General Photographs (including Hazards)

Photo 101 – Rock Outcrop near Site 3

Photo 102 – Erosion Area near Site 26

Photo 103 – Rock Outcrop near Site 27

Parameter		Site 1 GR01 0.0-0.1 Soil	Site 1 GR01 0.2-0.3 Soil	Site 1 GR01 0.3-0.45 Soil	Site 1 GR01 0.45-0.55 Soil	Site 2 GR02 0.0-0.1 Soil	Site 2 GR02 0.15-0.2 Soil	Site 3 GR03 0.0-0.1 Soil	Site 3 GR03 0.1-0.2 Soil	Site 3 GR03 0.4-0.5 Soil	Site 4 GR04 0.0-0.1 Soil	Site 4 GR04 0.2-0.3 Soil	Site 5 GR05 0.0-0.1 Soil	Site 5 GR05 0.2-0.3 Soil	Site 6 GR06 0.0-0.1 Soil	Site 6 GR06 0.15-0.25 Soil	Site 6 GR06 0.3-0.4 Soil	Site 7 GR07 0.0-0.1 Soil	Site 7 GR07 0.1-0.2 Soil	Site 7 GR07 0.35-0.4 Soil	Site 7 GR07 0.5-0.7 Soil	Site 8 GR08 0.0-0.1 Soil	Site 8 GR08 0.15-0.2 Soil	Site 9 GR09 0.0-0.1 Soil	Site 9 GR09 0.1-0.2 Soil	Site 10 GR10 0.0-0.1 Soil	Site 10 GR10 0.1-0.2 Soil
Soluble Calcium (mg/kg)		**602**	606	729	1,095	**291**	524	**258**	382	254	**925**	4577	**1,241**	1333	**348**	376	2,305	**278**	131	112	31	**2,073**	1,900	**3,090**	1,488	1,137	1,170
Soluble Magnesium (mg/kg)		**214**	129	224	562	**75**	108	**85**	124	485	**356**	1,616	**643**	1078	**252**	542	2245	**125**	50	73	338	**364**	212	**704**	217	203	165
Soluble Potassium (mg/kg)		**512**	286	129	43	**182**	38	**138**	65	32	**325**	32	**141**	58	**34**	<25	<25	**87**	<25	<25	<25	**221**	<25	**1175**	165	612	386
Soluble Phosphorus (mg/kg)		**4.0**	3.0	2.7	3.2	**1.7**	1.7	**2.1**	1.9	1.6	**4.8**	6.5	**5.1**	5.2	**2.3**	2.2	5.3	**2.7**	1.1	<1	<1	**9.9**	4.0	**86.6**	5.7	8.2	5.9
Phosphorus (mg/kg P)		**7**	6.4	3.7	1	**1.6**	<1	**1.7**	1.2	1.0	**2.9**	1.0	**5.9**	<1	**4.3**	1	1.1	**6.0**	1.9	1.6	1.4	**44.1**	2.6	**140.1**	45	39.5	24.7
		28	33	36	15	**7**	2	**10**	2	3	**8**	2	**24**	2	**9**	2	3	**14**	3	1	1	**132**	40	**335**	196	116	87
		14	11.2	7.7	2	**2.5**	1.6	**2.5**	2.0	1.9	**6.2**	2.4	**12**	3.1	**8.2**	2	3.2	**12.0**	3	2.1	2.3	**63.8**	9.1	**261.1**	109	85.2	49.6
Nitrate Nitrogen (mg/kg N)		**15.1**	3.7	1.6	1.6	**3.25**	0.91	**4.14**	1.7	0.8	**28.44**	1.24	**4.73**	1.26	**6.52**	0.80	0.83	**4.36**	1.0	0.8	0.26	**8.16**	1.39	**107.5**	2.7	7.8	1.9
Ammonium Nitrogen (mg/kg N)		**5.1**	2.0	1.41	2.6	**3.9**	1.03	**5.99**	2.0	1.1	**16.5**	1.7	**3.6**	2.01	**4.38**	2.1	1.30	**2.7**	1.2	1.3	0.9	**5.4**	2.1	**21.24**	1.3	7.1	2.2
Sulfur (mg/kg S)		**10.1**	4.3	4.9	7.0	**6.9**	3.3	**5.2**	6.8	4.7	**8.2**	6.0	**7.5**	8.2	**7.2**	8.2	12.1	**7**	4.4	6.0	5.8	**15.4**	5.9	**21.9**	7.6	14.6	5.9
pH		**6.20**	6.27	6.82	7.05	**5.45**	7.33	**5.63**	6.23	8.65	**5.72**	8.25	**6.48**	8.25	**5.98**	6.62	9.09	**6.25**	6.48	6.89	6.84	**6.25**	7.19	**6.55**	6.55	6.42	6.57
Electrical Conductivity (dS/m)		**0.073**	0.032	0.022	0.032	**0.033**	0.022	**0.041**	0.038	0.114	**0.100**	0.174	**0.054**	0.067	**0.037**	0.051	0.447	**0.042**	0.017	0.022	0.094	**0.056**	0.042	**0.319**	0.030	0.063	0.041
Estimated Organic Matter (% OM)		**3.9**	1.19	0.48	0.8	**2.61**	0.39	**2.98**	1.1	0.2	**7.19**	2.00	**4.9**	1.6	**3.2**	1.1	0.86	**1.72**	0.3	0.11	0.04	**5.4**	1.80	**19.95**	2.4	5.11	2.70
Exchangeable Calcium	(cmol+/kg)	**6.4**	5.4	10.4	11.9	**3.0**	4.2	**2.2**	3.1	2.01	**10.91**	28.21	**13.99**	16.01	**2.97**	3.9	7.1	**1.7**	0.9	0.6	0.2	**17.6**	17.9	**27.8**	15.3	12.9	12.1
	(kg/ha)	**2,882**	2,421	4,685	5,364	**1,336**	1,905	**978**	1,381	904	**4,896**	12665	**6,282**	7,187	**1332**	1,766	3,183	**770**	423	261	80	**7,914**	8,058	**12,462**	6,855	5,807	5,412
	(mg/kg)	**1,286**	1,081	2,091	2,394	**596**	851	**437**	617	404	**2186**	5654	**2,804**	3209	**595**	789	1,421	**344**	189	116	36	**3,533**	3,597	**5,563**	3,060	2,593	2,416
Exchangeable Magnesium	(cmol+/kg)	**2.94**	1.7	4.9	9.13	**1.17**	1.4	**1.0**	1.4	6	**5**	17	**9.9**	19.3	**3.0**	9.03	17.46	**1.1**	0.51	0.63	4.6	**4.3**	2.9	**7.8**	3.25	2.89	2.3
	(kg/ha)	**800**	453	1,341	2,487	**319**	370	**262**	393	1,620	**1,463**	4,664	**2,693**	5,245	**806**	2,457	4,754	**290**	139	172	1,245	**1,171**	781	**2,123**	885	787	622
	(mg/kg)	**357**	202	598	1110	**142**	165	**117**	176	723	**653**	2,082	**1,202**	2,341	**360**	1097	2122	**129**	62	77	556	**523**	349	**948**	395	351	278
Exchangeable Potassium	(cmol+/kg)	**4.00**	2.05	1.90	0.96	**1.50**	0.47	**0.91**	0.60	0.49	**2.63**	0.72	**1.79**	1.03	**0.38**	0.40	0.32	**0.44**	0.18	0.14	0.18	**1.73**	0.40	**5.75**	1.6	4.43	2.78
	(kg/ha)	**3,507**	1,795	1,662	839	**1,314**	408	**801**	526	428	**2,303**	632	**1567**	904	**334**	350	280	**383**	162	122	159	**1,512**	354	**5,035**	1,423	3,881	2,437
	(mg/kg)	**1,565**	801	742	374	**587**	182	**357**	235	191	**1,028**	282	**700**	404	**149**	156	125	**171**	72	54	71	**675**	158	**2248**	635	1,733	1,088
Exchangeable Sodium	(cmol+/kg)	**0.20**	0.21	0.27	0.43	**0.20**	0.25	**0.31**	0.46	3.0	**0.3**	1.1	**0.85**	3.37	**0.56**	1.58	7.15	**0.31**	0.26	0.29	2.97	**0.27**	0.35	**0.27**	0.26	0.19	0.22
	(kg/ha)	**104**	109	141	221	**102**	131	**157**	235	1,524	**157**	588	**436**	1734	**289**	812	3680	**161**	134	152	1528	**139**	181	**141**	133	99	113
	(mg/kg)	**46**	49	63	99	**45**	58	**70**	105	680	**70**	263	**195**	774	**129**	362	1643	**72**	60	68	682	**62**	81	**63**	59	44	50
Exchangeable Aluminium	(cmol+/kg)	**0.04**	0.04	0.04	0.03	**0.36**	0.03	**0.15**	<0.01	<0.01	**0.02**	0.01	**0.01**	<0.01	**0.08**	0.05	0.01	**0.02**	0.01	0.01	<0.01	**0.02**	0.03	**0.03**	0.02	0.02	0.03
	(kg/ha)	**8.6**	8.3	7.5	6	**72**	5.7	**30.4**	2	<1	**4.3**	2.4	**02**	1	**16**	9.4	2.4	**4.3**	2.8	2.2	1.2	**4.4**	6.2	**5.7**	3.5	4.7	5.2
	(mg/kg)	**3.8**	3.7	3.4	2.7	**32.2**	2.5	**13.6**	<1	<1	**1.9**	1.1	**<1**	<1	**7**	4.2	1.1	**1.9**	1.3	<1	<1	**2.0**	2.8	**2.5**	1.6	2.1	2.3
Exchangeable Hydrogen	(cmol+/kg)	**<0.01**	0.01	<0.01	<0.01	**0.21**	<0.01	**0.12**	0.02	<0.01	**0.09**	<0.01	**0.0**	<0.01	**0.10**	<0.01	<0.01	**0.02**	0.01	<0.01	<0.01	**<0.01**	<0.01	**<0.01**	<0.01	0.03	<0.01
	(kg/ha)	**<1**	<1	<1	<1	**4.8**	<1	**3**	<1	<1	**2**	<1	**<1**	<1	**2**	<1	<1	**<1**	<1	<1	<1	**<1**	<1	**<1**	<1	<1	<1
	(mg/kg)	**<1**	<1	<1	<1	**2.1**	<1	**1**	<1	<1	**<1**	<1	**<1**	<1	**<1**	<1	<1	**<1**	<1	<1	<1	**<1**	<1	**<1**	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol+/kg)		**13.6**	9.4	17.6	22.5	**6.4**	6	**5**	5.6	11	**19**	47	**26.6**	39.7	**7.0**	15.0	32.0	**4**	1.9	1.7	7.9	**24.0**	21.6	**41.6**	20.4	20.5	17.4
Calcium (%)		**47**	58	59	53	**46**	67	**47**	55	17.6	**56.4**	59.75	**53**	40	**42.1**	26	22	**48**	49	35	2	**74**	83	**67**	75	63	69
Magnesium (%)		**22**	18	28	41	**18**	21	**21**	26	52	**28**	36	**37**	49	**42**	60	55	**30**	27	38	58	**18**	13	**19**	16	14	13
Potassium (%)		**29**	21.9	10.8	4.3	**23.4**	7.3	**19.7**	10.7	4.3	**13.6**	1.5	**6.7**	2.6	**5.4**	3	1.0	**12.2**	10	8.4	2.3	**7.2**	1.9	**13.8**	8	22	16.0
Sodium - ESP (%)		**1.48**	2.25	1.6	1.90	**3.1**	4.0	**6.6**	8.1	26	**2**	2	**3.2**	8.5	**8.0**	10.5	22.3	**8.8**	13.52	17.76	37.5	**1.1**	1.6	**0.7**	1.27	0.9	1.3
Aluminium (%)		**0.31**	0.44	0.21	0.1	**5.6**	0.44	**3.26**	0.1	0.04	**0.11**	0.02	**0**	0	**1.1**	0.31	0.0	**0.60**	0.72	0.66	0.08	**0.09**	0.14	**0.07**	0.08	0.1	0.15
Hydrogen (%)		**0.1**	0.12	0.00	0.00	**3.3**	0.00	**2.56**	0	0.00	**0.47**	0.00	**0**	0	**1**	0.0	0.0	**0.61**	0.6	0.00	0.00	**0.0**	0.00	**0.00**	0.0	0	0.00
Calcium/Magnesium Ratio		**2.2**	3.2	2.1	1.3	**2.5**	3.12	**2.26**	2.13	0.34	**2.03**	1.65	**1.41**	0.83	**1.00**	0.4	0.4	**1.61**	1.8	0.9	0.0	**4.1**	6.3	**3.6**	4.7	4.5	5.28
Zinc (mg/kg)		**2.2**	<0.5	0.6	<0.5	**2.1**	<0.5	**1.3**	<0.5	1.3	**3.8**	<0.5	**<0.5**	<0.5	**0.5**	1.46	<0.5	**<0.5**	<0.5	<0.5	<0.5	**0.77**	<0.5	**7.9**	<0.5	<0.5	<0.5
Manganese (mg/kg)		**112**	80.7	46.6	18	**95.2**	16.89	**69.33**	40	9.96	**129.37**	8.41	**113.4**	16.4	**29.27**	05	3	**24.5**	3	1	0.6	**127**	9	**88**	24	115	102.9
Iron (mg/kg)		**242**	89	53.2	36	**264**	36	**220**	37	672	**163**	21	**83**	34	**238**	1839	19	**151**	46	94	266.3	**177**	13	**200**	22	97	60
Copper (mg/kg)		**1.71**	1.70	1.30	0.81	**1.16**	0.69	**0.78**	0.82	0.88	**1.71**	0.40	**2.15**	1.35	**0.93**	2.1	0.55	**0.28**	0.18	0.13	0.33	**4.84**	0.45	**3.18**	0.97	2.09	2.22
Boron (mg/kg)		**0.72**	0.39	0.34	0.68	**0.52**	0.42	**0.35**	0.55	0.96	**0.98**	3.10	**1.18**	1.39	**0.86**	1.22	1.32	**0.64**	0.26	0.37	0.71	**2.30**	0.78	**4.01**	0.61	0.75	1.50
Silicon (mg/kg Si)		**46**	42	53	33	**30**	36	**24**	28	3	**62**	43	**47**	22	**30**	20	7	**12**	9	11	22	**125**	19	**231**	30	49	119

Sum	Rating
0-3.9	Very Low
4-7.9	Low
8-17.9	Moderate
>18	High

(Lorimer and Rowan, 1982). Sum of exchangeable Ca, Mg and K

	Site 1	Site 1	Site 1	Site 1	Site 2	Site 2	Site 3	Site 3	Site 3	Site 4	Site 4	Site 5	Site 5
	0.0-0.1	0.2-0.3	0.3-0.45	0.45-0.55	0.0-0.1	0.15-0.2	0.0-0.1	0.1-0.2	0.4-0.5	0.0-0.1	0.2-0.3	0.0-0.1	0.2-0.3
Soil Horizon	A1	A2	A22	B1		A1	A1	B1	B2	A1	B1	A1	B1
Nutrient status	13.361	9.107	17.258	22.041	5.649	6.069	4.056	5.122	8.452	18.911	46.069	25.677	36.309
Rating	Moderate	Moderate	Moderate	High	Low	Low	Low	Low	Moderate	High	High	High	High

	Site 6	Site 6	Site 6	Site 7	Site 7	Site 7	Site 7	Site 8	Site 8	Site 9	Site 9	Site 10	Site 10
	0.0-0.1	0.15-0.25	0.3-0.4	0.0-0.1	0.1-0.2	0.35-0.4	0.5-0.7	0.0-0.1	0.15-0.2	0.0-0.1	0.1-0.2	0.0-0.1	0.1-0.2
Soil Horizon	A1	B1	B2??	A1	A2	B1	B2	A1	B1	A1	B1	A1	A2
Nutrient status	6.308	13.361	24.875	3.216	1.637	1.352	4.935	23.656	21.221	41.309	20.149	20.260	17.124
Rating	Low	Moderate	High	Very Low	Very Low	Very Low	Low	High	High	High	High	High	Moderate

	Site 10	Site 11	Site 11	Site 12	Site 12	Site 12	Site 13	Site 13	Site 13	Site 14	Site 14	Site 14	Site 15
	0.6-0.7	0.0-0.1	0.15-0.25	0.0-0.1	0.15-0.25	0.55-0.6	0.0-0.1	0.2-0.3	0.55-0.65	0.0-0.1	0.15-0.25	0.65-0.75	0.0-0.15
Soil Horizon	B2	A1	B1	A1	B1	B2	A1	B1	B2	A1	B1	B2	A1
Nutrient status	22.723	18.597	19.665	16.543	16.387	37.255	19.949	14.219	16.525	18.448	20.302	29.410	22.030
Rating	High	High	High	Moderate	Moderate	High	High	Moderate	Moderate	High	High	High	High

	Site 15	Site 15	Site 16	Site 16	Site 16	Site 18	Site 18	Site 18	Site 19	Site 19	Site 20	Site 20	Site 20
	0.15-0.25	0.6-0.7	0.0-0.15	0.2-0.3	0.85-0.95	0.0-0.15	0.15-0.25	0.6-0.7	0.0-0.1	0.2-0.3	0.0-0.1	0.2-0.3	0.0-0.05
Soil Horizon	B1	B2	A1	B1	B2	A1	B1	B2	A1	B1	A1	B1	A1
Nutrient status	20.016	27.944	25.047	18.470	36.527	17.982	14.596	25.360	16.468	26.128	26.021	13.658	24.380
Rating	High	High	High	High	High	FALSE	Moderate	High	Moderate	High	High	Moderate	High

	Site 21	Site 21	Site 22	Site 22	Site 22	Site 23	Site 23	Site 24	Site 24	Site 26	Site 26	Site 26	Site 27
	0.1-0.2	0.5-0.6	0.0-0.15	0.15-0.25	0.5-0.6	0.0-0.1	0.15-0.25	0.0-0.1	0.3-0.4	0.0-00.1	0.1-0.2	0.3-0.4	0.0-0.1
Soil Horizon	B1	B2	A1	B1	C	A1	B1	A1	B1	A1	B1	B2	A1
Nutrient status	35.653	40.666	24.855	24.850	29.242	31.499	38.539	40.927	45.363	6.918	5.956	5.979	27.107
Rating	High	High	High	High	High	High	High	High	High	Low	Low	Low	High

	Site 27	Site 27	Site 28	Site 28	Site 28	Site 17	Site 17	Site 25	Site 25	Site 29	Site 29	Site 30	Site 30
	0.2-0.3	0.4-0.5	0.0-0.1	0.1-0.2	0.55-0.65	0.0-0.1	0.2-0.3	0.0-0.1	0.3-0.4	0.0-0.1	0.3-0.5	0.0-0.1	0.2-0.4
Soil Horizon	B1	B2	A1	B1	B2	A1	B1	A1	B2	A1	B1	A1	B2
Nutrient status	65.894	68.551	18.268	37.710	58.056	18.267	17.717	4.619	8.009	8.026	5.504	8.329	5.826
Rating	High	High	High	High	High	High	Moderate	Low	Moderate	Moderate	Low	Moderate	Low

	Site 30	Site 31	Site 31	Site 31	Site 32	Site 33	Site 33	Site 34	Site 34	Site 35	Site 35	Site 36	Site 36
	0.4-0.6	0.0-0.1	0.1-0.3	0.4-0.5	0.0-0.05	0.0-0.1	0.1-0.2	0.0-0.05	0.1-0.2	0.0-0.05	0.4-0.6	0.0-0.1	0.3-0.5
Soil Horizon	B2	A1	A2	B2	A1	A1	B2	A1	B1	A1	B2	A1	B2
Nutrient status	6.065	1.128	1.106	2.906	22.027	15.634	10.934	22.360	17.202	5.625	2.248	18.250	26.524
Rating	Low	Very Low	Very Low	Very Low	High	Moderate	Moderate	High	Moderate	Low	Very Low	High	High

		Soil Horizon	Nutrient status	Rating
Site 1	0.0-0.1		13.361	
Site 1	0.2-0.3			
Site 1	0.3-0.45			
Site 1	0.45-0.55			
Site 2	0.0-0.1			
Site 2	0.15-0.2			
Site 3	0.0-0.1			
Site 3	0.1-0.2			
Site 3	0.4-0.5			
Site 4	0.0-0.1			
Site 4	0.2-0.3			
Site 5	0.0-0.1			
Site 5	0.2-0.3			
Site 6	0.0-0.1			
Site 6	0.15-0.25			
Site 6	0.3-0.4			
Site 7	0.0-0.1			
Site 7	0.1-0.2			
Site 7	0.35-0.4			
Site 7	0.5-0.7			
Site 8	0.0-0.1			
Site 8	0.15-0.2			
Site 9	0.0-0.1			
Site 9	0.1-0.2			
Site 10	0.0-0.1			
Site 10	0.1-0.2			
Site 10	0.6-0.7			
Site 11	0.0-0.1			
Site 11	0.15-0.25			
Site 12	0.0-0.1			
Site 12	0.15-0.25			
Site 12	0.55-0.6			
Site 13	0.0-0.1			
Site 13	0.2-0.3			
Site 13	0.55-0.65			
Site 14	0.0-0.1			
Site 14	0.15-0.25			
Site 14	0.65-0.75			
Site 15	0.0-0.15			
Site 15	0.15-0.25			
Site 15	0.6-0.7			
Site 16	0.0-0.15			
Site 16	0.2-0.3			
Site 16	0.85-0.95			
Site 18	0.0-0.15			
Site 18	0.15-0.25			
Site 18	0.6-0.7			
Site 19	0.0-0.1			
Site 19	0.2-0.3			
Site 20	0.0-0.1			
Site 20	0.2-0.3			
Site 20	0.0-0.05			
Site 21	0.1-0.2			
Site 21	0.5-0.6			
Site 2	0.0-0.15			
Site 22	0.15-0.25			
Site 22	0.5-0.6			
Site 23	0.0-0.1			
Site 23	0.15-0.25			
Site 24	0.0-0.1			
Site 24	0.3-0.4			
Site 26	0.0-00.1			
Site 26	0.1-0.2			
Site 26	0.3-0.4			
Site 27	0.0-0.1			
Site 27	0.2-0.3			
Site 27	0.4-0.5			
Site 28	0.0-0.1			
Site 28	0.1-0.2			
Site 28	0.55-0.65			

