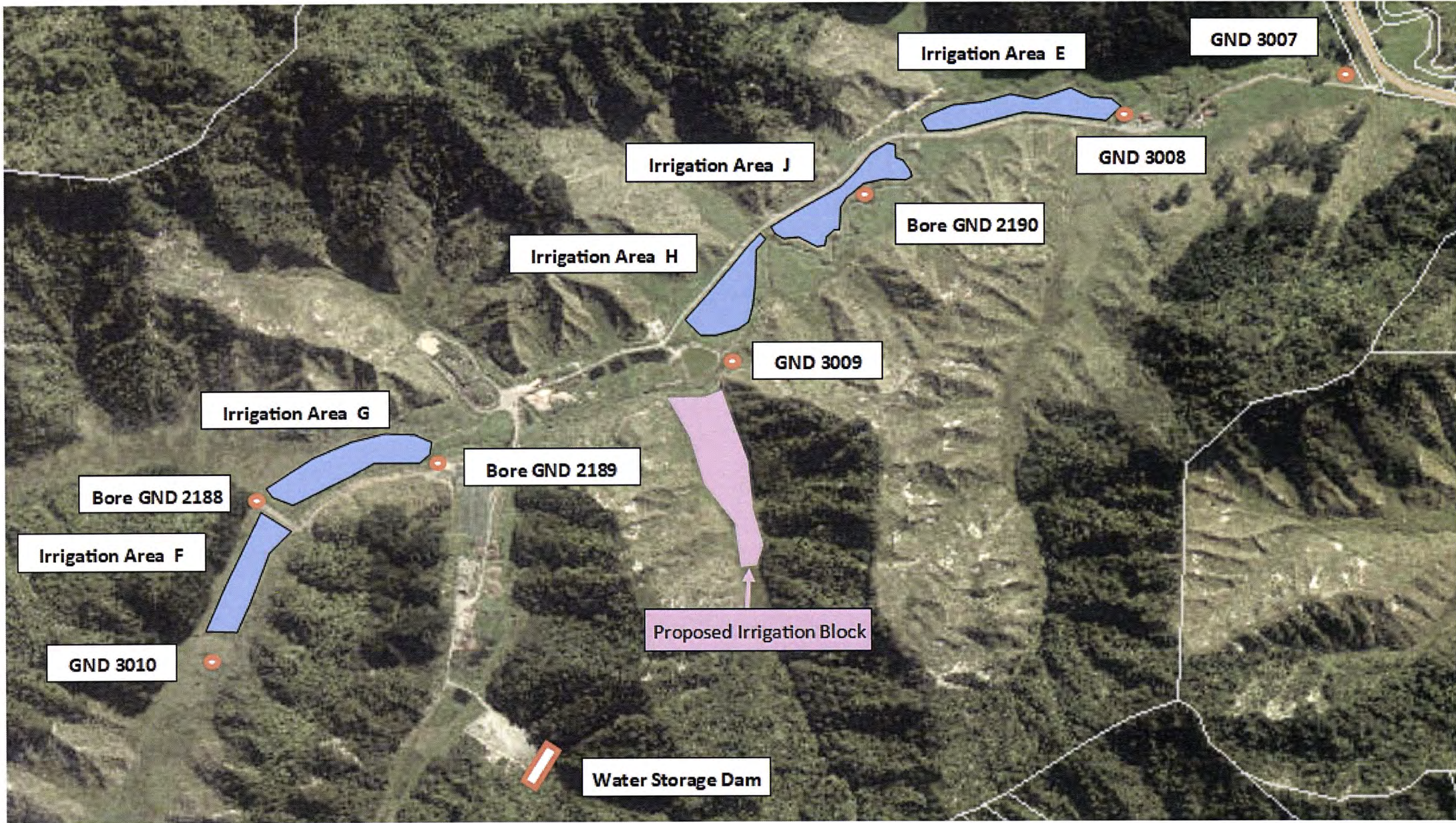




Irrigation Pond Management

Irrigation Blocks

- Southern irrigation block (Area F) will be commissioned Feb/March 2019
- Plan to develop a further new irrigation block
- Plan to install fixed sprinkler system onto areas F & G
 - Low application rate sprinklers
 - Irrigate 2mm/hour during wet conditions
 - Pulse irrigation



Irrigation Pond Management

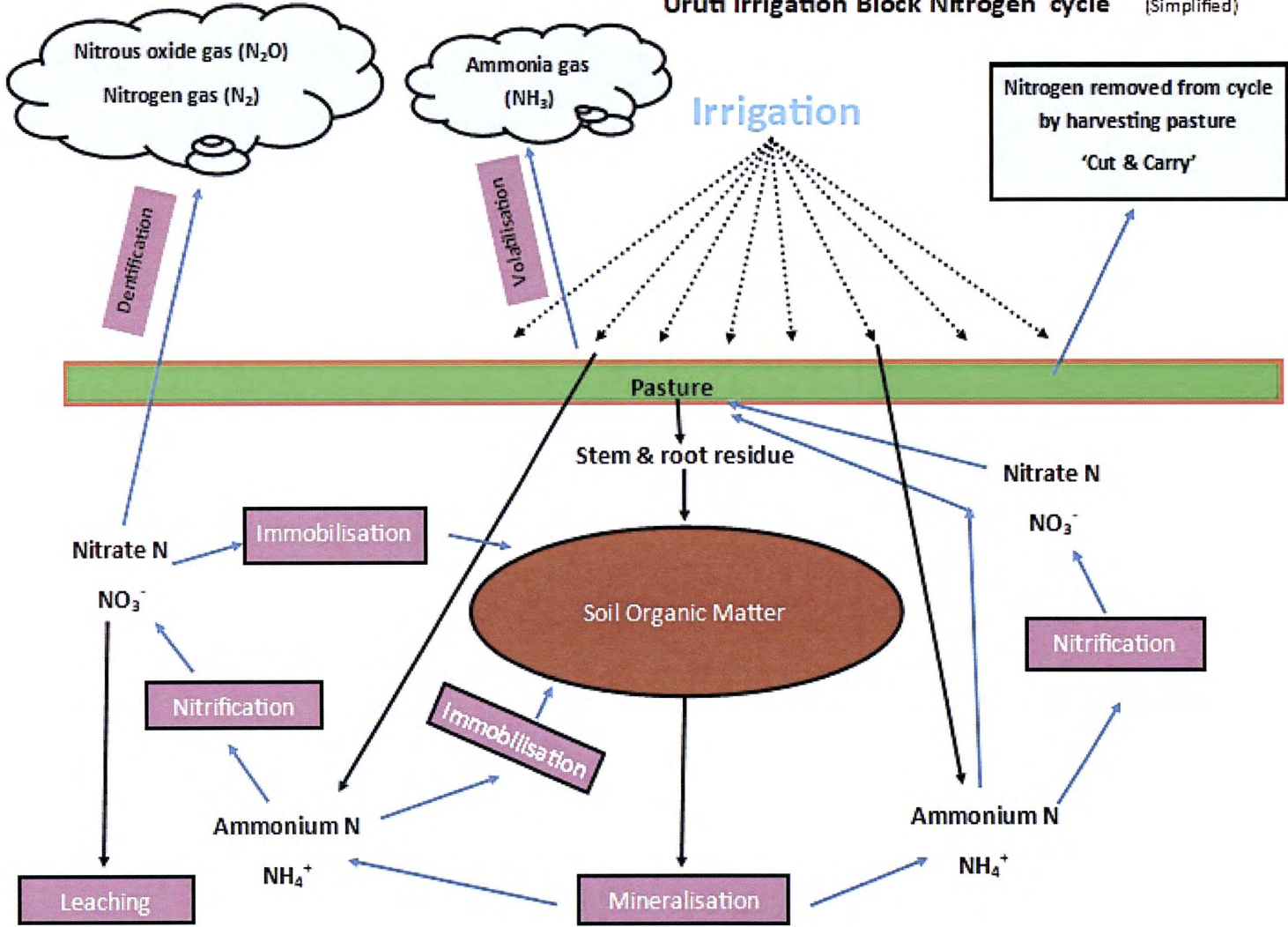
Irrigation Pond Concentration

- Maintain nutrient concentrations in irrigated liquid
- Pump fresh water from duck pond into irrigation pond during summer

