Appendix 3
Certificates of Analysis

Environmental Analysis Laboratory

Southern Cross University
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ABN: 41 995 651 524

AGRICULTURAL SOIL ANALYSIS REPORT - RE-ISSUED

58 samples supplied by Minesoils Pty. Ltd. on 17/05/2022. Lab Job No.M8725 re-issued
Analysis requested by Clayton Richards. Your Job: MS-051 Soils
PO BOX 11034 TAMWORTH NSW 2340

Parameter		Method reference	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Sample ID:			1	1	1	1	2	2
Sample Depth:			0-10	20-30	50-60	80-90	0-10	20-30
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			M8725/1	M8725/2	M8725/3	M8725/4	M8725/5	M8725/6
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.05	7.31	8.53	8.64	5.46	7.11
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.074	0.039	0.105	0.216	0.068	0.025
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	14	18	20	20	3.3	6.3
	(kg/ha)		6,269	7,886	8,968	8,963	1,503	2,834
	(mg/kg)		2,799	3,521	4,004	4,001	671	1,265
Exchangeable Magnesium	(cmol$_+$/kg)		4.3	7.8	19	22	1.8	3.3
	(kg/ha)		1,183	2,128	5,158	5,957	491	886
	(mg/kg)		528	950	2,303	2,659	219	396
Exchangeable Potassium	(cmol$_+$/kg)		2.3	1.6	0.99	0.72	0.57	0.26
	(kg/ha)		2,006	1,420	866	629	496	227
	(mg/kg)		896	634	386	281	222	101
Exchangeable Sodium	(cmol$_+$/kg)		0.12	0.12	0.72	1.6	0.17	0.12
	(kg/ha)		61	62	370	829	90	60
	(mg/kg)		27	28	165	370	40	27
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.01	<0.01	<0.01	<0.01	0.81	0.02
	(kg/ha)		2.5	1.3	1.2	<1	164	3.5
	(mg/kg)		1.1	<1	<1	<1	73	1.6
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.07	<0.01	<0.01	<0.01	0.40	<0.01
	(kg/ha)		1.6	<1	<1	<1	9.0	<1
	(mg/kg)		<1	<1	<1	<1	4.0	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	21	27	41	44	7.1	10.0
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	67	65	49	45	47	63
Magnesium (%)			21	29	47	50	25	33
Potassium (%)			11	6.0	2.4	1.6	8.0	2.6
Sodium - ESP (%)			0.57	0.45	1.8	3.6	2.5	1.2
Aluminium (%)			0.06	0.02	0.01	0.01	11	0.17
Hydrogen (%)			0.34	0.00	0.00	0.00	5.6	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	3.2	2.2	1.1	0.91	1.9	1.9

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		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
	Sample ID:	1	1	1	1	2	2
	Sample Depth:	0-10	20-30	50-60	80-90	0-10	20-30
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	M8725/1	M8725/2	M8725/3	M8725/4	M8725/5	M8725/6

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
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 issued 30/5/22 replaces the report issued on 27/05/2022.

NATA
WORLD RECOGNISED ACCREDITATION
Accreditation No. 14960
Accredited for compliance with ISO/IEC 17025 - Testing

Quality Checked: Kris Saville
Agricultural Co-Ordinator KS

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Parameter		Method reference	Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Sample 12
Sample ID:			2	2	3	3	4	4
Sample Depth:			60-70	80-90	0-10	20-30	0-10	20-30
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			M8725/7	M8725/8	M8725/9	M8725/10	M8725/11	M8725/12
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.45	7.45	6.35	6.25	5.33	6.29
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.026	0.025	0.056	0.043	0.034	0.018
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.2	8.8	7.6	8.7	1.7	2.2
	(kg/ha)		3,221	3,968	3,394	3,918	751	995
	(mg/kg)		1,438	1,771	1,515	1,749	335	444
Exchangeable Magnesium	(cmol$_+$/kg)		10	15	1.4	1.6	0.59	0.66
	(kg/ha)		2,734	4,068	379	445	162	179
	(mg/kg)		1,221	1,816	169	199	72	80
Exchangeable Potassium	(cmol$_+$/kg)		0.35	0.48	1.4	1.5	0.51	0.40
	(kg/ha)		309	422	1,212	1,282	449	348
	(mg/kg)		138	188	541	572	200	156
Exchangeable Sodium	(cmol$_+$/kg)		0.21	0.45	<0.065	0.10	<0.065	<0.065
	(kg/ha)		110	233	<33	50	<33	<33
	(mg/kg)		49	104	<15	23	<15	<15
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	<0.01	<0.01	0.37	0.19	0.45	0.08
	(kg/ha)		1.0	1.0	75	39	91	17
	(mg/kg)		<1	<1	34	18	41	7.5
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.21	0.12	0.26	0.06
	(kg/ha)		<1	<1	4.6	2.7	5.8	1.3
	(mg/kg)		<1	<1	2.1	1.2	2.6	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	18	25	11	12	3.5	3.4
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	40	36	69	71	47	64
Magnesium (%)			56	60	13	13	17	19
Potassium (%)			2.0	1.9	13	12	14	12
Sodium - ESP (%)			1.2	1.8	0.50	0.80	1.4	0.96
Aluminium (%)			0.03	0.02	3.4	1.6	13	2.4
Hydrogen (%)			0.00	0.00	1.9	0.97	7.4	1.7
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	0.71	0.59	5.4	5.3	2.8	3.4

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			Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Sample 12
		Sample ID:	2	2	3	3	4	4
		Sample Depth:	60-70	80-90	0-10	20-30	0-10	20-30
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	M8725/7	M8725/8	M8725/9	M8725/10	M8725/11	M8725/12

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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6. Indicative guidelines are based on 'Albrecht' and 'Reams' concepts.
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Quality Checked: Kris Saville
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	Parameter		Method reference	Sample 13	Sample 14	Sample 15	Sample 16	Sample 17	Sample 18
	Sample ID:			5	5	6	6	6	7
	Sample Depth:			0-10	20-30	0-10	30-40	80-90	0-10
	Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
				M8725/13	M8725/14	M8725/15	M8725/16	M8725/17	M8725/18
	pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.64	7.28	6.89	6.67	6.42	7.05
	Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.089	0.062	0.043	0.028	0.016	0.071
	Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	25	29	18	17	15	19
		(kg/ha)		11,280	12,925	7,859	7,417	6,772	8,681
		(mg/kg)		5,036	5,770	3,508	3,311	3,023	3,875
	Exchangeable Magnesium	(cmol$_+$/kg)		7.6	7.6	3.8	4.6	5.1	4.9
		(kg/ha)		2,060	2,063	1,044	1,257	1,388	1,344
		(mg/kg)		920	921	466	561	620	600
	Exchangeable Potassium	(cmol$_+$/kg)		0.43	<0.12	0.20	0.18	0.21	0.32
		(kg/ha)		378	<112	173	160	186	278
		(mg/kg)		169	<50	77	72	83	124
	Exchangeable Sodium	(cmol$_+$/kg)		0.10	0.45	0.30	0.41	0.21	0.28
		(kg/ha)		50	234	152	211	109	146
		(mg/kg)		22	104	68	94	49	65
	Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
		(kg/ha)		1.7	2.4	<1	<1	2.0	<1
		(mg/kg)		<1	1.1	<1	<1	<1	<1
	Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
		(kg/ha)		<1	<1	<1	<1	<1	<1
		(mg/kg)		<1	<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	33	37	22	22	21	25
	Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	76	78	80	76	73	78
	Magnesium (%)			23	21	18	21	25	20
	Potassium (%)			1.3	0.30	0.91	0.84	1.0	1.3
	Sodium - ESP (%)			0.29	1.2	1.4	1.9	1.0	1.1
	Aluminium (%)			0.03	0.03	0.02	0.02	0.05	0.02
	Hydrogen (%)			0.00	0.00	0.00	0.00	0.03	0.00
	Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	3.3	3.8	4.6	3.6	3.0	3.9

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			Sample 13	Sample 14	Sample 15	Sample 16	Sample 17	Sample 18
		Sample ID:	5	5	6	6	6	7
		Sample Depth:	0-10	20-30	0-10	30-40	80-90	0-10
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	M8725/13	M8725/14	M8725/15	M8725/16	M8725/17	M8725/18

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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Parameter		Method reference	Sample 19	Sample 20	Sample 21	Sample 22	Sample 23	Sample 24
Sample ID:			7	9	9	9	10	10
Sample Depth:			20-30	0-10	20-30	40-50	0-10	20-30
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			M8725/19	M8725/20	M8725/21	M8725/22	M8725/23	M8725/24
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.28	6.83	7.15	7.64	6.45	6.77
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.049	0.114	0.064	0.054	0.085	0.033
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	22	19	25	38	15	15
	(kg/ha)		10,017	8,617	11,431	17,175	6,707	6,733
	(mg/kg)		4,472	3,847	5,103	7,667	2,994	3,006
Exchangeable Magnesium	(cmol$_+$/kg)		6.0	4.6	5.1	6.5	5.3	7.9
	(kg/ha)		1,644	1,256	1,392	1,767	1,440	2,153
	(mg/kg)		734	561	621	789	643	961
Exchangeable Potassium	(cmol$_+$/kg)		0.18	5.0	3.3	1.6	1.2	0.26
	(kg/ha)		155	4,345	2,930	1,429	1,057	229
	(mg/kg)		69	1,940	1,308	638	472	102
Exchangeable Sodium	(cmol$_+$/kg)		0.37	<0.065	0.15	0.30	0.11	0.21
	(kg/ha)		190	<33	77	155	59	108
	(mg/kg)		85	<15	34	69	26	48
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
	(kg/ha)		<1	1.2	1.5	<1	1.5	2.4
	(mg/kg)		<1	<1	<1	<1	<1	1.1
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	<0.01	<0.01	0.06	<0.01
	(kg/ha)		<1	<1	<1	<1	1.2	<1
	(mg/kg)		<1	<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	29	29	34	47	22	23
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	77	67	75	82	69	64
Magnesium (%)			21	16	15	14	24	34
Potassium (%)			0.61	17	9.8	3.5	5.6	1.1
Sodium - ESP (%)			1.3	0.12	0.44	0.65	0.53	0.90
Aluminium (%)			0.01	0.02	0.02	0.01	0.03	0.05
Hydrogen (%)			0.00	0.00	0.00	0.00	0.26	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	3.7	4.2	5.0	5.9	2.8	1.9

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			Sample 19	Sample 20	Sample 21	Sample 22	Sample 23	Sample 24
		Sample ID:	7	9	9	9	10	10
		Sample Depth:	20-30	0-10	20-30	40-50	0-10	20-30
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	M8725/19	M8725/20	M8725/21	M8725/22	M8725/23	M8725/24

Notes:

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PO BOX 11034 TAMWORTH NSW 2340

			Sample 25	Sample 26	Sample 27	Sample 28	Sample 29	Sample 30
		Sample ID:	10	10	11	11	11	11
		Sample Depth:	50-60	70-80	0-10	15-25	30-40	50-60
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	M8725/25	M8725/26	M8725/27	M8725/28	M8725/29	M8725/30
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.69	7.41	6.41	6.66	6.76	8.13
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.024	0.028	0.045	0.023	0.025	0.060
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	17	22	7.0	5.6	12	14
	Exchangeable Calcium (kg/ha)		7,539	9,779	3,154	2,496	5,404	6,306
	Exchangeable Calcium (mg/kg)		3,366	4,366	1,408	1,114	2,412	2,815
	Exchangeable Magnesium (cmol+/kg)		14	18	2.9	3.3	12	18
	Exchangeable Magnesium (kg/ha)		3,739	4,801	788	894	3,318	4,917
	Exchangeable Magnesium (mg/kg)		1,669	2,143	352	399	1,481	2,195
	Exchangeable Potassium (cmol+/kg)		0.29	0.29	0.72	0.22	0.41	0.46
	Exchangeable Potassium (kg/ha)		255	253	632	192	363	404
	Exchangeable Potassium (mg/kg)		114	113	282	86	162	180
	Exchangeable Sodium (cmol+/kg)		0.54	1.1	0.07	0.11	0.50	1.5
	Exchangeable Sodium (kg/ha)		276	548	39	56	260	791
	Exchangeable Sodium (mg/kg)		123	245	17	25	116	353
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.09	0.04	0.01	0.01	0.04	0.02
	Exchangeable Aluminium (kg/ha)		19	8.2	2.9	2.1	8.9	3.4
	Exchangeable Aluminium (mg/kg)		8.4	3.7	1.3	<1	4.0	1.5
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	<1	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	31	41	11	9.2	25	34
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	53	53	65	61	48	41
	Magnesium (%)		44	43	27	36	48	53
	Potassium (%)		0.93	0.71	6.7	2.4	1.6	1.4
	Sodium - ESP (%)		1.7	2.6	0.70	1.2	2.0	4.5
	Aluminium (%)		0.30	0.10	0.13	0.11	0.18	0.05
	Hydrogen (%)		0.00	0.00	0.09	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	1.2	1.2	2.4	1.7	0.99	0.78