				Wet Munsell Colour		Munsell Mottle Colour		
Site	Horizon	Sample Dept	Texture (Sandy loam ect	Colour (Munsell)	Munsell Colour Score	Code	Description	Degree of Mottling (%)
Site 1	**A1**	**0.0-0.1**	Clay Loam	Dark Brown	7.5 YR 3/3	..	..	..
Site 1	**A2**	**0.2-0.3**	Clay Loam	Dark Brown	7.5 YR 3/4	..	..	..
Site 1	**A22**	**0.3-0.45**	Clay Loam	Strong Brown	7.5 YR 4/6	..	..	..
Site 1	**B1**	**0.45-0.55**	Clay Loam	Strong Brown	7.5 YR 4/6	..	..	..
Site 2	**A1**	**0.0-0.1**	Clay Loam	Very Dark Brown	7.5 YR 2.5/3	..	..	..
Site 2	**B1**	**0.15-0.2**	Clay Loam	Strong Brown	7.5 YR 4/6	..	..	..
Site 3	**A1**	**0.0-0.1**	Clay Loam	Dark Brown	7.5 YR 3/4	..	..	..
Site 3	**B1**	**0.1-0.2**	Clay Loam	Strong Brown	7.5 YR 4/6	..	..	..
Site 3	**B2**	**0.4-0.5**	Clay Loam	Yellowish Brown	10 YR 5/4	5 YR 4/6	Yellowish Red	40
Site 4	**A1**	**0.0-0.1**	Clay Loam	Dark Reddish Brown	5 YR 3/2	..	..	..
Site 4	**B1**	**0.2-0.3**	Clay Loam	Yellowish Red	5 YR 4/6	..	..	..
Site 5	**A1**	**0.0-0.1**	Clay Loam	Very Dark Brown	7.5 YR 2.5/3	..	..	..
Site 5	**B1**	**0.2-0.3**	Clay Loam	Dark Reddish Brown	5 YR 3/4	..	..	..
Site 6	**A1**	**0.0-0.1**	Clay Loam	Very Dark Brown	10 YR 2/2	..	..	..
Site 6	**B1**	**0.15-0.25**	Clay Loam	Yellowish Brown	10 YR 5/4	7.5 YR 5/6	Strong Brown	
Site 6	**B2**	**0.3-0.4**	Clay	Pale Brown	10 YR 6/3	..	..	..
Site 7	**A1**	**0.0-0.1**	Clay Loam	Very Dark Grayish Brown	10 YR 3/2	..	..	..
Site 7	**A2**	**0.1-0.2**	Sandy Soil	Brown	10 YR 5/3	..	..	..
Site 7	**B1**	**0.35-0.4**	Sandy Soil	Brown	10 YR 5/3	..	..	..
Site 7	**B2**	**0.5-0.7**	Clay	White	5 Y 8/1	2.5 Y 6/8	Olive Yellow	35
Site 8	**A1**	**0.0-0.1**	Clay Loam	Very Dark Brown	7.5 YR 2.5/3	..	..	..
Site 8	**B1**	**0.15-0.2**	Clay Loam	Dark Reddish Brown	2.5 YR 2.5/4	..	..	..
Site 9	**A1**	**0.0-0.1**	Clay Loam	Very Dark brown	10 YR 2/2	..	..	..
Site 9	**B1**	**0.1-0.2**	Clay Loam	Dark Reddish Brown	2.5 YR 2.5/4	..	..	..
Site 10	**A1**	**0.0-0.1**	Clay Loam	Very Dark Brown	7.5 YR 2.5/2	..	..	..
Site 10	**A2**	**0.1-0.2**	Clay Loam	Very Dark Brown	7.5 YR 2.5/3	..	..	..
Site 10	**B2**	**0.6-0.7**	Clay Loam	Dark Reddish Brown	5 YR 3/4	..	..	..
Site 11	**A1**	**0.0-0.1**	Clay Loam	Very Dark Brown	7.5 YR 2.5/2	..	..	..
Site 11	**B2**	**0.15-0.25**	Clay Loam	Dark Reddish Brown	2.5 YR 2.5/4	..	..	..
Site 12	**A1**	**0.0-0.1**	Clay Loam	Very Dark Brown	7.5 YR 2.5/2	..	..	..
Site 12	**B1**	**0.15-0.25**	Clay Loam	Brown	7.5 YR 4/4	..	..	..
Site 12	**B2**	**0.55-0.6**	Clay Loam	Dark Reddish Brown	5 YR 3/4	..	..	..
Site 13	**A1**	**0.0-0.1**	Clay Loam	Very Dark Brown	7.5 YR 3/2	..	..	..
Site 13	**B1**	**0.2-0.3**	Clay Loam	Dark Red	2.5 YR 3/6	..	..	..
Site 13	**B2**	**0.55-0.65**	Clay Loam	Dark Red	2.5 YR 3/6	..	..	..
Site 14	**A1**	**0.0-0.1**	Clay Loam	Dark Brown	7.5 YR 3/2	2.5 Y 8/6	Yellow	3
Site 14	**B1**	**0.15-0.25**	Clay Loam	Dark Reddish Brown	2.5 YR 2.5/4	..	..	..
Site 14	**B2**	**0.65-0.75**	Clay Loam	Dark Reddish Brown	5 YR 3/4	..	..	..
Site 15	**A1**	**0.0-0.15**	Clay Loam	Reddish Brown	5 YR 4/4	..	..	..
Site 15	**B1**	**0.15-0.25**	Clay Loam	Yellowish Red	5 YR 4/6	..	..	..
Site 15	**B2**	**0.6-0.7**	Clay Loam	Dark Reddish Brown	5 YR 3/4	..	..	..
Site 16	**A1**	**0.0-0.15**	Clay Loam	Very Dark Brown	7.5 YR 2.5/3	..	..	..
Site 16	**B1**	**0.2-0.3**	Clay	Dark Reddish Brown	2.5 YR 2.5/4	..	..	..
Site 16	**B2**	**0.85-0.95**	Clay	Dark Reddish Brown	5 YR 3/4	..	..	..
Site 18	**A1**	**0.0-0.15**	Clay Loam	Very Dark Brown	7.5 YR 2.5/3	..	..	..
Site 18	**B1**	**0.15-0.25**	Clay	Dark Reddish Brown	2.5 YR 2.5/4	..	..	..
Site 18	**B2**	**0.6-0.7**	Clay	Dark Red	2.5 YR 3/6	10 YR 5/8	Red	10
Site 19	**A1**	**0.0-0.1**	Clay	Dark Reddish Brown	2.5 YR 2.5/3	..	..	..
Site 19	**B1**	**0.2-0.3**	Clay	Dusky Red	7.5 YR 3/4	..	..	..
Site 20	**A1**	**0.0-0.1**	Clay Loam	Very Dusky Red	5 YR 2.5/2	..	..	..
Site 20	**B1**	**0.2-0.3**	Clay	Dusky Red	7.5 YR 3/4	..	..	..
Site 20	**A1**	**0.0-0.05**	Clay	Dark Reddish Brown	2.5 YR 3/4	..	..	..
Site 21	**B1**	**0.1-0.2**	Clay	Dark Red	2.5 YR 3/6	..	..	..
Site 21	**B2**	**0.5-0.6**	Clay	Yellowish Red	5 YR 5/6	7.5 YR 6/8	Reddish Yellow	15
Site 22	**A1**	**0.0-0.15**	Clay Loam	Very Dark Brown	7.5 YR 2.5/2	..	..	..
Site 22	**B1**	**0.15-0.25**	Clay	Dark Brown	7.5 YR 3/4	..	..	..
Site 22	**C**	**0.5-0.6**	Clay	Dark Brown	7.5 YR 3/4	7.5 YR 6/8	Reddish Yellow	3
Site 23	**A1**	**0.0-0.1**	Clay	Dark Reddish Brown	5 YR 3/4	..	..	..
Site 23	**B1**	**0.15-0.25**	Clay	Dark Reddish Brown	5 YR 3/4	..	..	..
Site 24	**A1**	**0.0-0.1**	Clay	Very Dusky Red	2.5 YR 2.5/2	**2.5 YR 5/6**	**Red**	**2**
Site 24	**B1**	**0.3-0.4**	Clay	Dark Reddish Brown	2.5 YR 2.5/3	..	..	..
Site 26	**A1**	**0.0-00.1**	Clay Loam	Dark Reddish Brown	2.5 YR 2.5/3	..	..	..
Site 26	**B1**	**0.1-0.2**	Clay	Dark Red	2.5 YR 3/6	2.5 YR 2.5/1	Reddish Black	1
Site 26	**B2**	**0.3-0.4**	Clay	Red	2.5 YR 4/8	2.5 YR 6/8	Light Red	15
Site 27	**A1**	**0.0-0.1**	Clay	Black	5 YR 2.5/1	..	..	..
Site 27	**B1**	**0.2-0.3**	Clay Loam	Redddish Black	7.5 YR 2.5/1	..	..	..
Site 27	**B2**	**0.4-0.5**	Clay Loam	Very Dusky Red	10 YR 2.5/2	..	..	..
Site 28	**A1**	**0.0-0.1**	Clay Loam	Very Dusky Red	10 YR 2.5/2	..	..	..
Site 28	**B1**	**0.1-0.2**	Clay	Dark Reddish Brown	2.5 YR 3/4	..	..	..
Site 28	**B2**	**0.55-0.65**	Loam	Dark Reddish Brown	5 YR 3/4	5 YR 6/8	Reddish Yellow	1
Site 17	**A1**	**0.0-0.1**	Clay Loam	Very Dark Brown	7.5YR 2.5/3			
Site 17	**B1**	**0.2-0.3**	Clay Loam	Very Dark Brown	7.5YR 2.5/3			
Site 25	**A1**	**0.0-0.1**	Clay Loam	Dark Reddish Brown	2.5YR 2.5/3			
Site 25	**B2**	**0.3-0.4**	Clay Loam	Dark Red	2.5YR 3/6			
Site 29	**A1**	**0.0-0.1**	Clay Loam	Dark Brown	7.5YR 3/4			
Site 29	**B1**	**0.3-0.5**	Clay Loam	Dark Red	2.5YR 3/6			
Site 30	**A1**	**0.0-0.1**	Clay Loam	Dark Reddish Brown	5YR 3/4			
Site 30	**B2**	**0.2-0.4**	Clay Loam	Dark Reddish Brown	2.5YR 2.5/4			
Site 30	**B2**	**0.4-0.6**	Clay Loam	Dark Reddish Brown	2.5YR 2.5/4			
Site 31	**A1**	**0.0-0.1**	Loam	Dark Brown	7.5YR 3/3			
Site 31	**A2**	**0.1-0.3**	Loam	Brown	7.5YR 4/3			
Site 31	**B2**	**0.4-0.5**	Clay Loam	Light Brownish gray	2.5Y 6/2			
Site 32	**A1**	**0.0-0.05**	Clay Loam	Dark Reddish Brown	2.5YR 2.5/4			
Site 33	**A1**	**0.0-0.1**	Clay Loam	Dark Reddish Brown	2.5YR 2.5/4			
Site 33	**B2**	**0.1-0.2**	Clay Loam	Dark Red	2.5YR 3/6			
Site 34	**A1**	**0.0-0.05**	Clay Loam	Very Dark Brown	7.5YR 2.5/3			
Site 34	**B1**	**0.1-0.2**	Clay Loam	Dark Reddish Brown	5YR 3/4			
Site 35	**A1**	**0.0-0.05**	Clay Loam	Very Dark Brown	7.5YR 2.5/3			
Site 35	**B2**	**0.4-0.6**	Loam	Strong Brown	7.5YR 4/6			
Site 36	**A1**	**0.0-0.1**	Clay Loam	Dark Reddish Brown	5YR 3/4			
Site 36	**B2**	**0.3-0.5**	Clay Loam	Dark Reddish Brown	2.5YR 2.5/4			

Table 2
Interpretation of Dispersion Percentage Values
[after Hazelton and Murphy, in press]

D% Value	Dispersion Rating
< 6	Negligible
6 – 30	Slight
30 – 50	Moderate
50 – 65	High
> 65	Very high

Cation Excgange Capacity		
Rating	**CEC cmol (+) / kg**	
Low	<5	dystrophic
Moderate	5-15	mesotrophic
High	>15	eutrophic

	Site 1	Site 1	Site 1	Site 1	Site 2	Site 2	Site 3	Site 3	Site 3	Site 4	Site 4	Site 5	Site 5
	0.0-0.1	0.2-0.3	0.3-0.45	0.45-0.55	0.0-0.1	0.15-0.2	0.0-0.1	0.1-0.2	0.4-0.5	0.0-0.1	0.2-0.3	0.0-0.1	0.2-0.3
Soil Horizon	A1	A2	B1	B2	A1	B1	A1	B1	B2	A1	B1	A1	B1
Effective Cation	**13.6**	9.4	17.6	22.5	**6.4**	6	**5**	5.6	11	**19**	47	**26.6**	39.7
Rating	Moderate	Moderate	High	High	Moderate	Moderate	Low	Moderate	Moderate	High	High	High	High
	mesotrophic	mesotrophic	eutrophic	eutrophic	mesotrophic	mesotrophic	dystrophic	mesotrophic	mesotrophic	eutrophic	eutrophic	eutrophic	eutrophic

	Site 6	Site 6	Site 6	Site 7	Site 7	Site 7	Site 7	Site 8	Site 8	Site 9	Site 9	Site 10	Site 10
	0.0-0.1	0.15-0.25	0.3-0.4	0.0-0.1	0.1-0.2	0.35-0.4	0.5-0.7	0.0-0.1	0.15-0.2	0.0-0.1	0.1-0.2	0.0-0.1	0.1-0.2
Soil Horizon	A1	B1	B2??	A1	A2	B1	B2	A1	B1	A1	B1	A1	A2
Effective Cation	**7.0**	15.0	32.0	**4**	1.9	1.7	7.9	**24.0**	21.6	**41.6**	20.4	20.5	17.4
Rating	Moderate	Moderate	High	Low	Low	Low	Moderate	High	High	High	High	High	High
	mesotrophic	mesotrophic	eutrophic	dystrophic	dystrophic	dystrophic	mesotrophic	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic

	Site 10	Site 11	Site 11	Site 12	Site 12	Site 12	Site 13	Site 13	Site 13	Site 14	Site 14	Site 14	Site 15
	0.6-0.7	0.0-0.1	0.15-0.25	0.0-0.1	0.15-0.25	0.55-0.6	0.0-0.1	0.2-0.3	0.55-0.65	0.0-0.1	0.15-0.25	0.65-0.75	0.0-0.15
Soil Horizon	B2	A1	B1	A1	B1	B2	A1	B1	B2	A1	B1	B2	A1
Effective Cation	**23.3**	19.0	20.1	**16.8**	16.7	37.7	**20.3**	14.5	17	**18.7**	20.6	30	**23**
Rating	High	High	High	High	High	High	High	Moderate	High	High	High	High	High
	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	mesotrophic	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic

	Site 15	Site 15	Site 16	Site 16	Site 16	Site 18	Site 18	Site 18	Site 19	Site 19	Site 20	Site 20	Site 20
	0.15-0.25	0.6-0.7	0.0-0.15	0.2-0.3	0.85-0.95	0.0-0.15	0.15-0.25	0.6-0.7	0.0-0.1	0.2-0.3	0.0-0.1	0.2-0.3	0.0-0.05
Soil Horizon	B1	B2	A1	B1	B2	A1	B1	B2	A1	B1	A1	B1	A1
Effective Cation	20	29	**25**	19	37	**18**	15	26	**17**	26	**26**	14	**25**
Rating	High	High	High	High	High	High	Moderate	High	High	High	High	Moderate	High
	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	mesotrophic	eutrophic	eutrophic	eutrophic	eutrophic	mesotrophic	eutrophic

	Site 21	Site 21	Site 22	Site 22	Site 22	Site 23	Site 23	Site 24	Site 24	Site 26	Site 26	Site 26	Site 27
	0.1-0.2	0.5-0.6	0.0-0.15	0.15-0.25	0.5-0.6	0.0-0.1	0.15-0.25	0.0-0.1	0.3-0.4	0.0-00.1	0.1-0.2	0.3-0.4	0.0-0.1
Soil Horizon	B1	B2	A1	B1	C	A1	B1	A1	B1	A1	B1	B2	A1
Effective Cation	36	41	**25**	25	30	**32**	40	**41**	46	**7**	6	6	**27**
Rating	High	High	High	High	High	High	High	High	High	Moderate	Moderate	Moderate	High
	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	mesotrophic	mesotrophic	mesotrophic	eutrophic

	Site 27	Site 27	Site 28	Site 28	Site 28	Site 17	Site 17	Site 25	Site 25	Site 29	Site 29	Site 30	Site 30
	0.2-0.3	0.4-0.5	0.0-0.1	0.1-0.2	0.55-0.65	0.0-0.1	0.2-0.3	0.0-0.1	0.3-0.4	0.0-0.1	0.3-0.5	0.0-0.1	0.2-0.4
Soil Horizon	B1	B2	A1	B1	B2	A1	B1	A1	B2	A1	B1	A1	B2
Effective Cation	66	69	**18**	38	59	18	18	5	8	8	6	9	6
Rating	High	High	High	High	High	High	High	Low	Moderate	Moderate	Moderate	Moderate	Moderate
	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	eutrophic	dystrophic	mesotrophic	mesotrophic	mesotrophic	mesotrophic	mesotrophic

	Site 30	Site 31	Site 31	Site 31	Site 32	Site 33	Site 33	Site 34	Site 34	Site 35	Site 35	Site 36	Site 36
	0.4-0.6	0.0-0.1	0.1-0.3	0.4-0.5	0.0-0.05	0.0-0.1	0.1-0.2	0.0-0.05	0.1-0.2	0.0-0.05	0.4-0.6	0.0-0.1	0.3-0.5
Soil Horizon	B2	A1	A2	B2	A1	A1	B2	A1	B1	A1	B2	A1	B2
Effective Cation	6	2	1	3	22	16	11	23	17	6	2	18	27
Rating	Moderate	Low	Low	Low	High	High	Moderate	High	High	Moderate	Low	High	High
	mesotrophic	dystrophic	dystrophic	dystrophic	eutrophic	eutrophic	mesotrophic	eutrophic	eutrophic	mesotrophic	dystrophic	eutrophic	eutrophic

top soils	41.6
	1.6
subsoils	68.9
	1.3

Ca:Mg Ratio	ratings	
Ca:Mg > 2:1.		
5	**High** good soil structure	-6 balanced
<5 - 2	**Moderate** may require additional Ca	1-4 Ca Low
<2	**Low** A ratio < 1 (significantly more Mg than Ca) often indicates high clay content soil and possibly a clay sub-soil. Leads to an increasein soil erosion potential	Ca deficient

	Site 1	Site 1	Site 1	Site 1	Site 2	Site 2	Site 3	Site 3	Site 3	Site 4	Site 4	Site 5	Site 5	Site 6	Site 6	Site 6	Site 7	Site 7	Site 7	Site 7
	0.0-0.1	0.2-0.3	0.3-0.45	0.45-0.55	0.0-0.1	0.15-0.2	0.0-0.1	0.1-0.2	0.4-0.5	0.0-0.1	0.2-0.3	0.0-0.1	0.2-0.3	0.0-0.1	0.15-0.25	0.3-0.4	0.0-0.1	0.1-0.2	0.35-0.4	0.5-0.7
Soil Horizon	A1	A2	A22	B1	A1	B1	A1	B1	B2	A1	B1	A1	B1	A1	B1	B2??	A1	A2	B1	B2
Calcium/Magnesium Ratio	**2.2**	3.2	2.1	1.3	**2.5**	3.12	**2.26**	2.13	0.34	**2.03**	1.65	**1.41**	0.83	**1.00**	0.4	0.4	**1.61**	1.8	0.9	0.0
Rating	Moderate	Moderate	Moderate	Low	Moderate	Moderate	Moderate	Moderate	Low	Moderate	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

	Site 8	Site 8	Site 9	Site 9	Site 10	Site 10	Site 10	Site 11	Site 11	Site 12	Site 12	Site 12	Site 13	Site 13	Site 13	Site 14	Site 14	Site 14	Site 15	Site 15	Site 15
	0.0-0.1	0.15-0.2	0.0-0.1	0.1-0.2	0.0-0.1	0.1-0.2	0.6-0.7	0.0-0.1	0.15-0.25	0.0-0.1	0.15-0.25	0.55-0.6	0.0-0.1	0.2-0.3	0.55-0.65	0.0-0.1	0.15-0.25	0.65-0.75	0.0-0.15	0.15-0.25	0.6-0.7
Soil Horizon	A1	B1	A1	B1	A1	A2	B2	A1	B1	A1	B1	B2	A1	B1	B2	A1	B1	B2	A1	B1	B2
Calcium/Magnesium Ratio	**4.1**	6.3	**3.6**	4.7	4.5	5.28	**4.9**	3.3	2.9	**4.5**	6.2	17.26	**4.26**	3.76	3.05	**3.8**	5.0	6.04	**5.30**	4.24	2.76
Rating	Moderate	High	Moderate	oderate - hi	Moderate	High	oderate - hi	Moderate	Moderate	Moderate	High	High	Moderate	Moderate	Moderate	Moderate	oderate - hi	High	High	Moderate	Moderate

	Site 16	Site 16	Site 16	Site 18	Site 18	Site 18	Site 19	Site 19	Site 20	Site 20	Site 21	Site 21	Site 21	Site 22	Site 22	Site 22	Site 23	Site 23	Site 24	Site 24
	0.0-0.15	0.2-0.3	0.85-0.95	0.0-0.15	0.15-0.25	0.6-0.7	0.0-0.1	0.2-0.3	0.0-0.1	0.2-0.3	0.0-0.05	0.1-0.2	0.5-0.6	0.0-0.15	0.15-0.25	0.5-0.6	0.0-0.1	0.15-0.25	0.0-0.1	0.3-0.4
Soil Horizon	A1	B1	B2	A1	B1	B2	A1	B1	A1	B1	A1	B1	B2	A1	B1	C	A1	B1	A1	B1
Calcium/Magnesium Ratio	**4.76**	7.57	6.46	**2.93**	2.72	2.37	**3.36**	10.22	**3.25**	2.63	**4.21**	5.12	6.54	**4.42**	2.35	2.15	**1.45**	1.17	**2.59**	1.41
Rating	oderate - h	High	High	Moderate	Moderate	Moderate	Moderate	High	Moderate	Moderate	Moderate	High	High	Moderate	Moderate	Moderate	Low	Low	Moderate	Low

	Site 26	Site 26	Site 26	Site 27	Site 27	Site 27	Site 28	Site 28	Site 28	Site 17	Site 17	Site 25	Site 25	Site 29	Site 29	Site 30	Site 30	Site 30	Site 31	Site 31
	0.0-00.1	0.1-0.2	0.3-0.4	0.0-0.1	0.2-0.3	0.4-0.5	0.0-0.1	0.1-0.2	0.55-0.65	0.0-0.1	0.2-0.3	0.0-0.1	0.3-0.4	0.0-0.1	0.3-0.5	0.0-0.1	0.2-0.4	0.4-0.6	0.0-0.1	0.1-0.3
Soil Horizon	A1	B1	B2	A1	B1	B2	A1	B1	B2	A1	B1	A1	B2	A1	B1	A1	B2	B2	A1	A2
Calcium/Magnesium Ratio	**4.13**	4.85	4.57	**2.54**	2.31	2.29	**1.93**	1.42	1.56	4.2	4.0	2.1	0.55	2.5	1.7	1.7	2.5	1.5	2.9	3.2
Rating	Moderate	oderate - h	oderate - h	Moderate	Moderate	Moderate	Low	Low	Low	Moderate	Moderate	Moderate	Low	Moderate	Low	Low	Moderate	Low	Moderate	Moderate

	Site 31	Site 32	Site 33	Site 33	Site 34	Site 34	Site 35	Site 35	Site 36	Site 36
	0.4-0.5	0.0-0.05	0.0-0.1	0.1-0.2	0.0-0.05	0.1-0.2	0.0-0.05	0.4-0.6	0.0-0.1	0.3-0.5
Soil Horizon	B2	A1	A1	B2	A1	B1	A1	B2	A1	B2
Calcium/Magnesium Ratio	0.72	4.4	2.8	3.3	3.9	4.1	2.4	1.1	3.6	4.1
Rating	Low	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate	Moderate

Topsoil	5.3
	1.0
Subsoil	17.3
	0.0

	Site 1	Site 1	Site 1	Site 1	Site 2	Site 2	Site 3	Site 3	Site 3	Site 4	Site 4	Site 5	Site 5	Site 6	Site 6	Site 6
	0.0-0.1	0.2-0.3	0.3-0.45	0.45-0.55	0.0-0.1	0.15-0.2	0.0-0.1	0.1-0.2	0.4-0.5	0.0-0.1	0.2-0.3	0.0-0.1	0.2-0.3	0.0-0.1	0.15-0.25	0.3-0.4
Soil Horizon	A1	A2	A22	B1	A1	B1	A1	B1	B2	A1	B1	A1	B1	A1	B1	B2??
Carbon/Nitrogen Ratio	**10**	6	4	4	**10**	3	**10**	7	1	**12**	11	**12**	9	**12**	8	11
Rating	Very Low	Very Low	Very Low	Very Low	Low	Very Low	Low	Very Low	Very Low	Low	Low	Low	Very Low	Low	Very Low	Low

	Site 7	Site 7	Site 7	Site 7	Site 8	Site 8	Site 9	Site 9	Site 10	Site 10	Site 10	Site 11	Site 11	Site 12	Site 12	Site 12
	0.0-0.1	0.1-0.2	0.35-0.4	0.5-0.7	0.0-0.1	0.15-0.2	0.0-0.1	0.1-0.2	0.0-0.1	0.1-0.2	0.6-0.7	0.0-0.1	0.15-0.25	0.0-0.1	0.15-0.25	0.55-0.6
Soil Horizon	A1	A2	B1	B2	A1	B1	A1	B1	A1	A2	B2	A1	B1	A1	B1	B2
Carbon/Nitrogen Ratio	**9**	5	2	1	**11**	9	**12**	9	11	11	**4**	12	6	**11**	8	10
Rating	Very Low	Very Low	Very Low	Very Low	Low	Very Low	Low	Very Low	Low	Low	Very Low	Low	Very Low	Low	Very Low	Very Low

	Site 13	Site 13	Site 13	Site 14	Site 14	Site 14	Site 15	Site 15	Site 15	Site 16	Site 16	Site 16	Site 18	Site 18	Site 18	Site 19
	0.0-0.1	0.2-0.3	0.55-0.65	0.0-0.1	0.15-0.25	0.65-0.75	0.0-0.15	0.15-0.25	0.6-0.7	0.0-0.15	0.2-0.3	0.85-0.95	0.0-0.15	0.15-0.25	0.6-0.7	0.0-0.1
Soil Horizon	A1	B1	B2	A1	B1	B2	A1	B1	B2	A1	B1	B2	A1	B1	B2	A1
Carbon/Nitrogen Ratio	**10**	8	7	**11**	9	6	**13**	8	7	**12**	10	5	**11**	9	7	**12**
Rating	Low	Very Low	Very Low	Low	Very Low	Very Low	Low	Very Low	Very Low	Low	Very Low	Very Low	Low	Very Low	Very Low	Low

	Site 19	Site 20	Site 20	Site 20	Site 21	Site 21	Site 2	Site 22	Site 22	Site 23	Site 23	Site 24	Site 24	Site 26	Site 26	Site 26
	0.2-0.3	0.0-0.1	0.2-0.3	0.0-0.05	0.1-0.2	0.5-0.6	0.0-0.15	0.15-0.25	0.5-0.6	0.0-0.1	0.15-0.25	0.0-0.1	0.3-0.4	0.0-00.1	0.1-0.2	0.3-0.4
Soil Horizon	B1	A1	B1	A1	B1	B2	A1	B1	C	A1	B1	A1	B1	A1	B1	B2
Carbon/Nitrogen Ratio	10	**11**	9	**11**	11	19	**11**	9	7	**11**	10	**12**	13	**10**	6	4
Rating	Low	Low	Very Low	Low	Low	Medium	Low	Very Low	Very Low	Low	Low	Low	Low	Low	Very Low	Very Low

	Site 27	Site 27	Site 27	Site 28	Site 28	Site 28	Site 17	Site 17	Site 25	Site 25	Site 29	Site 29	Site 30	Site 30	Site 30	Site 31
	0.0-0.1	0.2-0.3	0.4-0.5	0.0-0.1	0.1-0.2	0.55-0.65	0.0-0.1	0.2-0.3	0.0-0.1	0.3-0.4	0.0-0.1	0.3-0.5	0.0-0.1	0.2-0.4	0.4-0.6	0.0-0.1
Soil Horizon	A1	B1	B2	A1	B1	B2	A1	B1	A1	B2	A1	B1	A1	B2	B2	A1
Carbon/Nitrogen Ratio	**14**	9	6	**11**	8	6	13	13	13	6	13	8	11	8	6	9
Rating	Low	Very Low	Very Low	Low	Very Low	Very Low	Low	Low	Low	Very Low	Low	Very Low	Low	Very Low	Very Low	Very Low

	Site 31	Site 31	Site 32	Site 33	Site 33	Site 34	Site 34	Site 35	Site 35	Site 36	Site 36
	0.1-0.3	0.4-0.5	0.0-0.05	0.0-0.1	0.1-0.2	0.0-0.05	0.1-0.2	0.0-0.05	0.4-0.6	0.0-0.1	0.3-0.5
Soil Horizon	A2	B2	A1	A1	B2	A1	B1	A1	B2	A1	B2
Carbon/Nitrogen Ratio	12	3	12	12	10	11	11	15	5	8	15
Rating	Low	Very Low	Low	Low	Very Low	Low	Low	Low	Very Low	Very Low	Medium

Rating	range C:N ratio
Very Low	<10
Low	10-15
Medium	15-25
High	25-70
Very High	70-100
Extremely High	>100
End Point	860