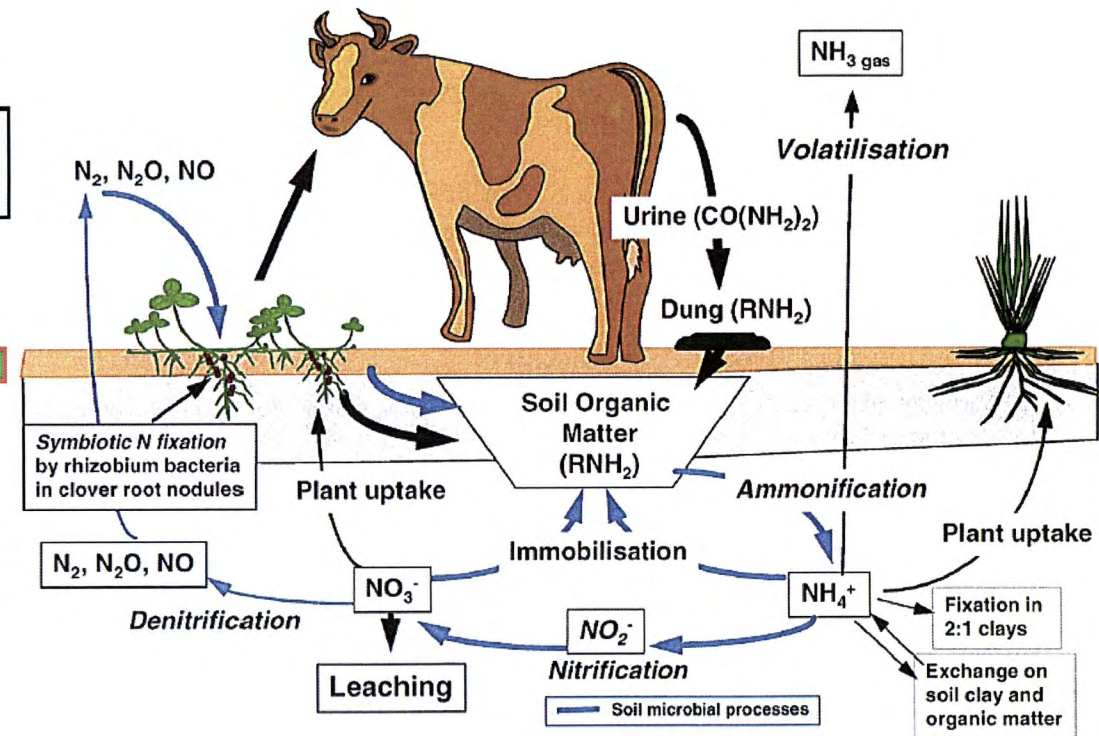
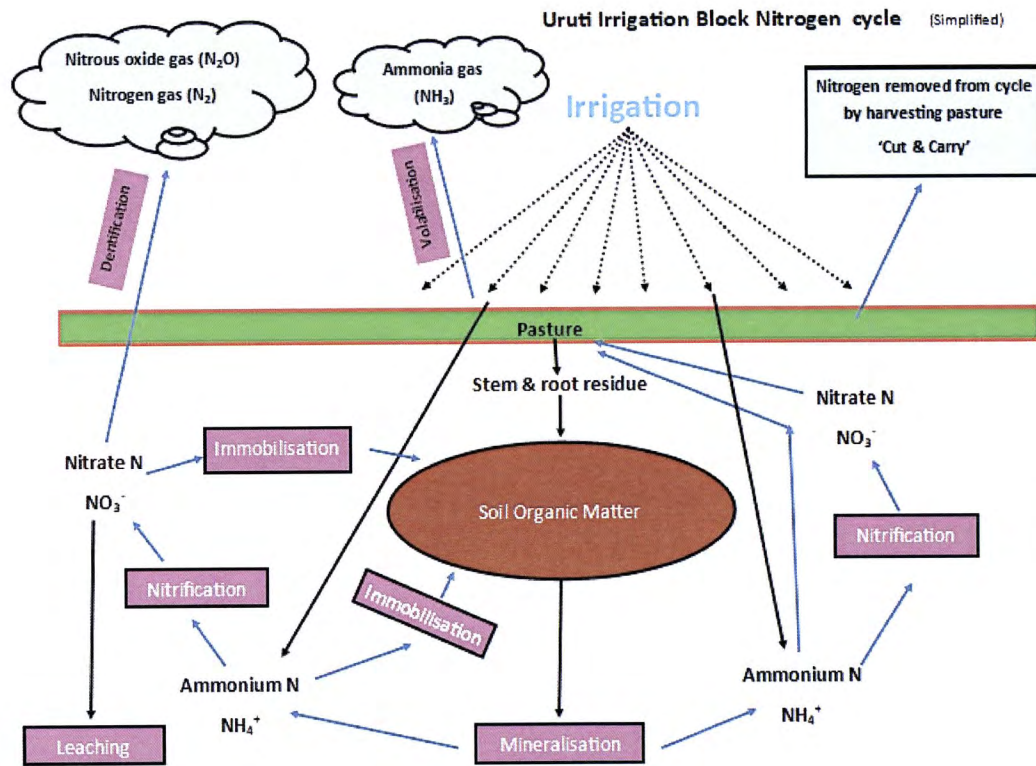


Irrigation Pond Management

Uruti Irrigation Block Nitrogen cycle (Simplified)



Uruti irrigation block compared to Dairy farm block



Release of Compost

- Developed Compost monitoring sheet
- NZS 4454: 2005
 - Compost, Soil Conditioners and Mulches
- BioGro Standard 2009 Appendix A
 - Residue levels in Certified Products, Water, Soil and Composts
- MfE Guidelines for Assessing and Managing Petroleum Contaminated Sites
- Released material used as fill and a soil conditioner on Uruti site