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Analysis requested by Clayton Richards. Your Job: MS-051 Soils
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			Sample 25	Sample 26	Sample 27	Sample 28	Sample 29	Sample 30
		Sample ID:	10	10	11	11	11	11
		Sample Depth:	50-60	70-80	0-10	15-25	30-40	50-60
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	M8725/25	M8725/26	M8725/27	M8725/28	M8725/29	M8725/30

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: Collingwo
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 res
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-estimat
13. ** NATA accreditation does not cover the performance of this service.
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Agricultural Co-Ordinator KS

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			Sample 31	Sample 32	Sample 33	Sample 34	Sample 35	Sample 36
		Sample ID:	12	12	12	13	13	13
		Sample Depth:	0-10	20-30	50-60	0-10	20-30	50-60
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	M8725/31	M8725/32	M8725/33	M8725/34	M8725/35	M8725/36
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.13	7.43	7.75	6.96	6.90	6.86
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.054	0.034	0.027	0.046	0.028	0.019
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	16	14	14	18	14	15
	Exchangeable Calcium (kg/ha)		7,144	6,353	6,500	7,909	6,233	6,805
	Exchangeable Calcium (mg/kg)		3,189	2,836	2,902	3,531	2,783	3,038
	Exchangeable Magnesium (cmol+/kg)		2.6	3.2	3.5	2.6	1.7	2.5
	Exchangeable Magnesium (kg/ha)		703	879	941	695	469	669
	Exchangeable Magnesium (mg/kg)		314	393	420	310	209	299
	Exchangeable Potassium (cmol+/kg)		0.75	0.32	0.35	0.43	0.22	0.35
	Exchangeable Potassium (kg/ha)		659	284	310	374	189	305
	Exchangeable Potassium (mg/kg)		294	127	138	167	84	136
	Exchangeable Sodium (cmol+/kg)		0.10	0.12	0.12	0.07	0.08	0.27
	Exchangeable Sodium (kg/ha)		52	60	62	35	41	139
	Exchangeable Sodium (mg/kg)		23	27	28	16	18	62
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.01	0.01	0.02	0.02	0.02	0.02
	Exchangeable Aluminium (kg/ha)		2.9	2.6	3.5	4.0	3.3	4.6
	Exchangeable Aluminium (mg/kg)		1.3	1.1	1.6	1.8	1.5	2.1
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	<1	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	19	18	18	21	16	18
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	82	79	79	85	87	83
	Magnesium (%)		13	18	19	12	11	13
	Potassium (%)		3.9	1.8	1.9	2.1	1.4	1.9
	Sodium - ESP (%)		0.52	0.65	0.65	0.33	0.50	1.5
	Aluminium (%)		0.07	0.07	0.09	0.10	0.10	0.12
	Hydrogen (%)		0.00	0.00	0.00	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	6.2	4.4	4.2	6.9	8.1	6.2

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Analysis requested by Clayton Richards. Your Job: MS-051 Soils
PO BOX 11034 TAMWORTH NSW 2340

		Sample 31	Sample 32	Sample 33	Sample 34	Sample 35	Sample 36
	Sample ID:	12	12	12	13	13	13
	Sample Depth:	0-10	20-30	50-60	0-10	20-30	50-60
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	M8725/31	M8725/32	M8725/33	M8725/34	M8725/35	M8725/36

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: Collingwo
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 res
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    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-estimat
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Agricultural Co-Ordinator KS

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Analysis requested by Clayton Richards. Your Job: MS-051 Soils
PO BOX 11034 TAMWORTH NSW 2340

			Sample 37	Sample 38	Sample 39	Sample 40	Sample 41	Sample 42
		Sample ID:	13	14	14	15	16	16
		Sample Depth:	80-90	0-10	20-30	0-10	0-10	20-30
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	M8725/37	M8725/38	M8725/39	M8725/40	M8725/41	M8725/42
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.43	6.09	7.74	5.73	5.84	6.57
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.016	0.056	0.037	0.062	0.063	0.028
	Exchangeable Calcium (cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	19	8.5	9.8	8.3	13	16
	Exchangeable Calcium (kg/ha)		8,627	3,824	4,416	3,727	5,760	7,187
	Exchangeable Calcium (mg/kg)		3,851	1,707	1,971	1,664	2,572	3,208
	Exchangeable Magnesium (cmol$_+$/kg)		3.2	2.0	1.6	1.9	5.2	9.4
	Exchangeable Magnesium (kg/ha)		879	551	436	525	1,421	2,558
	Exchangeable Magnesium (mg/kg)		393	246	195	235	634	1,142
	Exchangeable Potassium (cmol$_+$/kg)		0.29	0.96	0.26	0.85	0.45	0.16
	Exchangeable Potassium (kg/ha)		254	842	231	749	397	141
	Exchangeable Potassium (mg/kg)		113	376	103	334	177	63
	Exchangeable Sodium (cmol$_+$/kg)		0.33	<0.065	<0.065	<0.065	0.15	0.30
	Exchangeable Sodium (kg/ha)		169	<33	<33	<33	75	154
	Exchangeable Sodium (mg/kg)		75	<15	<15	<15	34	69
	Exchangeable Aluminium (cmol$_+$/kg)	**Inhouse S37 (KCl)	0.05	0.03	0.02	0.06	0.08	0.10
	Exchangeable Aluminium (kg/ha)		10	6.2	4.1	11	16	21
	Exchangeable Aluminium (mg/kg)		4.5	2.8	1.8	5.1	7.3	9.4
	Exchangeable Hydrogen (cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.01	<0.01	<0.01	0.05	0.09	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	<1	1.2	2.1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	23	12	12	11	19	26
	Calcium (%)	**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	83	74	84	74	68	62
	Magnesium (%)		14	17	14	17	28	36
	Potassium (%)		1.3	8.3	2.2	7.6	2.4	0.62
	Sodium - ESP (%)		1.4	0.41	0.44	0.45	0.77	1.2
	Aluminium (%)		0.22	0.27	0.17	0.51	0.43	0.40
	Hydrogen (%)		0.05	0.00	0.00	0.47	0.49	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol$_+$/kg)	6.0	4.2	6.1	4.3	2.5	1.7

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Analysis requested by Clayton Richards. Your Job: MS-051 Soils
PO BOX 11034 TAMWORTH NSW 2340

		Sample 37	Sample 38	Sample 39	Sample 40	Sample 41	Sample 42
	Sample ID:	13	14	14	15	16	16
	Sample Depth:	80-90	0-10	20-30	0-10	0-10	20-30
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	M8725/37	M8725/38	M8725/39	M8725/40	M8725/41	M8725/42

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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11. Conversions to kg/ha = mg/kg x 2.24
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Parameter		Method reference	Sample 43	Sample 44	Sample 45	Sample 46	Sample 47	Sample 48
Sample ID:			16	17	17	17	17	18
Sample Depth:			40-50	0-10	20-30	50-60	80-90	0-10
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			M8725/43	M8725/44	M8725/45	M8725/46	M8725/47	M8725/48
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.63	6.32	7.27	7.07	7.81	5.84
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.015	0.040	0.032	0.034	0.031	0.048
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	17	11	15	16	22	10
	(kg/ha)		7,589	4,813	6,860	7,155	9,867	4,570
	(mg/kg)		3,388	2,149	3,062	3,194	4,405	2,040
Exchangeable Magnesium	(cmol$_+$/kg)		9.3	4.0	12	9.6	17	2.7
	(kg/ha)		2,530	1,102	3,136	2,624	4,544	742
	(mg/kg)		1,130	492	1,400	1,172	2,029	331
Exchangeable Potassium	(cmol$_+$/kg)		0.13	0.77	0.41	0.57	0.27	0.22
	(kg/ha)		116	674	358	496	239	191
	(mg/kg)		52	301	160	221	106	85
Exchangeable Sodium	(cmol$_+$/kg)		0.30	0.14	0.39	0.33	0.71	0.19
	(kg/ha)		156	74	203	172	365	96
	(mg/kg)		70	33	91	77	163	43
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.55	0.03	0.02	0.02	0.02	0.12
	(kg/ha)		111	6.1	4.0	4.7	4.0	25
	(mg/kg)		50	2.7	1.8	2.1	1.8	11
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	<0.01	<0.01	<0.01	0.09
	(kg/ha)		<1	<1	<1	<1	<1	2.0
	(mg/kg)		<1	<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	27	16	28	27	40	14
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	62	68	55	60	55	75
Magnesium (%)			34	26	42	36	42	20
Potassium (%)			0.49	4.9	1.5	2.1	0.69	1.6
Sodium - ESP (%)			1.1	0.92	1.4	1.3	1.8	1.4
Aluminium (%)			2.0	0.19	0.07	0.09	0.05	0.90
Hydrogen (%)			0.00	0.01	0.00	0.00	0.00	0.67
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	1.8	2.6	1.3	1.7	1.3	3.7

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Analysis requested by Clayton Richards. Your Job: MS-051 Soils
PO BOX 11034 TAMWORTH NSW 2340

		Sample 43	Sample 44	Sample 45	Sample 46	Sample 47	Sample 48
	Sample ID:	16	17	17	17	17	18
	Sample Depth:	40-50	0-10	20-30	50-60	80-90	0-10
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	M8725/43	M8725/44	M8725/45	M8725/46	M8725/47	M8725/48

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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Parameter		Method reference	Sample 49	Sample 50	Sample 51	Sample 52	Sample 53	Sample 54
Sample ID:			18	18	19	19	20	20
Sample Depth:			30-40	70-80	0-10	25-35	0-10	20-30
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			M8725/49	M8725/50	M8725/51	M8725/52	M8725/53	M8725/54
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.27	6.56	6.07	6.93	5.05	5.41
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.016	0.017	0.054	0.024	0.166	0.087
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	15	17	15	14	5.2	6.9
	(kg/ha)		6,689	7,670	6,619	6,319	2,320	3,095
	(mg/kg)		2,986	3,424	2,955	2,821	1,036	1,382
Exchangeable Magnesium	(cmol$_+$/kg)		10	8.5	6.6	8.5	1.3	1.6
	(kg/ha)		2,773	2,301	1,801	2,301	366	426
	(mg/kg)		1,238	1,027	804	1,027	163	190
Exchangeable Potassium	(cmol$_+$/kg)		0.30	0.12	0.59	0.30	1.8	0.52
	(kg/ha)		262	<112	519	262	1,599	457
	(mg/kg)		117	<50	232	117	714	204
Exchangeable Sodium	(cmol$_+$/kg)		0.22	0.07	0.20	0.16	0.10	0.22
	(kg/ha)		114	36	102	84	53	115
	(mg/kg)		51	16	46	37	24	52
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.26	0.32	0.06	0.01	0.46	0.23
	(kg/ha)		53	65	12	2.8	93	46
	(mg/kg)		24	29	5.5	1.3	41	20
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.16	<0.01	0.05	<0.01	0.20	0.11
	(kg/ha)		3.5	<1	1.0	<1	4.5	2.5
	(mg/kg)		1.6	<1	<1	<1	2.0	1.1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	26	26	22	23	9.1	9.5
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	57	66	66	61	57	72
Magnesium (%)			39	32	30	37	15	16
Potassium (%)			1.1	0.48	2.7	1.3	20	5.5
Sodium - ESP (%)			0.85	0.27	0.89	0.71	1.1	2.3
Aluminium (%)			1.0	1.2	0.27	0.06	5.0	2.4
Hydrogen (%)			0.61	0.00	0.20	0.00	2.2	1.1
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	1.5	2.0	2.2	1.7	3.8	4.4

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AGRICULTURAL SOIL ANALYSIS REPORT - RE-ISSUEI

58 samples supplied by Minesoils Pty. Ltd. on 17/05/2022. Lab Job No.M8725 re-issued
Analysis requested by Clayton Richards. Your Job: MS-051 Soils
PO BOX 11034 TAMWORTH NSW 2340

			Sample 49	Sample 50	Sample 51	Sample 52	Sample 53	Sample 54
		Sample ID:	18	18	19	19	20	20
		Sample Depth:	30-40	70-80	0-10	25-35	0-10	20-30
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	M8725/49	M8725/50	M8725/51	M8725/52	M8725/53	M8725/54

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: Collingwo
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 res
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-estimat
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 Conditio
17. This report issued 30/5/22 replaces the report issued on 27/05/2022.