Site	Depth (m)	Emerson Aggregate Classes	Dispersability	ESP (%)	Rating
Site 1	0.0-0.1	3	Slightly dispersive	**1.48**	Non sodic
Site 1	0.2-0.3	3	Slightly dispersive	2.25	Non sodic
Site 1	0.3-0.45	3	Slightly dispersive	1.6	Non sodic
Site 1	0.45-0.55	4.00	Negligible / aggregated	1.90	Non sodic
Site 2	0.0-0.1	3	Slightly dispersive	**3.1**	Slightly sodic and dispersion can only occur under raindrop impact in surface soils
Site 2	0.15-0.2	2	Moderately dispersive	4.0	Slightly sodic and dispersion can only occur under raindrop impact in surface soils
Site 3	0.0-0.1	3	Slightly dispersive	**6.6**	Sodic
Site 3	0.1-0.2	2	Moderately dispersive	8.1	Sodic
Site 3	0.4-0.5	2	Moderately dispersive	26	Strongly Sodic
Site 4	0.0-0.1	3	Slightly dispersive	**2**	Non sodic
Site 4	0.2-0.3	4.00	Negligible / aggregated	2	Non sodic
Site 5	0.0-0.1	3	Slightly dispersive	**3.2**	Slightly sodic and dispersion can only occur under raindrop impact in surface soils
Site 5	0.2-0.3	3	Slightly dispersive	8.5	Sodic
Site 6	0.0-0.1	4.00	Negligible / aggregated	**8.0**	Sodic
Site 6	0.15-0.25	2	Moderately dispersive	10.5	Sodic
Site 6	0.3-0.4	2	Moderately dispersive	22.3	Strongly Sodic
Site 7	0.0-0.1	3	Slightly dispersive	**8.8**	Sodic
Site 7	0.1-0.2	3	Slightly dispersive	13.52	Sodic
Site 7	0.35-0.4	3	Slightly dispersive	17.76	Strongly Sodic
Site 7	0.5-0.7	2	Moderately dispersive	37.5	Strongly Sodic
Site 8	0.0-0.1	4.00	Negligible / aggregated	**1.1**	Non sodic
Site 8	0.15-0.2	4.00	Negligible / aggregated	1.6	Non sodic
Site 9	0.0-0.1	4.00	Negligible / aggregated	**0.7**	Non sodic
Site 9	0.1-0.2	4.00	Negligible / aggregated	1.27	Non sodic
Site 10	0.0-0.1	3	Slightly dispersive	0.9	Non sodic
Site 10	0.1-0.2	3	Slightly dispersive	1.3	Non sodic
Site 10	0.6-0.7	4.00	Negligible / aggregated	**2.5**	Non sodic
Site 11	0.0-0.1	3	Slightly dispersive	1.6	Non sodic
Site 11	0.15-0.25	4.00	Negligible / aggregated	2.17	Non sodic
Site 12	0.0-0.1	3	Slightly dispersive	**1.3**	Non sodic
Site 12	0.15-0.25	4.00	Negligible / aggregated	2.0	Non sodic
Site 12	0.55-0.6	4.00	Negligible / aggregated	1	Non sodic
Site 13	0.0-0.1	3	Slightly dispersive	**1.3**	Non sodic
Site 13	0.2-0.3	4.00	Negligible / aggregated	1.6	Non sodic
Site 13	0.55-0.65	4.00	Negligible / aggregated	3	Slightly sodic and dispersion can only occur under raindrop impact in surface soils
Site 14	0.0-0.1	4.00	Negligible / aggregated	**1.3**	Non sodic
Site 14	0.15-0.25	4.00	Negligible / aggregated	1.53	Non sodic
Site 14	0.65-0.75	4.00	Negligible / aggregated	2.1	Non sodic
Site 15	0.0-0.15	4.00	Negligible / aggregated	**2.4**	Non sodic
Site 15	0.15-0.25	4.00	Negligible / aggregated	1.3	Non sodic
Site 15	0.6-0.7	4.00	Negligible / aggregated	2.4	Non sodic
Site 16	0.0-0.15	4.00	Negligible / aggregated	**0.9**	Non sodic
Site 16	0.2-0.3	4.00	Negligible / aggregated	1.3	Non sodic
Site 16	0.85-0.95	4.00	Negligible / aggregated	1.0	Non sodic
Site 18	0.0-0.15	4.00	Negligible / aggregated	**1.2**	Non sodic
Site 18	0.15-0.25	4.00	Negligible / aggregated	2.2	Non sodic
Site 18	0.6-0.7	4.00	Negligible / aggregated	2.2	Non sodic
Site 19	0.0-0.1	3	Slightly dispersive	**2.1**	Non sodic
Site 19	0.2-0.3	4.00	Negligible / aggregated	1.0	Non sodic
Site 20	0.0-0.1	4.00	Negligible / aggregated	**0.7**	Non sodic
Site 20	0.2-0.3	4.00	Negligible / aggregated	1.9	Non sodic
Site 21	0.0-0.05	3	Slightly dispersive	**0.8**	Non sodic
Site 21	0.1-0.2	4.00	Negligible / aggregated	0.8	Non sodic
Site 21	0.5-0.6	4.00	Negligible / aggregated	1.4	Non sodic
Site 22	0.0-0.15	3	Slightly dispersive	**1.4**	Non sodic
Site 22	0.15-0.25	4.00	Negligible / aggregated	1.5	Non sodic
Site 22	0.5-0.6	3	Slightly dispersive	3.8	Slightly sodic and dispersion can only occur under raindrop impact in surface soils
Site 23	0.0-0.1	2	Moderately dispersive	**1.2**	Non sodic
Site 23	0.15-0.25	4.00	Negligible / aggregated	2.5	Non sodic
Site 24	0.0-0.1	3	Slightly dispersive	**1.1**	Non sodic
Site 24	0.3-0.4	04	Negligible / aggregated	2.4	Non sodic
Site 26	0.0-00.1	3	Slightly dispersive	**2.4**	Non sodic
Site 26	0.1-0.2	3	Slightly dispersive	2.6	Non sodic
Site 26	0.3-0.4	3	Slightly dispersive	2.3	Non sodic
Site 27	0.0-0.1	3	Slightly dispersive	**0.9**	Non sodic
Site 27	0.2-0.3	4.00	Negligible / aggregated	0.4	Non sodic
Site 27	0.4-0.5	3	Slightly dispersive	0.4	Non sodic
Site 28	0.0-0.1	3	Slightly dispersive	**0.7**	Non sodic
Site 28	0.1-0.2	4.00	Negligible / aggregated	0.6	Non sodic
Site 28	0.55-0.65	4.00	Negligible / aggregated	0.8	Non sodic
Site 17	0.0-0.1	3	Slightly dispersive	0.41	Non sodic
Site 17	0.2-0.3	3	Slightly dispersive	0.47	Non sodic
Site 25	0.0-0.1	3	Slightly dispersive	1.3	Non sodic
Site 25	0.3-0.4	3	Slightly dispersive	1.5	Non sodic
Site 29	0.0-0.1	3	Slightly dispersive	0.67	Non sodic
Site 29	0.3-0.5	3	Slightly dispersive	1.0	Non sodic
Site 30	0.0-0.1	3	Slightly dispersive	1.1	Non sodic
Site 30	0.2-0.4	3	Slightly dispersive	1.4	Non sodic
Site 30	0.4-0.6	4	Negligible / aggregated	2.6	Non sodic
Site 31	0.0-0.1	3	Slightly dispersive	3.7	Slightly sodic and dispersion can only occur under raindrop impact in surface soils
Site 31	0.1-0.3	3	Slightly dispersive	5.1	Slightly sodic and dispersion can only occur under raindrop impact in surface soils
Site 31	0.4-0.5	2	Moderately dispersive	14	Sodic
Site 32	0.0-0.05	3	Slightly dispersive	0.24	Non sodic

Emmerson Ag Test	Dispersability
1	Highly dispersive
2	Moderate
3	Slightly
4	Negligible / aggregated
5	Slight
6	Negligible / aggregated

topsoils - Max	8.76
topsoils - min	0.20
Subsoils - max	37.52
Subsoils - Min	0.28

Exchangable Sodium Percentage (ESP%)	Rating
>14	Strongly Sodic
6-14	Sodic
3-6	Slightly sodic and dispersion can only occur under raindrop impact in surface soils
0-3	Non-sodic

Site 33	**0.0-0.1**	3	Slightly dispersive	0.72	Non sodic
Site 33	**0.1-0.2**	3	Slightly dispersive	0.84	Non sodic
Site 34	**0.0-0.05**	3	Slightly dispersive	0.51	Non sodic
Site 34	**0.1-0.2**	3	Slightly dispersive	0.28	Non sodic
Site 35	**0.0-0.05**	3	Slightly dispersive	0.65	Non sodic
Site 35	**0.4-0.6**	3	Slightly dispersive	2.3	Non sodic
Site 36	**0.0-0.1**	3	Slightly dispersive	0.20	Non sodic
Site 36	**0.3-0.5**	3	Slightly dispersive	0.37	Non sodic

0.0-0.9	Excellent
1.0-1.9	Very Good
2.0-2.9	Good
3.0-3.9	Satisfactory
4.0-4.9	Poor
5.0-5.9	Very Poor
6.0-6.9	Critical
7.0-7.9	Very Critical
8.0-8.9	Extremely Critical
9.0-10	Dangerous

Bridge Name	Span No.	Span Type	Span Length (m)	Deck Type	Deck Width (m)	Deck Condition	Superstructure Condition	Substructure Condition	Scour Condition	Bridge Condition Rating
Ambagiri	1	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	2	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	3	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	4	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	5	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	6	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	7	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	8	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	9	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	10	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	11	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	12	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	13	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	14	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	15	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	16	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	17	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	18	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	19	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	20	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	21	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	22	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	23	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	24	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	25	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	26	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	27	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	28	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	29	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	30	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	31	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	32	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	33	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	34	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	35	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	36	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	37	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	38	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	39	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	40	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	41	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	42	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	43	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	44	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	45	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	46	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	47	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	48	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	49	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	50	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	51	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	52	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	53	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	54	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	55	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	56	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	57	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	58	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	59	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	60	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	61	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	62	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	63	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	64	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	65	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	66	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	67	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	68	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	69	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	70	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	71	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	72	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	73	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	74	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	75	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	76	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	77	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	78	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	79	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	80	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	81	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	82	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	83	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	84	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	85	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	86	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	87	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	88	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	89	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	90	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	91	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	92	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	93	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	94	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	95	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	96	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	97	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	98	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	99	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	100	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	101	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	102	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	103	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	104	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	105	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	106	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	107	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	108	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	109	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	110	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	111	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	112	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	113	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	114	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	115	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	116	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	117	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	118	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	119	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	120	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	121	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	122	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	123	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	124	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	125	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	126	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	127	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	128	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	129	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	130	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	131	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	132	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	133	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	134	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	135	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	136	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	137	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	138	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	139	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	140	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	141	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	142	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	143	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	144	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	145	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	146	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	147	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	148	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	149	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	150	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	151	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	152	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	153	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	154	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	155	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	156	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	157	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	158	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	159	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	160	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	161	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	162	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	163	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	164	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	165	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	166	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	167	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	168	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	169	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	170	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	171	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	172	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	173	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	174	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	175	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	176	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	177	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	178	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	179	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	180	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	181	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	182	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	183	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	184	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	185	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	186	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	187	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	188	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	189	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	190	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	191	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	192	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	193	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	194	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	195	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	196	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	197	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	198	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	199	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0
	200	RCC Slab	6.00	RCC	8.00	2.0	2.0	2.0	2.0	2.0

Total 200
Salvaire 0

Soil texture	Multiplier factor
Sand, loamy sand, clayey sand	23
Sandy loam, fine sandy loam, light sandy clay loam	14
Loam, fine sandy loam, silty loam, sandy clay loam	9.5
Clay loam, silty clay loam, fine sandy clay loam, sandy clay, silty clay, light clay	8.6
Light medium clay	8.6
Medium clay	7.5
Heavy clay	5.8
Peat	4.9

Electrical Conductivity (ECe)	Rating
<2	Non-saline
2-4	Slightly saline
4-8	Moderately saline
8-16	Highly saline
>16	Extremely saline

Converting EC (dS/m to Ee)
Ece = EC 1:5 (dS/m x multiplier factor

	Site 1 0.0-0.1	Site 1 0.2-0.3	Site 1 0.3-0.45	Site 1 0.45-0.55	Site 2 0.0-0.1	Site 2 0.15-0.2	Site 3 0.0-0.1	Site 3 0.1-0.2	Site 3 0.4-0.5	Site 4 0.0-0.1	Site 4 0.2-0.3	Site 5 0.0-0.1	Site 5 0.2-0.3
Soil Horizon	A1	A2	A22	B1	A1	B1	A1	B1	B2	A1	B1	A1	B1
Electrical Conductivity (dS/m)	**0.073**	0.032	0.022	0.032	**0.033**	0.022	**0.041**	0.038	0.114	**0.100**	0.174	**0.054**	0.067
ECe	0.63	0.28	0.19	0.28	0.28	0.19	0.35	0.33	0.98	0.86	1.50	0.46	0.58
Rating	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline
Soil texture	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam

	Site 6 0.0-0.1	Site 6 0.15-0.25	Site 6 0.3-0.4	Site 7 0.0-0.1	Site 7 0.1-0.2	Site 7 0.35-0.4	Site 7 0.5-0.7	Site 8 0.0-0.1	Site 8 0.15-0.2	Site 9 0.0-0.1	Site 9 0.1-0.2	Site 10 0.0-0.1	Site 10 0.1-0.2
Soil Horizon	A1	B1	B2??	A1	A2	B1	B2	A1	B1	A1	B1	A1	A2
Electrical Conductivity (dS/m)	**0.037**	0.051	0.447	**0.042**	0.017	0.022	0.094	**0.056**	0.042	**0.319**	0.030	0.063	0.041
ECe	0.32	0.44	3.84	0.36	0.24	0.31	0.81	0.48	0.36	2.74	0.26	0.54	0.35
Rating	Non-saline	Non-saline	Slightly saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Slightly saline	Non-saline	Non-saline	Non-saline
Soil texture	Clay Loam	Clay Loam	Clay	Clay Loam	Sandy Soil	Sandy Soil	Clay	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam

	Site 10 0.6-0.7	Site 11 0.0-0.1	Site 11 0.15-0.25	Site 12 0.0-0.1	Site 12 0.15-0.25	Site 12 0.55-0.6	Site 13 0.0-0.1	Site 13 0.2-0.3	Site 13 0.55-0.65	Site 14 0.0-0.1	Site 14 0.15-0.25	Site 14 0.65-0.75	Site 15 0.0-0.15
Soil Horizon	B2	A1	B1	A1	B1	B2	A1	B1	B2	A1	B1	B2	A1
Electrical Conductivity (dS/m)	**0.034**	0.053	0.027	**0.075**	0.040	0.150	**0.115**	0.044	0.044	**0.192**	0.034	0.057	**0.082**
ECe	0.29	0.46	0.23	0.65	0.34	1.29	0.99	0.38	0.38	1.65	0.29	0.49	0.71
Rating	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline
Soil texture	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam

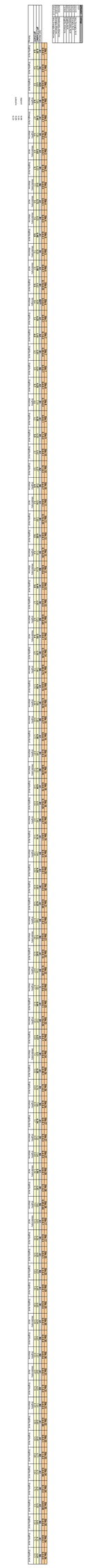
	Site 15 0.15-0.25	Site 15 0.6-0.7	Site 16 0.0-0.15	Site 16 0.2-0.3	Site 16 0.85-0.95	Site 18 0.0-0.15	Site 18 0.15-0.25	Site 18 0.6-0.7	Site 19 0.0-0.1	Site 19 0.2-0.3	Site 20 0.0-0.1	Site 20 0.2-0.3	Site 20 0.0-0.05
Soil Horizon	B1	B2	A1	B1	B2	A1	B1	B2	A1	B1	A1	B1	A1
Electrical Conductivity (dS/m)	0.039	0.042	**0.096**	0.058	0.084	**0.090**	0.037	0.048	**0.085**	0.155	**0.125**	0.030	**0.086**
ECe	0.34	0.36	0.83	0.50	0.72	0.77	0.32	0.41	0.73	1.33	1.08	0.26	0.74
Rating	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline
Soil texture	Clay Loam	Clay Loam	Clay Loam	Clay	Clay	Clay Loam	Clay	Clay	Clay	Clay	Clay Loam	Clay	Clay

	Site 21 0.1-0.2	Site 21 0.5-0.6	Site 2 0.0-0.15	Site 22 0.15-0.25	Site 22 0.5-0.6	Site 23 0.0-0.1	Site 23 0.15-0.25	Site 24 0.0-0.1	Site 24 0.3-0.4	Site 26 0.0-00.1	Site 26 0.1-0.2	Site 26 0.3-0.4	Site 27 0.0-0.1
Soil Horizon	B1	B2	A1	B1	C	A1	B1	A1	B1	A1	B1	B2	A1
Electrical Conductivity (dS/m)	0.056	0.130	**0.208**	0.052	0.061	**0.069**	0.073	**0.139**	0.093	**0.045**	0.023	0.021	**0.051**
ECe	0.48	1.12	1.79	0.45	0.52	0.59	0.63	1.20	0.80	0.39	0.20	0.18	0.44
Rating	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline
Soil texture	Clay	Clay	Clay Loam	Clay	Clay	Clay	Clay	Clay	Clay	Clay Loam	Clay	Clay	Clay

	Site 27 0.2-0.3	Site 27 0.4-0.5	Site 28 0.0-0.1	Site 28 0.1-0.2	Site 28 0.55-0.65	Site 17 0.0-0.1	Site 17 0.2-0.3	Site 25 0.0-0.1	Site 25 0.3-0.4	Site 29 0.0-0.1	Site 29 0.3-0.5	Site 30 0.0-0.1	Site 30 0.2-0.4
Soil Horizon	B1	B2	A1	B1	B2	A1	B1	A1	B2	A1	B1	A1	B2
Electrical Conductivity (dS/m)	0.051	0.079	**0.148**	0.069	0.060	0.048	0.034	0.036	0.032	0.047	0.015	0.038	0.018
ECe	0.44	0.68	1.27	0.59	0.52	0.41	0.29	0.31	0.28	0.40	0.13	0.33	0.15
Rating	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline
Soil texture	Clay Loam	Clay Loam	Clay Loam	Clay	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam

	Site 30 0.4-0.6	Site 31 0.0-0.1	Site 31 0.1-0.3	Site 31 0.4-0.5	Site 32 0.0-0.05	Site 33 0.0-0.1	Site 33 0.1-0.2	Site 34 0.0-0.05	Site 34 0.1-0.2	Site 35 0.0-0.05	Site 35 0.4-0.6	Site 36 0.0-0.1	Site 36 0.3-0.5
Soil Horizon	B2	A1	A2	B2	A1	A1	B2	A1	B1	A1	B2	A1	B2
Electrical Conductivity (dS/m)	0.024	0.026	0.016	0.041	0.072	0.103	0.032	0.113	0.042	0.051	0.022	0.052	0.028
ECe	0.21	0.22	0.14	0.35	0.62	0.89	0.28	0.97	0.36	0.44	0.19	0.45	0.24
Rating	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline	Non-saline
Soil texture	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam

	EC	Ece
Topsoil		2.74
		0.22
subsoils		3.84
		0.13



	Land and Soil Capability Factors											
Site	Water Erosion Slope Class	Wind Erosion Class	Structural Decline Class	Soil Acidification Class	Salinity Class	Waterlogging Class	Shallow Soil Class	Mass Movement Class	LSC Class	LSC Description	BSAL Status	Agricultural Land Classification
1	3	2	4	3	1	4	4	1	4			
2	3	2	4	4	1	3	4	1	4			
3	3	2	6	3	3	6	4	1	6			
4	4	2	4	3	1	4	6	1	6			
5	3	2	4	3	1	4	4	1	4			
6	3	2	4	3	1	4	4	1	4			
7	3	2	6	3	3	6	4	1	6			
8	4	2	3	3	1	4	6	1	6			
9	4	2	3	3	1	4	6	1	6			
10	3	2	3	3	1	2	4	1	4			
11	2	2	3	3	1	4	4	1	4			
12	3	2	3	3	1	4	4	1	4			
13	3	1	3	3	1	4	4	1	4			
14	3	2	3	3	1	2	4	1	4			
15	3	2	4	3	1	4	4	1	4			
16	3	2	4	3	1	4	4	1	4			
18	3	2	3	3	1	4	4	1	4			
19	2	2	3	3	1	2	4	1	4			
20	3	1	3	3	1	4	6	1	6			
21	3	1	3	3	1	4	6	1	6			
22	3	1	3	3	1	4	4	1	4			
23	3	1	3	3	1	4	3	1	4			
24	3	1	3	3	1	4	3	1	4			
26	3	1	3	3	1	3	4	1	4			
27	4	1	3	3	1	3	4	1	4			
28	3	1	3	3	1	3	4	1	4			
17	3	2	4	3	1	4	4	1	4			
25	3	1	3	3	1	3	4	1	4			
29	3	2	4	3	1	4	4	1	4			
30	2	2	3	3	1	4	4	1	4			
31	3	2	6	3	3	6	4	1	6			
32	4	2	3	3	1	4	6	1	6			
33	2	2	3	3	1	4	4	1	4			
34	3	1	3	3	1	4	6	1	6			
35	3	1	3	3	1	4	6	1	6			
36	3	2	3	3	1	4	4	1	4			

Site	Texture horizon between A/B	Nutrient Status	CEC	Acidity	Salinity	Sodicity	Ca/Mg Ratio	Dispersive?	mottled	Likely soil classification?
1	Gradual		Moderate Mesotrophic	Slightly Acid A Slightly Alkaline B	Non-saline	non-sodic	Moderate A Low B	Slightly dispersive	nil	Brown Petroferic Eutrophic Dermosol
2	**Gradual**		**Moderate/mesotrophic**	**Strongly Acid A Slightly Alkaline B**	**Non-saline**	**slightly sodic**	**Moderate A & B**	**Moderately dispersive**	**nil**	**Brown Petroferic Eutrophic Dermosol**
3	Strong contrast		Low (dystrophic) A Moderate (Mesotrophic) B	Moderately Acid A Slightly Acid B1 Moderately Alkaline B2	Non-saline	sodic	Moderate A1 & B1 Low B2	Moderately dispersive	B2 many mottles	Humose Mottled Dermosol
4	Strong contrast		**High (Eutropic) A and B**	**Moderately Acid A Moderately Alkaline B1**	**Non-saline**	**non-sodic**	**Moderate A Low B**	**Slightly dispersive**	**nil**	**Red Pertoferic Eutrophic Dermosol**
5	Strong contrast		High (Eutropic) A and B	Slightly Acid A Moderately Alkaline B1	Non-saline	slightly sodic A Sodic subsoils	Low A & B	slightly dispersive	nil	Brown Petroferic Eutrophic Ferric Sodic Dermosol
6	**Strong contrast**		**Moderate (Mesotrophic) A1& B1 High (Eutropic) B2**	**Moderately Alkaline A1 Slightly Acid B1 Strongly Alkaline B2**	**Non-saline A1 and B1 Slightly saline B2**	**Sodic A and B1 and strongly sodic B2**	**Low A & B**	**Negligible/aggregated A Mod Dis Subsoils**	**B2**	Mesotropic Mottled-Hypernatric Brown Sodosol
7	Strong contrast		Low (Dystropic) A1,A2&B1 Moderate (Mesotrophic) B2	all horizons slightly acid	Non-saline	Sodic A & B strongly sodic B21 & B22	low (0)	slightly dispersive	B2 many mottles	Mesotropic Mottled-Hypernatric Brown Sodosol
8	**Gradual**		**High (Eutropic) A and B**	**Slightly Acid A Slightly Alkaline B1**	**Non-saline**	**non-sodic**	**Moderate A High B1**	**Negligible / aggregated**	**nil**	**red leptic eutrophic ferrosol**
9	Gradual		High (Eutropic) A and B	Slightly Acid A Slightly Acid B1	Non-saline	non-sodic	Moderate A & B	Negligible / aggregated	nil	red leptic eutrophic ferrosol
10	**Gradual**		**High (Eutropic) A and B**	**Slightly Acid A Slightly Alkaline B2**	**Non-saline**	**non-sodic**	**Moderate A1 High A2 Moderate B2**	**Slightly dispersive**	**nil**	**Red Petroferic Eutrophic Dermosol**
11	Gradual		High (Eutropic) A and B	Moderately Acid A Slightly Acid B1	Non-saline	non-sodic	Moderate A & B	Slightly dispersive A Non dispersive subsoils	nil	red leptic eutrophic ferrosol
12	**Gradual**		**High (Eutropic) A and B**	**Slightly Acid A Slightly Alkaline B1**	**Non-saline**	**non-sodic**	**Moderate A High B1 & B2**	**Slightly dispersive A Non dispersive subsoils**	**nil**	**Red Petroferic Eutrophic Dermosol**
13	Gradual		High (Eutropic) A Moderate (Mesotrophic) B1 High (Eutropic) B2	Slightly Acid A Slightly Acid B1 Slightly Alkaline B2	Non-saline	non-sodic A and B1 Slightly Sodic B2	Moderate A & B	Slightly dispersive A Non dispersive subsoils	nil	Red Petroferic Eutrophic Dermosol

14	**Gradual**		**High (Eutropic) A and B**	**Moderately Acid A Slightly Acid B1 Slightly Alkaline B2**	**Non-saline**	**non-sodic**	**Moderate A1 Moderate B1 High B2**	**Negligible / aggregated**	**A1 very few mottles**	**red leptic eutrophic ferrosol**
15	Gradual		High (Eutropic) A and B	Slightly Acid A Slightly Alkaline B1 & 2	Non-saline	non-sodic	High A Moderate B1 & B2	Negligible / aggregated	nil	Red Petroferic Eutrophic Dermosol
16	**Gradual**		**High (Eutropic) A and B**	**Slightly Acid A Slightly Alkaline B1 Moderately Alkaline B2**	**Non-saline**	**non-sodic**	**Moderate A High B1 & B2**	**Negligible / aggregated**	**nil**	**Red Petroferic Eutrophic Dermosol**
18	Gradual		High (Eutropic) A Moderate (Mesotrophic) B1 High (Eutropic) B2	Slightly Acid A Slightly Alkaline B1 & 2	Non-saline	non-sodic	Moderate A & B	Negligible / aggregated	B2 few mottles	Mottled Red Petroferic Eutrophic Dermosol
19	**Gradual**		**High (Eutropic) A and B**	**Slightly Acid A Slightly Alkaline B1**	**Non-saline**	**non-sodic**	**Moderate A High B1**	**Negligible / aggregated**	**nil**	**Red Petroferic Eutrophic Dermosol**
20	Gradual		High (Eutropic) A Moderate (Mesotrophic) B1 High (Eutropic) B2	Slightly Acid A Slightly Acid B1	Non-saline	non-sodic	Moderate A & B	Negligible / aggregated	nil	Red Petroferic Eutrophic Dermosol
21	**Gradual**		**High (Eutropic) A and B**	**Slightly Acid A Slightly Alkaline B1 Moderately Alkaline B2**	**Non-saline**	**non-sodic**	**Moderate A High B**	**Slightly dispersive A Non dispersive subsoils**	**B2 common**	**Mottled Red Petroferic Eutrophic Dermosol**
22	Gradual		High (Eutropic) A and B	Slightly Acid A Slightly Alkaline B1 & C	Non-saline	non-sodic	Moderate A, B & C	Negligible / aggregated	C very few mottles	Brown Petroferic Eutrophic Dermosol
23	**Gradual**		**High (Eutropic) A and B**	**Slightly Acid A Slightly Alkaline B1**	**Non-saline**	**non-sodic A and B1 Slightly Sodic B22**	**Low A & B**	**Negligible/aggregated A Slightly Dis Subsoils**	**nil**	**Red Petroferic Eutrophic Dermosol**
24	Gradual		High (Eutropic) A and B	Slightly Acid A Moderately Alkaline B1	Non-saline	non-sodic	Moderate A1 Low B1	Moderately dispersive A Non dispersive subsoils	A1 very few mottles	Red Petroferic Eutrophic Dermosol
26	**Gradual**		**Moderate (Mesotrophic) A & B**	**Slightly Acid A Slightly Acid B1 Slightly Alkaline B2**	**Non-saline**	**non-sodic**	**Moderate A & B**	**Slightly dispersive A Non dispersive subsoils**	**B2 common mottles**	**Mottled Red Petroferic Eutrophic Dermosol**
27	Strong contrast		High (Eutropic) A and B	Slightly Acid A Slightly Alkaline B1 Slightly Alkaline B2	Non-saline	non-sodic	Moderate A & B	Slightly dispersive A Non dispersive subsoils	nil	Red Petroferic Eutrophic Dermosol
28	**Strong contrast**		**High (Eutropic) A and B**	**Moderately Acid A Slightly Acid B1 Slightly Alkaline B2**	**Non-saline**	**non-sodic**	**Low A & B**	**Slightly dispersive A Non dispersive subsoils**	**B2 very few mottles**	**Red Petroferic Eutrophic Dermosol**
17	Strong contrast		High (Eutropic) A and B	Moderately Acid A Slightly Acid B1	Non-saline	non-sodic	Moderate A & B	Slightly dispersive A Slightly Dis Subsoils	nil	Brown Petroferic Eutrophic Dermosol
25			**Low (Dystropic) A1 Moderate (Mesotrophic) B2**	**Slightly Acid A Slightly Acid B1**	**Non-saline**	**non-sodic**	**Moderate A1 Low B1**	**Slightly dispersive A Slightly Dis Subsoils**	**nil**	**Red Petroferic Eutrophic Dermosol**