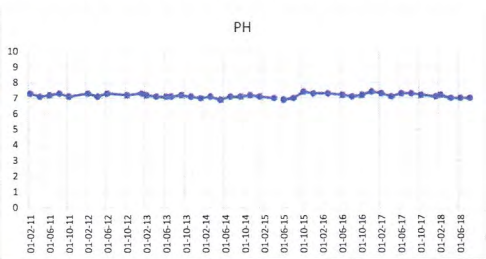
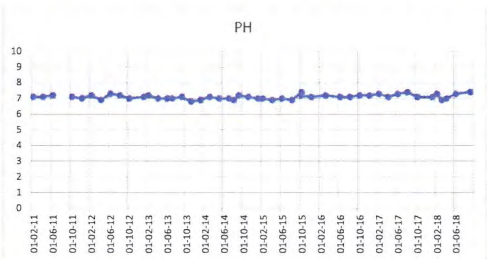
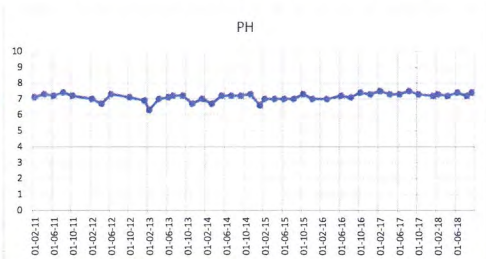
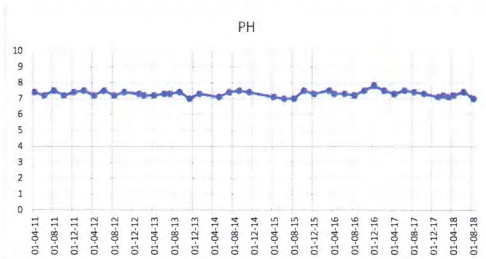
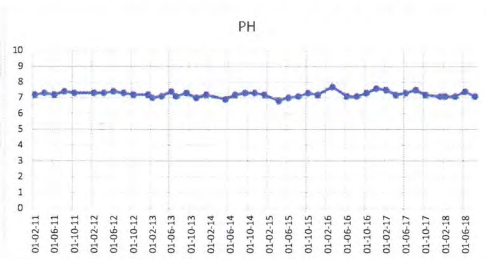
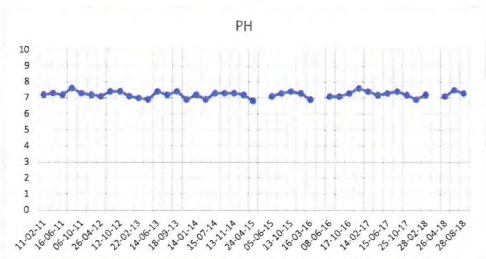
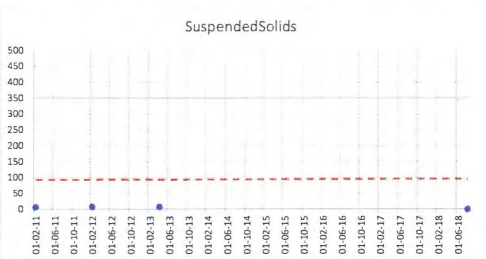
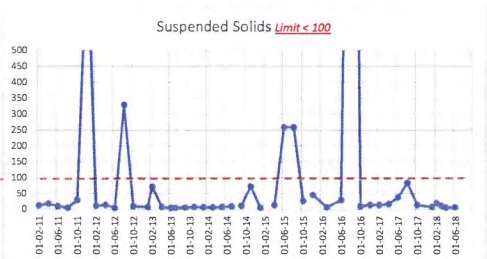
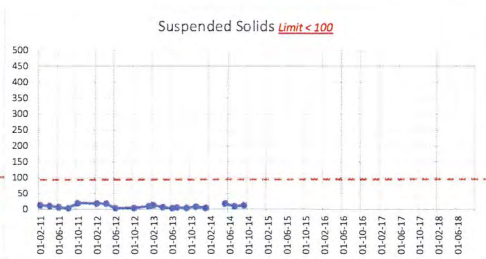
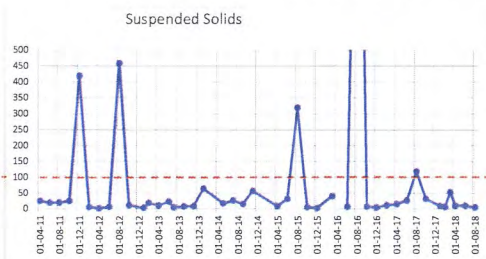
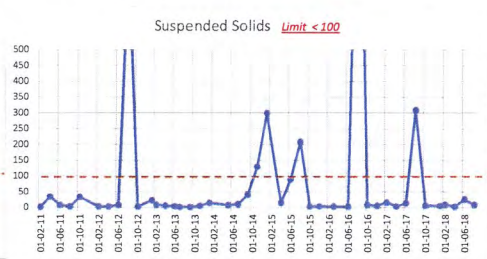
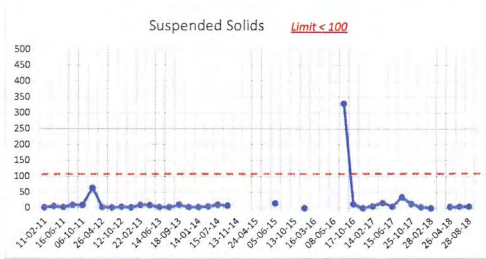
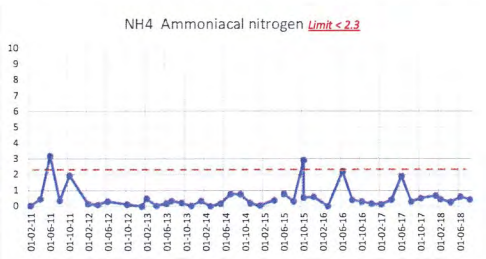
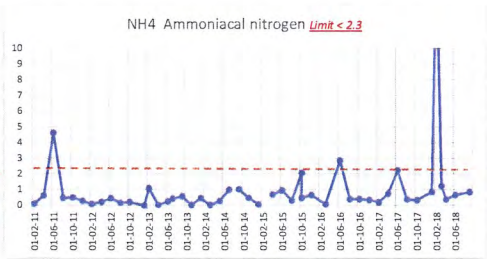
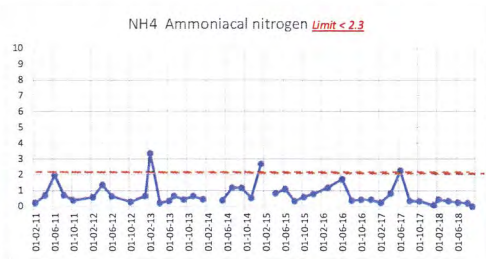
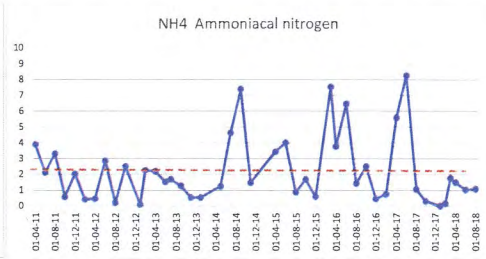
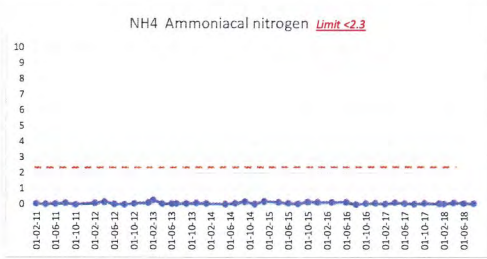
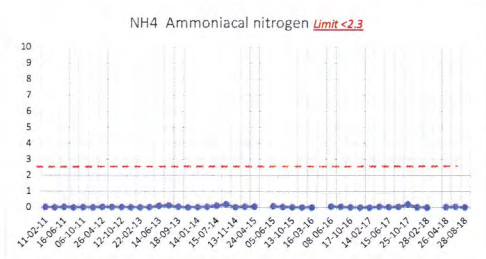
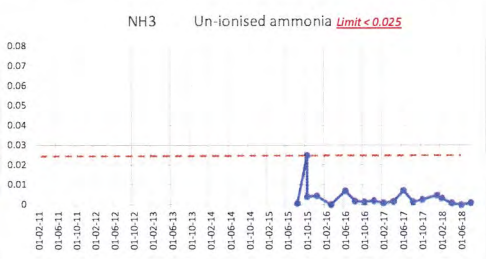
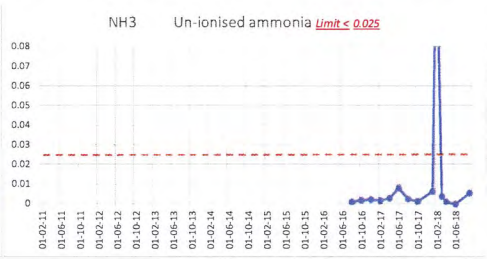
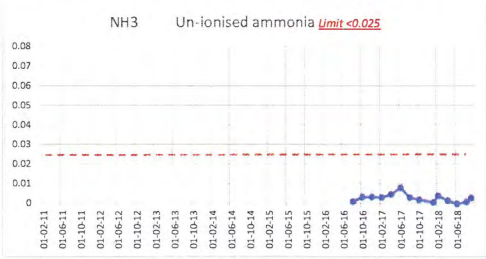
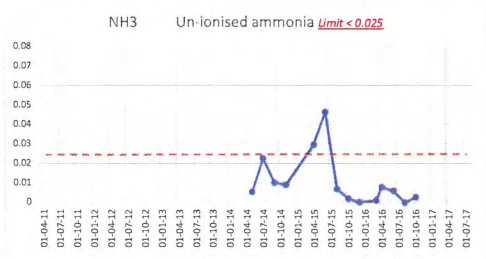
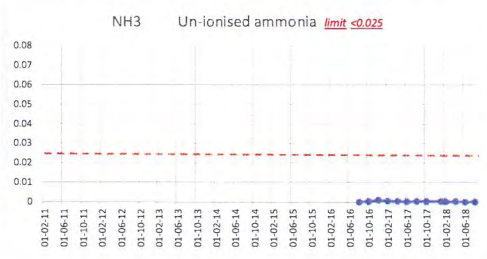
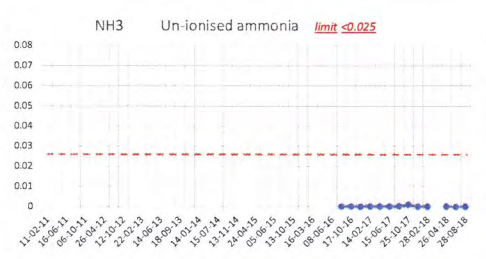
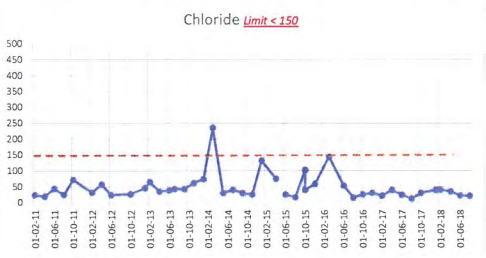
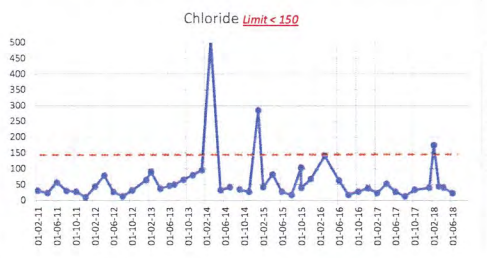
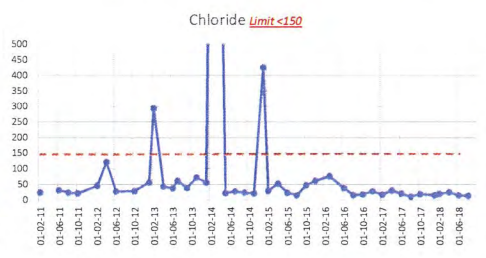
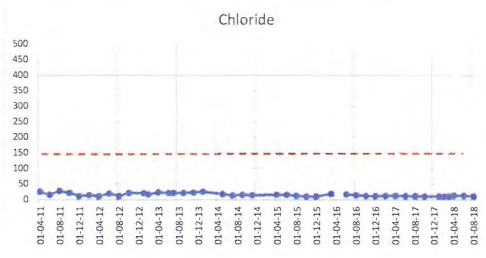
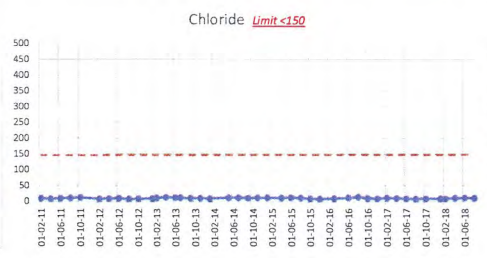
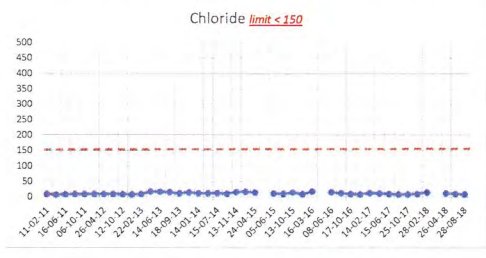
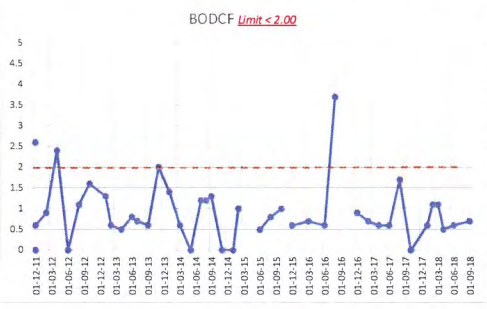
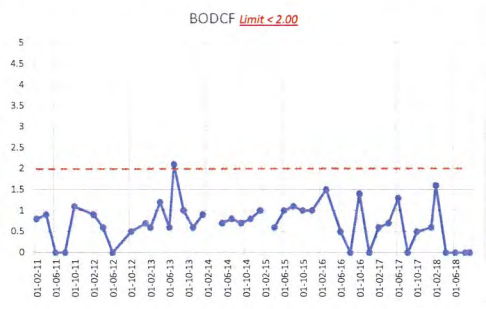
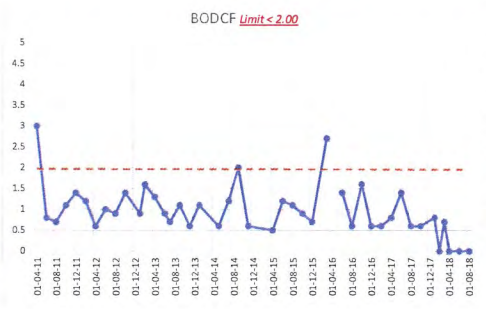
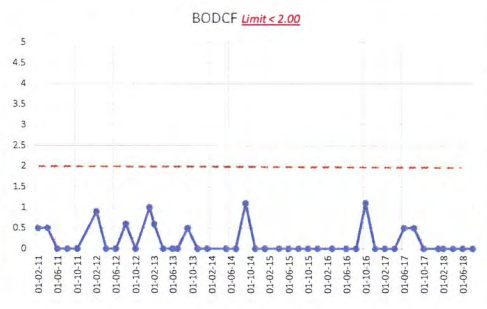
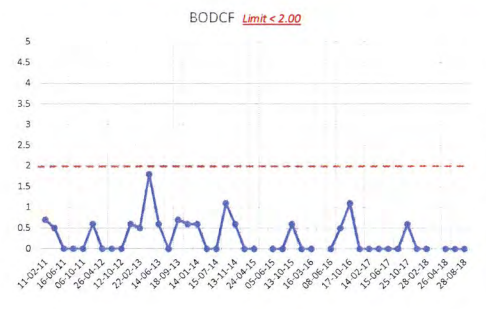
Comparison between compart sample results (Hill Lab) and MFE Guidelines for Assessing and Managing Petroleum										Hill Laboratory sample results			
Tablet in MFE Guidelines	Table 4.10	Table 4.11	Table 4.12	Table 4.13	Table 4.14	Table 4.15	Table 4.16	Table 5.11	Sample date	12-04-18	13-04-18	18-09-18	
	Silty Clay	Residential use	Commercial/Industrial use	Agriculture	Residential use	Commercial/Industrial use	Agriculture	Inhalation Residential/agriculture use	Groundwater acceptance criteria Irrigation		End of compart pile	End of compart pile	
									Hill Lab Number	1963125.2	1963135.1	2050996.18 2057936.1	
MAH	Benzene	1.7	7.2	1.7			300	0.8					
	Toluene	210	670	210			<10,000	39					