Quality Checked: Kris Saville
Agricultural Co-Ordinator KS

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Analysis requested by Clayton Richards. Your Job: MS-051 Soils
PO BOX 11034 TAMWORTH NSW 2340

			Sample 55	Sample 56	Sample 57	Sample 58
		Sample ID:	21	21	21	21
		Sample Depth:	0-10	30-40	50-60	90-100
		Client:	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	M8725/55	M8725/56	M8725/57	M8725/58
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.93	6.31	6.99	7.42
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.087	0.032	0.036	0.043
	Exchangeable Calcium (cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	5.9	2.7	3.1	11
	Exchangeable Calcium (kg/ha)		2,627	1,196	1,389	4,736
	Exchangeable Calcium (mg/kg)		1,173	534	620	2,114
	Exchangeable Magnesium (cmol$_+$/kg)		1.6	0.94	2.5	18
	Exchangeable Magnesium (kg/ha)		425	255	674	4,933
	Exchangeable Magnesium (mg/kg)		190	114	301	2,202
	Exchangeable Potassium (cmol$_+$/kg)		1.7	0.59	0.46	0.51
	Exchangeable Potassium (kg/ha)		1,486	521	402	443
	Exchangeable Potassium (mg/kg)		664	232	180	198
	Exchangeable Sodium (cmol$_+$/kg)		0.13	<0.065	0.15	1.7
	Exchangeable Sodium (kg/ha)		67	<33	76	901
	Exchangeable Sodium (mg/kg)		30	<15	34	402
	Exchangeable Aluminium (cmol$_+$/kg)	**Inhouse S37 (KCl)	0.03	0.02	0.01	<0.01
	Exchangeable Aluminium (kg/ha)		6.5	4.7	2.1	1.9
	Exchangeable Aluminium (mg/kg)		2.9	2.1	<1	<1
	Exchangeable Hydrogen (cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.05	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		1.2	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	9.3	4.3	6.2	31
	Calcium (%)	**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	63	63	50	34
	Magnesium (%)		17	22	40	59
	Potassium (%)		18	14	7.4	1.6
	Sodium - ESP (%)		1.4	0.91	2.4	5.7
	Aluminium (%)		0.35	0.55	0.17	0.03
	Hydrogen (%)		0.58	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol$_+$/kg)	3.7	2.8	1.3	0.58

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Analysis requested by Clayton Richards. Your Job: MS-051 Soils

PO BOX 11034 TAMWORTH NSW 2340

	Sample 55	Sample 56	Sample 57	Sample 58
Sample ID:	21	21	21	21
Sample Depth:	0-10	30-40	50-60	90-100
Client:	Umwelt	Umwelt	Umwelt	Umwelt
Parameter / **Method reference**	M8725/55	M8725/56	M8725/57	M8725/58

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: Collingwo
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 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-estimat
13. ** NATA accreditation does not cover the performance of this service.
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Quality Checked: Kris Saville
Agricultural Co-Ordinator KS

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Analysis requested by Clayton Richards. Your Job: MS-051 Soils
PO BOX 11034 TAMWORTH NSW 2340

			Heavy Soil	Medium Soil	Light Soil	Sandy Soil
		Sample ID:				
		Sample Depth:				
		Client:	Clay	Clay Loam	Loam	Loamy Sand
	Parameter	Method reference	Indicative guidelines - refer to Notes 6 and 8			
	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
	Exchangeable Calcium (cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	15.6	10.8	5.0	1.9
	Exchangeable Calcium (kg/ha)		7000	4816	2240	840
	Exchangeable Calcium (mg/kg)		3125	2150	1000	375
	Exchangeable Magnesium (cmol$_+$/kg)		2.4	1.7	1.2	0.60
	Exchangeable Magnesium (kg/ha)		650	448	325	168
	Exchangeable Magnesium (mg/kg)		290	200	145	75
	Exchangeable Potassium (cmol$_+$/kg)		0.60	0.50	0.40	0.30
	Exchangeable Potassium (kg/ha)		526	426	336	224
	Exchangeable Potassium (mg/kg)		235	190	150	100
	Exchangeable Sodium (cmol$_+$/kg)		0.3	0.26	0.22	0.11
	Exchangeable Sodium (kg/ha)		155	134	113	57
	Exchangeable Sodium (mg/kg)		69	60	51	25
	Exchangeable Aluminium (cmol$_+$/kg)	**Inhouse S37 (KCl)	0.6	0.5	0.4	0.2
	Exchangeable Aluminium (kg/ha)		121	101	73	30
	Exchangeable Aluminium (mg/kg)		54	45	32	14
	Exchangeable Hydrogen (cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.6	0.5	0.4	0.2
	Exchangeable Hydrogen (kg/ha)		13	11	8	3
	Exchangeable Hydrogen (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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Analysis requested by Clayton Richards. Your Job: MS-051 Soils
PO BOX 11034 TAMWORTH NSW 2340

	Heavy Soil	Medium Soil	Light Soil	Sandy Soil
Sample ID:				
Sample Depth:				
Client:	*Clay*	*Clay Loam*	*Loam*	*Loamy Sand*

	Parameter	Method reference	Indicative guidelines - refer to Notes 6 and 8

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: Collingwo
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 res
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-estimat
13. ** NATA accreditation does not cover the performance of this service.
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17. This report issued 30/5/22 replaces the report issued on 27/05/2022.

Quality Checked: Kris Saville
Agricultural Co-Ordinator KS

GRAIN SIZE ANALYSIS (hydrometer and sieving techniques)

58 soil samples supplied by Minesoils Pty. Ltd. on 17 May, 2022 - Lab Job No. M8725

Analysis requested by Clayton Richards. Job ref. MS-062 Soils

PO BOX 11034 TAMWORTH NSW 2340

SAMPLE ID	Lab Code	MOISTURE CONTENT (% of water in sample)	TOTAL GRAVEL > 2 mm (% of total oven-dry equivalent)	GRAVEL > 4.75 mm (% of total oven-dry equivalent)	GRAVEL 2.00-4.75 mm (% of total oven-dry equivalent)	COARSE SAND 200-2000 µm (0.2-2.0 mm) (% of total oven-dry equivalent)	FINE SAND 20-200 µm (0.02-0.2 mm) (% of total oven-dry equivalent)	SILT 2-20 µm ISSS (% of total oven-dry equivalent)	CLAY < 2 µm (% of total oven-dry equivalent)
1 0-10 cm	M8725/1	20.4%	2.1%	0.4%	1.6%	7.3%	38.6%	23.5%	28.5%
1 20-30 cm	M8725/2	21.6%	0.9%	0.0%	0.9%	6.6%	31.3%	18.6%	42.7%
1 50-60 cm	M8725/3	22.4%	1.4%	0.0%	1.4%	4.1%	23.7%	10.2%	60.7%
1 80-90 cm	M8725/4	18.7%	0.5%	0.0%	0.5%	4.3%	24.9%	10.0%	60.2%
2 0-10 cm	M8725/5	16.4%	1.3%	0.3%	1.1%	16.3%	46.4%	18.8%	17.1%
2 20-30 cm	M8725/6	16.1%	3.5%	0.3%	3.2%	18.8%	44.6%	15.0%	18.1%
2 60-70 cm	M8725/7	14.4%	10.2%	2.7%	7.5%	11.3%	39.8%	11.4%	27.4%
2 80-90 cm	M8725/8	19.6%	3.4%	1.8%	1.6%	5.8%	42.6%	11.3%	36.9%
3 0-10 cm	M8725/9	21.8%	33.0%	25.3%	7.8%	16.8%	22.5%	15.2%	12.5%
3 20-30 cm	M8725/10	18.9%	8.4%	0.0%	8.4%	24.3%	29.9%	20.5%	16.9%
4 0-10 cm	M8725/11	12.8%	16.7%	3.1%	13.6%	17.6%	38.3%	14.4%	13.0%
4 20-30 cm	M8725/12	11.2%	16.8%	9.3%	7.4%	12.6%	36.4%	22.6%	11.6%
5 0-10 cm	M8725/13	19.3%	23.5%	11.7%	11.8%	12.7%	21.3%	14.2%	28.2%
5 20-30 cm	M8725/14	16.1%	12.5%	6.6%	5.9%	12.6%	17.5%	30.0%	27.4%
6 0-10 cm	M8725/15	18.7%	0.3%	0.0%	0.3%	40.6%	24.3%	15.2%	19.6%
6 30-40 cm	M8725/16	19.7%	0.3%	0.0%	0.3%	6.5%	40.8%	21.9%	30.5%
6 80-90 cm	M8725/17	12.6%	1.1%	0.0%	1.1%	11.0%	48.8%	18.4%	20.7%
7 0-10 cm	M8725/18	15.6%	22.6%	14.3%	8.3%	17.3%	27.9%	15.5%	16.7%
7 20-30 cm	M8725/19	14.9%	22.4%	10.0%	12.3%	20.4%	19.5%	18.4%	19.4%
9 0-10 cm	M8725/20	24.2%	2.1%	0.0%	2.1%	8.3%	50.9%	21.4%	17.3%
9 20-30 cm	M8725/21	22.3%	9.2%	0.0%	9.2%	2.4%	34.8%	13.9%	39.6%
9 40-50 cm	M8725/22	22.8%	6.5%	0.0%	6.5%	26.8%	9.7%	9.1%	48.0%
10 0-10 cm	M8725/23	8.0%	11.5%	0.0%	11.5%	17.4%	32.5%	16.5%	22.1%
10 20-30 cm	M8725/24	5.2%	15.2%	4.3%	11.0%	13.9%	20.2%	19.2%	31.5%
10 50-60 cm	M8725/25	15.3%	2.4%	0.0%	2.4%	5.9%	15.6%	7.9%	68.2%
10 70-80 cm	M8725/26	22.9%	2.9%	0.0%	2.9%	8.3%	28.2%	6.1%	54.5%
11 0-10 cm	M8725/27	17.5%	10.0%	0.0%	10.0%	17.9%	42.4%	15.6%	14.0%
11 15-25 cm	M8725/28	15.3%	12.0%	3.6%	8.5%	10.3%	42.2%	16.5%	18.9%
11 30-40 cm	M8725/29	23.0%	7.5%	1.0%	6.5%	9.5%	4.3%	16.0%	62.6%
11 50-60 cm	M8725/30	15.6%	0.6%	0.0%	0.6%	22.1%	10.7%	13.7%	52.9%
12 0-10 cm	M8725/31	15.0%	2.2%	0.0%	2.2%	21.2%	51.9%	14.3%	10.5%
12 20-30 cm	M8725/32	13.5%	8.4%	2.3%	6.1%	36.5%	39.6%	11.8%	3.7%
12 50-60 cm	M8725/33	13.4%	18.1%	5.7%	12.4%	26.8%	31.0%	8.8%	15.3%
13 0-10 cm	M8725/34	15.9%	14.8%	2.5%	12.2%	17.3%	43.9%	21.2%	2.9%
13 20-30 cm	M8725/35	15.3%	14.6%	3.2%	11.4%	17.9%	36.5%	17.5%	13.5%
13 50-60 cm	M8725/36	15.4%	14.0%	4.8%	9.2%	16.7%	32.0%	14.2%	23.2%
13 80-90 cm	M8725/37	17.1%	3.4%	0.6%	2.8%	24.9%	16.3%	13.4%	42.0%
14 0-10 cm	M8725/38	16.1%	24.1%	12.5%	11.6%	24.8%	18.2%	12.2%	20.8%
14 20-30 cm	M8725/39	16.1%	9.7%	0.0%	9.7%	19.3%	10.5%	16.4%	44.2%
15 0-10 cm	M8725/40	18.1%	26.9%	10.2%	16.7%	25.4%	19.0%	15.0%	13.8%
16 0-10 cm	M8725/41	18.4%	16.9%	10.1%	6.9%	13.4%	24.8%	19.9%	25.0%
16 20-30 cm	M8725/42	19.3%	4.6%	0.0%	4.6%	22.4%	22.6%	14.0%	36.3%
16 40-50 cm	M8725/43	11.8%	3.4%	0.0%	3.4%	35.9%	26.3%	8.5%	25.8%
17 0-10 cm	M8725/44	16.8%	7.7%	3.7%	3.9%	7.4%	31.7%	19.7%	33.5%
17 20-30 cm	M8725/45	24.1%	1.5%	0.0%	1.5%	2.8%	20.0%	3.1%	72.5%
17 50-60 cm	M8725/46	22.4%	1.0%	0.0%	1.0%	3.8%	31.6%	15.6%	48.1%
17 80-90 cm	M8725/47	20.8%	9.5%	0.0%	9.5%	3.5%	13.3%	17.3%	56.4%
18 0-10 cm	M8725/48	15.4%	17.8%	8.7%	9.2%	16.2%	29.1%	15.5%	21.4%
18 30-40 cm	M8725/49	22.7%	0.6%	0.0%	0.6%	3.4%	23.6%	13.9%	58.5%
18 70-80 cm	M8725/50	9.9%	21.6%	2.8%	18.8%	45.6%	6.3%	7.8%	18.6%
19 0-10 cm	M8725/51	18.6%	26.0%	21.1%	4.9%	5.0%	17.0%	21.5%	30.5%
19 25-35 cm	M8725/52	22.1%	16.3%	11.9%	4.4%	5.5%	12.1%	16.7%	49.4%
20 0-10 cm	M8725/53	17.0%	1.9%	0.0%	1.9%	12.2%	50.2%	11.5%	24.1%
20 20-30 cm	M8725/54	17.8%	1.4%	0.0%	1.4%	13.9%	48.2%	15.1%	21.4%
21 0-10 cm	M8725/55	19.0%	2.6%	0.0%	2.6%	7.8%	49.5%	19.6%	20.5%
21 30-40 cm	M8725/56	14.1%	4.9%	2.1%	2.8%	5.8%	41.5%	19.4%	28.4%
21 50-60 cm	M8725/57	11.8%	18.2%	7.3%	10.9%	6.8%	36.9%	10.4%	27.7%
21 90-100 cm	M8725/58	23.2%	1.7%	0.0%	1.7%	1.3%	6.8%	12.1%	78.0%

Note:

1: The Hydrometer Analysis method was used to determine the percentage sand, silt and clay,
modified from SOP meth004 (California Dept of Pesticide Regulation), using method of Gee & Bauder (1986),
in *Methods of Soil Analysis. Part 1* Agron. Monogr. 9 (2nd Ed). Klute, A., American Soc. of Agronomy Inc., Soil Sci. Soc. America Inc., Madison WI: 383-411.