29	Strong contrast		Moderate (Mesotrophic) A1 & B1	Slightly Acid A Slightly Acid B1	Non-saline	non-sodic	Moderate A Low B	Slightly dispersive A Slightly Dis Subsoils	nil	Red Petroferic Eutrophic Ferric Dermosol
30	**Gradual**		**Moderate (Mesotrophic) A1 & B2**	**Moderately Acid A Slightly Acid B2 into Slightly Alkaline B2**	**Non-saline**	**non-sodic**	**Low A Moderate B**	**Slightly dispersive A Slightly Dis Subsoils non dispersive at depth**	**nil**	**red leptic eutrophic ferrosol**
31	Strong contrast		Low (dystrophic) A and B	Moderately Acid A1 Slightly Acid A2 Slightly Alkaline B2	Non-saline	Slightly Sodic A sodic B2	Moderate A Low B	Slightly dispersive A Dis Subsoils	nil	Mesotropic Mottled-Hypernatric Brown Sodosol
32	**Gradual**		**High (Eutropic) A**	**Slightly Acid A1**	**Non-saline**	**non-sodic**	**Moderate A**	**Slightly dispersive A**	**nil**	**red leptic eutrophic ferrosol**
33	Gradual		High (Eutropic) A Moderate (Mesotrophic) B2	Slightly Acid A1/2	Non-saline	non-sodic	Moderate A & B	Slightly dispersive A Slightly Dis Subsoils	nil	Red Petroferic Eutrophic Dermosol
34	**Gradual**		**High (Eutropic) A & B**	**Slightly Acid A1 and B1**	**Non-saline**	**non-sodic**	**Moderate A & B**	**Slightly dispersive A Slightly Dis Subsoils**	**nil**	**Red Petroferic Eutrophic Dermosol**
35	Gradual		Moderate (Mesotrophic) A1 Low (Dystropic) B2	**Slightly Acid A1 and B2**	Non-saline	non-sodic	Moderate A Low B	Slightly dispersive A Slightly Dis Subsoils	nil	Brown Petroferic Eutrophic Dermosol
36	**Gradual**		**High (Eutropic) A and B**	**Slightly Acid A1 and B2**	**Non-saline**	**non-sodic**	**Moderate A & B**	**Slightly dispersive A Slightly Dis Subsoils**	**nil**	**Red Petroferic Eutrophic Dermosol**

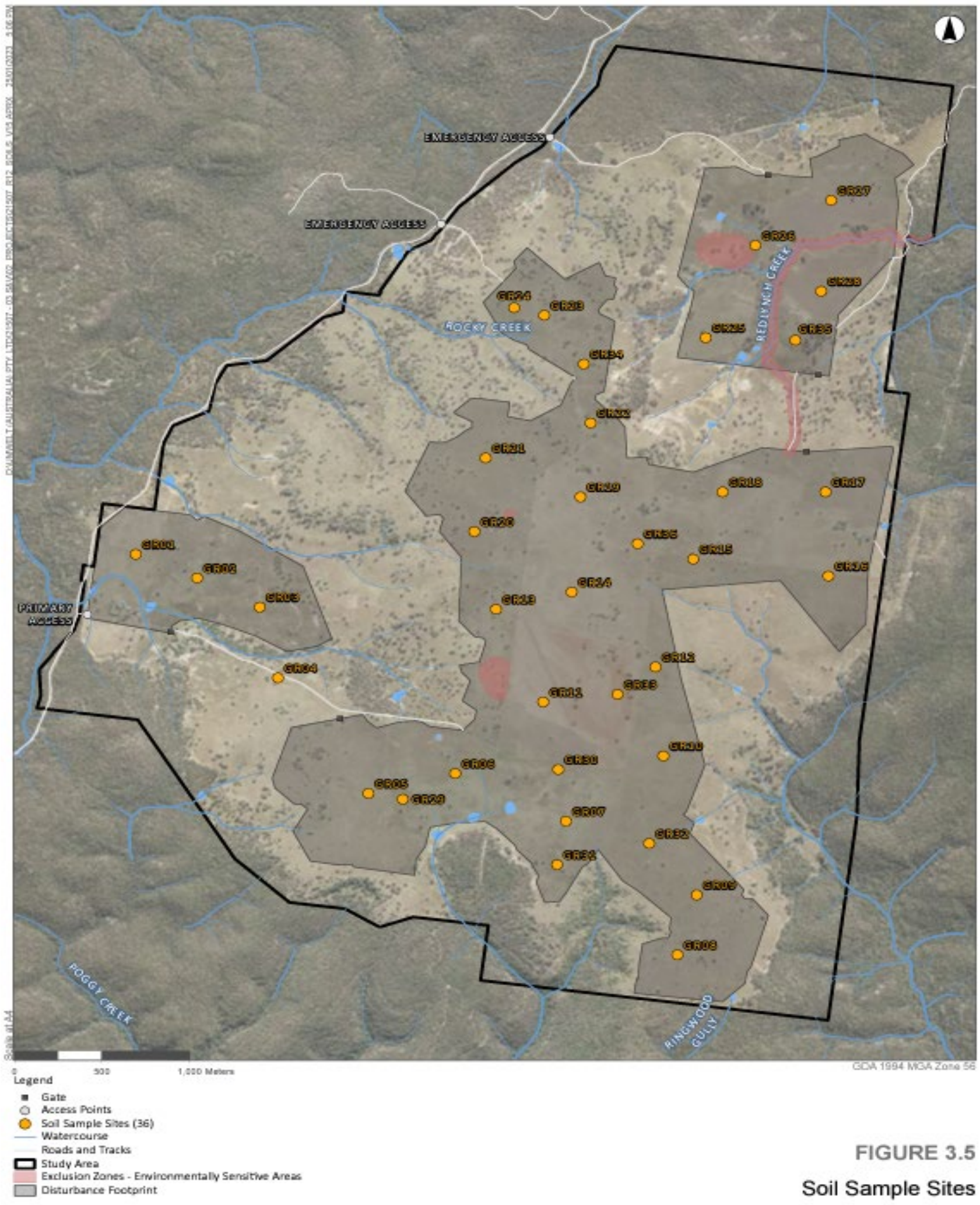


FIGURE 3.5

Soil Sample Sites

SITE	SLOPE	ROCK	ROCK	GILGAI	SLOPE	ROCK	FERTILITY		DEPTH	DRAINAGE	pH	Ece	ERD	
	1. Is slope < 10%?	2. Is there < 30% Rock Outcrop?	3. < 20% unattached Rock Fragments > 60mm?	4. Does < 50% have Gilgai >500mm deep?	5. Is Slope <5%?	6. Are there nil rock outcrops?	7a. Does Soil Have Moderate Fertility?	7b. Does soil have moderately high or high fertility?	8. Is Effective Rooting Depth to a physical barrier >750mm?	9. Is drainage better than poor?	10. Is pH between 5.0 and 8.9?	11. Is salinity (ECe) < 4 dS/m	12. Is Effective Rooting Depth to a chemical barrier >750mm?	**Verified BSAL**
1	Yes	No	Yes	Yes							Yes	Yes		
2	Yes	Yes	Yes	Yes							Yes	Yes		
3	Yes	No	Yes	Yes							Yes	Yes		
4	Yes	Yes	Yes	Yes							Yes	Yes		
5	Yes	Yes	Yes	Yes							Yes	Yes		
6	Yes	Yes	Yes	Yes							Yes	Yes		
7	Yes	Yes	Yes	Yes							Yes	Yes		
8	Yes	Yes	Yes	Yes							Yes	Yes		
9	Yes	Yes	No	Yes							Yes	Yes		
10	Yes	Yes	No	Yes							Yes	Yes		
11	Yes			Yes							Yes	Yes		
12	Yes			Yes							Yes	Yes		
13	Yes			Yes							Yes	Yes		
14	Yes			Yes							Yes	Yes		
15	Yes			Yes							Yes	Yes		
16	Yes			Yes							Yes	Yes		
18	Yes			Yes							Yes	Yes		
19	Yes			Yes							Yes	Yes		
20	Yes			Yes							Yes	Yes		
21	Yes			Yes							Yes	Yes		
22	Yes			Yes							Yes	Yes		
23	Yes			Yes							Yes	Yes		
24	Yes			Yes							Yes	Yes		
26	Yes		No	Yes							Yes	Yes		
27	Yes		No	Yes							Yes	Yes		
28	Yes		No	Yes							Yes	Yes		

Site	Depth (m)	Emerson Aggregate Classes	Dispersability	ESP (%)	pH	CEC	Rating	Gypsum Application Rates
3	0.0-0.1	3	Slightly dispersive	7.6	**5.86**	**7.0**	Sodic	2.5
3	0.15-0.25	2	Moderately dispersive	11	7.11	22	Sodic	5
3	0.4-0.5	2	Moderately dispersive	12	8.26	29	Sodic	5
3	0.5-0.55	2	Moderately dispersive	13	8.47	25	Sodic	5
4	0.0-0.1	3	Slightly dispersive	5.3	**5.50**	**4.0**	Slightly sodic and dispersion can only occur under raindrop impact in surface soils	
4	0.1-0.2	3	Slightly dispersive	5.4	5.79	2.6	Slightly sodic and dispersion can only occur under raindrop impact in surface soils	
4	0.3-0.4	2	Moderately dispersive	8.9	5.98	2.9	Sodic	2.5
5	0.0-0.1	3	Slightly dispersive	2.3	**6.31**	**4.1**	Non-sodic	na
5	0.1-0.2	3	Slightly dispersive	3.5	6.45	2.2	Slightly sodic and dispersion can only occur under raindrop impact in surface soils	na
5	0.3-0.4	3	Slightly dispersive	5.1	6.64	13	Slightly sodic and dispersion can only occur under raindrop impact in surface soils	na
6	0.0-0.1	3	Slightly dispersive	0.1	**6.16**	**4.8**	Non-sodic	na
6	0.15-0.3	3	Slightly dispersive	0.57	6.80	3.9	Non-sodic	na
6	0.35-0.45	4	Negligible / aggregated	1.9	7.10	7.8	Non-sodic	na
7	0.0-0.1	3	Slightly dispersive	1.7	**5.86**	**4.7**	Non-sodic	na
7	0.3-0.4	3	Slightly dispersive	3.5	6.63	4.3	Slightly sodic and dispersion can only occur under raindrop impact in surface soils	na
7	0.6-0.7	3	Slightly dispersive	6.1	7.28	8.1	Martinally Sodic	na
8	0.0-0.1	3	Slightly dispersive	0.58	**6.45**	**3.7**	Non-sodic	na
8	0.2-0.3	3	Slightly dispersive	1.3	5.65	2.4	Non-sodic	na
8	0.45-0.55	4	Negligible / aggregated	8.2	7.27	8.3	Sodic	2.5
9	0.0-0.1	3	Slightly dispersive	-0.2	**5.93**	**2.5**	Non-sodic	na
9	0.15-0.25	3	Slightly dispersive	-0.4	5.80	1.4	Non-sodic	na
9	0.5-0.6	2	Moderately dispersive	0.51	6.42	5.6	Non-sodic	na
10	0.0-0.1	3	Slightly dispersive	2.1	**5.27**	**2.5**	Non-sodic	na
10	0.15-0.25	3	Slightly dispersive	3.2	5.88	1.7	Slightly sodic and dispersion can only occur under raindrop impact in surface soils	na
10	0.35-0.45	2	Moderately dispersive	12	6.45	7.8	Sodic	5
11	0.0-0.1	3	Slightly dispersive	5.9	**5.50**	**4.5**	Slightly sodic and dispersion can only occur under raindrop impact in surface soils	
11	0.1-0.2	3	Slightly dispersive	6.3	5.75	2.7	Sodic	2.5
11	0.25-0.35	2	Moderately dispersive	10	6.15	13	Sodic	5
12	0.0-0.1	3	Slightly dispersive	2.1	**6.32**	**2.7**	Non-sodic	na
12	0.2-0.3	3	Slightly dispersive	0.86	5.77	3.7	Non-sodic	na
12	0.5-0.6	3	Slightly dispersive	4.6	6.57	14	Slightly sodic and dispersion can only occur under raindrop impact in surface soils	na
			topsoils		7.6			
					-0.2			
			subsoils Max	#REF!				
			Min	#REF!				

Correction of sodicity rates pH >6		
low	2.5	
medium	5	
high	10	

SOIL PROFILE DESCRIPTION SHEET

SITE: GR34 | Date 12/1/23 | Assessor: DMcQueeney

Depth (mm)	Horizon	Texture	Structure	Colour	Mottle / Gley	Roots	Coarse Frags (%) e.g. stones – abundance & size	Moisture	Soils Notes (firmness, strength, stickiness plasticity, drainage, consistency -Loose to Rigid)	Site Notes (land use, slope %, landform, topography, surface condition, surface rock, vegetation, pan presence & form)
0.0-0.3	A_1	gravelly clayey silt	crumb	Brown	N.L	~20%	1% of gravel & stones	Dry	weak F+S, Low stickiness & plasticity, Freedraining loose consistency	grazing, 5% slope, undulating to hilly, some surface rock, good grass cover.
(GR34 0.0-0.05) (GR34 0.1-0.2)					generally	gravelly		profile		
TD @ 0.3 due to rocks										

SOIL PROFILE DESCRIPTION SHEET

SITE: GR32 | Date 11/1/23 | Assessor: DM

Depth (mm)	Horizon	Texture	Structure	Colour	Mottle / Gley	Roots	Coarse Frags (%) e.g. stones – abundance & size	Moisture	Soils Notes (firmness, strength, stickiness plasticity, drainage, consistency -Loose to Rigid)	Site Notes (land use, slope %, landform, topography, surface condition, surface rock, vegetation, pan presence & form)
0.0 – 0.1 (GR32 0.0–0.05)				Hole suspended @ 0.1m due to Rocks → refer to GR08 & GR09 Notes						
GR33										
0.0 – 0.1	A_1	Massive ↓	↓ Silty clay	Reddish Brown	nil	↓%	20% Gravel - stones	Dry	↓ weak, mod strength, ↓ plast., mod drainage, rigid	Generally Flat, Grazing
0.1 – 0.4	B_2	↓	↓ "	Brownish red	nil	↓%	75%	mod moisture	mod strength & Firmness, mod plast, mod drainage, Firm to Rigid.	Good veg cover. 2% slope to west.
TD @ 0.4 Suspended due to Rock.										
		High % of surface Rock								

SOIL PROFILE DESCRIPTION SHEET

SITE: GR31 | Date 11/1/23 | Assessor: DM.

Depth (mm)	Horizon	Texture	Structure	Colour	Mottle / Gley	Roots	Coarse Frags (%) e.g. stones – abundance & size	Moisture	Soils Notes (firmness, strength, stickiness plasticity, drainage, consistency -Loose to Rigid)	Site Notes (land use, slope %, landform, topography, surface condition, surface rock, vegetation, pan presence & form)
0.0–0.1 (GR31 0.0-0.1)	A_1	Silty Sand	~~grainy~~ granular	Dark grey	Nil	~10%	Nil	Dry	↓ weak, ↓ firmness, ~~↓ stick~~ non sticky, non plastic free draining, loose	3% slope, undulating, 85% groundcover,
0.1–0.4 (GR31 0.1–0.3)	A_2	Silty Sand	~~grain~~ granular	Pale grey	Nil	<5%	Nil	↓	↓	PAN @ 0.4m. Nil surface rock.
0.4–0.6 (GR31 0.4–0.5)	$A_{\cancel{22}\,3}$	~~Sandy~~ Clayey Sand	granular	Pale grey	Mottle	Nil	Nil	↓	weak, ↓ firmness, low stickiness low plasticity, poor drainage mod rigidity, PAN @ ~0.4m	

SOIL PROFILE DESCRIPTION SHEET

SITE: GR30 | Date 11/1/23 | Assessor: DMQ

Depth (mm)	Horizon	Texture	Structure	Colour	Mottle / Gley	Roots	Coarse Frags (%) e.g. stones – abundance & size	Moisture	Soils Notes (firmness, strength, stickiness plasticity, drainage, consistency -Loose to Rigid)	Site Notes (land use, slope %, landform, topography, surface condition, surface rock, vegetation, pan presence & form)
0.0-0.2 (GR30 0.0-0.1)	A_1	Sandy Silt	Massive	~~Dark~~ Brown	Nil	~30%	4%	Dry	Weak F+S, ↓ plast, Free Drainage, Loose	Ref GR07
0.2-0.6 (GR30 0.2-0.4) (GR30 0.4-0.6)	B_2	Sandy clay	Massive	Dark Red	Nil	~10%	Nil	Moist	Moderate strength & Firmness, Low-Mod plast, Mod drainage, Mod rigidity	
TD@0.6										

SOIL PROFILE DESCRIPTION SHEET

SITE: GR29 Date 11/1/23 Assessor: DMcQueen

Depth (mm)	Horizon	Texture	Structure	Colour	Mottle / Gley	Roots	Coarse Frags (%) e.g. stones – abundance & size	Moisture	Soils Notes (firmness, strength, stickiness plasticity, drainage, consistency -Loose to Rigid)	Site Notes (land use, slope %, landform, topography, surface condition, surface rock, vegetation, pan presence & form)
0.0-0.2 (GR29_0.0-0.1)	A1	Silty Sandy Loam	Massive	Dark Brown	Nil	Medium ~30%	Nil	Dry	(when wet) refer to GR05	~7% Slope. Ref to GR05
0.2-0.5 (GR29_0.3-0.5)	B1	Friable Sandy Clay	"	light red	"	↓% <5%	Nil	"	(when wet) mod strength ↓plast. ↓stickiness, Firm	
TD@ 500mm 0.5m										

SOIL PROFILE DESCRIPTION SHEET

SITE: GR17 Date 12/1/23 Assessor: DM

Depth (mm)	Horizon	Texture	Structure	Colour	Mottle / Gley	Roots	Coarse Frags (%) e.g. stones – abundance & size	Moisture	Soils Notes (firmness, strength, stickiness plasticity, drainage, consistency -Loose to Rigid)	Site Notes (land use, slope %, landform, topography, surface condition, surface rock, vegetation, pan presence & form)
0.0–0.15	A_1	Silty Clay	Massive	dark brown	nil	~50%	~50% gravel, cobbles & stones	Dry	As per GR18	As per GR18
~~0.0~~ 0.15–0.3	B_1	Silty Clay	Massive	"	Nil	>10%	As above	Dry	As per GR18	
TD @ 0.3m										

GR25 12/1/23 DM

Depth	Horizon	Text	Structure	Colour	Mottle/Gley	Coarse Fragments	Moist	Notes
0.0-0.1 GR25 0.0-0.1	A_1	Sandy-Silty Loam	Massive	Brown	Nil	Minor gravel	Dry	Weak strength + firmness, ~~S~~ stickiness, Mod rigidity Free draining
0.1 - 0.5 TD@ 0.5m (refusal under hand Auger & Shovel)	B_2	Clay Loam	Massive	Pale Brown	Nil	Nil	~~Dry~~ Slightly Moist	MOD Strength + Firm, Mod stickiness, Mod-well drained

Surface recently cultivated, Sloping 5%, good ground/veg cover (90%), some surface rock across the surface

GR25 12/1/23 DM

Depth	Horizon	Text	Structure	Colour	Mottle/Gley	Coarse Fragments	Moist	Notes
0.0-0.1 GR25 0.0-0.1	A_1	Sandy-Silty Loam	Massive	Brown	Nil	Minor gravel	Dry	Weak strength + firmness, ~~S~~ stickiness, Mod rigidity Free draining
0.1 - 0.5 TD@ 0.5m (refusal under hand Auger & Shovel)	B_2	Clay Loam	Massive	Pale Brown	Nil	Nil	~~Dry~~ Slightly Moist	MOD Strength + Firm, Mod stickiness, Mod-well drained

Surface recently cultivated, Sloping 5%, good ground/veg cover (90%), some surface rock across the surface

GR36 12/1/23 DMcQueeney

Depth	Horizon	Texture	Structure	Colour	Mottle/ gley?	Roots	Frags	Description
0.0-0.1 (GR36 0.0-0.1)	A_1	clayey-Silty Loam	~~Blocky~~ Angular	Dark Brown	NIL	~30% Dry	Minor gravel fragments	weak strength + firm, mod plastic, Free draining sticky
0.1-0.6 (GR36 0.3-0.5)	B_2	Silty Clay	crumb	Pale Red/Brown	NIL	Fine roots / No roots @ depth	Basalt gravel fragments throughout	weak boundary As per GR19

TD @ 0.6m
4 resistance/refusal

Site Notes as per GR19 ~3% slope
Mid slope

GR35 12/11/23 OMcQ.

Depth	Horizon	Texture	Structure	Colour	Mottled gley	Roots	Coarse fragments	description
0.0-0.15 (GR35 0.0-0.05)	A_1	Sandy-Silty Loam	~~massive~~ granular	Brown	Nil	>50%	<5% gravel	weak strenght & firmness weakly plastic, Low stickness Free draining loose
0.15-0.6 (GR35 0.4-0.6)	B_2	Sandy-Silty Loam	granular	Pale Brown	Nil	<20%	gravel fragments increasing with depth cobble (20%) @ 0.4 to TD	As above

(Basalt Fragments)

TD @ 0.6m
refusal (rock)

Some surfac rock 5% slope, sample site near rock outcrop, grazing, good grand cove (100x), valley (mid slope to Redlynch ck)

APPENDIX C

Laboratory and Field Assessment Parameters

Table C.1 - Laboratory Analysis Parameters

Parameter	Reference Method
PH and EC (1:5 water), pH (CaCl)	Rayment & Lyons 2011-4A1
Available Ammonium, Nitrate, Sulfur	Rayment & Lyons 2011-3A1
Exchangeable Sodium, Potassium, Calcium, Magnesium, Hydrogen, Aluminium	Rayment & Lyons 2011-15D3
Cation Exchange Capacity	Rayment & Lyons 2011 15M1
Colwell Phosphorus	Rayment & Lyons 2011-15J1
Available Micronutrients Zinc, Manganese, Iron, Copper, Boron, Silicon	Rayment & Lyons 2011-9B2
Total Carbon (TC)	Rayment & Lyons 2011-12A1
Total Nitrogen (TN)	Rayment & Lyons 2011-6B2b
TC/TN Ratio	Rayment & Lyons 2011-7A5
Organic Matter	Rayment & Lyons 2011-8A1
Available Ammonium, Nitrate, Sulfur	% C x 1.75
Basic Colour	Munsell Colour Chart
Basic Texture	CSIRO 'Yellow Book'
Munsell Colour	Munsell Colour Chart
Emerson Aggregate test (EAT)	AS1289.3.8.1

Table C.2 -Field Assessment Parameters

Horizon depth including distinctiveness and shape	Pan presence and form
Field texture grade	Permeability and drainage
Field colour (Munsell colour chart)	Field pH
Pedality structure, grade and consistence	Field moisture
Soil fabric and stickiness	Surface condition
Stones (abundance and size)	Landform pattern / element
Mottles (amount, size and distinctiveness)	Current land use and previous disturbance
Segregations (abundance, nature, form and size)	Vegetation

APPENDIX D

Laboratory Results

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AGRICULTURAL SOIL ANALYSIS REPORT

70 samples supplied by Umwelt (Australia) Pty Ltd on 6/09/2022 . Lab Job No.N2420
Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

			Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
		Sample ID:	GR01 0.0-0.1	GR01 0.2-0.3	GR01 0.3-0.45	GR01 0.45-0.55	GR02 0.0-0.1
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter		Method reference	N2420/1	N2420/2	N2420/3	N2420/4	N2420/5
Soluble Calcium (mg/kg)		**Inhouse S10 - Morgan 1	602	606	729	1,095	291
Soluble Magnesium (mg/kg)			214	129	224	562	75
Soluble Potassium (mg/kg)			512	286	129	43	182
Soluble Phosphorus (mg/kg)			4.0	3.0	2.7	3.2	1.7
Phosphorus (mg/kg P)		**Rayment & Lyons 2011 - 9E2 (Bray 1)	6.5	6.4	3.7	1.4	1.6
		**Rayment & Lyons 2011 - 9B2 (Colwell)	28	33	36	15	7.2
		**Inhouse S3A (Bray 2)	14	11	7.7	2.4	2.5
Nitrate Nitrogen (mg/kg N)		**Inhouse S37 (KCl)	15	3.7	1.6	1.6	3.3
Ammonium Nitrogen (mg/kg N)			5.1	2.0	1.4	2.6	3.9
Sulfur (mg/kg S)			10	4.3	4.9	7.0	6.9
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.2	6.3	6.8	7.1	5.5
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.073	0.032	0.022	0.032	0.033
Estimated Organic Matter (% OM)		**Calculation: Total Carbon x 1.75	3.9	1.2	0.48	0.79	2.6
Exchangeable Calcium	(cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	6.4	5.4	10	12	3.0
	(kg/ha)		2,882	2,421	4,685	5,364	1,336
	(mg/kg)		1,286	1,081	2,091	2,394	596
Exchangeable Magnesium	(cmol+/kg)		2.9	1.7	4.9	9.1	1.2
	(kg/ha)		800	453	1,341	2,487	319
	(mg/kg)		357	202	598	1,110	142
Exchangeable Potassium	(cmol+/kg)		4.0	2.0	1.9	0.96	1.5
	(kg/ha)		3,507	1,795	1,662	839	1,314
	(mg/kg)		1,565	801	742	374	587
Exchangeable Sodium	(cmol+/kg)		0.20	0.21	0.27	0.43	0.20
	(kg/ha)		104	109	141	221	102
	(mg/kg)		46	49	63	99	45
Exchangeable Aluminium	(cmol+/kg)	**Inhouse S37 (KCl)	0.04	0.04	0.04	0.03	0.36
	(kg/ha)		8.6	8.3	7.5	6.1	72
	(mg/kg)		3.8	3.7	3.4	2.7	32
Exchangeable Hydrogen	(cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	0.01	<0.01	<0.01	0.21
	(kg/ha)		<1	<1	<1	<1	4.8
	(mg/kg)		<1	<1	<1	<1	2.1
Effective Cation Exchange Capacity (ECEC) (cmol+/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	14	9.4	18	23	6.4
Calcium (%)		**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	47	58	59	53	46
Magnesium (%)			22	18	28	41	18
Potassium (%)			29	22	11	4.3	23
Sodium - ESP (%)			1.5	2.3	1.6	1.9	3.1
Aluminium (%)			0.31	0.44	0.21	0.14	5.6
Hydrogen (%)			0.07	0.12	0.00	0.00	3.3
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol+/kg)	2.2	3.2	2.1	1.3	2.5

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Office 4 ORANGE NSW 2800

		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
	Sample ID:	GR01 0.0-0.1	GR01 0.2-0.3	GR01 0.3-0.45	GR01 0.45-0.55	GR02 0.0-0.1
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/1	N2420/2	N2420/3	N2420/4	N2420/5
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	2.2	<0.5	0.62	<0.5	2.1
Manganese (mg/kg)		112	81	47	18	95
Iron (mg/kg)		242	89	53	36	264
Copper (mg/kg)		1.7	1.7	1.3	0.81	1.2
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	0.72	0.39	0.34	0.68	0.52
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	46	42	53	33	30
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	2.2	0.68	0.28	0.45	1.5
Total Nitrogen (%)		0.23	0.11	0.08	0.10	0.15
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	9.7	6.0	3.5	4.4	10
Basic Texture	**Inhouse S65	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	47	20	14	20	21
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	5.4	5.4	5.9	6.3	4.7
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	3	3	3	4C	3
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Dark Brown 7.5 YR 3/3	Dark Brown 7.5 YR 3/4	Strong Brown 7.5 YR 4/6	Strong Brown 7.5 YR 4/6	Very Dark Brown 7.5 YR 2.5/3
Mottles Munsell Colour		.. .. ..	.. .. ..	.. .. ..	.. .. ..	.. .. ..
Degree of Mottling (%)						
Mottles Munsell Colour		.. .. ..	.. .. ..	.. .. ..	.. .. ..	.. .. ..
Degree of Mottling (%)						

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collingwood.
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013, Schedule B(1) - Guideline on Investigation Levels for Soil and Groundwater. Table 5-A Background Ranges.
9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil results'.
10. Conversions for 1 cmol$_c$/kg = 230 mg/kg Sodium, 390 mg/kg Potassium, 122 mg/kg Magnesium, 200 mg/kg Calcium
11. Conversions to kg/ha = mg/kg x 2.24
12. The chloride calculation of Cl mg/L = EC x 640 is considered an estimate, and most likely an over-estimate
13. ** NATA accreditation does not cover the performance of this service.
14. Analysis conducted between sample arrival date and reporting date.
15. This report is not to be reproduced except in full. Results only relate to the item tested.
16. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer SCU.edu.au/eal/t&cs).
17. This report was issued on 16/09/2022.

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Quality Checked: Kris Saville
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AGRICULTURAL SOIL ANALYSIS REPORT

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			Sample 6	Sample 7	Sample 8	Sample 9	Sample 10
		Sample ID:	GR02 0.15-0.2	GR03 0.0-0.1	GR03 0.1-0.2	GR03 0.4-0.5	GR04 0.0-0.1
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	N2420/6	N2420/7	N2420/8	N2420/9	N2420/10
	Soluble Calcium (mg/kg)	**Inhouse S10 - Morgan 1	524	258	382	254	925
	Soluble Magnesium (mg/kg)		108	85	124	485	356
	Soluble Potassium (mg/kg)		38	138	65	32	325
	Soluble Phosphorus (mg/kg)		1.7	2.1	1.9	1.6	4.8
	Phosphorus (mg/kg P)	**Rayment & Lyons 2011 - 9E2 (Bray 1)	<1	1.7	1.2	1.0	2.9
		**Rayment & Lyons 2011 - 9B2 (Colwell)	1.6	9.5	2.0	2.6	8.2
		**Inhouse S3A (Bray 2)	1.6	2.5	2.0	1.9	6.2
	Nitrate Nitrogen (mg/kg N)	**Inhouse S37 (KCl)	0.91	4.1	1.7	0.80	28
	Ammonium Nitrogen (mg/kg N)		1.0	6.0	2.0	1.1	17
	Sulfur (mg/kg S)		3.3	5.2	6.8	4.7	8.2
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.3	5.6	6.2	8.7	5.7
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.022	0.041	0.038	0.114	0.100
	Estimated Organic Matter (% OM)	**Calculation: Total Carbon x 1.75	0.39	3.0	1.1	0.17	7.2
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	4.2	2.2	3.1	2.0	11
	Exchangeable Calcium (kg/ha)		1,905	978	1,381	904	4,896
	Exchangeable Calcium (mg/kg)		851	437	617	404	2,186
	Exchangeable Magnesium (cmol+/kg)		1.4	0.96	1.4	5.9	5.4
	Exchangeable Magnesium (kg/ha)		370	262	393	1,620	1,463
	Exchangeable Magnesium (mg/kg)		165	117	176	723	653
	Exchangeable Potassium (cmol+/kg)		0.47	0.91	0.60	0.49	2.6
	Exchangeable Potassium (kg/ha)		408	801	526	428	2,303
	Exchangeable Potassium (mg/kg)		182	357	235	191	1,028
	Exchangeable Sodium (cmol+/kg)		0.25	0.31	0.46	3.0	0.31
	Exchangeable Sodium (kg/ha)		131	157	235	1,524	157
	Exchangeable Sodium (mg/kg)		58	70	105	680	70
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.03	0.15	<0.01	<0.01	0.02
	Exchangeable Aluminium (kg/ha)		5.7	30	1.7	<1	4.3
	Exchangeable Aluminium (mg/kg)		2.5	14	<1	<1	1.9
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	0.12	0.02	<0.01	0.09
	Exchangeable Hydrogen (kg/ha)		<1	2.7	<1	<1	2.1
	Exchangeable Hydrogen (mg/kg)		<1	1.2	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	6.4	4.6	5.6	11	19
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	67	47	55	18	56
	Magnesium (%)		21	21	26	52	28
	Potassium (%)		7.3	20	11	4.3	14
	Sodium - ESP (%)		4.0	6.6	8.1	26	1.6
	Aluminium (%)		0.44	3.3	0.15	0.04	0.11
	Hydrogen (%)		0.00	2.6	0.32	0.00	0.47
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	3.1	2.3	2.1	0.34	2.0

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Office 4 ORANGE NSW 2800

		Sample 6	Sample 7	Sample 8	Sample 9	Sample 10
	Sample ID:	GR02 0.15-0.2	GR03 0.0-0.1	GR03 0.1-0.2	GR03 0.4-0.5	GR04 0.0-0.1
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/6	N2420/7	N2420/8	N2420/9	N2420/10
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	1.3	<0.5	1.3	3.8
Manganese (mg/kg)		17	69	40	10.0	129
Iron (mg/kg)		36	220	37	672	163
Copper (mg/kg)		0.69	0.78	0.82	0.88	1.7
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	0.42	0.35	0.55	0.96	0.98
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	36	24	28	3.3	62
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	0.22	1.7	0.62	0.10	4.1
Total Nitrogen (%)		0.07	0.16	0.08	0.07	0.36
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	3.4	10	7.4	1.4	12
Basic Texture	**Inhouse S65	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	14	26	24	73	64
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	6.6	4.9	5.7	7.7	5.0
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	2	3	2	2	3
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Strong Brown 7.5 YR 4/6	Dark Brown 7.5 YR 3/4	Strong Brown 7.5 YR 4/6	Yellowish Brown 10 YR 5/4	Dark Reddish Brown 5 YR 3/2
Mottles Munsell Colour		.. ..	.. ..	.. ..	Yellowish Red 5 YR 4/6	.. ..
Degree of Mottling (%)		..	..	..	40	..
Mottles Munsell Colour		.. ..	.. ..	.. ..	Olive Yellow 2.5 Y 6/6	.. ..
Degree of Mottling (%)		..	..	..	1	..

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collin
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013,
   Schedule B(1) - Guideline on Investigation Levels for Soil and Groundwater. Table 5-A Background Range
9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil re
10. Conversions for 1 cmol$_c$/kg = 230 mg/kg Sodium, 390 mg/kg Potassium,
    122 mg/kg Magnesium, 200 mg/kg Calcium
11. Conversions to kg/ha = mg/kg x 2.24
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			Sample 11	Sample 12	Sample 13	Sample 14	Sample 15
		Sample ID:	GR04 0.2-0.3	GR05 0.0-0.1	GR05 0.2-0.3	GR06 0.0-0.1	GR06 0.15-0.25
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter		Method reference	N2420/11	N2420/12	N2420/13	N2420/14	N2420/15
Soluble Calcium (mg/kg)		**Inhouse S10 - Morgan 1	4,577	1,241	1,333	348	376
Soluble Magnesium (mg/kg)			1,616	643	1,078	252	542
Soluble Potassium (mg/kg)			32	141	58	34	<25
Soluble Phosphorus (mg/kg)			6.5	5.1	5.2	2.3	2.2
Phosphorus (mg/kg P)		**Rayment & Lyons 2011 - 9E2 (Bray 1)	1.0	5.9	<1	4.3	1.3
		**Rayment & Lyons 2011 - 9B2 (Colwell)	2.3	24	2.3	9.2	2.3
		**Inhouse S3A (Bray 2)	2.4	12	3.1	8.2	2.3
Nitrate Nitrogen (mg/kg N)		**Inhouse S37 (KCl)	1.2	4.7	1.3	6.5	0.80
Ammonium Nitrogen (mg/kg N)			1.7	3.6	2.0	4.4	2.1
Sulfur (mg/kg S)			6.0	7.5	8.2	7.2	8.2
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	8.3	6.5	8.3	6.0	6.6
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.174	0.054	0.067	0.037	0.051
Estimated Organic Matter (% OM)		**Calculation: Total Carbon x 1.75	2.0	4.9	1.6	3.2	1.1
Exchangeable Calcium	(cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	28	14	16	3.0	3.9
	(kg/ha)		12,665	6,282	7,187	1,332	1,766
	(mg/kg)		5,654	2,804	3,209	595	789
Exchangeable Magnesium	(cmol+/kg)		17	9.9	19	3.0	9.0
	(kg/ha)		4,664	2,693	5,245	806	2,457
	(mg/kg)		2,082	1,202	2,341	360	1,097
Exchangeable Potassium	(cmol+/kg)		0.72	1.8	1.0	0.38	0.40
	(kg/ha)		632	1,567	904	334	350
	(mg/kg)		282	700	404	149	156
Exchangeable Sodium	(cmol+/kg)		1.1	0.85	3.4	0.56	1.6
	(kg/ha)		588	436	1,734	289	812
	(mg/kg)		263	195	774	129	362
Exchangeable Aluminium	(cmol+/kg)	**Inhouse S37 (KCl)	0.01	0.01	<0.01	0.08	0.05
	(kg/ha)		2.4	2.0	1.1	16	9.4
	(mg/kg)		1.1	<1	<1	7.0	4.2
Exchangeable Hydrogen	(cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	0.03	<0.01	0.10	<0.01
	(kg/ha)		<1	<1	<1	2.2	<1
	(mg/kg)		<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol+/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	47	27	40	7.0	15
Calcium (%)		**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	60	53	40	42	26
Magnesium (%)			36	37	49	42	60
Potassium (%)			1.5	6.7	2.6	5.4	2.7
Sodium - ESP (%)			2.4	3.2	8.5	8.0	11
Aluminium (%)			0.02	0.04	0.01	1.1	0.31
Hydrogen (%)			0.00	0.13	0.00	1.4	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol+/kg)	1.6	1.4	0.83	1.0	0.44

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AGRICULTURAL SOIL ANALYSIS REPORT

70 samples supplied by Umwelt (Australia) Pty Ltd on 6/09/2022 . Lab Job No.N2420
Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

		Sample 11	Sample 12	Sample 13	Sample 14	Sample 15
	Sample ID:	GR04 0.2-0.3	GR05 0.0-0.1	GR05 0.2-0.3	GR06 0.0-0.1	GR06 0.15-0.25
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/11	N2420/12	N2420/13	N2420/14	N2420/15
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	<0.5	<0.5	0.52	1.5
Manganese (mg/kg)		8.4	113	16	29	4.8
Iron (mg/kg)		21	83	34	238	1,839
Copper (mg/kg)		0.40	2.1	1.3	0.93	2.1
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	3.1	1.2	1.4	0.86	1.2
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	43	47	22	30	20
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	1.1	2.8	0.92	1.8	0.64
Total Nitrogen (%)		0.10	0.24	0.11	0.16	0.08
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	11	12	8.8	12	8.0
Basic Texture	**Inhouse S65	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	111	35	43	24	33
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	7.8	5.8	7.2	5.1	5.5
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	4C	3	3	4C	2
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Yellowish Red	Very Dark Brown	Dark Reddish Brown	Very Dark Brown	Strong Brown
		5 YR 4/6	7.5 YR 2.5/3	5 YR 3/4	10 YR 2/2	10 YR 5/4
Mottles Munsell Colour		..	..	..	..	Yellowish Brown
		..	..	..	..	7.5 YR 5/6
Degree of Mottling (%)		..	..	..	..	20
Mottles Munsell Colour		..	..	..	..	
		..	..	..	..	
Degree of Mottling (%)		..	..	..	..	

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collin
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013,
   Schedule B(1) - Guideline on Investigation Levels for Soil and Groundwater. Table 5-A Background Range
9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil re
10. Conversions for 1 cmol$_c$/kg = 230 mg/kg Sodium, 390 mg/kg Potassium,
    122 mg/kg Magnesium, 200 mg/kg Calcium
11. Conversions to kg/ha = mg/kg x 2.24
12. The chloride calculation of Cl mg/L = EC x 640 is considered an estimate, and most likely an over-estim
13. ** NATA accreditation does not cover the performance of this service.
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17. This report was issued on 16/09/2022.

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70 samples supplied by Umwelt (Australia) Pty Ltd on 6/09/2022 . Lab Job No.N2420
Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

			Sample 16	Sample 17	Sample 18	Sample 19	Sample 20
		Sample ID:	GR06 0.3-0.4	GR07 0.0-0.1	GR07 0.1-0.2	GR07 0.35-0.4	GR07 0.5-0.7
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter		Method reference	N2420/16	N2420/17	N2420/18	N2420/19	N2420/20
Soluble Calcium (mg/kg)		**Inhouse S10 - Morgan 1	2,305	278	131	112	31
Soluble Magnesium (mg/kg)			2,245	125	50	73	338
Soluble Potassium (mg/kg)			<25	87	<25	<25	<25
Soluble Phosphorus (mg/kg)			5.3	2.7	1.1	<1	<1
Phosphorus (mg/kg P)		**Rayment & Lyons 2011 - 9E2 (Bray 1)	1.1	6.0	1.9	1.6	1.4
		**Rayment & Lyons 2011 - 9B2 (Colwell)	2.6	14	3.3	1.3	1.3
		**Inhouse S3A (Bray 2)	3.2	12	2.7	2.1	2.3
Nitrate Nitrogen (mg/kg N)		**Inhouse S37 (KCl)	0.83	4.4	1.0	0.84	0.26
Ammonium Nitrogen (mg/kg N)			1.3	2.7	1.2	1.3	0.90
Sulfur (mg/kg S)			12	7.0	4.4	6.0	5.8
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	9.1	6.3	6.5	6.9	6.8
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.447	0.042	0.017	0.022	0.094
Estimated Organic Matter (% OM)		**Calculation: Total Carbon x 1.75	0.86	1.7	0.34	0.11	0.04
Exchangeable Calcium	(cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.1	1.7	0.94	0.58	0.18
	(kg/ha)		3,183	770	423	261	80
	(mg/kg)		1,421	344	189	116	36
Exchangeable Magnesium	(cmol+/kg)		17	1.1	0.51	0.63	4.6
	(kg/ha)		4,754	290	139	172	1,245
	(mg/kg)		2,122	129	62	77	556
Exchangeable Potassium	(cmol+/kg)		0.32	0.44	0.18	0.14	0.18
	(kg/ha)		280	383	162	122	159
	(mg/kg)		125	171	72	54	71
Exchangeable Sodium	(cmol+/kg)		7.1	0.31	0.26	0.29	3.0
	(kg/ha)		3,680	161	134	152	1,528
	(mg/kg)		1,643	72	60	68	682
Exchangeable Aluminium	(cmol+/kg)	**Inhouse S37 (KCl)	0.01	0.02	0.01	0.01	<0.01
	(kg/ha)		2.4	4.3	2.8	2.2	1.2
	(mg/kg)		1.1	1.9	1.3	<1	<1
Exchangeable Hydrogen	(cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	0.02	0.01	<0.01	<0.01
	(kg/ha)		<1	<1	<1	<1	<1
	(mg/kg)		<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol+/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	32	3.6	1.9	1.7	7.9
Calcium (%)		**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	22	48	49	35	2.3
Magnesium (%)			55	30	27	38	58
Potassium (%)			1.00	12	9.6	8.4	2.3
Sodium - ESP (%)			22	8.8	14	18	38
Aluminium (%)			0.04	0.60	0.72	0.66	0.08
Hydrogen (%)			0.00	0.61	0.63	0.00	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol+/kg)	0.41	1.6	1.8	0.92	0.04

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		Sample 16	Sample 17	Sample 18	Sample 19	Sample 20
	Sample ID:	GR06 0.3-0.4	GR07 0.0-0.1	GR07 0.1-0.2	GR07 0.35-0.4	GR07 0.5-0.7
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/16	N2420/17	N2420/18	N2420/19	N2420/20
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (mg/kg)		3.1	24	3.0	0.51	0.56
Iron (mg/kg)		19	151	46	94	266
Copper (mg/kg)		0.55	0.28	0.18	0.13	0.33
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	1.3	0.64	0.26	0.37	0.71
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	6.7	12	9.1	11	22
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	0.49	0.99	0.20	0.07	0.02
Total Nitrogen (%)		0.05	0.11	0.04	0.04	0.03
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	11	8.8	5.2	1.7	0.61
Basic Texture	**Inhouse S65	Clay	Clay Loam	Sandy Soil	Sandy Soil	Clay
Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	286	27	11	14	60
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	8.4	5.4	6.0	6.3	5.9
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	2	3	3	3	2
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Pale Brown 10 YR 6/3	Very Dark Gravish Brown 10 YR 3/2	Brown 10 YR 5/3	Brown 10 YR 5/3	White 5 Y 8/1
Mottles Munsell Colour		.. ..	.. ..	.. ..	.. ..	Olive Yellow 2.5 Y 6/8
Degree of Mottling (%)		..	..	..	..	20
Mottles Munsell Colour		.. ..	.. ..	.. ..	.. ..	Light Brownish Gray 2.5 Y 6/2
Degree of Mottling (%)		..	..	..	..	15

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collin
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
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7. Total Acid Extractable Nutrients indicate a store of nutrients.
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Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

			Sample 21	Sample 22	Sample 23	Sample 24	Sample 25
		Sample ID:	GR08 0.0-0.1	GR08 0.15-0.2	GR09 0.0-0.1	GR09 0.1-0.2	GR10 0.0-0.1
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter		Method reference	N2420/21	N2420/22	N2420/23	N2420/24	N2420/25
Soluble Calcium (mg/kg)		**Inhouse S10 - Morgan 1	2,073	1,900	3,090	1,488	1,137
Soluble Magnesium (mg/kg)			364	212	704	217	203
Soluble Potassium (mg/kg)			221	<25	1,175	165	612
Soluble Phosphorus (mg/kg)			9.9	4.0	87	5.7	8.2
Phosphorus (mg/kg P)		**Rayment & Lyons 2011 - 9E2 (Bray 1)	44	2.6	140	45	39
		**Rayment & Lyons 2011 - 9B2 (Colwell)	132	40	335	196	116
		**Inhouse S3A (Bray 2)	64	9.1	261	109	85
Nitrate Nitrogen (mg/kg N)		**Inhouse S37 (KCl)	8.2	1.4	108	2.7	7.8
Ammonium Nitrogen (mg/kg N)			5.4	2.1	21	1.3	7.1
Sulfur (mg/kg S)			15	5.9	22	7.6	15
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.3	7.2	6.6	6.6	6.4
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.056	0.042	0.319	0.030	0.063
Estimated Organic Matter (% OM)		**Calculation: Total Carbon x 1.75	5.4	1.8	20	2.4	5.1
Exchangeable Calcium	(cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	18	18	28	15	13
	(kg/ha)		7,914	8,058	12,462	6,855	5,807
	(mg/kg)		3,533	3,597	5,563	3,060	2,593
Exchangeable Magnesium	(cmol+/kg)		4.3	2.9	7.8	3.3	2.9
	(kg/ha)		1,171	781	2,123	885	787
	(mg/kg)		523	349	948	395	351
Exchangeable Potassium	(cmol+/kg)		1.7	0.40	5.7	1.6	4.4
	(kg/ha)		1,512	354	5,035	1,423	3,881
	(mg/kg)		675	158	2,248	635	1,733
Exchangeable Sodium	(cmol+/kg)		0.27	0.35	0.27	0.26	0.19
	(kg/ha)		139	181	141	133	99
	(mg/kg)		62	81	63	59	44
Exchangeable Aluminium	(cmol+/kg)	**Inhouse S37 (KCl)	0.02	0.03	0.03	0.02	0.02
	(kg/ha)		4.4	6.2	5.7	3.5	4.7
	(mg/kg)		2.0	2.8	2.5	1.6	2.1
Exchangeable Hydrogen	(cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	<0.01	<0.01	0.03
	(kg/ha)		<1	<1	<1	<1	<1
	(mg/kg)		<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol+/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	24	22	42	20	21
Calcium (%)		**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	74	83	67	75	63
Magnesium (%)			18	13	19	16	14
Potassium (%)			7.2	1.9	14	8.0	22
Sodium - ESP (%)			1.1	1.6	0.66	1.3	0.93
Aluminium (%)			0.09	0.14	0.07	0.08	0.11
Hydrogen (%)			0.03	0.00	0.00	0.00	0.14
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol+/kg)	4.1	6.3	3.6	4.7	4.5

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		Sample 21	Sample 22	Sample 23	Sample 24	Sample 25
	Sample ID:	GR08 0.0-0.1	GR08 0.15-0.2	GR09 0.0-0.1	GR09 0.1-0.2	GR10 0.0-0.1
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/21	N2420/22	N2420/23	N2420/24	N2420/25
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	0.77	<0.5	7.9	<0.5	<0.5
Manganese (mg/kg)		127	8.9	88	24	115
Iron (mg/kg)		177	13	200	22	97
Copper (mg/kg)		4.8	0.45	3.2	0.97	2.1
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	2.3	0.78	4.0	0.61	0.75
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	125	19	231	30	49
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	3.1	1.0	11	1.4	2.9
Total Nitrogen (%)		0.27	0.11	0.98	0.14	0.27
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	11	9.0	12	9.4	11
Basic Texture	**Inhouse S65	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	36	27	204	19	40
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	5.7	6.6	6.2	5.9	5.7
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	4C	4C	4C	4C	3
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Very Dark Brown 7.5 YR 2.5/3	Dark Reddish Brown 2.5 YR 2.5/4	Very Dark brown 10 YR 2/2	Dark Reddish Brown 2.5 YR 2.5/4	Very Dark Brown 7.5 YR 2.5/2
Mottles Munsell Colour		..	..	..	..	..
		..	..	..	..	..
Degree of Mottling (%)		..	..	..	..	..
Mottles Munsell Colour		..	..	..	..	..
		..	..	..	..	..
Degree of Mottling (%)		..	..	..	..	..