	Ethylbenzene	110	350	110			<10,000	19					
PAH	Naphthalene	69	230	7.2			3,400	0.8				<0.09	
	Benzo(a)pyrene	1600	NA	160			<10,000	2				<0.017	
	Benzo(a)pyrene eq	0.27	11	0.027			150	0.001				<0.017	
BTEN	Benzene											<0.04	
	Toluene											<0.04	
	Ethylbenzene											<0.04	
MAH	m,p-Xylene											<0.07	
	o-Xylene											<0.04	
	n-Butylbenzene											<0.04	
	tert-Butylbenzene											<0.04	
	Isopropylbenzene (Cumene)											<0.04	
	4-Isopropyltoluene (p-Cymene)											<0.04	
	n-Propylbenzene											<0.04	
	sec-Butylbenzene											<0.04	
	Styrene											<0.04	
	1,2,4-Trimethylbenzene											<0.04	
TPH	C7-C9				2700	8,800	2,700	<20,000	<5		<11	<10	<11
	C10-C14				560	1,900	58	<20,000	<5		1350	22	24
	C15-C26				<20,000	<20,000	4,000	<20,000	<5		9100	980	980
Heavy Metals	Total Arsenic	mg/kg	0.2						Guideline for 125 445: 2005	Biogro Std 2009 Appendix A			10.6
	Total Barium	mg/kg	6						<200	-	10	15	
	Total Cadmium	mg/kg	0.02						<3	<1			0.04
	Total Chromium	mg/kg	0.2						<600	<150			25
	Total Copper	mg/kg	4						<300	<60	125	54	28
	Total Lead	mg/kg	0.1						<250	<250			11.5
	Total Mercury	mg/kg	0.1						<2	<1			<0.12
	Total Nickel	mg/kg	0.2						<60	<60			16.8
	Total Zinc	mg/kg	4						<600	<300	174	146	59
	Total Calcium	mg/kg	100							-	49,900	34,800	
	Total Iron	mg/kg	40							-	18,600	19,000	
	Total Manganese	mg/kg	3							-	290	340	
	Total Magnesium	mg/kg	40							-	3,790	3,820	
Total Phosphorus	mg/kg	65							-	1,896	1,483		
Total Phosphorus	%								>0.1 (if a contribution to plant nutrient is claimed)	-	0.19	0.15	
Total Potassium	mg/kg	70							-	2,380	1,955	1,337	
Total Sodium	mg/kg	20							-	1,019	537	793	
Total Sulphur	mg/kg	45							-	3,030	3,020		
Organic Matter	%	0.2							>25	-	24.4	19.3	
Total Carbon	%	0.2							-	-	14.2	11.2	
Total Nitrogen	%	0.04%							>0.6 (if a contribution to plant nutrient is claimed)	-	0.59	0.59	0.04
C/N Ratio									-	-	24	19	
Dry Matter	g/100g arcc	0.5							-	-	59.1	59	
pH		0.1							5.0-8.5	-			7.8
Chloride	mg/L	6							-	-			126
Organochlorines in soil													
Total DDT	mg/kg									0.2			
Lindane	mg/kg									2			