2: Australian Standard 1289.3.8.1-1997 (see attached)

3. Analysis conducted between sample arrival date and reporting date.

4. This report is not to be reproduced except in full. Results only relate to the item tested.

5. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal).

6. This final report was issued on 15/06/2022 and replaces the report issued on 10/06/2022. The report now includes the data for M8725/51.

checked: .....
Graham Lancaster (Nata signatory)
Laboratory Manager

Munsell Colour

58 soil samples supplied by Minesoils Pty. Ltd. on 17 May, 2022 - Lab Job No. M8725
Analysis requested by Clayton Richards. Job ref. MS-062 Soils
PO BOX 11034 TAMWORTH NSW 2340

SAMPLE ID	Lab Code	MOIST MUNSELL COLOUR		MOTTLE MUNSELL COLOUR		DEGREE OF MOTTLING (%)
		Code	Description	Code	Description	
1 0-10 cm	M8725/1	5YR 2.5/2	DARK REDDISH BROWN	..	..	..
1 20-30 cm	M8725/2	2.5YR 2.5/2	VERY DUSKY RED	..	..	..
1 50-60 cm	M8725/3	10YR 4/6	DARK YELLOWISH BROWN	..	..	..
1 80-90 cm	M8725/4	10YR 5/6	YELLOWISH BROWN	7.5YR 3/1	VERY DARK GRAY	40
2 0-10 cm	M8725/5	7.5YR 3/4	DARK BROWN	..	..	..
2 20-30 cm	M8725/6	7.5YR 3/4	DARK BROWN		..	..
2 60-70 cm	M8725/7	10YR 3/4	DARK YELLOWISH BROWN	..	..	..
2 80-90 cm	M8725/8	10YR 4/6	DARK YELLOWISH BROWN	..	..	..
3 0-10 cm	M8725/9	7.5YR 3/3	DARK BROWN	..	..	..
3 20-30 cm	M8725/10	7.5YR 3/3	DARK BROWN	..	..	..
4 0-10 cm	M8725/11	10YR 4/4	DARK YELLOWISH BROWN	..	..	..
4 20-30 cm	M8725/12	7.5YR 5/4	BROWN	..	..	..
5 0-10 cm	M8725/13	10YR 3/3	DARK BROWN	5YR 5/6	YELLOWISH RED	15
5 20-30 cm	M8725/14	10YR 4/6	DARK YELLOWISH BROWN	..	..	..
6 0-10 cm	M8725/15	10YR 2/2	VERY DARK BROWN	..	..	..
6 30-40 cm	M8725/16	10YR 2/2	VERY DARK BROWN	..	..	..
6 80-90 cm	M8725/17	10YR 2/2	VERY DARK BROWN	..	..	..
7 0-10 cm	M8725/18	10YR 3/3	DARK BROWN	..	..	..
7 20-30 cm	M8725/19	7.5YR 2.5/3	VERY DARK BROWN	..	..	..
9 0-10 cm	M8725/20	7.5YR 2.5/3	VERY DARK BROWN	..	..	..
9 20-30 cm	M8725/21	7.5YR 3/3	DARK BROWN	..	..	..
9 40-50 cm	M8725/22	7.5YR 3/2	DARK BROWN	..	..	..
10 0-10 cm	M8725/23	7.5YR 3/4	DARK BROWN	..	..	..
10 20-30 cm	M8725/24	5YR 4/6	YELLOWISH RED	..	..	..
10 50-60 cm	M8725/25	5YR 4/6	YELLOWISH RED	..	..	..
10 70-80 cm	M8725/26	7.5YR 4/6	STRONG BROWN	7.5YR 2.5/1	BLACK	7
11 0-10 cm	M8725/27	7.5YR 2.5/2	VERY DARK BROWN	..	..	..
11 15-25 cm	M8725/28	10YR 4/3	BROWN	..	..	..
11 30-40 cm	M8725/29	5YR 4/4	REDDISH BROWN	..	..	..
11 50-60 cm	M8725/30	10YR 5/4	YELLOWISH BROWN	..	..	..
12 0-10 cm	M8725/31	10YR 2/2	VERY DARK BROWN	..	..	..
12 20-30 cm	M8725/32	10YR 2/2	VERY DARK BROWN	..	..	..
12 50-60 cm	M8725/33	10YR 2/2	VERY DARK BROWN	..	..	..
13 0-10 cm	M8725/34	10YR 2/2	VERY DARK BROWN	..	..	..
13 20-30 cm	M8725/35	7.5YR 2.5/3	VERY DARK BROWN	..	..	..
13 50-60 cm	M8725/36	7.5YR 3/4	DARK BROWN	..	..	..
13 80-90 cm	M8725/37	7.5YR 2.5/2	VERY DARK BROWN	..	..	..
14 0-10 cm	M8725/38	5YR 3/4	DARK REDDISH BROWN	..	..	..
14 20-30 cm	M8725/39	5YR 4/6	YELLOWISH RED	10YR 8/8	YELLOW	3
15 0-10 cm	M8725/40	7.5YR 2.5/2	VERY DARK BROWN	..	..	..
16 0-10 cm	M8725/41	7.5YR 3/4	DARK BROWN	..	..	..
16 20-30 cm	M8725/42	5YR 4/6	YELLOWISH RED	..	..	..
16 40-50 cm	M8725/43	10YR 6/6	BROWNISH YELLOW	..	..	..
17 0-10 cm	M8725/44	7.5YR 3/2	DARK BROWN	..	..	..
17 20-30 cm	M8725/45	5YR 4/4	REDDISH BROWN	..	..	..
17 50-60 cm	M8725/46	7.5YR 3/4	DARK BROWN	..	..	..
17 80-90 cm	M8725/47	10YR 5/4	YELLOWISH BROWN	..	..	..
18 0-10 cm	M8725/48	7.5YR 3/3	DARK BROWN	..	..	..
18 30-40 cm	M8725/49	2.5YR 3/6	DARK RED	..	..	..
18 70-80 cm	M8725/50	7.5YR 5/6	STRONG BROWN	..	..	..
19 0-10 cm	M8725/51	7.5YR 3/4	DARK BROWN	..	..	..
19 25-35 cm	M8725/52	7.5YR 2.5/3	VERY DARK BROWN	2.5YR 8/8	YELLOW	30
20 0-10 cm	M8725/53	7.5YR 2.5/3	VERY DARK BROWN	..	..	..
20 20-30 cm	M8725/54	7.5YR 3/3	DARK BROWN	..	..	..
21 0-10 cm	M8725/55	7.5YR 2.5/3	VERY DARK BROWN	..	..	..
21 30-40 cm	M8725/56	5YR 5/8	YELLOWISH RED	..	..	..
21 50-60 cm	M8725/57	10YR 3/6	DARK YELLOWISH BROWN	..	..	..
21 90-100 cm	M8725/58	7.5YR 3/4	DARK BROWN	..	..	..

Note:
1: The Munsell Colour Chart was used to determine the colour
2. Analysis conducted between sample arrival date and reporting date.
3. This report is not to be reproduced except in full. Results only relate to the item tested.
4. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal).
5. This report was issued on 10/06/2022.

GRAIN SIZE ANALYSIS (hydrometer and sieving techniques)

224 soil samples supplied by Minesoils Pty Ltd on 3 May, 2021 - Lab Job No. K6461.
Analysis requested by Clayton Richards. Your project: MS-051 BSAL
PO Box 11034 TAMWORTH NSW 2340.

SAMPLE ID	Lab Code	MOISTURE CONTENT (% of water in sample)	TOTAL GRAVEL > 2 mm (% of total oven-dry equivalent)	GRAVEL > 4.75 mm (% of total oven-dry equivalent)	GRAVEL 2.00-4.75 mm (% of total oven-dry equivalent)	COARSE SAND 200-2000 µm (0.2-2.0 mm) (% of total oven-dry equivalent)	FINE SAND 20-200 µm (0.02-0.2 mm) (% of total oven-dry equivalent)	SILT 2-20 µm ISSS (% of total oven-dry equivalent)	CLAY < 2 µm (% of total oven-dry equivalent)	Total soil fractions (incl. Gravel)
1 0-10cm	K6461/1	20.3%	2.2%	0.0%	2.2%	7.0%	48.4%	27.6%	14.7%	100.0%
1 20-30cm	K6461/2	18.3%	0.8%	0.0%	0.8%	7.8%	44.1%	32.2%	15.1%	100.0%
1 40-50cm	K6461/3	15.3%	0.2%	0.0%	0.2%	8.3%	38.3%	31.2%	22.1%	100.0%
1 65-75cm	K6461/4	10.4%	1.7%	0.0%	1.7%	9.7%	35.6%	25.4%	27.6%	100.0%
2 0-10cm	K6461/5	16.5%	1.6%	0.0%	1.6%	8.7%	42.6%	17.5%	29.6%	100.0%
2 20-30cm	K6461/6	25.2%	0.6%	0.0%	0.6%	4.3%	24.4%	10.4%	60.3%	100.0%
2 40-50cm	K6461/7	23.9%	0.9%	0.0%	0.9%	4.9%	29.4%	13.1%	51.7%	100.0%
2 65-75cm	K6461/8	19.4%	0.8%	0.0%	0.8%	5.7%	29.2%	12.0%	52.3%	100.0%
3 0-10cm	K6461/9	18.5%	3.9%	0.0%	3.9%	8.7%	40.6%	22.5%	24.3%	100.0%
3 20-30cm	K6461/10	24.8%	1.1%	0.0%	1.1%	5.0%	23.6%	7.2%	63.0%	100.0%
3 40-50cm	K6461/11	21.2%	0.4%	0.0%	0.4%	4.5%	25.0%	7.6%	62.5%	100.0%
3 65-75cm	K6461/12	17.4%	0.3%	0.0%	0.3%	5.9%	22.9%	17.9%	53.0%	100.0%
4 0-10cm	K6461/13	17.8%	1.6%	0.0%	1.6%	8.9%	53.0%	19.8%	16.6%	100.0%
4 20-30cm	K6461/14	24.8%	3.9%	0.0%	3.9%	8.0%	31.9%	21.9%	34.2%	100.0%
4 40-50cm	K6461/15	16.5%	4.3%	0.0%	4.3%	7.8%	29.1%	19.8%	39.0%	100.0%
4 65-75cm	K6461/16	11.0%	6.0%	0.0%	6.0%	11.0%	41.5%	18.4%	23.1%	100.0%
5 0-10cm	K6461/17	17.7%	1.7%	0.0%	1.7%	4.9%	55.8%	21.1%	16.5%	100.0%
5 20-30cm	K6461/18	14.7%	7.2%	0.0%	7.2%	3.2%	56.0%	17.7%	15.9%	100.0%
5 40-50cm	K6461/19	12.5%	11.1%	0.0%	11.1%	5.3%	35.3%	15.3%	33.0%	100.0%
5 65-75cm	K6461/20	14.7%	2.3%	0.0%	2.3%	5.9%	36.0%	14.3%	41.6%	100.0%
6 0-10cm	K6461/21	16.4%	2.7%	0.0%	2.7%	7.9%	47.6%	21.1%	20.6%	100.0%
6 20-30cm	K6461/22	23.4%	0.7%	0.0%	0.7%	2.9%	19.9%	11.2%	65.2%	100.0%
6 40-50cm	K6461/23	11.7%	2.1%	0.0%	2.1%	2.8%	31.0%	12.8%	51.3%	100.0%
6 65-75cm	K6461/24	21.3%	3.7%	0.0%	3.7%	4.5%	30.2%	11.2%	50.4%	100.0%
7 0-10cm	K6461/25	17.8%	1.2%	0.0%	1.2%	4.5%	63.9%	10.6%	19.8%	100.0%