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collin
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013,
   Schedule B(1) - Guideline on Investigation Levels for Soil and Groundwater. Table 5-A Background Range
9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil re
10. Conversions for 1 cmol$_c$/kg = 230 mg/kg Sodium, 390 mg/kg Potassium,
    122 mg/kg Magnesium, 200 mg/kg Calcium
11. Conversions to kg/ha = mg/kg x 2.24
12. The chloride calculation of Cl mg/L = EC x 640 is considered an estimate, and most likely an over-estim
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AGRICULTURAL SOIL ANALYSIS REPORT

70 samples supplied by Umwelt (Australia) Pty Ltd on 6/09/2022 . Lab Job No.N2420
Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

			Sample 26	Sample 27	Sample 28	Sample 29	Sample 30
		Sample ID:	GR10 0.1-0.2	GR10 0.6-0.7	GR11 0.0-0.1	GR11 0.15-0.25	GR12 0.0-0.1
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	N2420/26	N2420/27	N2420/28	N2420/29	N2420/30
	Soluble Calcium (mg/kg)	**Inhouse S10 - Morgan 1	1,170	1,780	1,195	1,447	974
	Soluble Magnesium (mg/kg)		165	253	264	336	176
	Soluble Potassium (mg/kg)		386	101	273	60	566
	Soluble Phosphorus (mg/kg)		5.9	4.1	11	4.4	6.8
	Phosphorus (mg/kg P)	**Rayment & Lyons 2011 - 9E2 (Bray 1)	25	23	103	16	62
		**Rayment & Lyons 2011 - 9B2 (Colwell)	87	83	279	82	160
		**Inhouse S3A (Bray 2)	50	102	175	33	108
	Nitrate Nitrogen (mg/kg N)	**Inhouse S37 (KCl)	1.9	0.96	5.6	0.82	7.1
	Ammonium Nitrogen (mg/kg N)		2.2	0.48	4.6	0.84	4.2
	Sulfur (mg/kg S)		5.9	4.4	8.9	2.7	7.6
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.6	7.5	6.0	7.0	6.1
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.041	0.034	0.053	0.027	0.075
	Estimated Organic Matter (% OM)	**Calculation: Total Carbon x 1.75	2.7	0.36	5.7	1.0	5.3
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	12	18	13	14	11
	Exchangeable Calcium (kg/ha)		5,412	8,085	5,626	6,286	4,799
	Exchangeable Calcium (mg/kg)		2,416	3,609	2,512	2,806	2,142
	Exchangeable Magnesium (cmol+/kg)		2.3	3.6	3.8	4.9	2.4
	Exchangeable Magnesium (kg/ha)		622	992	1,023	1,321	650
	Exchangeable Magnesium (mg/kg)		278	443	456	590	290
	Exchangeable Potassium (cmol+/kg)		2.8	1.1	2.3	0.81	3.5
	Exchangeable Potassium (kg/ha)		2,437	936	2,021	709	3,034
	Exchangeable Potassium (mg/kg)		1,088	418	902	317	1,355
	Exchangeable Sodium (cmol+/kg)		0.22	0.58	0.31	0.44	0.21
	Exchangeable Sodium (kg/ha)		113	298	159	225	109
	Exchangeable Sodium (mg/kg)		50	133	71	101	49
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.03	0.03	0.04	0.01	0.02
	Exchangeable Aluminium (kg/ha)		5.2	7.0	7.9	2.3	3.9
	Exchangeable Aluminium (mg/kg)		2.3	3.1	3.5	1.0	1.7
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.03	<0.01	0.02
	Exchangeable Hydrogen (kg/ha)		<1	<1	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	17	23	19	20	17
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	69	77	66	70	64
	Magnesium (%)		13	16	20	24	14
	Potassium (%)		16	4.6	12	4.0	21
	Sodium - ESP (%)		1.3	2.5	1.6	2.2	1.3
	Aluminium (%)		0.15	0.15	0.21	0.06	0.12
	Hydrogen (%)		0.00	0.00	0.16	0.00	0.14
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	5.3	4.9	3.3	2.9	4.5

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Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

		Sample 26	Sample 27	Sample 28	Sample 29	Sample 30
	Sample ID:	GR10 0.1-0.2	GR10 0.6-0.7	GR11 0.0-0.1	GR11 0.15-0.25	GR12 0.0-0.1
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/26	N2420/27	N2420/28	N2420/29	N2420/30
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	<0.5	1.1	<0.5	0.66
Manganese (mg/kg)		103	8.5	140	40	120
Iron (mg/kg)		60	15	113	26	361
Copper (mg/kg)		2.2	0.31	2.3	0.84	3.3
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	1.5	0.67	1.0	0.76	1.5
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	119	12	67	44	121
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	1.5	0.21	3.2	0.58	3.0
Total Nitrogen (%)		0.15	0.06	0.27	0.10	0.27
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	11	3.7	12	5.9	11
Basic Texture	**Inhouse S65	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	26	22	34	17	48
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	5.9	6.9	5.2	6.2	5.2
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	3	4C	3	4C	3
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Very Dark Brown 7.5 YR 2.5/3	Dark Reddish Brown 5 YR 3/4	Very Dark Brown 7.5 YR 2.5/2	Dark Reddish Brown 2.5 YR 2.5/4	Very Dark Brown 7.5 YR 2.5/2
Mottles Munsell Colour		..	..	..	..	..
		..	..	..	..	..
Degree of Mottling (%)		..	..	..	..	..
Mottles Munsell Colour		..	..	..	..	..
		..	..	..	..	..
Degree of Mottling (%)		..	..	..	..	..

Notes:

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2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collin
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013,
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9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil re
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Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

			Sample 31	Sample 32	Sample 33	Sample 34	Sample 35
		Sample ID:	GR12 0.15-0.25	GR12 0.55-0.6	GR13 0.0-0.1	GR13 0.2-0.3	GR13 0.55-0.65
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter		Method reference	N2420/31	N2420/32	N2420/33	N2420/34	N2420/35
Soluble Calcium (mg/kg)		**Inhouse S10 - Morgan 1	1,570	7,653	1,368	1,196	1,350
Soluble Magnesium (mg/kg)			176	235	235	210	296
Soluble Potassium (mg/kg)			66	63	443	191	47
Soluble Phosphorus (mg/kg)			3.8	7.5	10	4.7	3.3
Phosphorus (mg/kg P)		**Rayment & Lyons 2011 - 9E2 (Bray 1)	19	8.2	56	33	11
		**Rayment & Lyons 2011 - 9B2 (Colwell)	96	113	130	99	91
		**Inhouse S3A (Bray 2)	62	59	103	60	50
Nitrate Nitrogen (mg/kg N)		**Inhouse S37 (KCl)	1.5	1.2	23	7.8	5.7
Ammonium Nitrogen (mg/kg N)			2.5	1.1	27	3.3	1.5
Sulfur (mg/kg S)			7.8	6.9	10	5.9	6.0
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.1	8.1	6.5	6.8	7.2
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.040	0.150	0.115	0.044	0.044
Estimated Organic Matter (% OM)		**Calculation: Total Carbon x 1.75	1.6	1.5	5.2	1.4	0.94
Exchangeable Calcium	(cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	14	35	14	10	12
	(kg/ha)		6,070	15,551	6,133	4,521	5,410
	(mg/kg)		2,710	6,942	2,738	2,018	2,415
Exchangeable Magnesium	(cmol+/kg)		2.2	2.0	3.2	2.7	4.0
	(kg/ha)		598	547	873	729	1,076
	(mg/kg)		267	244	390	326	480
Exchangeable Potassium	(cmol+/kg)		0.67	0.60	3.1	1.5	0.52
	(kg/ha)		585	529	2,696	1,285	458
	(mg/kg)		261	236	1,204	574	204
Exchangeable Sodium	(cmol+/kg)		0.34	0.40	0.27	0.24	0.56
	(kg/ha)		174	208	137	121	290
	(mg/kg)		78	93	61	54	129
Exchangeable Aluminium	(cmol+/kg)	**Inhouse S37 (KCl)	0.01	0.01	0.01	<0.01	<0.01
	(kg/ha)		2.3	2.7	2.3	1.6	1.7
	(mg/kg)		1.0	1.2	1.0	<1	<1
Exchangeable Hydrogen	(cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.02	<0.01	<0.01
	(kg/ha)		<1	<1	<1	<1	<1
	(mg/kg)		<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol+/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	17	38	20	14	17
Calcium (%)		**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	81	92	67	70	70
Magnesium (%)			13	5.3	16	19	23
Potassium (%)			4.0	1.6	15	10	3.1
Sodium - ESP (%)			2.0	1.1	1.3	1.6	3.3
Aluminium (%)			0.07	0.04	0.06	0.06	0.05
Hydrogen (%)			0.00	0.00	0.11	0.00	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol+/kg)	6.2	17	4.3	3.8	3.0

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		Sample 31	Sample 32	Sample 33	Sample 34	Sample 35
	Sample ID:	GR12 0.15-0.25	GR12 0.55-0.6	GR13 0.0-0.1	GR13 0.2-0.3	GR13 0.55-0.65
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/31	N2420/32	N2420/33	N2420/34	N2420/35
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	<0.5	1.3	<0.5	<0.5
Manganese (mg/kg)		33	9.4	139	35	9.7
Iron (mg/kg)		23	25	83	25	9.1
Copper (mg/kg)		0.74	0.67	2.2	1.1	0.17
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	0.54	0.80	1.1	0.86	0.53
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	18	7.1	78	40	8.6
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	0.94	0.87	3.0	0.79	0.54
Total Nitrogen (%)		0.12	0.09	0.29	0.10	0.08
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	7.9	9.9	10	7.6	6.9
Basic Texture	**Inhouse S65	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	26	96	74	28	28
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	6.4	7.6	5.8	6.1	6.5
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	4C	4C	3	4C	4C
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Brown 7.5 YR 4/4	Dark Reddish Brown 5 YR 3/4	Very Dark Brown 7.5 YR 3/2	Dark Red 2.5 YR 3/6	Dark Red 2.5 YR 3/6
Mottles Munsell Colour		.. .. ..	.. .. ..	.. .. ..	.. .. ..	.. .. ..
Degree of Mottling (%)						
Mottles Munsell Colour		.. .. ..	.. .. ..	.. .. ..	.. .. ..	.. .. ..
Degree of Mottling (%)						

Notes:

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2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collin
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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			Sample 36	Sample 37	Sample 38	Sample 39	Sample 40
		Sample ID:	GR14 0.0-0.1	GR14 0.15-0.25	GR14 0.65-0.75	GR15 0.0-0.15	GR15 0.15-0.25
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter		Method reference	N2420/36	N2420/37	N2420/38	N2420/39	N2420/40
Soluble Calcium (mg/kg)		**Inhouse S10 - Morgan 1	1,104	1,525	2,188	1,655	1,647
Soluble Magnesium (mg/kg)			231	219	264	237	265
Soluble Potassium (mg/kg)			490	144	106	198	133
Soluble Phosphorus (mg/kg)			8.5	5.4	4.2	5.2	4.9
Phosphorus (mg/kg P)		**Rayment & Lyons 2011 - 9E2 (Bray 1)	70	44	13	20	45
		**Rayment & Lyons 2011 - 9B2 (Colwell)	164	135	45	63	178
		**Inhouse S3A (Bray 2)	129	125	109	53	105
Nitrate Nitrogen (mg/kg N)		**Inhouse S37 (KCl)	56	1.7	1.0	7.3	0.97
Ammonium Nitrogen (mg/kg N)			38	1.5	1.2	4.9	1.7
Sulfur (mg/kg S)			12	9.2	12	7.7	5.5
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.0	7.0	7.5	6.3	7.1
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.192	0.034	0.057	0.082	0.039
Estimated Organic Matter (% OM)		**Calculation: Total Carbon x 1.75	6.4	1.7	0.72	5.1	1.3
Exchangeable Calcium	(cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	12	16	24	17	15
	(kg/ha)		5,443	7,109	10,898	7,719	6,880
	(mg/kg)		2,430	3,173	4,865	3,446	3,071
Exchangeable Magnesium	(cmol+/kg)		3.2	3.2	4.0	3.2	3.6
	(kg/ha)		876	863	1,094	883	984
	(mg/kg)		391	385	488	394	439
Exchangeable Potassium	(cmol+/kg)		3.1	1.3	1.1	1.6	1.1
	(kg/ha)		2,718	1,134	976	1,393	942
	(mg/kg)		1,213	506	436	622	421
Exchangeable Sodium	(cmol+/kg)		0.25	0.32	0.64	0.55	0.26
	(kg/ha)		130	163	332	285	134
	(mg/kg)		58	73	148	127	60
Exchangeable Aluminium	(cmol+/kg)	**Inhouse S37 (KCl)	0.01	0.02	<0.01	0.01	0.01
	(kg/ha)		2.5	3.7	1.9	2.3	2.6
	(mg/kg)		1.1	1.6	<1	1.0	1.2
Exchangeable Hydrogen	(cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.02	<0.01	<0.01	0.01	<0.01
	(kg/ha)		<1	<1	<1	<1	<1
	(mg/kg)		<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol+/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	19	21	30	23	20
Calcium (%)		**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	65	77	81	76	76
Magnesium (%)			17	15	13	14	18
Potassium (%)			17	6.3	3.7	7.0	5.3
Sodium - ESP (%)			1.3	1.5	2.1	2.4	1.3
Aluminium (%)			0.07	0.09	0.03	0.05	0.06
Hydrogen (%)			0.12	0.00	0.00	0.06	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol+/kg)	3.8	5.0	6.0	5.3	4.2

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AGRICULTURAL SOIL ANALYSIS REPORT

70 samples supplied by Umwelt (Australia) Pty Ltd on 6/09/2022 . Lab Job No.N2420
Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

		Sample 36	Sample 37	Sample 38	Sample 39	Sample 40
	Sample ID:	GR14 0.0-0.1	GR14 0.15-0.25	GR14 0.65-0.75	GR15 0.0-0.15	GR15 0.15-0.25
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/36	N2420/37	N2420/38	N2420/39	N2420/40
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	1.0	<0.5	<0.5	<0.5	<0.5
Manganese (mg/kg)		76	26	7.6	146	19
Iron (mg/kg)		198	29	19	159	15
Copper (mg/kg)		1.8	0.55	0.25	3.2	0.40
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	1.4	0.63	0.33	1.7	0.70
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	96	31	13	140	19
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	3.6	0.99	0.41	2.9	0.77
Total Nitrogen (%)		0.34	0.12	0.07	0.23	0.10
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	11	8.6	6.1	13	7.8
Basic Texture	**Inhouse S65	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	123	22	36	52	25
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	5.4	6.3	7.0	5.7	6.5
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	4C	4C	4C	4C	4C
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Dark Brown	Dark Reddish Brown	Dark Reddish Brown	Reddish Brown	Yellowish Red
		7.5 YR 3/2	2.5 YR 2.5/4	5 YR 3/4	5 YR 4/4	5 YR 4/6
Mottles Munsell Colour		Yellow	..	..	..	..
		2.5 Y 8/6	..	..	..	..
Degree of Mottling (%)		3	..	..	..	..
Mottles Munsell Colour		..	..	..	..	..
		..	..	..	..	..
Degree of Mottling (%)		..	..	..	..	..

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collin
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013, Schedule B(1) - Guideline on Investigation Levels for Soil and Groundwater. Table 5-A Background Range
9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil re
10. Conversions for 1 cmol$_c$/kg = 230 mg/kg Sodium, 390 mg/kg Potassium, 122 mg/kg Magnesium, 200 mg/kg Calcium
11. Conversions to kg/ha = mg/kg x 2.24
12. The chloride calculation of Cl mg/L = EC x 640 is considered an estimate, and most likely an over-estim
13. ** NATA accreditation does not cover the performance of this service.
14. Analysis conducted between sample arrival date and reporting date.
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17. This report was issued on 16/09/2022.

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			Sample 41	Sample 42	Sample 43	Sample 44	Sample 45
		Sample ID:	GR15 0.6-0.7	GR16 0.0-0.15	GR16 0.2-0.3	GR16 0.85-0.95	GR18 0.0-0.15
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter		Method reference	N2420/41	N2420/42	N2420/43	N2420/44	N2420/45
Soluble Calcium (mg/kg)		**Inhouse S10 - Morgan 1	1,855	1,807	1,979	3,062	1,127
Soluble Magnesium (mg/kg)			465	309	184	347	304
Soluble Potassium (mg/kg)			37	404	159	99	386
Soluble Phosphorus (mg/kg)			4.0	14	4.4	5.1	9.5
Phosphorus (mg/kg P)		**Rayment & Lyons 2011 - 9E2 (Bray 1)	25	97	16	9.2	89
		**Rayment & Lyons 2011 - 9B2 (Colwell)	94	231	106	84	188
		**Inhouse S3A (Bray 2)	204	207	72	115	173
Nitrate Nitrogen (mg/kg N)		**Inhouse S37 (KCl)	1.6	18	1.3	0.91	17
Ammonium Nitrogen (mg/kg N)			3.0	9.8	0.90	0.52	5.6
Sulfur (mg/kg S)			9.0	9.9	4.9	4.8	13
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.3	6.3	7.5	8.1	6.0
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.042	0.096	0.058	0.084	0.090
Estimated Organic Matter (% OM)		**Calculation: Total Carbon x 1.75	0.73	9.2	2.0	0.54	5.6
Exchangeable Calcium	(cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	20	19	15	31	12
	(kg/ha)		9,070	8,367	6,913	13,881	5,268
	(mg/kg)		4,049	3,735	3,086	6,197	2,352
Exchangeable Magnesium	(cmol+/kg)		7.3	3.9	2.0	4.8	4.0
	(kg/ha)		1,992	1,066	554	1,304	1,090
	(mg/kg)		889	476	247	582	487
Exchangeable Potassium	(cmol+/kg)		0.42	2.5	1.0	0.82	2.2
	(kg/ha)		369	2,183	906	714	1,964
	(mg/kg)		165	975	404	319	877
Exchangeable Sodium	(cmol+/kg)		0.67	0.23	0.25	0.38	0.21
	(kg/ha)		347	119	130	196	110
	(mg/kg)		155	53	58	87	49
Exchangeable Aluminium	(cmol+/kg)	**Inhouse S37 (KCl)	0.03	0.02	0.02	0.02	0.02
	(kg/ha)		6.4	3.9	4.1	4.3	4.7
	(mg/kg)		2.8	1.7	1.8	1.9	2.1
Exchangeable Hydrogen	(cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	0.02	<0.01	<0.01	<0.01
	(kg/ha)		<1	<1	<1	<1	<1
	(mg/kg)		<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol+/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	29	25	19	37	18
Calcium (%)		**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	71	74	82	84	64
Magnesium (%)			26	15	11	13	22
Potassium (%)			1.5	9.8	5.5	2.2	12
Sodium - ESP (%)			2.4	0.91	1.3	1.0	1.2
Aluminium (%)			0.11	0.08	0.11	0.06	0.13
Hydrogen (%)			0.00	0.06	0.00	0.00	0.03
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol+/kg)	2.8	4.8	7.6	6.5	2.9

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		Sample 41	Sample 42	Sample 43	Sample 44	Sample 45
	Sample ID:	GR15 0.6-0.7	GR16 0.0-0.15	GR16 0.2-0.3	GR16 0.85-0.95	GR18 0.0-0.15
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/41	N2420/42	N2420/43	N2420/44	N2420/45
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (mg/kg)		5.4	3.1	0.63	0.12	2.2
Iron (mg/kg)		4.7	3.3	<0.5	<0.5	3.9
Copper (mg/kg)		<0.1	<0.1	<0.1	<0.1	<0.1
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	0.89	1.2	1.9	0.61	2.4
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	90	80	17	7.9	104
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	0.42	5.2	1.2	0.31	3.2
Total Nitrogen (%)		0.06	0.44	0.12	0.06	0.28
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	6.5	12	9.6	5.4	11
Basic Texture	**Inhouse S65	Clay Loam	Clay Loam	Clay	Clay	Clay Loam
Basic Colour		Brownish	Brownish	Red	Brownish	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	27	61	37	54	58
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	6.7	5.7	7.0	7.7	5.5
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	4C	4C	4C	4C	4C
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Dark Reddish Brown 5 YR 3/4	Very Dark Brown 7.5 YR 2.5/3	Dark Reddish Brown 2.5 YR 2.5/4	Dark Reddish Brown 5 YR 3/4	Very Dark Brown 7.5 YR 2.5/3
Mottles Munsell Colour		.. .. ..	.. .. ..	.. .. ..	.. .. ..	.. .. ..
Degree of Mottling (%)						
Mottles Munsell Colour		.. .. ..	.. .. ..	.. .. ..	.. .. ..	.. .. ..
Degree of Mottling (%)						

Notes:

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3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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			Sample 46	Sample 47	Sample 48	Sample 49	Sample 50
		Sample ID:	GR18 0.15-0.25	GR18 0.6-0.7	GR19 0.0-0.1	GR19 0.2-0.3	GR20 0.0-0.1
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	N2420/46	N2420/47	N2420/48	N2420/49	N2420/50
	Soluble Calcium (mg/kg)	**Inhouse S10 - Morgan 1	1,323	1,734	1,052	4,179	1,846
	Soluble Magnesium (mg/kg)		337	525	260	262	466
	Soluble Potassium (mg/kg)		26	<25	570	131	552
	Soluble Phosphorus (mg/kg)		4.9	4.0	6.0	5.6	14
	Phosphorus (mg/kg P)	**Rayment & Lyons 2011 - 9E2 (Bray 1)	35	15	19	1.6	60
		**Rayment & Lyons 2011 - 9B2 (Colwell)	121	44	56	7.5	166
		**Inhouse S3A (Bray 2)	84	108	34	5.2	137
	Nitrate Nitrogen (mg/kg N)	**Inhouse S37 (KCl)	2.8	3.0	13	2.9	18
	Ammonium Nitrogen (mg/kg N)		2.5	2.6	5.4	1.6	18
	Sulfur (mg/kg S)		6.4	17	11	5.2	13
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.9	7.4	6.1	7.9	6.5
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.037	0.048	0.085	0.155	0.125
	Estimated Organic Matter (% OM)	**Calculation: Total Carbon x 1.75	1.7	0.79	6.1	2.1	13
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	11	18	10	23	18
	Exchangeable Calcium (kg/ha)		4,720	7,957	4,706	10,386	7,948
	Exchangeable Calcium (mg/kg)		2,107	3,552	2,101	4,637	3,548
	Exchangeable Magnesium (cmol+/kg)		3.9	7.5	3.1	2.3	5.5
	Exchangeable Magnesium (kg/ha)		1,053	2,039	850	616	1,484
	Exchangeable Magnesium (mg/kg)		470	910	379	275	663
	Exchangeable Potassium (cmol+/kg)		0.21	0.15	2.9	0.73	2.9
	Exchangeable Potassium (kg/ha)		185	128	2,508	638	2,508
	Exchangeable Potassium (mg/kg)		83	57	1,120	285	1,120
	Exchangeable Sodium (cmol+/kg)		0.33	0.57	0.36	0.27	0.20
	Exchangeable Sodium (kg/ha)		170	296	184	139	101
	Exchangeable Sodium (mg/kg)		76	132	82	62	45
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.02	0.04	0.02	0.01	<0.01
	Exchangeable Aluminium (kg/ha)		3.0	8.4	3.5	2.6	<1
	Exchangeable Aluminium (mg/kg)		1.4	3.7	1.5	1.2	<1
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.02	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	15	26	17	26	26
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	70	68	62	88	68
	Magnesium (%)		26	29	19	8.6	21
	Potassium (%)		1.4	0.56	17	2.8	11
	Sodium - ESP (%)		2.2	2.2	2.1	1.0	0.75
	Aluminium (%)		0.10	0.16	0.10	0.05	0.00
	Hydrogen (%)		0.00	0.00	0.10	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	2.7	2.4	3.4	10	3.2

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		Sample 46	Sample 47	Sample 48	Sample 49	Sample 50
	Sample ID:	GR18 0.15-0.25	GR18 0.6-0.7	GR19 0.0-0.1	GR19 0.2-0.3	GR20 0.0-0.1
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/46	N2420/47	N2420/48	N2420/49	N2420/50
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (mg/kg)		0.49	0.40	3.8	0.69	4.3
Iron (mg/kg)		<0.5	<0.5	1.8	<0.5	4.1
Copper (mg/kg)		<0.1	<0.1	<0.1	<0.1	<0.1
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	0.43	1.3	0.87	0.62	2.4
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	22	75	74	20	165
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	1.00	0.45	3.5	1.2	7.3
Total Nitrogen (%)		0.11	0.07	0.30	0.12	0.66
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	8.9	6.7	12	10	11
Basic Texture	**Inhouse S65	Clay	Clay	Clay	Clay	Clay Loam
Basic Colour		Red	Brownish	Brownish	Red	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	24	31	54	99	80
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	6.3	6.9	5.4	7.5	6.0
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	4C	4C	3	4C	4C
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Dark Reddish Brown 2.5 YR 2.5/4	Dark Red 2.5 YR 3/6	Dark Reddish Brown 2.5 YR 2.5/3	Dusky Red 7.5 YR 3/4	Very Dusky Red 5 YR 2.5/2
Mottles Munsell Colour		.. ..	Red 10 YR 5/8	.. ..	.. ..	.. ..
Degree of Mottling (%)		..	10	..	..	..
Mottles Munsell Colour		.. ..	.. ..	.. ..	.. ..	.. ..
Degree of Mottling (%)		..	..	..	..	..

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			Sample 51	Sample 52	Sample 53	Sample 54	Sample 55
		Sample ID:	GR20 0.2-0.3	GR22 0.0-0.05	GR21 0.1-0.2	GR21 0.5-0.6	GR22 0.0-0.15
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	N2420/51	N2420/52	N2420/53	N2420/54	N2420/55
	Soluble Calcium (mg/kg)	**Inhouse S10 - Morgan 1	1,112	1,763	2,617	10,328	2,618
	Soluble Magnesium (mg/kg)		293	324	373	608	422
	Soluble Potassium (mg/kg)		158	373	108	79	838
	Soluble Phosphorus (mg/kg)		4.3	5.8	7.1	10	21
	Phosphorus (mg/kg P)	**Rayment & Lyons 2011 - 9E2 (Bray 1)	18	15	1.4	1.7	92
		**Rayment & Lyons 2011 - 9B2 (Colwell)	89	46	5.6	15	161
		**Inhouse S3A (Bray 2)	40	32	5.7	16	192
	Nitrate Nitrogen (mg/kg N)	**Inhouse S37 (KCl)	3.3	13	1.1	1.6	49
	Ammonium Nitrogen (mg/kg N)		5.4	9.6	1.9	1.5	9.9
	Sulfur (mg/kg S)		15	16	6.9	4.8	16
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.8	6.2	7.6	8.5	6.6
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.030	0.086	0.056	0.130	0.208
	Estimated Organic Matter (% OM)	**Calculation: Total Carbon x 1.75	1.8	9.4	3.3	3.1	6.9
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	9.2	18	29	35	18
	Exchangeable Calcium (kg/ha)		4,117	8,092	13,059	15,659	8,017
	Exchangeable Calcium (mg/kg)		1,838	3,612	5,830	6,990	3,579
	Exchangeable Magnesium (cmol+/kg)		3.5	4.3	5.7	5.3	4.0
	Exchangeable Magnesium (kg/ha)		949	1,166	1,547	1,452	1,100
	Exchangeable Magnesium (mg/kg)		424	521	690	648	491
	Exchangeable Potassium (cmol+/kg)		1.0	2.1	0.88	0.45	3.0
	Exchangeable Potassium (kg/ha)		876	1,813	771	394	2,587
	Exchangeable Potassium (mg/kg)		391	809	344	176	1,155
	Exchangeable Sodium (cmol+/kg)		0.26	0.20	0.30	0.57	0.36
	Exchangeable Sodium (kg/ha)		133	102	155	292	183
	Exchangeable Sodium (mg/kg)		60	45	69	130	82
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	<0.01	<0.01	<0.01	<0.01	<0.01
	Exchangeable Aluminium (kg/ha)		1.7	1.2	<1	<1	1.3
	Exchangeable Aluminium (mg/kg)		<1	<1	<1	<1	<1
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	0.04	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	14	25	36	41	25
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	66	73	81	85	71
	Magnesium (%)		25	17	16	13	16
	Potassium (%)		7.2	8.4	2.4	1.1	12
	Sodium - ESP (%)		1.9	0.80	0.84	1.4	1.4
	Aluminium (%)		0.06	0.02	0.01	0.01	0.02
	Hydrogen (%)		0.00	0.16	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	2.6	4.2	5.1	6.5	4.4

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AGRICULTURAL SOIL ANALYSIS REPORT

70 samples supplied by Umwelt (Australia) Pty Ltd on 6/09/2022 . Lab Job No.N2420
Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

		Sample 51	Sample 52	Sample 53	Sample 54	Sample 55
	Sample ID:	GR20 0.2-0.3	GR22 0.0-0.05	GR21 0.1-0.2	GR21 0.5-0.6	GR22 0.0-0.15
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/51	N2420/52	N2420/53	N2420/54	N2420/55
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (mg/kg)		2.1	3.1	0.43	0.13	2.3
Iron (mg/kg)		0.83	5.8	<0.5	<0.5	3.2
Copper (mg/kg)		<0.1	<0.1	<0.1	<0.1	<0.1
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	2.4	2.9	1.2	1.4	2.6
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	133	173	19	7.8	220
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	1.0	5.4	1.9	1.8	3.9
Total Nitrogen (%)		0.12	0.47	0.17	0.09	0.35
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	8.6	11	11	19	11
Basic Texture	**Inhouse S65	Clay	Clay	Clay	Clay	Clay Loam
Basic Colour		Red	Brownish	Brownish	Brownish	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	19	55	36	83	133
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	6.0	5.6	6.8	7.8	6.2
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	4C	3	4C	4C	3
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Dusky Red 7.5 YR 3/4	Dark Reddish Brown 2.5 YR 3/4	Dark Red 2.5 YR 3/6	Yellowish Red 5 YR 5/6	Very Dark Brown 7.5 YR 2.5/2
Mottles Munsell Colour		.. ..	.. ..	.. ..	Reddish Yellow 7.5 YR 6/8	.. ..
Degree of Mottling (%)		..	..	..	15	..
Mottles Munsell Colour		.. ..	.. ..	.. ..	.. ..	.. ..
Degree of Mottling (%)		..	..	..	..	..