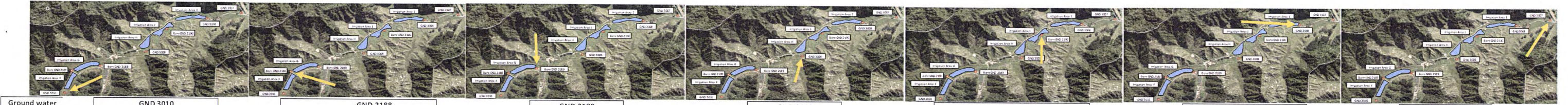
MFE Guidelines

RNZ Uruti Site minimum guidelines for release of final product (Compost and Soil Conditioner)

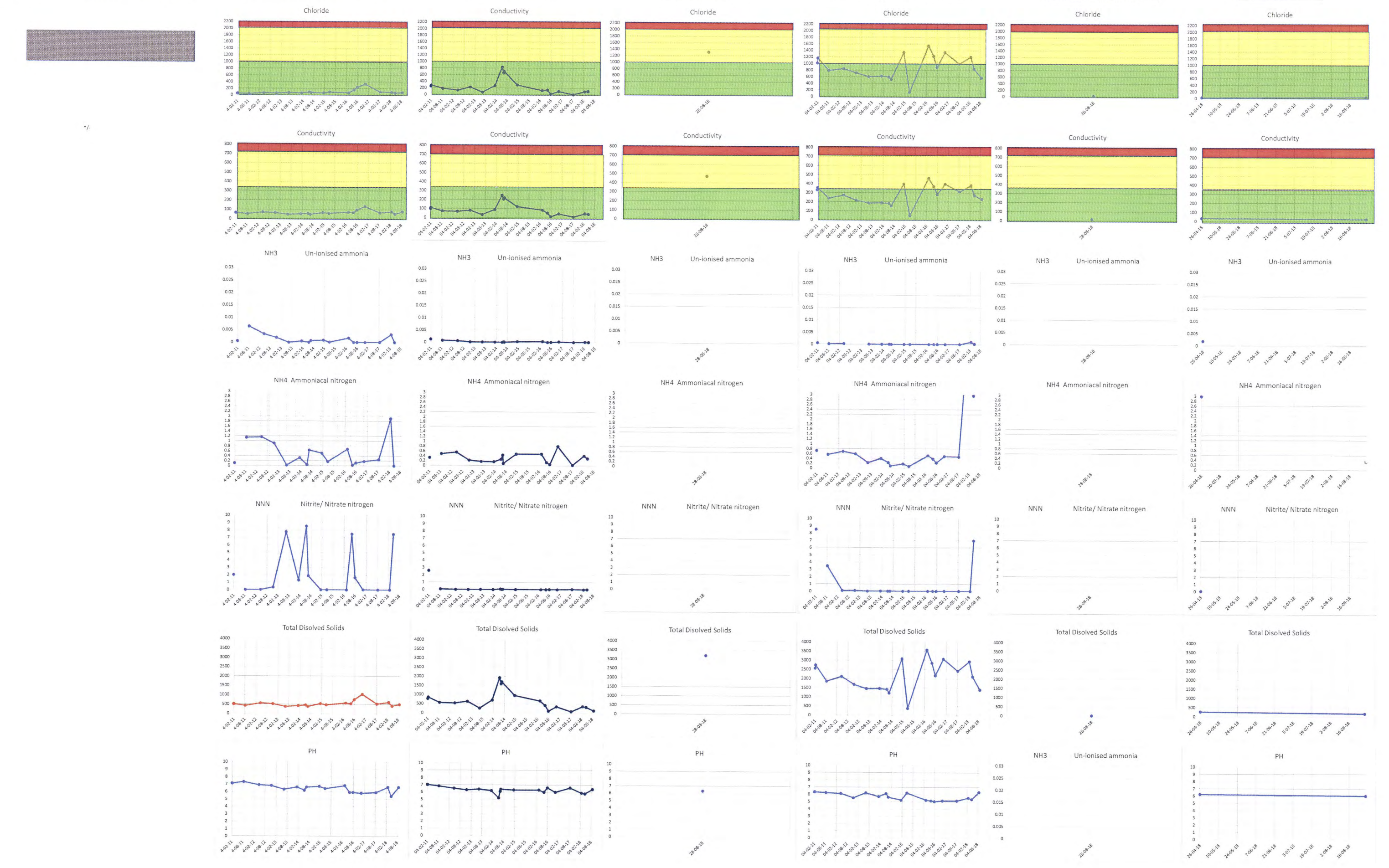
Fresh Water Ecology

- In discussions with a Fresh Water Ecologist
- 4Sight Consulting Ltd
- Investigate and report on the dead eels discovery





Ground water Sampling



Uruti Irrigation Model v1.4c

Month	May	June	July	August	September	October	November	December	January	February	March	April	April
Days in Month	31	30	31	31	30	31	30	31	31	28	31	30	30
Uruti Virtual Climate Station Evaporation mm	31.12	21.41	25.43	39.04	57.48	85.05	109.32	126.01	134.46	107.97	88.65	52.65	52.65
Uruti Virtual Climate Station Rainfall mm	181.20	189.51	181.83	178.04	175.35	188.38	149.39	149.04	120.00	107.02	119.22	151.25	151.25

			m2	1mm on 1m2	1mm on	Runoff
Rainfall	Pad 1	7,765	1	7765	0.25	1.94
Rainfall	Pad 3	8,133	1	8133	0.25	2.03
Rainfall	Ponds	4,300	1	4300	1	4.30
Liquid deliveries						187.50
Truck wash water						50.00
Rainfall	Baffling	1,000	1	1000	0.25	0.25
Rainfall	Wash pad	1,000	1	1000	1	1.00
Evaporation	Ponds	4,300	1	4300	1	4.30
Evaporation	Wash ponds	500	1	500	1	0.50
						4.80

13 Month Calendar

	1	2	3	4	5	6	7	8	9	10	11	12	13
mm/day	5.85	6.32	5.87	5.74	5.85	6.08	4.98	4.81	3.87	3.82	3.85	5.04	5.04
Week 1 Predicted Rainfall	41.03	44.34	41.17	40.31	41.03	42.65	34.95	33.75	27.17	26.83	26.99	35.39	35.39
Week 2 Predicted Rainfall	41.03	44.34	41.17	40.31	41.03	42.65	34.95	33.75	27.17	26.83	26.99	35.39	35.39
Week 3 Predicted Rainfall	41.03	44.34	41.17	40.31	41.03	42.65	34.95	33.75	27.17	26.83	26.99	35.39	35.39
Week 4 Predicted Rainfall	41.03	44.34	41.17	40.31	41.03	42.65	34.95	33.75	27.17	26.83	26.99	35.39	35.39
1	164.11	177.36	164.68	161.25	164.11	170.62	139.81	134.99	108.68	107.31	107.98	141.55	141.55
1	164.11	177.36	164.68	161.25	164.11	170.62	139.81	134.99	108.68	107.31	107.98	141.55	141.55