checked: .....
Graham Lancaster (Nata signatory)
Laboratory Manager

SAMPLE ID	Lab Code	MOISTURE CONTENT (% of water in sample)	TOTAL GRAVEL > 2 mm (% of total oven-dry equivalent)	GRAVEL > 4.75 mm (% of total oven-dry equivalent)	GRAVEL 2.00-4.75 mm (% of total oven-dry equivalent)	COARSE SAND 200-2000 µm (0.2-2.0 mm) (% of total oven-dry equivalent)	FINE SAND 20-200 µm (0.02-0.2 mm) (% of total oven-dry equivalent)	SILT 2-20 µm ISSS (% of total oven-dry equivalent)	CLAY < 2 µm (% of total oven-dry equivalent)	Total soil fractions (incl. Gravel)
7 20-30cm	K6461/26	17.7%	0.0%	0.0%	0.0%	2.1%	47.0%	11.1%	39.8%	100.0%
7 40-50cm	K6461/27	20.2%	0.4%	0.0%	0.4%	0.9%	35.3%	8.4%	54.9%	100.0%
7 65-75cm	K6461/28	15.6%	0.5%	0.0%	0.5%	1.0%	36.4%	15.7%	46.4%	100.0%
10 0-10cm	K6461/29	13.5%	0.6%	0.0%	0.6%	4.8%	64.0%	16.4%	14.1%	100.0%
10 20-30cm	K6461/30	13.6%	7.6%	0.0%	7.6%	3.3%	53.1%	14.2%	21.7%	100.0%
10 40-50cm	K6461/31	11.8%	3.0%	0.0%	3.0%	3.9%	43.5%	12.9%	36.6%	100.0%
10 65-75cm	K6461/32	10.5%	59.9%	53.0%	6.8%	4.6%	18.3%	7.1%	10.1%	100.0%
11 0-10cm	K6461/33	13.5%	22.4%	0.0%	22.4%	10.0%	40.8%	16.5%	10.3%	100.0%
11 20-30cm	K6461/34	13.7%	66.5%	56.9%	9.5%	2.6%	9.6%	7.4%	14.0%	100.0%
11 40-50cm	K6461/35	25.5%	4.8%	0.0%	4.8%	2.7%	12.4%	10.4%	69.8%	100.0%
11 65-75cm	K6461/36	23.0%	4.4%	0.0%	4.4%	2.2%	11.0%	11.9%	70.5%	100.0%
12 0-10cm	K6461/37	13.2%	1.1%	0.0%	1.1%	3.7%	65.2%	13.1%	17.0%	100.0%
12 20-30cm	K6461/38	14.0%	0.3%	0.0%	0.3%	2.2%	49.5%	16.0%	31.9%	100.0%
12 40-50cm	K6461/39	12.9%	1.7%	0.0%	1.7%	1.4%	40.8%	14.3%	41.7%	100.0%
12 65-75cm	K6461/40	15.1%	1.4%	0.0%	1.4%	1.9%	38.2%	14.9%	43.6%	100.0%
13 0-10cm	K6461/41	15.5%	0.9%	0.0%	0.9%	5.8%	62.4%	9.6%	21.2%	100.0%
13 20-30cm	K6461/42	14.4%	7.6%	6.0%	1.6%	3.8%	50.4%	9.2%	29.0%	100.0%
13 40-50cm	K6461/43	16.3%	11.4%	0.0%	11.4%	5.5%	34.2%	12.7%	36.2%	100.0%
13 65-75cm	K6461/44	16.5%	7.0%	2.7%	4.3%	5.0%	37.6%	13.9%	36.5%	100.0%
18 0-10cm	K6461/45	28.6%	4.1%	0.0%	4.1%	8.8%	39.4%	27.1%	20.6%	100.0%
18 20-30cm	K6461/46	23.0%	7.8%	1.9%	5.9%	3.7%	41.8%	30.4%	16.4%	100.0%
18 40-50cm	K6461/47	17.3%	15.5%	0.0%	15.5%	4.7%	38.3%	24.9%	16.5%	100.0%
18 65-75cm	K6461/48	26.2%	0.3%	0.0%	0.3%	1.4%	21.4%	21.6%	55.3%	100.0%
19 0-10cm	K6461/49	22.7%	0.9%	0.0%	0.9%	2.6%	52.7%	33.6%	10.2%	100.0%
19 20-30cm	K6461/50	20.1%	23.1%	7.2%	15.9%	2.2%	35.4%	27.3%	12.0%	100.0%

Environmental Analysis Laboratory, Southern Cross University,
Tel. 02 6620 3678, website: scu.edu.au/eal

checked: .....
Graham Lancaster (Nata signatory)
Laboratory Manager

SAMPLE ID	Lab Code	MOISTURE CONTENT (% of water in sample)	TOTAL GRAVEL > 2 mm (% of total oven-dry equivalent)	GRAVEL > 4.75 mm (% of total oven-dry equivalent)	GRAVEL 2.00-4.75 mm (% of total oven-dry equivalent)	COARSE SAND 200-2000 µm (0.2-2.0 mm) (% of total oven-dry equivalent)	FINE SAND 20-200 µm (0.02-0.2 mm) (% of total oven-dry equivalent)	SILT 2-20 µm ISSS (% of total oven-dry equivalent)	CLAY < 2 µm (% of total oven-dry equivalent)	Total soil fractions (incl. Gravel)
19 40-50cm	K6461/51	25.0%	0.1%	0.0%	0.1%	2.1%	23.3%	19.9%	54.5%	100.0%
19 65-75cm	K6461/52	21.7%	7.0%	0.0%	7.0%	3.1%	57.1%	28.7%	4.0%	100.0%
20 0-10cm	K6461/53	21.2%	3.9%	0.0%	3.9%	3.7%	58.0%	28.2%	6.2%	100.0%
20 20-30cm	K6461/54	13.8%	21.0%	0.0%	21.0%	6.8%	41.2%	24.9%	6.1%	100.0%
20 40-50cm	K6461/55	24.4%	1.0%	0.0%	1.0%	3.4%	24.3%	8.1%	63.2%	100.0%
20 65-75cm	K6461/56	17.7%	8.1%	0.0%	8.1%	6.3%	31.2%	14.0%	40.3%	100.0%
21 0-10cm	K6461/57	17.2%	4.4%	0.0%	4.4%	13.1%	48.5%	24.1%	9.8%	100.0%
21 15-25cm	K6461/58	14.7%	7.7%	0.0%	7.7%	13.5%	51.1%	23.2%	4.6%	100.0%
21 40-50cm	K6461/59	26.2%	1.2%	0.0%	1.2%	3.8%	13.3%	15.8%	66.0%	100.0%
21 65-75cm	K6461/60	22.3%	2.4%	0.0%	2.4%	4.1%	20.3%	20.7%	52.6%	100.0%
22 0-10cm	K6461/61	17.5%	1.5%	0.0%	1.5%	26.9%	43.3%	16.9%	11.4%	100.0%
22 20-30cm	K6461/62	17.1%	0.5%	0.0%	0.5%	9.6%	13.7%	10.3%	65.9%	100.0%
22 40-50cm	K6461/63	12.5%	0.3%	0.0%	0.3%	9.7%	17.9%	21.0%	51.0%	100.0%
22 65-75cm	K6461/64	12.7%	0.0%	0.0%	0.0%	11.1%	21.7%	16.4%	50.9%	100.0%
24 0-10cm	K6461/65	15.2%	0.5%	0.0%	0.5%	8.9%	47.0%	16.7%	26.9%	100.0%
24 20-30cm	K6461/66	12.9%	1.6%	0.0%	1.6%	4.7%	38.3%	13.0%	42.4%	100.0%
24 40-50cm	K6461/67	14.2%	3.0%	0.0%	3.0%	3.4%	29.2%	16.1%	48.3%	100.0%
24 65-75cm	K6461/68	12.2%	6.3%	4.3%	2.0%	4.4%	37.0%	15.3%	36.9%	100.0%
25 0-10cm	K6461/69	17.7%	3.8%	0.0%	3.8%	4.8%	39.2%	18.0%	34.1%	100.0%
25 20-30cm	K6461/70	12.6%	14.4%	0.0%	14.4%	6.1%	50.1%	10.6%	18.8%	100.0%
25 40-50cm	K6461/71	15.1%	3.1%	0.0%	3.1%	5.0%	30.1%	15.6%	46.1%	100.0%
25 65-75cm	K6461/72	17.3%	11.1%	0.0%	11.1%	4.9%	28.6%	7.1%	48.3%	100.0%
26 0-10cm	K6461/73	13.7%	4.3%	0.0%	4.3%	18.5%	48.1%	13.2%	15.8%	100.0%
26 20-30cm	K6461/74	19.2%	2.6%	0.0%	2.6%	11.0%	22.2%	11.4%	52.8%	100.0%
26 40-50cm	K6461/75	22.6%	1.5%	0.0%	1.5%	6.0%	13.5%	11.1%	67.9%	100.0%

[redacted]

checked: .....
Graham Lancaster (Nata signatory)
Laboratory Manager

SAMPLE ID	Lab Code	MOISTURE CONTENT (% of water in sample)	TOTAL GRAVEL > 2 mm (% of total oven-dry equivalent)	GRAVEL > 4.75 mm (% of total oven-dry equivalent)	GRAVEL 2.00-4.75 mm (% of total oven-dry equivalent)	COARSE SAND 200-2000 µm (0.2-2.0 mm) (% of total oven-dry equivalent)	FINE SAND 20-200 µm (0.02-0.2 mm) (% of total oven-dry equivalent)	SILT 2-20 µm ISSS (% of total oven-dry equivalent)	CLAY < 2 µm (% of total oven-dry equivalent)	Total soil fractions (incl. Gravel)
26 65-75cm	K6461/76	24.1%	13.9%	0.0%	13.9%	18.6%	16.3%	16.0%	35.2%	100.0%
28 0-10cm	K6461/77	14.6%	4.2%	0.0%	4.2%	3.5%	47.5%	31.2%	13.6%	100.0%
28 20-30cm	K6461/78	10.4%	24.8%	0.0%	24.8%	5.2%	41.3%	21.6%	7.1%	100.0%
28 40-50cm	K6461/79	12.3%	7.5%	0.0%	7.5%	12.3%	32.6%	4.9%	42.6%	100.0%
28 65-75cm	K6461/80	15.3%	0.5%	0.0%	0.5%	1.0%	21.6%	19.2%	57.8%	100.0%
29 0-10cm	K6461/81	19.7%	1.1%	0.0%	1.1%	6.1%	51.5%	21.4%	19.9%	100.0%
29 20-30cm	K6461/82	13.9%	5.1%	0.0%	5.1%	5.0%	36.9%	13.7%	39.3%	100.0%
29 40-50cm	K6461/83	14.9%	15.8%	0.0%	15.8%	7.1%	21.1%	12.1%	43.8%	100.0%
29 65-75cm	K6461/84	19.6%	6.9%	0.0%	6.9%	2.2%	8.8%	14.5%	67.7%	100.0%
30 0-10cm	K6461/85	19.8%	0.2%	0.0%	0.2%	2.7%	18.1%	14.1%	65.0%	100.0%
30 20-30cm	K6461/86	23.1%	0.7%	0.0%	0.7%	2.0%	7.6%	16.8%	73.0%	100.0%
30 40-50cm	K6461/87	18.9%	1.5%	0.0%	1.5%	7.3%	1.3%	8.0%	81.9%	100.0%
30 65-75cm	K6461/88	17.4%	0.9%	0.0%	0.9%	6.3%	0.7%	9.0%	83.2%	100.0%
31 0-10cm	K6461/89	17.5%	0.9%	0.0%	0.9%	4.1%	41.6%	19.7%	33.8%	100.0%
31 20-30cm	K6461/90	16.6%	1.0%	0.0%	1.0%	3.1%	28.2%	15.5%	52.2%	100.0%
31 40-50cm	K6461/91	19.0%	1.3%	0.0%	1.3%	2.5%	32.2%	19.2%	44.9%	100.0%
31 65-75cm	K6461/92	19.5%	1.1%	0.0%	1.1%	1.7%	37.4%	11.4%	48.5%	100.0%
32 0-10cm	K6461/93	16.3%	0.2%	0.0%	0.2%	3.0%	59.5%	17.8%	19.4%	100.0%
32 20-30cm	K6461/94	16.7%	0.6%	0.0%	0.6%	1.8%	45.7%	17.1%	34.8%	100.0%
32 40-50cm	K6461/95	17.7%	1.6%	0.0%	1.6%	1.7%	42.3%	18.0%	36.4%	100.0%
32 65-75cm	K6461/96	16.1%	3.3%	0.0%	3.3%	4.5%	31.0%	21.8%	39.4%	100.0%
33 0-10cm	K6461/97	16.1%	0.2%	0.0%	0.2%	2.5%	55.5%	25.9%	15.8%	100.0%
33 20-30cm	K6461/98	16.9%	3.0%	2.0%	0.9%	1.5%	39.0%	21.0%	35.5%	100.0%
33 40-50cm	K6461/99	18.9%	1.2%	0.0%	1.2%	2.0%	40.8%	18.1%	37.9%	100.0%
33 65-75cm	K6461/100	16.1%	2.0%	0.0%	2.0%	1.1%	28.8%	21.7%	46.4%	100.0%