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collin
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013,
   Schedule B(1) - Guideline on Investigation Levels for Soil and Groundwater. Table 5-A Background Range
9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil re
10. Conversions for 1 cmol$_c$/kg = 230 mg/kg Sodium, 390 mg/kg Potassium,
    122 mg/kg Magnesium, 200 mg/kg Calcium
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AGRICULTURAL SOIL ANALYSIS REPORT

70 samples supplied by Umwelt (Australia) Pty Ltd on 6/09/2022 . Lab Job No.N2420
Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

			Sample 56	Sample 57	Sample 58	Sample 59	Sample 60
		Sample ID:	GR22 0.15-0.25	GR22 0.5-0.6	GR23 0.0-0.1	GR23 0.15-0.25	GR24 0.0-0.1
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter		Method reference	N2420/56	N2420/57	N2420/58	N2420/59	N2420/60
Soluble Calcium (mg/kg)		**Inhouse S10 - Morgan 1	1,835	2,642	1,573	2,012	3,171
Soluble Magnesium (mg/kg)			534	808	779	1,169	955
Soluble Potassium (mg/kg)			114	93	409	81	748
Soluble Phosphorus (mg/kg)			5.3	10	5.8	5.5	20
Phosphorus (mg/kg P)		**Rayment & Lyons 2011 - 9E2 (Bray 1)	34	25	3.6	<1	53
		**Rayment & Lyons 2011 - 9B2 (Colwell)	123	40	22	3.6	103
		**Inhouse S3A (Bray 2)	112	225	14	3.0	86
Nitrate Nitrogen (mg/kg N)		**Inhouse S37 (KCl)	1.6	3.2	3.0	1.2	22
Ammonium Nitrogen (mg/kg N)			1.3	4.9	4.1	2.3	18
Sulfur (mg/kg S)			12	20	9.4	7.2	31
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.2	7.5	6.7	8.0	6.6
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.052	0.061	0.069	0.073	0.139
Estimated Organic Matter (% OM)		**Calculation: Total Carbon x 1.75	1.5	0.78	4.6	1.9	12
Exchangeable Calcium	(cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	17	20	17	20	27
	(kg/ha)		7,599	8,822	7,714	9,150	12,299
	(mg/kg)		3,393	3,938	3,444	4,085	5,490
Exchangeable Magnesium	(cmol+/kg)		7.2	9.1	12	17	11
	(kg/ha)		1,964	2,487	3,226	4,761	2,883
	(mg/kg)		877	1,110	1,440	2,125	1,287
Exchangeable Potassium	(cmol+/kg)		0.71	0.46	2.5	0.67	2.9
	(kg/ha)		620	399	2,158	585	2,575
	(mg/kg)		277	178	963	261	1,149
Exchangeable Sodium	(cmol+/kg)		0.39	1.2	0.39	0.97	0.46
	(kg/ha)		199	599	199	499	239
	(mg/kg)		89	268	89	223	107
Exchangeable Aluminium	(cmol+/kg)	**Inhouse S37 (KCl)	0.02	0.02	0.01	<0.01	0.02
	(kg/ha)		4.1	3.8	2.8	<1	3.6
	(mg/kg)		1.8	1.7	1.3	<1	1.6
Exchangeable Hydrogen	(cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	<0.01	<0.01	<0.01
	(kg/ha)		<1	<1	<1	<1	<1
	(mg/kg)		<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol+/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	25	30	32	40	41
Calcium (%)		**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	67	65	54	52	66
Magnesium (%)			29	30	37	44	26
Potassium (%)			2.8	1.5	7.7	1.7	7.1
Sodium - ESP (%)			1.5	3.8	1.2	2.5	1.1
Aluminium (%)			0.08	0.06	0.04	0.01	0.04
Hydrogen (%)			0.00	0.00	0.00	0.00	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol+/kg)	2.3	2.2	1.5	1.2	2.6

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		Sample 56	Sample 57	Sample 58	Sample 59	Sample 60
	Sample ID:	GR22 0.15-0.25	GR22 0.5-0.6	GR23 0.0-0.1	GR23 0.15-0.25	GR24 0.0-0.1
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/56	N2420/57	N2420/58	N2420/59	N2420/60
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (mg/kg)		1.2	1.4	3.9	1.5	7.4
Iron (mg/kg)		0.65	<0.5	1.9	<0.5	3.9
Copper (mg/kg)		<0.1	<0.1	<0.1	<0.1	<0.1
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	0.98	3.0	2.0	4.1	3.7
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	68	220	123	79	404
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	0.84	0.45	2.6	1.1	7.1
Total Nitrogen (%)		0.10	0.07	0.24	0.10	0.57
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	8.8	6.9	11	10	12
Basic Texture	**Inhouse S65	Clay	Clay	Clay	Clay	Clay
Basic Colour		Red	Brownish	Red	Red	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	33	39	44	47	89
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	6.5	6.8	6.2	7.3	6.0
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	4C	3	2	4C	3
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Dark Brown 7.5 YR 3/4	Dark Brown 7.5 YR 3/4	Dark Reddish Brown 5 YR 3/4	Dark Reddish Brown 5 YR 3/4	Very Dusky Red 2.5 YR 2.5/2
Mottles Munsell Colour		.. ..	Reddish Yellow 7.5 YR 6/8	.. ..	.. ..	Red 2.5 YR 5/6
Degree of Mottling (%)		..	3	..	..	2
Mottles Munsell Colour		.. ..	.. ..	.. ..	.. ..	.. ..
Degree of Mottling (%)		..	..	..	..	..

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collin
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013,
   Schedule B(1) - Guideline on Investigation Levels for Soil and Groundwater. Table 5-A Background Range
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    122 mg/kg Magnesium, 200 mg/kg Calcium
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70 samples supplied by Umwelt (Australia) Pty Ltd on 6/09/2022 . Lab Job No.N2420
Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

			Sample 61	Sample 62	Sample 63	Sample 64	Sample 65
		Sample ID:	GR24 0.3-0.4	GR26 0.0-00.1	GR26 0.1-0.2	GR26 0.3-0.4	GR27 0.0-0.1
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	N2420/61	N2420/62	N2420/63	N2420/64	N2420/65
	Soluble Calcium (mg/kg)	**Inhouse S10 - Morgan 1	2,520	728	675	767	1,806
	Soluble Magnesium (mg/kg)		1,201	136	97	109	556
	Soluble Potassium (mg/kg)		118	187	128	68	135
	Soluble Phosphorus (mg/kg)		7.8	3.8	2.6	2.4	9.6
	Phosphorus (mg/kg P)	**Rayment & Lyons 2011 - 9E2 (Bray 1)	1.2	2.3	1.3	1.1	35
		**Rayment & Lyons 2011 - 9B2 (Colwell)	5.6	4.6	2.3	3.9	86
		**Inhouse S3A (Bray 2)	9.9	4.0	2.3	2.3	102
	Nitrate Nitrogen (mg/kg N)	**Inhouse S37 (KCl)	2.0	6.0	0.83	0.82	3.3
	Ammonium Nitrogen (mg/kg N)		4.3	4.4	1.6	0.38	3.5
	Sulfur (mg/kg S)		9.5	5.3	6.3	4.8	10
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	8.0	6.3	6.8	7.1	6.3
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.093	0.045	0.023	0.021	0.051
	Estimated Organic Matter (% OM)	**Calculation: Total Carbon x 1.75	3.3	2.5	0.69	0.37	5.4
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	26	5.1	4.6	4.7	19
	Exchangeable Calcium (kg/ha)		11,688	2,298	2,054	2,109	8,535
	Exchangeable Calcium (mg/kg)		5,218	1,026	917	942	3,810
	Exchangeable Magnesium (cmol+/kg)		18	1.2	0.94	1.0	7.5
	Exchangeable Magnesium (kg/ha)		5,011	338	257	280	2,038
	Exchangeable Magnesium (mg/kg)		2,237	151	115	125	910
	Exchangeable Potassium (cmol+/kg)		0.92	0.56	0.44	0.25	0.61
	Exchangeable Potassium (kg/ha)		805	489	383	222	532
	Exchangeable Potassium (mg/kg)		359	218	171	99	237
	Exchangeable Sodium (cmol+/kg)		1.1	0.17	0.16	0.14	0.24
	Exchangeable Sodium (kg/ha)		568	89	81	73	122
	Exchangeable Sodium (mg/kg)		254	40	36	32	54
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	<0.01	0.01	<0.01	<0.01	<0.01
	Exchangeable Aluminium (kg/ha)		1.0	2.1	1.7	<1	<1
	Exchangeable Aluminium (mg/kg)		<1	<1	<1	<1	<1
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	<0.01	<0.01	0.03
	Exchangeable Hydrogen (kg/ha)		<1	<1	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	46	7.1	6.1	6.1	27
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	56	72	75	77	69
	Magnesium (%)		40	17	15	17	27
	Potassium (%)		2.0	7.9	7.1	4.1	2.2
	Sodium - ESP (%)		2.4	2.4	2.6	2.3	0.86
	Aluminium (%)		0.01	0.15	0.13	0.06	0.02
	Hydrogen (%)		0.00	0.00	0.00	0.00	0.11
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	1.4	4.1	4.8	4.6	2.5

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		Sample 61	Sample 62	Sample 63	Sample 64	Sample 65
	Sample ID:	GR24 0.3-0.4	GR26 0.0-00.1	GR26 0.1-0.2	GR26 0.3-0.4	GR27 0.0-0.1
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/61	N2420/62	N2420/63	N2420/64	N2420/65
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (mg/kg)		1.8	2.9	0.78	0.41	1.7
Iron (mg/kg)		<0.5	2.1	<0.5	<0.5	3.2
Copper (mg/kg)		<0.1	<0.1	<0.1	<0.1	<0.1
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	4.1	0.62	0.33	0.49	0.76
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	139	32	22	13	131
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	1.9	1.4	0.40	0.21	3.1
Total Nitrogen (%)		0.15	0.14	0.07	0.05	0.23
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	13	10	5.9	3.9	14
Basic Texture	**Inhouse S65	Clay	Clay Loam	Clay	Clay	Clay
Basic Colour		Brownish	Brownish	Red	Red	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	60	29	15	13	33
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	7.4	5.6	6.0	6.3	5.7
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	4C	3	3	3	3
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Dark Reddish Brown 2.5 YR 2.5/3	Dark Reddish Brown 2.5 YR 2.5/3	Dark Red 2.5 YR 3/6	Red 2.5 YR 4/8	Black 5 YR 2.5/1
Mottles Munsell Colour		.. ..	.. ..	Reddish Black 2.5 YR 2.5/1	Light Red 2.5 YR 6/8	.. ..
Degree of Mottling (%)		..	..	1	15	..
Mottles Munsell Colour		.. ..	.. ..	.. ..		.. ..
Degree of Mottling (%)		..	..	..		..

Notes:

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AGRICULTURAL SOIL ANALYSIS REPORT

70 samples supplied by Umwelt (Australia) Pty Ltd on 6/09/2022 . Lab Job No.N2420
Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

			Sample 66	Sample 67	Sample 68	Sample 69	Sample 70
		Sample ID:	GR27 0.2-0.3	GR27 0.4-0.5	GR28 0.0-0.1	GR28 0.1-0.2	GR28 0.55-0.65
		Crop:	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter		Method reference	N2420/66	N2420/67	N2420/68	N2420/69	N2420/70
Soluble Calcium (mg/kg)		**Inhouse S10 - Morgan 1	2,730	2,832	996	1,605	2,213
Soluble Magnesium (mg/kg)			1,075	1,159	443	923	1,257
Soluble Potassium (mg/kg)			<25	<25	264	54	49
Soluble Phosphorus (mg/kg)			7.8	6.4	6.6	5.3	4.7
Phosphorus (mg/kg P)		**Rayment & Lyons 2011 - 9E2 (Bray 1)	26	20	41	10	8.5
		**Rayment & Lyons 2011 - 9B2 (Colwell)	95	50	85	47	17
		**Inhouse S3A (Bray 2)	265	348	84	81	382
Nitrate Nitrogen (mg/kg N)		**Inhouse S37 (KCl)	1.1	0.92	38	0.93	0.92
Ammonium Nitrogen (mg/kg N)			0.32	<0.1	115	3.2	0.76
Sulfur (mg/kg S)			7.3	17	11	8.3	9.0
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.2	7.3	6.0	6.8	7.8
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.051	0.079	0.148	0.069	0.060
Estimated Organic Matter (% OM)		**Calculation: Total Carbon x 1.75	2.0	0.87	3.9	1.6	0.77
Exchangeable Calcium	(cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	46	48	11	22	35
	(kg/ha)		20,519	21,354	4,926	9,746	15,692
	(mg/kg)		9,160	9,533	2,199	4,351	7,005
Exchangeable Magnesium	(cmol+/kg)		20	21	5.7	15	22
	(kg/ha)		5,390	5,654	1,546	4,153	6,118
	(mg/kg)		2,406	2,524	690	1,854	2,731
Exchangeable Potassium	(cmol+/kg)		0.38	0.21	1.6	0.74	0.63
	(kg/ha)		337	185	1,415	650	549
	(mg/kg)		151	83	632	290	245
Exchangeable Sodium	(cmol+/kg)		0.24	0.31	0.13	0.24	0.46
	(kg/ha)		125	158	69	123	236
	(mg/kg)		56	70	31	55	105
Exchangeable Aluminium	(cmol+/kg)	**Inhouse S37 (KCl)	0.01	0.01	0.01	0.01	<0.01
	(kg/ha)		3.0	2.0	2.0	2.3	1.7
	(mg/kg)		1.3	<1	<1	1.0	<1
Exchangeable Hydrogen	(cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.03	<0.01	<0.01
	(kg/ha)		<1	<1	<1	<1	<1
	(mg/kg)		<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol+/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	66	69	18	38	59
Calcium (%)		**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	69	69	59	57	60
Magnesium (%)			30	30	31	40	38
Potassium (%)			0.58	0.31	8.8	2.0	1.1
Sodium - ESP (%)			0.37	0.44	0.73	0.63	0.78
Aluminium (%)			0.02	0.01	0.05	0.03	0.01
Hydrogen (%)			0.00	0.00	0.18	0.00	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol+/kg)	2.3	2.3	1.9	1.4	1.6

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AGRICULTURAL SOIL ANALYSIS REPORT

70 samples supplied by Umwelt (Australia) Pty Ltd on 6/09/2022 . Lab Job No.N2420
Analysis requested by David McQueeney. Your Job: 21507
Office 4 ORANGE NSW 2800

		Sample 66	Sample 67	Sample 68	Sample 69	Sample 70
	Sample ID:	GR27 0.2-0.3	GR27 0.4-0.5	GR28 0.0-0.1	GR28 0.1-0.2	GR28 0.55-0.65
	Crop:	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	N2420/66	N2420/67	N2420/68	N2420/69	N2420/70
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	<0.5	0.56	<0.5	<0.5
Manganese (mg/kg)		13	14	95	32	17
Iron (mg/kg)		66	57	128	55	24
Copper (mg/kg)		1.8	1.5	2.1	1.5	0.87
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	0.64	1.1	0.69	0.67	0.76
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	36	58	71	31	50
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	1.1	0.50	2.2	0.89	0.44
Total Nitrogen (%)		0.12	0.08	0.21	0.12	0.07
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	9.2	6.3	11	7.6	6.0
Basic Texture	**Inhouse S65	Clay Loam	Clay Loam	Clay Loam	Clay	Loam
Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	33	51	95	44	38
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	6.5	6.7	5.4	6.2	7.1
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	4C	3	3	4C	4C
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	Reddish Black	Very Dusky Red	Very Dusky Red	Dark Reddish Brown	Dark Reddish Brown
		7.5 YR 2.5/1	10 YR 2.5/2	10 YR 2.5/2	2.5 YR 3/4	5 YR 3/4
Mottles Munsell Colour		..	..	..	..	Reddish Yellow
		..	..	..	..	5 YR 6/8
Degree of Mottling (%)		..	..	..	..	1
Mottles Munsell Colour		..	..	..	..	..
		..	..	..	..	..
Degree of Mottling (%)		..	..	..	..	..

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collin
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013,
   Schedule B(1) - Guideline on Investigation Levels for Soil and Groundwater. Table 5-A Background Range
9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil re
10. Conversions for 1 cmol$_c$/kg = 230 mg/kg Sodium, 390 mg/kg Potassium,
    122 mg/kg Magnesium, 200 mg/kg Calcium
11. Conversions to kg/ha = mg/kg x 2.24
12. The chloride calculation of Cl mg/L = EC x 640 is considered an estimate, and most likely an over-estim
13. ** NATA accreditation does not cover the performance of this service.
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17. This report was issued on 16/09/2022.

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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by David McQueeney. Your Job: 21507

Office 4 ORANGE NSW 2800

			Heavy Soil	Medium Soil	Light Soil	Sandy Soil
		Sample ID:				
		Crop:				
		Client:	Clay	Clay Loam	Loam	Loamy Sand
Parameter		Method reference	Indicative guidelines - refer to Notes 6 and 9			
Soluble Calcium (mg/kg)		**Inhouse S10 - Morgan 1	1150	750	375	175
Soluble Magnesium (mg/kg)			160	105	60	25
Soluble Potassium (mg/kg)			113	75	60	50
Soluble Phosphorus (mg/kg)			15	12	10	5.0
Phosphorus (mg/kg P)		**Rayment & Lyons 2011 - 9E2 (Bray 1)	45 note 8	30 note 8	24 note 8	20 note 8
		**Rayment & Lyons 2011 - 9B2 (Colwell)	80	50	45	35
		**Inhouse S3A (Bray 2)	90 note 8	60 note 8	48 note 8	40 note 8
Nitrate Nitrogen (mg/kg N)		**Inhouse S37 (KCl)	15	13	10	10
Ammonium Nitrogen (mg/kg N)			20	18	15	12
Sulfur (mg/kg S)			10.0	8.0	8.0	7.0
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.5	6.5	6.3	6.3
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.200	0.150	0.120	0.100
Estimated Organic Matter (% OM)		**Calculation: Total Carbon x 1.75	> 5.5	>4 .5	> 3.5	> 2.5
Exchangeable Calcium	(cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	15.6	10.8	5.0	1.9
	(kg/ha)		7000	4816	2240	840
	(mg/kg)		3125	2150	1000	375
Exchangeable Magnesium	(cmol+/kg)		2.4	1.7	1.2	0.60
	(kg/ha)		650	448	325	168
	(mg/kg)		290	200	145	75
Exchangeable Potassium	(cmol+/kg)		0.60	0.50	0.40	0.30
	(kg/ha)		526	426	336	224
	(mg/kg)		235	190	150	100
Exchangeable Sodium	(cmol+/kg)		0.3	0.26	0.22	0.11
	(kg/ha)		155	134	113	57
	(mg/kg)		69	60	51	25
Exchangeable Aluminium	(cmol+/kg)	**Inhouse S37 (KCl)	0.6	0.5	0.4	0.2
	(kg/ha)		121	101	73	30
	(mg/kg)		54	45	32	14
Exchangeable Hydrogen	(cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.6	0.5	0.4	0.2
	(kg/ha)		13	11	8	3
	(mg/kg)		6	5	4	2
Effective Cation Exchange Capacity (ECEC) (cmol+/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	20.1	14.3	7.8	3.3
Calcium (%)		**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	77.6	75.7	65.6	57.4
Magnesium (%)			11.9	11.9	15.7	18.1
Potassium (%)			3.0	3.5	5.2	9.1
Sodium - ESP (%)			1.5	1.8	2.9	3.3
Aluminium (%)			6.0	7.1	10.5	12.1
Hydrogen (%)						
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol+/kg)	6.5	6.4	4.2	3.2

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		Heavy Soil	Medium Soil	Light Soil	Sandy Soil
	Sample ID:				
	Crop:				
	Client:	Clay	Clay Loam	Loam	Loamy Sand
Parameter	Method reference	Indicative guidelines - refer to Notes 6 and 8			
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	6.0	5.0	4.0	3.0
Manganese (mg/kg)		25	22	18	15
Iron (mg/kg)		25	22	18	15
Copper (mg/kg)		2.4	2.0	1.6	1.2
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	2.0	1.7	1.4	1.0
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	50	45	40	35
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	> 3.1	> 2.6	> 2.0	> 1.4
Total Nitrogen (%)		> 0.30	> 0.25	> 0.20	> 0.15
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	10–12	10–12	10–12	10–12
Basic Texture	**Inhouse S65	..	..	..	..
Basic Colour		..	..	..	..
Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	..	..	..	..
pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	..			
Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	Class 3–8			
Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	..			
		..			
Mottles Munsell Colour		..			
		..			
Degree of Mottling (%)		..			
Mottles Munsell Colour		..			
Degree of Mottling (%)		..			

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia*. CSIRO Publishing: Collin
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013,
   Schedule B(1) - Guideline on Investigation Levels for Soil and Groundwater. Table 5-A Background Range
9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil re
10. Conversions for 1 cmol$_c$/kg = 230 mg/kg Sodium, 390 mg/kg Potassium,
    122 mg/kg Magnesium, 200 mg/kg Calcium
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AGRICULTURAL SOIL ANALYSIS REPORT

21 samples supplied by Umwelt (Australia) Pty Ltd on 17/01/2023. Lab Job No.N6374

Analysis requested by David McQueeney. Your Job: 21507

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			Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
		Sample ID:	GR17 0.0-0.1	GR17 0.2-0.3	GR25 0.0-0.1	GR25 0.3-0.4	GR29 0.0-0.1
		Crop:	N/G	N/G	N/G	N/G	N/G
		Client:	LSBP	LSBP	LSBP	LSBP	LSBP
Parameter		**Method reference**	**N6374/1**	**N6374/2**	**N6374/3**	**N6374/4**	**N6374/5**
Soluble Calcium (mg/kg)		**Inhouse S10 - Morgan 1	1,324	1,333	327	310	562
Soluble Magnesium (mg/kg)			252	249	120	373	189
Soluble Potassium (mg/kg)			123	78	191	74	189
Soluble Phosphorus (mg/kg)			4.1	2.4	<1	<1	1.5
Phosphorus (mg/kg P)		**Rayment & Lyons 2011 - 9E2 (Bray 1)	41	22	2.9	1.2	3.3
		**Rayment & Lyons 2011 - 9B2 (Colwell)	109	64	4.9	<1	12
		**Inhouse S3A (Bray 2)	83	52	4.9	1.8	6.0
Nitrate Nitrogen (mg/kg N)		**Inhouse S37 (KCl)	2.9	2.3	0.89	0.38	3.3
Ammonium Nitrogen (mg/kg N)			2.5	1.2	0.89	0.87	2.9
Sulfur (mg/kg S)			5.9	4.2	5.1	4.3	3.0
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.91	6.36	6.09	6.57	6.49
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.048	0.034	0.036	0.032	0.047
Estimated Organic Matter (% OM)		**Calculation: Total Carbon x 1.75	8.5	6.5	3.0	0.83	5.3
Exchangeable Calcium	**(cmol$_+$/kg)**	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	14	14	2.6	2.7	5.2
	(kg/ha)		6,255	6,118	1,171	1,193	2,327
	(mg/kg)		2,792	2,731	523	532	1,039
Exchangeable Magnesium	**(cmol$_+$/kg)**		3.3	3.4	1.2	4.9	2.0
	(kg/ha)		909	931	331	1,321	556
	(mg/kg)		406	416	148	590	248
Exchangeable Potassium	**(cmol$_+$/kg)**		1.00	0.67	0.79	0.50	0.80
	(kg/ha)		872	585	695	437	702
	(mg/kg)		389	261	310	195	313
Exchangeable Sodium	**(cmol$_+$/kg)**		0.07	0.08	<0.065	0.13	<0.065
	(kg/ha)		38	43	<33	65	<33
	(mg/kg)		17	19	<15	29	<15
Exchangeable Aluminium	**(cmol$_+$/kg)**	**Inhouse S37 (KCl)	0.02	0.03	0.03	0.02	<0.01
	(kg/ha)		4.8	5.8	6.9	3.1	1.9
	(mg/kg)		2.1	2.6	3.1	1.4	<1
Exchangeable Hydrogen	**(cmol$_+$/kg)**	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.03	0.03	0.06	<0.01	<0.01
	(kg/ha)		<1	<1	1.4	<1	<1
	(mg/kg)		<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	18	18	4.8	8.2	8.1
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	76	76	55	33	64
Magnesium (%)			18	19	25	60	25
Potassium (%)			5.4	3.7	17	6.1	9.9
Sodium - ESP (%)			0.41	0.47	1.3	1.5	0.67
Aluminium (%)			0.13	0.16	0.72	0.19	0.11
Hydrogen (%)			0.14	0.19	1.3	0.00	0.01
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	4.2	4.0	2.1	0.55	2.5
Zinc (mg/kg)		Rayment & Lyons 2011 - 12A1 (DTPA)	0.79	<0.5	1.6	<0.5	0.68
Manganese (mg/kg)			74	79	73	13	32
Iron (mg/kg)			87	59	104	15	143
Copper (mg/kg)			1.3	0.99	0.73	0.82	0.52
Boron (mg/kg)		**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	0.77	0.89	0.49	0.50	0.55
Silicon (mg/kg Si)		**Inhouse S11 (Hot CaCl2)	75	70	28	18	45
Total Carbon (%)		Inhouse S4a (LECO Trumac Analyser)	4.8	3.7	1.7	0.48	3.1
Total Nitrogen (%)			0.36	0.30	0.13	0.07	0.24
Carbon/Nitrogen Ratio		**Calculation: Total Carbon/Total Nitrogen	13	13	13	6.4	13

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AGRICULTURAL SOIL ANALYSIS REPORT

21 samples supplied by Umwelt (Australia) Pty Ltd on 17/01/2023. Lab Job No.N6374

Analysis requested by David McQueeney. Your Job: 21507

Office 4 ORANGE NSW 2800

			Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
		Sample ID:	GR17 0.0-0.1	GR17 0.2-0.3	GR25 0.0-0.1	GR25 0.3-0.4	GR29 0.0-0.1
		Crop:	N/G	N/G	N/G	N/G	N/G
		Client:	LSBP	LSBP	LSBP	LSBP	LSBP
	Parameter	**Method reference**	**N6374/1**	**N6374/2**	**N6374/3**	**N6374/4**	**N6374/5**
	Basic Texture	**Inhouse S65	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
	Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
	Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	31	22	23	20	30
	pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	5.15	5.66	5.45	5.83	5.81
	Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	3	3	3	3	3
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	7.5YR 2.5/3	7.5YR 2.5/3	2.5YR 2.5/3	2.5YR 3/6	7.5YR 3/4
			Very Dark Brown	Very Dark Brown	Dark Reddish Brown	Dark Red	Dark Brown
	Mottles Munsell Colour		..	..	..	..	..
			..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collingwood.
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013, Schedule B(1) - Guideline on Investigation Levels for Soil and Groundwater. Table 5-A Background Ranges.
9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil results'.
10. Conversions for 1 $cmol_+$/kg = 230 mg/kg Sodium, 390 mg/kg Potassium, 122 mg/kg Magnesium, 200 mg/kg Calcium
11. Conversions to kg/ha = mg/kg x 2.24
12. The chloride calculation of Cl mg/L = EC x 640 is considered an estimate, and most likely an over-estimate
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17. This report was issued on 20/01/2023.