Week	1	2	3	4	5	6	7	8	9	10	11	12	13
1	450.15	481.70	451.51	443.33	450.15	465.64	392.29	380.79	318.16	314.89	316.48	396.42	396.43
2	450.15	481.70	451.51	443.33	450.15	465.64	392.29	380.79	318.16	314.89	316.48	396.42	396.43
3	450.15	481.70	451.51	443.33	450.15	465.64	392.29	380.79	318.16	314.89	316.48	396.42	396.43
4	450.15	481.70	451.51	443.33	450.15	465.64	392.29	380.79	318.16	314.89	316.48	396.42	396.43
	1,800.61	1,926.78	1,806.03	1,773.31	1,800.61	1,176.89	1,569.16	1,523.17	1,272.64	1,259.58	1,265.93	1,585.69	1,585.74

Week	1	2	3	4	5	6	7	8	9	10	11	12	13
1	(412.81)	(456.00)	(420.99)	(396.48)	(381.17)	(363.57)	(261.10)	(229.58)	(156.81)	(185.32)	(210.11)	(333.24)	(333.25)
2	(412.81)	(456.00)	(420.99)	(396.48)	(381.17)	(78.46)	(261.10)	(229.58)	(156.81)	(185.32)	(210.11)	(333.24)	(333.25)
3	(412.81)	(456.00)	(420.99)	(396.48)	(381.17)	36.98	(261.10)	(229.58)	(156.81)	(185.32)	(210.11)	(333.24)	(333.25)
4	(412.81)	(456.00)	(420.99)	(396.48)	(381.17)	(363.57)	(261.10)	(229.58)	(156.81)	(185.32)	(210.11)	(333.24)	(333.25)
	(1,651.25)	(1,824.01)	(1,683.97)	(1,585.92)	(1,524.70)	(768.63)	(1,044.41)	(918.31)	(627.23)	(741.30)	(840.44)	(1,332.96)	(1,333.01)

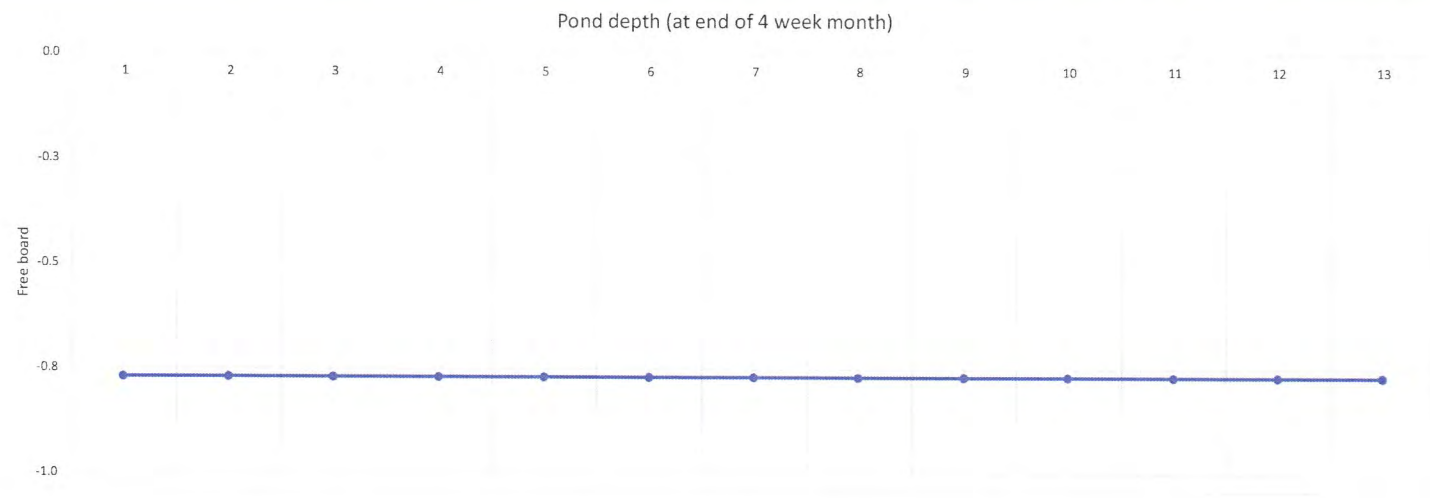
Planned irrigation	Month	1,860.00	1,860.00	1,833.00	1,745.00	1,823.00	1,806.00	1,453.00	1,413.00	861.00	1,060.00	919.00	1,557.00	1,557.00
Week		465.00	465.00	458.25	436.25	455.75	451.50	363.25	353.25	215.25	265.00	229.75	389.25	389.25

Week	1	2	3	4	5	6	7	8	9	10	11	12	13
1	412.81	456.00	420.99	396.48	381.17	363.57	261.10	229.58	156.81	185.32	210.11	333.24	333.25
2	412.81	456.00	420.99	396.48	381.17	78.46	261.10	229.58	156.81	185.32	210.11	333.24	333.25
3	412.81	456.00	420.99	396.48	381.17	(36.98)	261.10	229.58	156.81	185.32	210.11	333.24	333.25
4	412.81	456.00	420.99	396.48	381.17	363.57	261.10	229.58	156.81	185.32	210.11	333.24	333.25
	1,651.25	1,824.01	1,683.97	1,585.92	1,524.70	768.63	1,044.41	918.31	627.23	741.30	840.44	1,332.96	1,333.01

Week	1	2	3	4	5	6	7	8	9	10	11	12	13
1	13.8	15.2	14.0	13.2	12.7	12.1	8.7	7.7	5.2	6.2	7.0	11.1	11.1
2	13.8	15.2	14.0	13.2	12.7	2.6	8.7	7.7	5.2	6.2	7.0	11.1	11.1
3	13.8	15.2	14.0	13.2	12.7	(1.2)	8.7	7.7	5.2	6.2	7.0	11.1	11.1
4	13.8	15.2	14.0	13.2	12.7	12.1	8.7	7.7	5.2	6.2	7.0	11.1	11.1

	55.04	60.80	56.13	52.86	50.82	25.62	34.81	30.61	20.91	24.71	28.01	44.43	44.43
	529.20	(529.20)											

Pond freeboard storage (M³) at 1st day of month	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0
Surplus liquid													
Pond vol at end of month	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0
Pond vol per metre	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0
Pond depth (at beginning of month)	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8
Pond depth (at end of 4 week month)	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8



Liquid deliveries m3/month	375	Used in composting	0.50	187.50
Actual deliveries 2017		Composting MC best between 40 & 60%		
Pond Volume		m2	1 m depth	M3 per m
Freeboard	1304		1	1304
Pumping rate m3	30		0.5	652