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Graham Lancaster (Nata signatory)
Laboratory Manager

SAMPLE ID	Lab Code	MOISTURE CONTENT (% of water in sample)	TOTAL GRAVEL > 2 mm (% of total oven-dry equivalent)	GRAVEL > 4.75 mm (% of total oven-dry equivalent)	GRAVEL 2.00-4.75 mm (% of total oven-dry equivalent)	COARSE SAND 200-2000 µm (0.2-2.0 mm) (% of total oven-dry equivalent)	FINE SAND 20-200 µm (0.02-0.2 mm) (% of total oven-dry equivalent)	SILT 2-20 µm ISSS (% of total oven-dry equivalent)	CLAY < 2 µm (% of total oven-dry equivalent)	Total soil fractions (incl. Gravel)
34 0-10cm	K6461/101	15.0%	6.3%	0.0%	6.3%	10.2%	45.8%	23.4%	14.3%	100.0%
34 20-30cm	K6461/102	13.8%	5.5%	0.0%	5.5%	10.8%	42.4%	21.3%	20.1%	100.0%
34 40-50cm	K6461/103	14.7%	23.9%	0.0%	23.9%	6.6%	30.6%	16.1%	22.8%	100.0%
34 65-75cm	K6461/104	14.0%	15.5%	0.0%	15.5%	8.1%	26.8%	16.5%	33.0%	100.0%
36 0-10cm	K6461/105	13.0%	14.5%	0.0%	14.5%	11.8%	39.0%	24.7%	10.0%	100.0%
36 20-30cm	K6461/106	11.9%	28.2%	0.0%	28.2%	13.2%	35.9%	13.9%	8.8%	100.0%
36 40-50cm	K6461/107	20.7%	1.5%	0.0%	1.5%	3.2%	20.3%	9.5%	65.6%	100.0%
36 65-75cm	K6461/108	18.2%	4.3%	0.0%	4.3%	3.1%	19.7%	12.3%	60.6%	100.0%
37 0-10cm	K6461/109	13.4%	7.8%	0.0%	7.8%	10.1%	52.3%	22.4%	7.4%	100.0%
37 20-30cm	K6461/110	11.7%	22.9%	15.0%	7.9%	10.2%	38.2%	20.6%	8.1%	100.0%
37 40-50cm	K6461/111	16.5%	2.7%	0.0%	2.7%	7.0%	28.3%	12.2%	49.8%	100.0%
37 65-75cm	K6461/112	19.0%	0.9%	0.0%	0.9%	4.5%	26.1%	12.2%	56.2%	100.0%
39 0-10cm	K6461/113	16.1%	1.9%	0.0%	1.9%	14.2%	44.9%	18.9%	20.1%	100.0%
39 20-30cm	K6461/114	14.2%	4.9%	0.0%	4.9%	14.2%	36.4%	17.9%	26.6%	100.0%
39 40-50cm	K6461/115	18.4%	0.9%	0.0%	0.9%	5.1%	16.6%	14.1%	63.3%	100.0%
39 65-75cm	K6461/116	18.0%	0.7%	0.0%	0.7%	4.1%	17.3%	11.7%	66.1%	100.0%
40 0-10cm	K6461/117	17.9%	4.4%	0.0%	4.4%	4.1%	34.0%	22.8%	34.7%	100.0%
40 20-30cm	K6461/118	21.3%	1.3%	0.0%	1.3%	3.3%	20.1%	12.7%	62.6%	100.0%
40 40-50cm	K6461/119	20.0%	0.7%	0.0%	0.7%	3.4%	18.2%	14.2%	63.4%	100.0%
40 65-75cm	K6461/120	18.7%	1.7%	0.0%	1.7%	3.9%	17.3%	16.3%	60.7%	100.0%
41 0-10cm	K6461/121	10.4%	7.9%	0.0%	7.9%	7.6%	43.9%	29.5%	11.2%	100.0%
41 10-20cm	K6461/122	6.8%	16.1%	0.0%	16.1%	11.0%	41.0%	25.5%	6.4%	100.0%
41 30-40cm	K6461/123	19.5%	0.0%	0.0%	0.0%	2.0%	27.0%	15.9%	55.1%	100.0%
41 65-75cm	K6461/124	15.1%	0.7%	0.0%	0.7%	2.4%	27.1%	13.3%	56.4%	100.0%
42 0-10cm	K6461/125	11.7%	2.5%	0.0%	2.5%	5.9%	44.4%	21.7%	25.5%	100.0%

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Graham Lancaster (Nata signatory)
Laboratory Manager

SAMPLE ID	Lab Code	MOISTURE CONTENT (% of water in sample)	TOTAL GRAVEL > 2 mm (% of total oven-dry equivalent)	GRAVEL > 4.75 mm (% of total oven-dry equivalent)	GRAVEL 2.00-4.75 mm (% of total oven-dry equivalent)	COARSE SAND 200-2000 µm (0.2-2.0 mm) (% of total oven-dry equivalent)	FINE SAND 20-200 µm (0.02-0.2 mm) (% of total oven-dry equivalent)	SILT 2-20 µm ISSS (% of total oven-dry equivalent)	CLAY < 2 µm (% of total oven-dry equivalent)	Total soil fractions (incl. Gravel)
42 20-30cm	K6461/126	19.1%	0.5%	0.0%	0.5%	3.1%	26.0%	16.1%	54.3%	100.0%
42 40-50cm	K6461/127	21.3%	0.4%	0.0%	0.4%	2.5%	24.2%	10.7%	62.2%	100.0%
42 65-75cm	K6461/128	16.5%	0.7%	0.0%	0.7%	2.5%	25.4%	11.4%	60.0%	100.0%
43 0-10cm	K6461/129	6.1%	13.9%	0.0%	13.9%	7.9%	51.2%	18.6%	8.4%	100.0%
43 20-30cm	K6461/130	9.0%	35.8%	23.9%	11.9%	7.6%	35.1%	17.0%	4.6%	100.0%
43 40-50cm	K6461/131	16.7%	3.4%	0.0%	3.4%	4.6%	25.1%	13.7%	53.2%	100.0%
43 65-75cm	K6461/132	18.0%	1.5%	0.0%	1.5%	2.6%	19.8%	11.9%	64.1%	100.0%
46 0-10cm	K6461/133	10.6%	1.9%	0.0%	1.9%	10.2%	53.5%	18.8%	15.7%	100.0%
46 20-30cm	K6461/134	11.2%	7.6%	0.0%	7.6%	11.5%	47.3%	15.9%	17.7%	100.0%
46 40-50cm	K6461/135	11.4%	4.3%	0.0%	4.3%	9.5%	41.1%	14.3%	30.7%	100.0%
46 65-75cm	K6461/136	16.0%	0.9%	0.0%	0.9%	3.7%	25.0%	13.6%	56.8%	100.0%
47 0-10cm	K6461/137	12.8%	2.0%	0.0%	2.0%	9.3%	38.7%	27.5%	22.5%	100.0%
47 20-30cm	K6461/138	18.3%	9.2%	0.0%	9.2%	8.1%	27.3%	26.4%	29.1%	100.0%
47 40-50cm	K6461/139	16.5%	6.0%	0.0%	6.0%	8.5%	27.3%	18.8%	39.4%	100.0%
47 65-75cm	K6461/140	18.4%	2.1%	0.0%	2.1%	4.3%	13.4%	17.2%	63.0%	100.0%
49 0-10cm	K6461/141	8.5%	3.9%	0.0%	3.9%	8.0%	45.9%	27.0%	15.3%	100.0%
49 20-30cm	K6461/142	15.4%	1.6%	0.0%	1.6%	7.0%	38.3%	26.2%	27.0%	100.0%
49 40-50cm	K6461/143	22.8%	1.6%	0.0%	1.6%	2.4%	19.8%	14.9%	61.3%	100.0%
49 65-75cm	K6461/144	19.3%	2.5%	0.0%	2.5%	3.4%	20.2%	19.0%	54.9%	100.0%
50 0-10cm	K6461/145	10.6%	9.6%	0.0%	9.6%	6.2%	39.7%	17.7%	26.8%	100.0%
50 20-30cm	K6461/146	14.7%	8.7%	0.0%	8.7%	5.4%	34.5%	17.5%	33.9%	100.0%
50 40-50cm	K6461/147	17.5%	2.1%	0.0%	2.1%	4.2%	31.2%	11.3%	51.1%	100.0%
50 65-75cm	K6461/148	20.9%	0.6%	0.0%	0.6%	2.9%	19.4%	14.2%	63.0%	100.0%
51 0-10cm	K6461/149	9.9%	9.3%	0.0%	9.3%	4.2%	52.8%	25.6%	8.1%	100.0%
51 20-30cm	K6461/150	9.0%	16.1%	0.0%	16.1%	4.5%	47.5%	26.0%	5.9%	100.0%

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Laboratory Manager

SAMPLE ID	Lab Code	MOISTURE CONTENT (% of water in sample)	TOTAL GRAVEL > 2 mm (% of total oven-dry equivalent)	GRAVEL > 4.75 mm (% of total oven-dry equivalent)	GRAVEL 2.00-4.75 mm (% of total oven-dry equivalent)	COARSE SAND 200-2000 µm (0.2-2.0 mm) (% of total oven-dry equivalent)	FINE SAND 20-200 µm (0.02-0.2 mm) (% of total oven-dry equivalent)	SILT 2-20 µm ISSS (% of total oven-dry equivalent)	CLAY < 2 µm (% of total oven-dry equivalent)	Total soil fractions (incl. Gravel)
51 40-50cm	K6461/151	13.5%	42.0%	0.0%	42.0%	2.2%	11.0%	15.7%	29.1%	100.0%
51 65-75cm	K6461/152	20.8%	1.4%	0.0%	1.4%	1.2%	15.1%	14.9%	67.4%	100.0%
52 0-10cm	K6461/153	14.0%	2.4%	0.0%	2.4%	5.6%	40.1%	25.9%	25.9%	100.0%
52 20-30cm	K6461/154	23.5%	0.1%	0.0%	0.1%	2.5%	21.3%	11.1%	65.0%	100.0%
52 40-50cm	K6461/155	21.9%	0.7%	0.0%	0.7%	2.9%	21.7%	10.9%	63.9%	100.0%
52 65-75cm	K6461/156	20.3%	0.5%	0.0%	0.5%	2.9%	22.6%	12.8%	61.2%	100.0%
53 0-10cm	K6461/157	12.7%	5.1%	0.0%	5.1%	5.5%	55.4%	23.2%	10.8%	100.0%
53 20-30cm	K6461/158	10.1%	36.0%	0.0%	36.0%	11.9%	24.1%	18.0%	9.9%	100.0%
53 40-50cm	K6461/159	22.0%	2.0%	0.0%	2.0%	1.4%	7.4%	14.6%	74.7%	100.0%
53 65-75cm	K6461/160	20.5%	2.0%	0.0%	2.0%	1.2%	1.3%	7.8%	87.8%	100.0%
54 0-10cm	K6461/161	14.0%	2.0%	0.0%	2.0%	6.7%	60.2%	17.8%	13.4%	100.0%
54 20-30cm	K6461/162	15.1%	3.8%	0.0%	3.8%	5.4%	39.9%	15.8%	35.1%	100.0%
54 40-50cm	K6461/163	23.5%	0.7%	0.0%	0.7%	2.2%	20.8%	10.5%	65.8%	100.0%
54 65-75cm	K6461/164	24.6%	0.5%	0.0%	0.5%	1.9%	17.0%	9.2%	71.4%	100.0%
55 0-10cm	K6461/165	9.7%	15.3%	0.0%	15.3%	13.4%	0.3%	38.1%	33.0%	100.0%
55 20-30cm	K6461/166	8.9%	11.3%	0.0%	11.3%	6.5%	45.0%	18.9%	18.3%	100.0%
55 40-50cm	K6461/167	10.7%	36.1%	0.0%	36.1%	6.4%	24.5%	11.3%	21.7%	100.0%
55 65-75cm	K6461/168	16.8%	0.8%	0.0%	0.8%	3.1%	27.5%	11.8%	56.8%	100.0%
59 0-10cm	K6461/169	10.1%	5.3%	0.0%	5.3%	22.8%	36.9%	22.1%	12.8%	100.0%
59 20-30cm	K6461/170	22.8%	0.1%	0.0%	0.1%	6.5%	18.0%	21.8%	53.6%	100.0%
59 40-50cm	K6461/171	18.1%	0.9%	0.0%	0.9%	5.8%	24.0%	21.2%	48.1%	100.0%
59 65-75cm	K6461/172	12.0%	37.0%	17.9%	19.1%	24.9%	22.6%	7.8%	7.7%	100.0%
60 0-10cm	K6461/173	13.2%	4.5%	0.0%	4.5%	12.4%	37.7%	27.9%	17.5%	100.0%
60 20-30cm	K6461/174	15.7%	19.4%	9.3%	10.1%	7.6%	33.5%	17.5%	22.0%	100.0%
60 40-50cm	K6461/175	18.9%	3.7%	0.0%	3.7%	7.6%	21.9%	17.3%	49.6%	100.0%