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Accreditation No. 14960
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AGRICULTURAL SOIL ANALYSIS REPORT

21 samples supplied by Umwelt (Australia) Pty Ltd on 17/01/2023. Lab Job No.N6374

Analysis requested by David McQueeney. Your Job: 21507

Office 4 ORANGE NSW 2800

		Sample 6	Sample 7	Sample 8	Sample 9	Sample 10
	Sample ID:	GR29 0.3-0.5	GR30 0.0-0.1	GR30 0.2-0.4	GR30 0.4-0.6	GR30 0.0-0.1
	Crop:	N/G	N/G	N/G	N/G	N/G
	Client:	LSBP	LSBP	LSBP	LSBP	LSBP
Parameter	**Method reference**	**N6374/6**	**N6374/7**	**N6374/8**	**N6374/9**	**N6374/10**
Soluble Calcium (mg/kg)	**Inhouse S10 - Morgan 1	450	528	533	487	112
Soluble Magnesium (mg/kg)		177	253	149	218	29
Soluble Potassium (mg/kg)		34	55	<25	<25	53
Soluble Phosphorus (mg/kg)		<1	1.8	<1	<1	<1
Phosphorus (mg/kg P)	**Rayment & Lyons 2011 - 9E2 (Bray 1)	1.4	4.6	1.7	2.0	6.2
	**Rayment & Lyons 2011 - 9B2 (Colwell)	3.2	13	4.6	9.0	8.7
	**Inhouse S3A (Bray 2)	2.3	7.9	3.2	4.2	8.6
Nitrate Nitrogen (mg/kg N)	**Inhouse S37 (KCl)	0.37	2.5	0.78	0.69	2.6
Ammonium Nitrogen (mg/kg N)		0.60	2.8	0.29	1.1	0.54
Sulfur (mg/kg S)		1.0	6.3	4.8	5.4	2.1
pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.65	5.94	6.67	7.37	5.67
Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.015	0.038	0.018	0.024	0.026
Estimated Organic Matter (% OM)	**Calculation: Total Carbon x 1.75	0.85	4.9	0.82	0.43	1.1
Exchangeable Calcium (cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	3.4	5.0	4.2	3.6	0.70
Exchangeable Calcium (kg/ha)		1,522	2,240	1,871	1,625	316
Exchangeable Calcium (mg/kg)		679	1,000	835	725	141
Exchangeable Magnesium (cmol$_+$/kg)		2.0	3.0	1.7	2.4	0.25
Exchangeable Magnesium (kg/ha)		532	809	451	666	67
Exchangeable Magnesium (mg/kg)		237	361	201	297	30
Exchangeable Potassium (cmol$_+$/kg)		0.16	0.37	<0.12	<0.12	0.18
Exchangeable Potassium (kg/ha)		141	322	<112	<112	155
Exchangeable Potassium (mg/kg)		63	144	<50	<50	69
Exchangeable Sodium (cmol$_+$/kg)		<0.065	0.09	0.09	0.16	<0.065
Exchangeable Sodium (kg/ha)		<33	49	44	84	<33
Exchangeable Sodium (mg/kg)		<15	22	20	37	<15
Exchangeable Aluminium (cmol$_+$/kg)	**Inhouse S37 (KCl)	0.01	0.01	0.01	0.03	0.24
Exchangeable Aluminium (kg/ha)		2.3	2.8	2.9	6.0	48
Exchangeable Aluminium (mg/kg)		1.0	1.2	1.3	2.7	21
Exchangeable Hydrogen (cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	0.07	<0.01	<0.01	0.16
Exchangeable Hydrogen (kg/ha)		<1	1.6	<1	<1	3.5
Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	1.6
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	5.6	8.5	6.0	6.4	1.6
Calcium (%)	**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	61	59	69	57	45
Magnesium (%)		35	35	27	38	16
Potassium (%)		2.9	4.3	1.7	1.7	11
Sodium - ESP (%)		1.0	1.1	1.4	2.6	3.7
Aluminium (%)		0.20	0.16	0.24	0.47	15
Hydrogen (%)		0.00	0.85	0.00	0.00	10
Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol$_+$/kg)	1.7	1.7	2.5	1.5	2.9
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	1.8	<0.5	<0.5	<0.5
Manganese (mg/kg)		2.2	116	37	5.6	12
Iron (mg/kg)		16	151	21	11	98
Copper (mg/kg)		0.48	1.6	0.97	0.48	0.13
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	0.43	0.59	0.48	0.51	0.26
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	29	50	42	24	10
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	0.48	2.8	0.47	0.25	0.62
Total Nitrogen (%)		0.06	0.26	0.06	0.04	0.07
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	8.1	11	7.6	5.9	9.2

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AGRICULTURAL SOIL ANALYSIS REPORT

21 samples supplied by Umwelt (Australia) Pty Ltd on 17/01/2023. Lab Job No.N6374

Analysis requested by David McQueeney. Your Job: 21507

Office 4 ORANGE NSW 2800

			Sample 6	Sample 7	Sample 8	Sample 9	Sample 10
		Sample ID:	GR29 0.3-0.5	GR30 0.0-0.1	GR30 0.2-0.4	GR30 0.4-0.6	GR30 0.0-0.1
		Crop:	N/G	N/G	N/G	N/G	N/G
		Client:	LSBP	LSBP	LSBP	LSBP	LSBP
	Parameter	Method reference	N6374/6	N6374/7	N6374/8	N6374/9	N6374/10
	Basic Texture	**Inhouse S65	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Loam
	Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
	Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	9.6	24	12	15	17
	pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	5.84	5.28	5.92	6.55	4.97
	Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	3	3	3	4	3
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	2.5YR 3/6 Dark Red	5YR 3/4 Dark Reddish Brown	2.5YR 2.5/4 Dark Reddish Brown	2.5YR 2.5/4 Dark Reddish Brown	7.5YR 3/3 Dark Brown
	Mottles Munsell Colour		..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Colling
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013, Schedule B(1) - Guideline on Investigation Levels for Soil and Groundwater. Table 5-A Background Range
9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil re
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AGRICULTURAL SOIL ANALYSIS REPORT

21 samples supplied by Umwelt (Australia) Pty Ltd on 17/01/2023. Lab Job No.N6374

Analysis requested by David McQueeney. Your Job: 21507

Office 4 ORANGE NSW 2800

		Sample 11	Sample 12	Sample 13	Sample 14	Sample 15
	Sample ID:	GR31 0.1-0.3	GR31 0.4-0.5	GR2 0.0-0.05	GR33 0.0-0.1	GR33 0.1-0.2
	Crop:	N/G	N/G	N/G	N/G	N/G
	Client:	LSBP	LSBP	LSBP	LSBP	LSBP
Parameter	**Method reference**	**N6374/11**	**N6374/12**	**N6374/13**	**N6374/14**	**N6374/15**
Soluble Calcium (mg/kg)	**Inhouse S10 - Morgan 1	137	176	1,534	920	874
Soluble Magnesium (mg/kg)		31	162	277	254	191
Soluble Potassium (mg/kg)		<25	<25	483	565	216
Soluble Phosphorus (mg/kg)		<1	<1	7.3	2.8	<1
Phosphorus (mg/kg P)	**Rayment & Lyons 2011 - 9E2 (Bray 1)	2.6	1.6	73	25	5.4
	**Rayment & Lyons 2011 - 9B2 (Colwell)	3.3	1.7	158	55	13
	**Inhouse S3A (Bray 2)	3.3	2.1	123	47	10
Nitrate Nitrogen (mg/kg N)	**Inhouse S37 (KCl)	1.1	0.69	1.6	12	3.0
Ammonium Nitrogen (mg/kg N)		<0.1	0.19	4.2	3.3	0.77
Sulfur (mg/kg S)		<1	4.6	8.3	10	5.1
pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.51	7.31	6.60	6.40	6.71
Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.016	0.041	0.072	0.103	0.032
Estimated Organic Matter (% OM)	**Calculation: Total Carbon x 1.75	1.3	0.24	7.4	6.2	1.9
Exchangeable Calcium (cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	0.84	1.2	15	9.1	7.5
Exchangeable Calcium (kg/ha)		379	544	6,939	4,105	3,366
Exchangeable Calcium (mg/kg)		169	243	3,098	1,833	1,503
Exchangeable Magnesium (cmol$_+$/kg)		0.26	1.7	3.5	3.2	2.2
Exchangeable Magnesium (kg/ha)		71	461	953	883	609
Exchangeable Magnesium (mg/kg)		32	206	425	394	272
Exchangeable Potassium (cmol$_+$/kg)		<0.12	<0.12	3.1	3.2	1.2
Exchangeable Potassium (kg/ha)		<112	<112	2,688	2,842	1,048
Exchangeable Potassium (mg/kg)		<50	<50	1,200	1,269	468
Exchangeable Sodium (cmol$_+$/kg)		<0.065	0.49	<0.065	0.11	0.09
Exchangeable Sodium (kg/ha)		<33	252	<33	59	48
Exchangeable Sodium (mg/kg)		<15	112	<15	26	21
Exchangeable Aluminium (cmol$_+$/kg)	**Inhouse S37 (KCl)	0.02	0.02	0.04	0.03	0.03
Exchangeable Aluminium (kg/ha)		4.6	4.5	7.6	5.6	6.3
Exchangeable Aluminium (mg/kg)		2.1	2.0	3.4	2.5	2.8
Exchangeable Hydrogen (cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	<0.01	<0.01	<0.01
Exchangeable Hydrogen (kg/ha)		<1	<1	<1	<1	<1
Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	1.3	3.5	22	16	11
Calcium (%)	**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	67	35	70	58	68
Magnesium (%)		21	48	16	21	20
Potassium (%)		5.7	2.4	14	21	11
Sodium - ESP (%)		5.1	14	0.24	0.72	0.84
Aluminium (%)		1.8	0.63	0.17	0.18	0.28
Hydrogen (%)		0.00	0.00	0.00	0.00	0.00
Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol$_+$/kg)	3.2	0.72	4.4	2.8	3.3
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	<0.5	<0.5	0.93	<0.5
Manganese (mg/kg)		2.1	0.88	48	90	32
Iron (mg/kg)		26	23	37	63	12
Copper (mg/kg)		<0.1	0.29	1.5	1.2	0.75
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	0.20	0.59	0.92	1.1	1.0
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	11	26	51	64	40
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	0.77	0.14	4.2	3.5	1.1
Total Nitrogen (%)		0.07	0.04	0.35	0.30	0.11
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	12	3.3	12	12	9.9

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			Sample 11	Sample 12	Sample 13	Sample 14	Sample 15
		Sample ID:	GR31 0.1-0.3	GR31 0.4-0.5	GR2 0.0-0.05	GR33 0.0-0.1	GR33 0.1-0.2
		Crop:	N/G	N/G	N/G	N/G	N/G
		Client:	LSBP	LSBP	LSBP	LSBP	LSBP
	Parameter	**Method reference**	**N6374/11**	**N6374/12**	**N6374/13**	**N6374/14**	**N6374/15**
	Basic Texture	**Inhouse S65	Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
	Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
	Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	10	26	46	66	20
	pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	6.16	6.29	5.99	5.94	6.06
	Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	3	2	3	3	3
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	7.5YR 4/3 Brown	2.5Y 6/2 Light Brownish gray	2.5YR 2.5/4 Dark Reddish Brown	2.5YR 2.5/4 Dark Reddish Brown	2.5YR 3/6 Dark Red
	Mottles Munsell Colour		..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Colling
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
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Analysis requested by David McQueeney. Your Job: 21507

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		Sample 16	Sample 17	Sample 18	Sample 19	Sample 20
	Sample ID:	GR34 0.0-0.05	GR34 0.1-0.2	GR35 0.0-0.05	GR35 0.4-0.6	GR36 0.0-0.1
	Crop:	N/G	N/G	N/G	N/G	N/G
	Client:	LSBP	LSBP	LSBP	LSBP	LSBP
Parameter	**Method reference**	**N6374/16**	**N6374/17**	**N6374/18**	**N6374/19**	**N6374/20**
Soluble Calcium (mg/kg)	**Inhouse S10 - Morgan 1	1,727	1,250	417	163	1,202
Soluble Magnesium (mg/kg)		355	224	146	108	258
Soluble Potassium (mg/kg)		682	266	158	66	289
Soluble Phosphorus (mg/kg)		25	4.5	1.5	<1	5.5
Phosphorus (mg/kg P)	**Rayment & Lyons 2011 - 9E2 (Bray 1)	138	38	3.2	2.0	45
	**Rayment & Lyons 2011 - 9B2 (Colwell)	157	82	4.7	2.2	107
	**Inhouse S3A (Bray 2)	234	80	2.6	2.9	77
Nitrate Nitrogen (mg/kg N)	**Inhouse S37 (KCl)	8.0	3.5	8.0	1.0	6.7
Ammonium Nitrogen (mg/kg N)		6.7	0.85	2.2	0.30	1.6
Sulfur (mg/kg S)		8.6	7.7	3.3	2.6	6.0
pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.12	6.31	6.20	6.60	6.12
Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.113	0.042	0.051	0.022	0.052
Estimated Organic Matter (% OM)	**Calculation: Total Carbon x 1.75	11	4.3	4.6	0.52	1.4
Exchangeable Calcium (cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	15	12	3.6	1.0	13
Exchangeable Calcium (kg/ha)		6,883	5,556	1,606	470	5,695
Exchangeable Calcium (mg/kg)		3,073	2,480	717	210	2,542
Exchangeable Magnesium (cmol$_+$/kg)		3.9	3.0	1.5	0.98	3.5
Exchangeable Magnesium (kg/ha)		1,067	818	402	268	962
Exchangeable Magnesium (mg/kg)		476	365	179	120	430
Exchangeable Potassium (cmol$_+$/kg)		3.1	1.8	0.57	0.22	2.0
Exchangeable Potassium (kg/ha)		2,720	1,593	500	189	1,777
Exchangeable Potassium (mg/kg)		1,214	711	223	84	793
Exchangeable Sodium (cmol$_+$/kg)		0.12	<0.065	<0.065	<0.065	<0.065
Exchangeable Sodium (kg/ha)		60	<33	<33	<33	<33
Exchangeable Sodium (mg/kg)		27	<15	<15	<15	<15
Exchangeable Aluminium (cmol$_+$/kg)	**Inhouse S37 (KCl)	0.02	0.02	0.02	0.02	0.02
Exchangeable Aluminium (kg/ha)		4.7	3.9	3.9	4.0	3.5
Exchangeable Aluminium (mg/kg)		2.1	1.7	1.7	1.8	1.6
Exchangeable Hydrogen (cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.03	<0.01	<0.01	<0.01	<0.01
Exchangeable Hydrogen (kg/ha)		<1	<1	<1	<1	<1
Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	23	17	5.7	2.3	18
Calcium (%)	**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	68	72	63	45	69
Magnesium (%)		17	17	26	42	19
Potassium (%)		14	11	10	9.3	11
Sodium - ESP (%)		0.51	0.28	0.65	2.3	0.20
Aluminium (%)		0.10	0.11	0.34	0.86	0.10
Hydrogen (%)		0.14	0.00	0.00	0.00	0.01
Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol$_+$/kg)	3.9	4.1	2.4	1.1	3.6
Zinc (mg/kg)	Rayment & Lyons 2011 - 12A1 (DTPA)	1.7	<0.5	<0.5	<0.5	<0.5
Manganese (mg/kg)		66	44	22	9.3	70
Iron (mg/kg)		202	43	82	14	66
Copper (mg/kg)		1.7	1.3	0.24	0.15	0.93
Boron (mg/kg)	**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	1.8	0.76	0.34	0.29	0.71
Silicon (mg/kg Si)	**Inhouse S11 (Hot CaCl2)	171	77	31	17	74
Total Carbon (%)	Inhouse S4a (LECO Trumac Analyser)	6.3	2.5	2.6	0.30	0.81
Total Nitrogen (%)		0.56	0.23	0.18	0.06	0.10
Carbon/Nitrogen Ratio	**Calculation: Total Carbon/Total Nitrogen	11	11	15	5.3	8.4

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AGRICULTURAL SOIL ANALYSIS REPORT

21 samples supplied by Umwelt (Australia) Pty Ltd on 17/01/2023. Lab Job No.N6374

Analysis requested by David McQueeney. Your Job: 21507

Office 4 ORANGE NSW 2800

			Sample 16	Sample 17	Sample 18	Sample 19	Sample 20
		Sample ID:	GR34 0.0-0.05	GR34 0.1-0.2	GR35 0.0-0.05	GR35 0.4-0.6	GR36 0.0-0.1
		Crop:	N/G	N/G	N/G	N/G	N/G
		Client:	LSBP	LSBP	LSBP	LSBP	LSBP
	Parameter	Method reference	N6374/16	N6374/17	N6374/18	N6374/19	N6374/20
	Basic Texture	**Inhouse S65	Clay Loam	Clay Loam	Clay Loam	Loam	Clay Loam
	Basic Colour		Brownish	Brownish	Brownish	Brownish	Brownish
	Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	72	27	33	14	33
	pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	5.64	5.75	5.50	6.18	5.71
	Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	3	3	3	3	3
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	7.5YR 2.5/3 Very Dark Brown	5YR 3/4 Dark Reddish Brown	7.5YR 2.5/3 Very Dark Brown	7.5YR 4/6 Strong Brown	5YR 3/4 Dark Reddish Brown
	Mottles Munsell Colour		..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Colling
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
4. 'Morgan 1 Extract' adapted from 'Science in Agriculture', 'Non-Toxic Farming' and LaMotte Soil Handbook.
5. Guidelines for phosphorus have been reduced for Australian soils.
6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
7. Total Acid Extractable Nutrients indicate a store of nutrients.
8. National Environmental Protection (Assessment of Site Contamination) Measure 2013, Schedule B(1) - Guideline on Investigation Levels for Soil and Groundwater. Table 5-A Background Range
9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil re
10. Conversions for 1 $cmol_+$/kg = 230 mg/kg Sodium, 390 mg/kg Potassium, 122 mg/kg Magnesium, 200 mg/kg Calcium
11. Conversions to kg/ha = mg/kg x 2.24
12. The chloride calculation of Cl mg/L = EC x 640 is considered an estimate, and most likely an over-estima
13. ** NATA accreditation does not cover the performance of this service.
14. Analysis conducted between sample arrival date and reporting date.
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16. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Condi
17. This report was issued on 20/01/2023.

Quality Checked: Kris Saville
Agricultural Co-Ordinator KS

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			Sample 21	*Heavy Soil*	*Medium Soil*	*Light Soil*	*Sandy Soil*
		Sample ID:	**GR36 0.3-0.5**				
		Crop:	**N/G**				
		Client:	**LSBP**	*Clay*	*Clay Loam*	*Loam*	*Loamy Sand*
Parameter		**Method reference**	**N6374/21**	**Indicative guidelines - refer to Notes 6 and 8**			
Soluble Calcium (mg/kg)		**Inhouse S10 - Morgan 1	1,739	*1150*	*750*	*375*	*175*
Soluble Magnesium (mg/kg)			303	*160*	*105*	*60*	*25*
Soluble Potassium (mg/kg)			106	*113*	*75*	*60*	*50*
Soluble Phosphorus (mg/kg)			1.9	*15*	*12*	*10*	*5.0*
Phosphorus (mg/kg P)		**Rayment & Lyons 2011 - 9E2 (Bray 1)	33	*45 note 5*	*30 note 5*	*24 note 5*	*20 note 5*
		**Rayment & Lyons 2011 - 9B2 (Colwell)	82	*80*	*50*	*45*	*35*
		**Inhouse S3A (Bray 2)	135	*90 note 5*	*60 note 5*	*48 note 5*	*40 note 5*
Nitrate Nitrogen (mg/kg N)		**Inhouse S37 (KCl)	1.2	*15*	*13*	*10*	*10*
Ammonium Nitrogen (mg/kg N)			0.84	*20*	*18*	*15*	*12*
Sulfur (mg/kg S)			6.2	*10.0*	*8.0*	*8.0*	*7.0*
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.84	*6.5*	*6.5*	*6.3*	*6.3*
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.028	*0.200*	*0.150*	*0.120*	*0.100*
Estimated Organic Matter (% OM)		**Calculation: Total Carbon x 1.75	4.6	*> 5.5*	*>4 .5*	*> 3.5*	*> 2.5*
Exchangeable Calcium	**(cmol$_+$/kg)**	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	21	*15.6*	*10.8*	*5.0*	*1.9*
	(kg/ha)		9,216	*7000*	*4816*	*2240*	*840*
	(mg/kg)		4,114	*3125*	*2150*	*1000*	*375*
Exchangeable Magnesium	**(cmol$_+$/kg)**		5.0	*2.4*	*1.7*	*1.2*	*0.60*
	(kg/ha)		1,359	*650*	*448*	*325*	*168*
	(mg/kg)		607	*290*	*200*	*145*	*75*
Exchangeable Potassium	**(cmol$_+$/kg)**		1.0	*0.60*	*0.50*	*0.40*	*0.30*
	(kg/ha)		876	*526*	*426*	*336*	*224*
	(mg/kg)		391	*235*	*190*	*150*	*100*
Exchangeable Sodium	**(cmol$_+$/kg)**		0.10	*0.3*	*0.26*	*0.22*	*0.11*
	(kg/ha)		50	*155*	*134*	*113*	*57*
	(mg/kg)		22	*69*	*60*	*51*	*25*
Exchangeable Aluminium	**(cmol$_+$/kg)**	**Inhouse S37 (KCl)	0.03	*0.6*	*0.5*	*0.4*	*0.2*
	(kg/ha)		5.3	*121*	*101*	*73*	*30*
	(mg/kg)		2.4	*54*	*45*	*32*	*14*
Exchangeable Hydrogen	**(cmol$_+$/kg)**	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	*0.6*	*0.5*	*0.4*	*0.2*
	(kg/ha)		<1	*13*	*11*	*8*	*3*
	(mg/kg)		<1	*6*	*5*	*4*	*2*
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	27	*20.1*	*14.3*	*7.8*	*3.3*
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	77	*77.6*	*75.7*	*65.6*	*57.4*
Magnesium (%)			19	*11.9*	*11.9*	*15.7*	*18.1*
Potassium (%)			3.8	*3.0*	*3.5*	*5.2*	*9.1*
Sodium - ESP (%)			0.37	*1.5*	*1.8*	*2.9*	*3.3*
Aluminium (%)			0.10	*6.0*	*7.1*	*10.5*	*12.1*
Hydrogen (%)			0.00				
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	4.1	*6.5*	*6.4*	*4.2*	*3.2*
Zinc (mg/kg)		Rayment & Lyons 2011 - 12A1 (DTPA)	<0.5	*6.0*	*5.0*	*4.0*	*3.0*
Manganese (mg/kg)			25	*25*	*22*	*18*	*15*
Iron (mg/kg)			17	*25*	*22*	*18*	*15*
Copper (mg/kg)			0.23	*2.4*	*2.0*	*1.6*	*1.2*
Boron (mg/kg)		**Rayment & Lyons 2011 - 12C2 (Hot $CaCl_2$)	0.71	*2.0*	*1.7*	*1.4*	*1.0*
Silicon (mg/kg Si)		**Inhouse S11 (Hot CaCl2)	46	*50*	*45*	*40*	*35*
Total Carbon (%)		Inhouse S4a (LECO Trumac Analyser)	2.6	*> 3.1*	*> 2.6*	*> 2.0*	*> 1.4*
Total Nitrogen (%)			0.17	*> 0.30*	*> 0.25*	*> 0.20*	*> 0.15*
Carbon/Nitrogen Ratio		**Calculation: Total Carbon/Total Nitrogen	15	*10–12*	*10–12*	*10–12*	*10–12*

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		Client:	**LSBP**	*Clay*	*Clay Loam*	*Loam*	*Loamy Sand*
	Parameter	**Method reference**	**N6374/21**	**Indicative guidelines - refer to Notes 6 and 8**			
	Basic Texture	**Inhouse S65	Clay Loam	..	..	..	..
	Basic Colour		Brownish	..	..	..	..
	Chloride Estimate (equiv. mg/kg)	**Calculation: Electrical Conductivity x 640	18	..	..	..	..
	pH	**Rayment & Lyons 2011 - 4B4 ($CaCl_2$)	6.21	..			
	Emerson Aggregate Test (EAT)	**AS1289.3.8.1-2017	3	*Class 3–8*			
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	2.5YR 2.5/4	..			
			Dark Reddish Brown	..			
	Mottles Munsell Colour		..	..			
			..	..			
	Degree of Mottling (%)		..	..			

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Quality Checked: Kris Saville
Agricultural Co-Ordinator

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