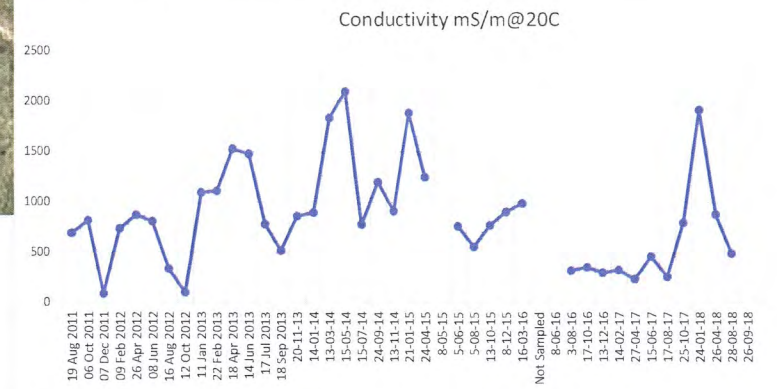
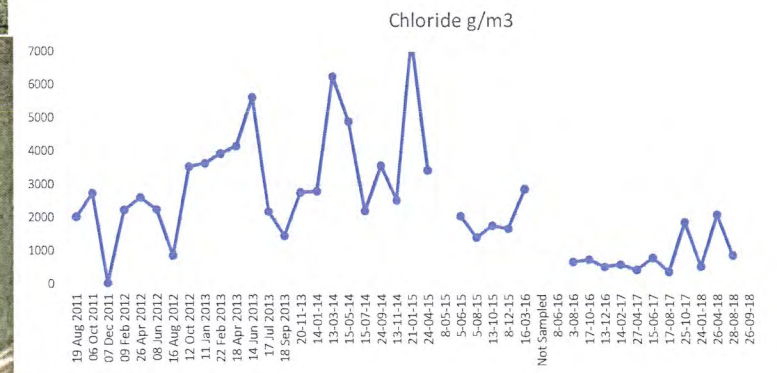
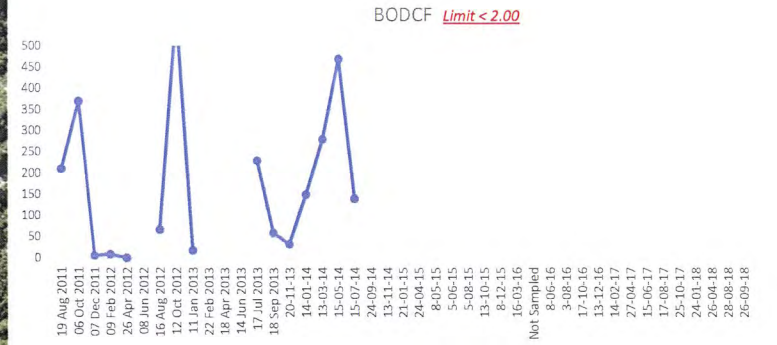
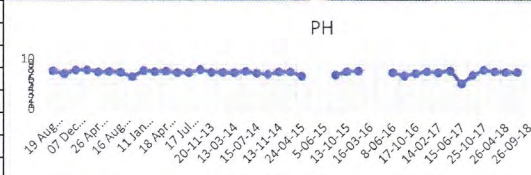
Sensibility test	Irrigation volume/yr	15,876
	Pumping rate M3/hr	30
	Irrigating hours/year	529.20
	Irrigating hours/week	10.18

350	15,876.13	1000	5,556.65
5,556.65	9.3		597.49

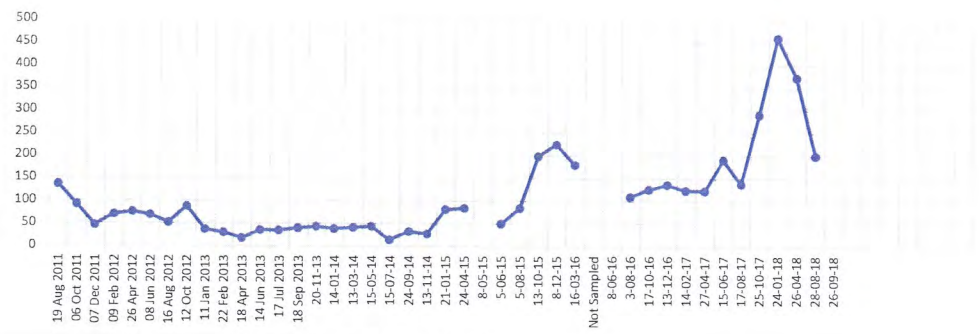
19,747.00	9
4,936.75	10220
	0.000880626
	0.088%
	20,000
	30
	666.67

Location	BODCF	Chloride	Conductivity	TPH	Sodium	NH4 Ammoniacal nitrogen	NNN Nitrite/ Nitrate nitrogen	NH3 Un-ionised ammonia	Total Nitrogen (TKN - NNN)	PH	Suspended Solids	Temperature
2044	Collected	g/m3	g/m3	mS/m@20C	g/m3	g/m3 N	g/m3 N	g/m3	g/m3	pH	g/m3	Deg.C
IND002044	19 Aug 2011	210	2030	692	542	136		1.4282		7.7		9
IND002044	06 Oct 2011	370	2750	816		91.8	0.14	0.41265		7.1		16.1
IND002044	07 Dec 2011	6	47.2	882	87.8	46.5	0.05	1.83034		7.9	44	20.9
IND002044	09 Feb 2012	8.9	2240	737	432	70	0.01	3.00348		7.9	160	22.1
IND002044	26 Apr 2012	>24	2620	872	384	75.8	0.15	0.88305		7.5	120	16.6
IND002044	08 Jun 2012		2260	808	452	69	0.08	0.71948		7.6	450	12
IND002044	16 Aug 2012	67	875	340	241	52.1		0.33384		7.4	74	11.6
IND002044	12 Oct 2012	580	3550	102	1220	87.7		0.12223		6.6	76	15.8
IND002044	11 Jan 2013	18	3650	1096	1250	37		1.14787		7.8	110	20.7
IND002044	22 Feb 2013		3940	1110	1400	30		0.63315		7.6	230	21.6
IND002044	18 Apr 2013		4170	1530	1980	17.6	0.02	0.34264		7.7	220	17.4
IND002044	14 Jun 2013		5630	1480	1830	35.2		0.18884		7.4	110	9.2
IND002044	17 Jul 2013	230	2200	781	666	34.9		0.1579		7.4	270	6.9
IND002044	18 Sep 2013	60	1470	521	550	39.9		1.29207		8	140	15.1
IND002044	20-11-13	33	2780	862	818	43.7		0.79115		7.5	240	22.6
IND002044	14-01-14	150	2820	898	753	38.6		1.06715		7.5	120	28.4
IND002044	13-03-14	280	6260	1840	1852	40.9		0.59433		7.4	65	22.7
IND002044	15-05-14	470	4910	2100	1168	44		0.49375		7.7		9.9
IND002044	15-07-14	140	2320	782	463	14.4		0.06469		7.3	140	9.9
IND002044	24-09-14		3590	1200	752	33		0.1398		7.1	180	15.3
IND002044	13-11-14		2550	913	834	27.5		0.46594		7.6		18.6
IND002044	21-01-15		7390	1890	1740	81.6		2.58865		7.6		27.2
IND002044	24-04-15		3450	1250	623	84.6		0.23159		6.8		18.7
IND002044	8-05-15											
IND002044	5-06-15		2070	762	378	50.2						10.9
IND002044	5-08-15		1430	559	333	84.3	0.06	0.18597		7		9.6
IND002044	13-10-15		1780	771	1030	199	0.13	3.93125		7.7		17.6
IND002044	8-12-15		1690	905	1250	225	0.11	7.29033		7.8		21.3
IND002044	16-03-16		2880	990	1160	180	<0.05					25.8
IND002044	Not Sampled											
IND002044	8-06-16									7.5		18.9
IND002044	3-08-16		692	322		214	110	0.02	0.21877	6.9		11.3
IND002044	17-10-16		764	356	200	126	0.05	1.02317		7.3		17.9
IND002044	13-12-16		546	303	184	137	0.02	3.46888		7.7		21
IND002044	14-02-17		610	329	232	124	0.03	2.02591		7.5		21.2
IND002044	27-04-17		454	238	162	123	0.05	4.22157		7.9		19
IND002044	15-06-17		813	464	312	191	0.24	0.00874		5.3		10.1
IND002044	17-08-17		398	262	119	138	0.05	0.39182		7		13
IND002044	25-10-17		1880	797	804	291	0.2	10.88808		8		17.1
IND002044	24-01-18		558	1920	3060	460	0.05	15.79717		7.7		25.2
IND002044	26-04-18		2110	880	823	373	0.18	5.45689		7.6		16.6
IND002044	28-08-18		890	492	17.5	210	200	0.013		7.6		13.8
IND002044	26-09-18							0.008	590			14.8