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Graham Lancaster (Nata signatory)
Laboratory Manager

SAMPLE ID	Lab Code	MOISTURE CONTENT (% of water in sample)	TOTAL GRAVEL > 2 mm (% of total oven-dry equivalent)	GRAVEL > 4.75 mm (% of total oven-dry equivalent)	GRAVEL 2.00-4.75 mm (% of total oven-dry equivalent)	COARSE SAND 200-2000 µm (0.2-2.0 mm) (% of total oven-dry equivalent)	FINE SAND 20-200 µm (0.02-0.2 mm) (% of total oven-dry equivalent)	SILT 2-20 µm ISSS (% of total oven-dry equivalent)	CLAY < 2 µm (% of total oven-dry equivalent)	Total soil fractions (incl. Gravel)
60 65-75cm	K6461/176	22.7%	2.5%	0.0%	2.5%	5.4%	21.1%	12.5%	58.5%	100.0%
61 0-10cm	K6461/177	11.2%	2.1%	0.5%	1.6%	12.3%	38.5%	25.8%	21.3%	100.0%
61 20-30cm	K6461/178	18.7%	3.6%	0.0%	3.6%	8.4%	19.8%	15.7%	52.4%	100.0%
61 40-50cm	K6461/179	18.2%	2.2%	0.0%	2.2%	7.1%	23.0%	15.4%	52.2%	100.0%
61 65-75cm	K6461/180	14.2%	2.7%	0.0%	2.7%	14.1%	20.9%	15.7%	46.6%	100.0%
62 0-10cm	K6461/181	10.9%	5.0%	0.0%	5.0%	7.3%	39.4%	26.2%	22.2%	100.0%
62 20-30cm	K6461/182	19.1%	0.6%	0.0%	0.6%	4.0%	28.0%	13.0%	54.4%	100.0%
62 40-50cm	K6461/183	19.3%	0.7%	0.0%	0.7%	3.2%	23.4%	12.0%	60.6%	100.0%
62 65-75cm	K6461/184	18.2%	1.6%	0.7%	1.0%	4.3%	13.3%	12.4%	68.2%	100.0%
63 0-10cm	K6461/185	14.3%	1.8%	0.4%	1.4%	5.5%	43.6%	24.6%	24.5%	100.0%
63 20-30cm	K6461/186	21.0%	0.0%	0.0%	0.0%	2.2%	18.9%	17.8%	61.1%	100.0%
63 40-50cm	K6461/187	19.1%	0.6%	0.0%	0.6%	2.1%	18.1%	17.9%	61.3%	100.0%
63 65-75cm	K6461/188	18.9%	0.2%	0.0%	0.2%	2.4%	18.3%	21.5%	57.6%	100.0%
64 0-10cm	K6461/189	12.1%	3.4%	0.0%	3.4%	9.1%	41.1%	22.5%	23.8%	100.0%
64 20-30cm	K6461/190	19.6%	1.5%	0.0%	1.5%	6.6%	25.6%	14.3%	52.0%	100.0%
64 40-50cm	K6461/191	21.8%	4.5%	0.0%	4.5%	6.1%	20.9%	14.8%	53.7%	100.0%
64 65-75cm	K6461/192	15.1%	0.6%	0.0%	0.6%	9.7%	25.2%	20.2%	44.3%	100.0%
66 0-10cm	K6461/193	15.3%	4.3%	1.7%	2.5%	7.7%	52.2%	19.2%	16.6%	100.0%
66 20-30cm	K6461/194	19.3%	4.9%	0.0%	4.9%	7.0%	27.5%	21.5%	39.1%	100.0%
66 40-50cm	K6461/195	20.2%	2.0%	0.0%	2.0%	4.9%	20.9%	15.1%	57.1%	100.0%
66 65-75cm	K6461/196	18.5%	1.9%	0.0%	1.9%	3.9%	35.9%	9.2%	49.1%	100.0%
67 0-10cm	K6461/197	17.8%	1.1%	0.0%	1.1%	12.0%	35.8%	32.7%	18.3%	100.0%
67 20-30cm	K6461/198	16.1%	2.0%	0.0%	2.0%	13.2%	32.9%	31.6%	20.3%	100.0%
67 40-50cm	K6461/199	17.0%	2.8%	0.0%	2.8%	13.4%	43.5%	21.7%	18.6%	100.0%
67 65-75cm	K6461/200	15.4%	2.5%	0.0%	2.5%	16.0%	19.7%	24.0%	37.7%	100.0%

checked: .....
Graham Lancaster (Nata signatory)
Laboratory Manager

SAMPLE ID	Lab Code	MOISTURE CONTENT (% of water in sample)	TOTAL GRAVEL > 2 mm (% of total oven-dry equivalent)	GRAVEL > 4.75 mm (% of total oven-dry equivalent)	GRAVEL 2.00-4.75 mm (% of total oven-dry equivalent)	COARSE SAND 200-2000 µm (0.2-2.0 mm) (% of total oven-dry equivalent)	FINE SAND 20-200 µm (0.02-0.2 mm) (% of total oven-dry equivalent)	SILT 2-20 µm ISSS (% of total oven-dry equivalent)	CLAY < 2 µm (% of total oven-dry equivalent)	Total soil fractions (incl. Gravel)
68 0-10cm	K6461/201	12.4%	3.0%	0.0%	3.0%	9.1%	46.9%	27.1%	13.8%	100.0%
68 20-30cm	K6461/202	21.5%	7.1%	4.5%	2.6%	4.8%	35.8%	16.3%	36.0%	100.0%
68 40-50cm	K6461/203	20.4%	1.3%	0.7%	0.6%	4.9%	23.9%	12.5%	57.3%	100.0%
68 65-75cm	K6461/204	16.9%	0.1%	0.0%	0.1%	3.7%	23.8%	19.6%	52.7%	100.0%
69 0-10cm	K6461/205	12.5%	4.0%	0.0%	4.0%	15.1%	49.6%	19.0%	12.3%	100.0%
69 20-30cm	K6461/206	12.6%	26.9%	21.6%	5.3%	7.8%	41.2%	12.9%	11.3%	100.0%
69 40-50cm	K6461/207	22.8%	2.0%	0.0%	2.0%	8.4%	17.1%	11.3%	61.2%	100.0%
69 65-75cm	K6461/208	20.5%	1.6%	0.0%	1.6%	6.3%	18.0%	11.0%	63.1%	100.0%
70 0-10cm	K6461/209	12.7%	2.3%	0.0%	2.3%	7.2%	50.4%	23.3%	16.8%	100.0%
70 20-30cm	K6461/210	13.6%	1.8%	0.0%	1.8%	7.6%	43.6%	20.7%	26.2%	100.0%
70 40-50cm	K6461/211	18.4%	1.0%	0.0%	1.0%	2.7%	38.3%	11.8%	46.3%	100.0%
70 65-75cm	K6461/212	18.6%	1.7%	0.0%	1.7%	2.3%	12.2%	17.2%	66.5%	100.0%
71 0-10cm	K6461/213	13.5%	3.8%	0.0%	3.8%	7.0%	28.9%	34.1%	26.2%	100.0%
71 20-30cm	K6461/214	12.4%	3.7%	0.0%	3.7%	9.9%	38.5%	25.3%	22.6%	100.0%
71 40-50cm	K6461/215	24.0%	3.9%	0.0%	3.9%	5.2%	20.7%	13.2%	57.0%	100.0%
71 65-75cm	K6461/216	20.3%	2.2%	0.0%	2.2%	4.2%	16.8%	11.0%	65.7%	100.0%
72 0-10cm	K6461/217	10.5%	2.8%	0.0%	2.8%	9.6%	58.2%	20.2%	9.2%	100.0%
72 20-30cm	K6461/218	11.4%	2.2%	0.0%	2.2%	9.6%	52.7%	20.4%	15.1%	100.0%
72 40-50cm	K6461/219	10.1%	1.7%	0.0%	1.7%	7.3%	40.3%	17.0%	33.7%	100.0%
72 65-75cm	K6461/220	8.9%	5.4%	0.0%	5.4%	8.0%	41.4%	19.3%	25.9%	100.0%
73 0-10cm	K6461/221	12.2%	2.1%	0.0%	2.1%	19.2%	33.5%	18.6%	26.6%	100.0%
73 20-30cm	K6461/222	21.0%	2.7%	0.0%	2.7%	10.8%	12.5%	17.6%	56.4%	100.0%
73 40-50cm	K6461/223	21.1%	4.6%	0.0%	4.6%	9.3%	18.4%	15.3%	52.4%	100.0%
73 65-75cm	K6461/224	19.9%	1.5%	0.0%	1.5%	4.6%	49.7%	14.8%	29.3%	100.0%

Note:

1: The Hydrometer Analysis method was used to determine the percentage sand, silt and clay,
modified from SOP meth004 (California Dept of Pesticide Regulation), using method of Gee & Bauder (1986),
in *Methods of Soil Analysis. Part 1* Agron. Monogr. 9 (2nd Ed). Klute, A., American Soc. of Agronomy Inc., Soil Sci. Soc. America Inc., Madison WI: 383-411.

2: Australian Standard 1289.3.8.1-1997 (see attached)

3. Analysis conducted between sample arrival date and reporting date.

4. This report is not to be reproduced except in full. Results only relate to the item tested.

5. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal).

6. This report was issued on 25/06/2021.

checked: .....
Graham Lancaster (Nata signatory)
Laboratory Manager

Environmental Analysis Laboratory

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

Parameter		Method reference	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Sample ID:			1 0-10cm	1 20-30cm	1 40-50cm	1 65-75cm	2 0-10cm	2 20-30cm
Crop:			Soil	Soil	Soil	Soil	Soil	Soil
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			K6461/1	K6461/2	K6461/3	K6461/4	K6461/5	K6461/6
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.39	6.33	6.75	6.92	5.68	6.92
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.171	0.037	0.016	0.014	0.055	0.038
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.2	6.9	7.0	8.1	9.7	16
	(kg/ha)		3,210	3,117	3,156	3,622	4,369	7,108
	(mg/kg)		1,433	1,391	1,409	1,617	1,950	3,173
Exchangeable Magnesium	(cmol$_+$/kg)		2.1	2.5	4.3	6.4	6.0	15
	(kg/ha)		577	668	1,183	1,740	1,642	4,005
	(mg/kg)		258	298	528	777	733	1,788
Exchangeable Potassium	(cmol$_+$/kg)		0.77	0.24	0.32	0.43	0.43	0.45
	(kg/ha)		673	212	277	378	379	398
	(mg/kg)		301	95	124	169	169	178
Exchangeable Sodium	(cmol$_+$/kg)		0.18	0.09	0.11	0.18	0.13	0.37
	(kg/ha)		95	46	55	95	66	189
	(mg/kg)		42	21	24	42	30	84
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.03	<0.01	0.01	0.01	0.04	0.01
	(kg/ha)		5.1	1.9	2.6	2.6	8.3	2.2
	(mg/kg)		2.3	<1	1.2	1.2	3.7	<1
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.13	0.05	<0.01	<0.01	0.13	<0.01
	(kg/ha)		2.8	1.1	<1	<1	2.8	<1
	(mg/kg)		1.3	<1	<1	<1	1.3	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	10	9.8	12	15	16	31
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	69	71	60	53	59	50
Magnesium (%)			20	25	37	42	37	47
Potassium (%)			7.4	2.5	2.7	2.9	2.6	1.4
Sodium - ESP (%)			1.8	0.92	0.90	1.2	0.78	1.2
Aluminium (%)			0.24	0.10	0.11	0.08	0.25	0.03
Hydrogen (%)			1.2	0.50	0.00	0.00	0.77	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	3.4	2.8	1.6	1.3	1.6	1.1
Moist Munsell Colour		**Inhouse Munsell Soil Colour Classification	7.5YR 3/3 Dark brown	10YR 4/4 Dark yellowish brown	7.5YR 4/6 Strong brown	7.5YR 4/4 Brown	7.5YR 2.5/2 Very dark brown	10YR 4/4 Dark yellowish brown
Mottles Munsell Colour			..	..	..	7.5YR 2.5/2 Very dark brown	..	..
Degree of Mottling (%)			..	..	..	80	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
	Sample ID:	1 0-10cm	1 20-30cm	1 40-50cm	1 65-75cm	2 0-10cm	2 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/1	K6461/2	K6461/3	K6461/4	K6461/5	K6461/6

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
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).
17. This report was issued on 09/07/2021.