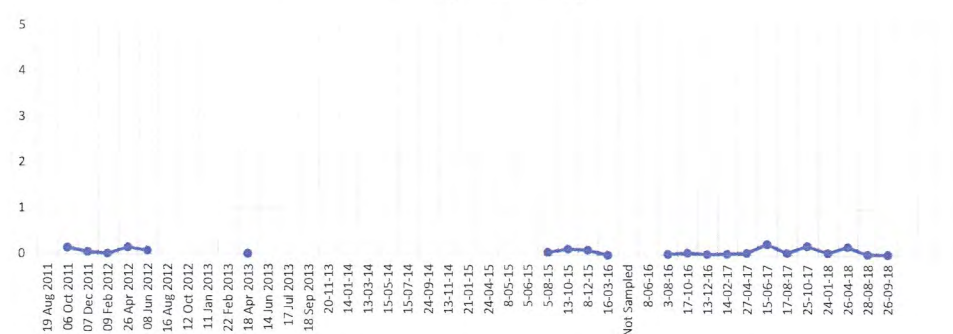
IND2044 Irrigation pond



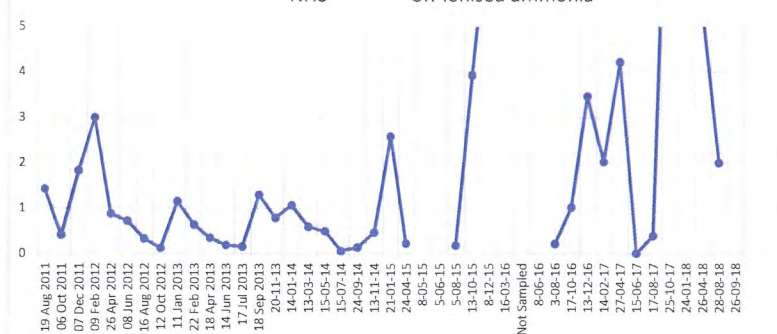
NH4 Ammoniacal nitrogen



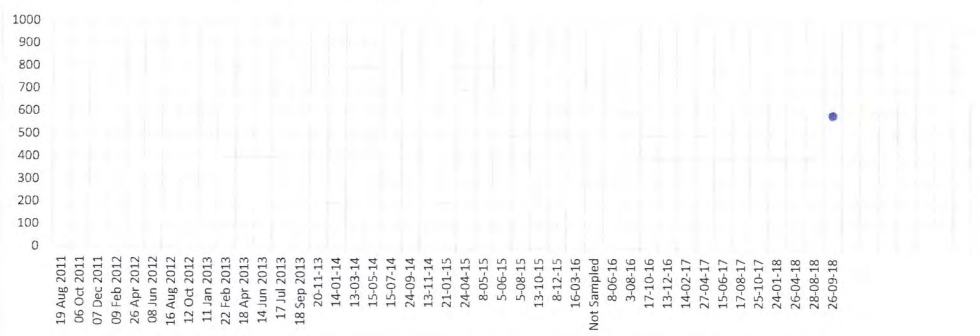
NNN Nitrite/ Nitrate nitrogen



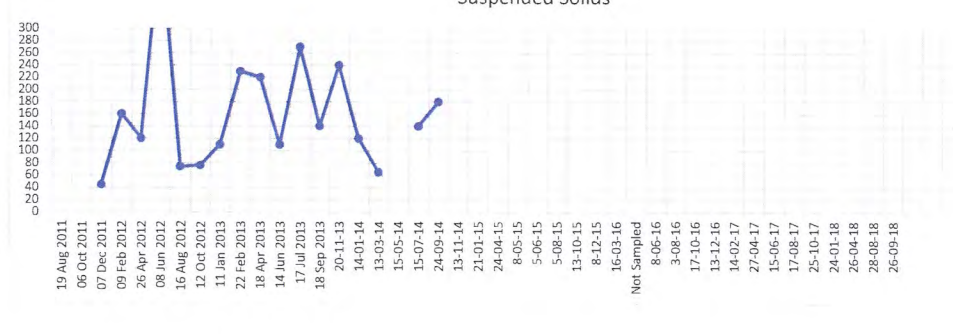
NH3 Un-ionised ammonia



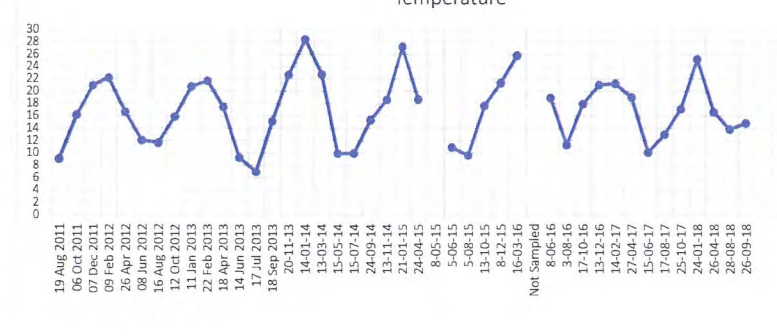
Total Nitrogen (TKN + NNN)



Suspended Solids



Temperature



Comparison between compost sample results (Hill Lab) and MfE Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites August 1999 (revised 2011)

Comparison between compost sample results (Hill Lab) and MfE Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites August 1999 (revised 2011)									Hill Laboratories sample results			
Tables in MfE Guidelines	Table 4.10	Table 4.11	Table 4.12	Table 4.13	Table 4.14	Table 4.15	Table 4.16	Table 5.11	Sample date	13-04-18	13-04-18	18-09-18
Silty Clay	Residential use	Commercial/Industrial use	Agricultural use	Residential use	Commercial/Industrial use	Agricultural use	Inhalation Residential/agricultural use	Groundwater acceptance criteria Irrigation		2/3rd down the compost pile	End of compost pile	End of compost pile
									Hill Lab Number	1963135.2	1963135.1	2050996.1 & 2057936.1
MAHs	Benzene	1.7	7.2	1.7			300	0.8				
	Toluene	210	670	210			<10,000	39				
	Ethylbenzene	110	350	110			<10,000	18				
	Xylenes	160	510	160			<10,000	13				
PAHs	Napthalene	69	230	7.2			3,400	0.8				<0.09
	Non-carc. (Pyrene)	1600	NA	160			<10,000	2				<0.017
	Benzo(a)pyrene eq	0.27	11	0.027			150	0.001				<0.017
BTEX	Benzene											<0.04
	Toluene											<0.04
	Ethylbenzene											<0.04
	m&p-Xylene											<0.07
	o-Xylene											<0.04
MAHs	n-Butylbenzene											<0.04
	tert-Butylbenzene											<0.04
	Isopropylbenzene (Cumene)											<0.04
	4-Isopropyltoluene (p-Cymene)											<0.04
	n-propylbenzene											<0.04
	sec-Butylbenzene											<0.04
	Styrene											<0.04
	1,2,4-Trimethylbenzene											<0.04
TPH	C7-C9				2700	8,800	2,700	<20,000	<5			<11
	C10-C14				560	1,900	58	<20,000	<5			1350
	C15-C36				<20,000	<20,000	4,000	<20,000	<5			9100

MfE Guidelines

RNZ Uruti Site minimum guidelines for release of final product (Compost and Soil Conditioner)

		Default detection Limit						Guidelines NZS 4454: 2005	BioGro Std 2009 Appendix A			
Heavy Metals	Total Arsenic	mg/kg	0.2					<20	<20			10.6
	Total Boron	mg/kg	6					<200	-	10	15	
	Total Cadmium	mg/kg	0.02					<3	<1			0.04
	Total Chromium	mg/kg	0.2					<600	<150			25
	Total Copper	mg/kg	4					<300	<60	125	54	28
	Total Lead	mg/kg	0.1					<250	<250			11.5
	Total Mercury	mg/kg	0.1					<2	<1			<0.12
	Total Nickel	mg/kg	0.2					<60	<60			16.8
Total Zinc	mg/kg	4					<600	<300	174	146	59	

Total Calcium	mg/kg	100							-	49,900	34,800	
Total Iron	mg/kg	40							-	18,600	19,000	
Total Manganese	mg/kg	3							-	290	340	
Total Magnesium	mg/kg	40							-	3,790	3,820	
Total Phosphours	mg/kg	65							-	1,896	1,483	
Total Phosphours	%							>0.1 (if a contribution to plant nutrient is claimed)	-	0.19	0.15	
Total Potassium	mg/kg	70							-	2,380	1,955	1,337
Total Sodium	mg/kg	20							-	1,019	537	793
Total Sulphur	mg/kg	45							-	3,030	3,020	

Organic Matter	%	0.2						>25	-	24.4	19.3	
Total Carbon	%	0.2							-	14.2	11.2	
Total Nitrogen	%	0.04%						>0.6 (if a contribution to plant nutrition is claimed)	-	0.59	0.59	0.04
C/N Ratio									-	24	19	
Dry Matter	g/100g as rcvd	0.5							-	59.1	59	
pH		0.1						5.0-8.5	-			7.8
Chloride	mg/L	6							-			136

Organochlorines in soil

Total DDT	mg/kg								0.2			
Lindane	mg/kg								2			