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WORLD RECOGNISED ACCREDITATION
Accreditation No. 14960
Accredited for compliance with ISO/IEC 17025 - Testing

Quality Checked: Kris Saville
Agricultural Co-Ordinator KS

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

Parameter		Method reference	Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Sample 12
Sample ID:			2 40-50cm	2 65-75cm	3 0-10cm	3 20-30cm	3 40-50cm	3 65-75cm
Crop:			Soil	Soil	Soil	Soil	Soil	Soil
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			K6461/7	K6461/8	K6461/9	K6461/10	K6461/11	K6461/12
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.18	7.44	5.90	6.84	7.36	7.75
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.033	0.038	0.074	0.033	0.042	0.039
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	15	15	12	17	17	19
	(kg/ha)		6,773	6,579	5,204	7,646	7,471	8,451
	(mg/kg)		3,024	2,937	2,323	3,413	3,335	3,773
Exchangeable Magnesium	(cmol$_+$/kg)		16	16	3.9	14	16	19
	(kg/ha)		4,358	4,343	1,071	3,774	4,360	5,092
	(mg/kg)		1,945	1,939	478	1,685	1,947	2,273
Exchangeable Potassium	(cmol$_+$/kg)		0.41	0.41	0.57	0.50	0.41	0.33
	(kg/ha)		362	363	497	435	362	290
	(mg/kg)		161	162	222	194	162	130
Exchangeable Sodium	(cmol$_+$/kg)		0.42	0.47	0.11	0.27	0.32	0.48
	(kg/ha)		216	245	54	137	164	245
	(mg/kg)		96	109	24	61	73	109
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.01	<0.01	0.02	<0.01	<0.01	<0.01
	(kg/ha)		2.7	1.3	3.5	1.9	1.4	1.6
	(mg/kg)		1.2	<1	1.6	<1	<1	<1
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.08	<0.01	<0.01	<0.01
	(kg/ha)		<1	<1	1.9	<1	<1	<1
	(mg/kg)		<1	<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	32	32	16	32	33	38
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	47	47	71	54	50	49
Magnesium (%)			50	51	24	44	48	49
Potassium (%)			1.3	1.3	3.5	1.6	1.2	0.86
Sodium - ESP (%)			1.3	1.5	0.65	0.84	0.96	1.2
Aluminium (%)			0.04	0.02	0.11	0.03	0.02	0.02
Hydrogen (%)			0.00	0.00	0.51	0.00	0.00	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	0.94	0.92	2.9	1.2	1.0	1.0
Moist Munsell Colour		**Inhouse Munsell Soil Colour Classification	10YR 4/3 Brown	10YR 4/2 Dark greyish brown	10YR 3/3 Dark brown	10YR 4/4 Dark yellowish brown	10YR 5/4 Yellowish brown	10YR 5/4 Yellowish brown
Mottles Munsell Colour			..	..	..	..	..	..
			..	..	..	..	..	..
Degree of Mottling (%)			..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Sample 12
	Sample ID:	2 40-50cm	2 65-75cm	3 0-10cm	3 20-30cm	3 40-50cm	3 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter / Method reference	K6461/7	K6461/8	K6461/9	K6461/10	K6461/11	K6461/12

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: Collingwo
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 res
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-estimat
13. ** NATA accreditation does not cover the performance of this service.
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17. This report was issued on 09/07/2021.

Quality Checked: Kris Saville
Agricultural Co-Ordinator KS

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

			Sample 13	Sample 14	Sample 15	Sample 16	Sample 17	Sample 18
		Sample ID:	4 0-10cm	4 20-30cm	4 40-50cm	4 65-75cm	5 0-10cm	5 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/13	K6461/14	K6461/15	K6461/16	K6461/17	K6461/18
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.31	6.53	6.73	6.78	4.76	6.49
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.104	0.025	0.024	0.019	0.133	0.024
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.2	8.2	9.0	6.8	3.5	5.6
	Exchangeable Calcium (kg/ha)		3,245	3,686	4,053	3,065	1,592	2,496
	Exchangeable Calcium (mg/kg)		1,449	1,646	1,809	1,368	711	1,114
	Exchangeable Magnesium (cmol+/kg)		1.4	2.1	3.6	3.9	0.77	1.4
	Exchangeable Magnesium (kg/ha)		383	576	985	1,059	211	368
	Exchangeable Magnesium (mg/kg)		171	257	440	473	94	164
	Exchangeable Potassium (cmol+/kg)		0.29	0.21	0.22	0.17	0.26	0.18
	Exchangeable Potassium (kg/ha)		252	184	193	151	231	153
	Exchangeable Potassium (mg/kg)		112	82	86	67	103	69
	Exchangeable Sodium (cmol+/kg)		0.12	0.07	0.08	0.09	0.15	0.15
	Exchangeable Sodium (kg/ha)		61	34	42	49	79	79
	Exchangeable Sodium (mg/kg)		27	15	19	22	35	35
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.08	0.02	0.02	0.02	0.82	0.03
	Exchangeable Aluminium (kg/ha)		16	3.3	3.5	5.0	166	6.9
	Exchangeable Aluminium (mg/kg)		7.0	1.5	1.6	2.2	74	3.1
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.19	<0.01	<0.01	<0.01	1.1	0.04
	Exchangeable Hydrogen (kg/ha)		4.3	<1	<1	<1	24	<1
	Exchangeable Hydrogen (mg/kg)		1.9	<1	<1	<1	11	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	9.3	11	13	11	6.6	7.3
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	78	77	70	62	53	76
	Magnesium (%)		15	20	28	35	12	18
	Potassium (%)		3.1	2.0	1.7	1.6	4.0	2.4
	Sodium - ESP (%)		1.3	0.62	0.63	0.86	2.3	2.1
	Aluminium (%)		0.83	0.15	0.14	0.23	12	0.47
	Hydrogen (%)		2.1	0.00	0.00	0.00	16	0.57
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	5.1	3.9	2.5	1.8	4.6	4.1
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	7.5YR 3/4 Dark brown	7.5YR 3/4 Dark brown	7.5YR 3/4 Dark brown	7.5YR 3/4 Dark brown	10YR 3/2 Very dark greyish brown	10YR 4/3 Brown
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 13	Sample 14	Sample 15	Sample 16	Sample 17	Sample 18
	Sample ID:	4 0-10cm	4 20-30cm	4 40-50cm	4 65-75cm	5 0-10cm	5 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter / Method reference	K6461/13	K6461/14	K6461/15	K6461/16	K6461/17	K6461/18

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: Collingwo
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.
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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 res
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-estimat
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Agricultural Co-Ordinator KS

Environmental Analysis Laboratory

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

			Sample 19	Sample 20	Sample 21	Sample 22	Sample 23	Sample 24
		Sample ID:	5 40-50cm	5 65-75cm	6 0-10cm	6 20-30cm	6 40-50cm	6 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/19	K6461/20	K6461/21	K6461/22	K6461/23	K6461/24
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.18	7.41	5.29	6.74	6.99	7.80
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.027	0.040	0.069	0.021	0.025	0.044
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	8.2	9.4	6.5	15	14	15
	Exchangeable Calcium (kg/ha)		3,666	4,235	2,934	6,534	6,507	6,557
	Exchangeable Calcium (mg/kg)		1,637	1,891	1,310	2,917	2,905	2,927
	Exchangeable Magnesium (cmol+/kg)		3.9	6.0	1.6	7.9	9.0	12
	Exchangeable Magnesium (kg/ha)		1,050	1,624	446	2,152	2,448	3,320
	Exchangeable Magnesium (mg/kg)		469	725	199	961	1,093	1,482
	Exchangeable Potassium (cmol+/kg)		0.24	0.32	0.27	0.42	0.44	0.45
	Exchangeable Potassium (kg/ha)		213	277	238	371	383	391
	Exchangeable Potassium (mg/kg)		95	124	106	166	171	174
	Exchangeable Sodium (cmol+/kg)		0.25	0.46	0.08	0.12	0.14	0.18
	Exchangeable Sodium (kg/ha)		128	237	41	59	71	94
	Exchangeable Sodium (mg/kg)		57	106	18	27	32	42
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.02	0.02	0.15	0.04	0.02	0.02
	Exchangeable Aluminium (kg/ha)		5.0	3.7	30	7.1	4.5	3.6
	Exchangeable Aluminium (mg/kg)		2.2	1.6	13	3.2	2.0	1.6
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.28	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	6.2	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	2.8	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	13	16	9.0	23	24	27
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	65	58	73	63	60	53
	Magnesium (%)		31	37	18	34	37	44
	Potassium (%)		1.9	2.0	3.0	1.8	1.8	1.6
	Sodium - ESP (%)		2.0	2.8	0.88	0.50	0.58	0.66
	Aluminium (%)		0.20	0.11	1.7	0.15	0.09	0.06
	Hydrogen (%)		0.00	0.00	3.1	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	2.1	1.6	4.0	1.8	1.6	1.2
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	10YR 5/4 Yellowish brown	10YR 5/4 Yellowish brown	7.5YR 3/3 Dark brown	7.5YR 4/6 Strong brown	7.5YR 5/6 Strong brown	10YR 5/6 Yellowish brown
	Mottles Munsell Colour		.. ..	7.5YR 5/6 Strong brown	.. ..	.. ..	.. ..	.. ..
	Degree of Mottling (%)		..	40	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 19	Sample 20	Sample 21	Sample 22	Sample 23	Sample 24
	Sample ID:	5 40-50cm	5 65-75cm	6 0-10cm	6 20-30cm	6 40-50cm	6 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/19	K6461/20	K6461/21	K6461/22	K6461/23	K6461/24

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: Collingwo
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 res
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-estimat
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PO BOX 11034 TAMWORTH NSW 2340

			Sample 25	Sample 26	Sample 27	Sample 28	Sample 29	Sample 30
		Sample ID:	7 0-10cm	7 20-30cm	7 40-50cm	7 65-75cm	10 0-10cm	10 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/25	K6461/26	K6461/27	K6461/28	K6461/29	K6461/30
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.81	6.74	6.69	6.86	5.03	5.21
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.119	0.032	0.034	0.024	0.072	0.045
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.5	7.6	7.7	6.8	2.4	3.5
	Exchangeable Calcium (kg/ha)		3,368	3,398	3,457	3,055	1,057	1,571
	Exchangeable Calcium (mg/kg)		1,504	1,517	1,543	1,364	472	702
	Exchangeable Magnesium (cmol+/kg)		1.6	2.1	3.3	3.9	0.49	0.86
	Exchangeable Magnesium (kg/ha)		447	582	890	1,063	132	234
	Exchangeable Magnesium (mg/kg)		200	260	397	474	59	104
	Exchangeable Potassium (cmol+/kg)		1.4	0.97	0.88	0.44	0.88	0.48
	Exchangeable Potassium (kg/ha)		1,237	850	770	381	771	420
	Exchangeable Potassium (mg/kg)		552	380	344	170	344	187
	Exchangeable Sodium (cmol+/kg)		<0.065	0.08	0.11	0.15	<0.065	<0.065
	Exchangeable Sodium (kg/ha)		<33	40	57	76	<33	<33
	Exchangeable Sodium (mg/kg)		<15	18	25	34	<15	<15
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.03	0.02	0.03	0.04	0.63	0.52
	Exchangeable Aluminium (kg/ha)		5.7	4.9	5.9	7.2	127	106
	Exchangeable Aluminium (mg/kg)		2.5	2.2	2.6	3.2	57	47
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.11	<0.01	<0.01	<0.01	0.77	0.64
	Exchangeable Hydrogen (kg/ha)		2.6	<1	<1	<1	17	14
	Exchangeable Hydrogen (mg/kg)		1.1	<1	<1	<1	7.7	6.4
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	11	11	12	11	5.2	6.0
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	70	70	64	60	46	58
	Magnesium (%)		15	20	27	34	9.4	14
	Potassium (%)		13	9.0	7.3	3.8	17	7.9
	Sodium - ESP (%)		0.38	0.72	0.92	1.3	0.95	0.84
	Aluminium (%)		0.26	0.22	0.24	0.32	12	8.7
	Hydrogen (%)		1.1	0.00	0.00	0.00	15	11
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	4.6	3.5	2.4	1.7	4.8	4.1
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	5YR 3/4 Dark reddish brown	2.5YR 2.5/4 Dark reddish brown	2.5YR 5/4 Dark reddish brown	2.5YR 5/4 Dark reddish brown	10YR 4/4 Dark yellowish brown	7.5YR 4/4 Brown
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 25	Sample 26	Sample 27	Sample 28	Sample 29	Sample 30
	Sample ID:	7 0-10cm	7 20-30cm	7 40-50cm	7 65-75cm	10 0-10cm	10 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/25	K6461/26	K6461/27	K6461/28	K6461/29	K6461/30

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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Parameter		Method reference	Sample 31	Sample 32	Sample 33	Sample 34	Sample 35	Sample 36
Sample ID:			10 40-50cm	10 65-75cm	11 0-10cm	11 20-30cm	11 40-50cm	11 65-75cm
Crop:			Soil	Soil	Soil	Soil	Soil	Soil
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			K6461/31	K6461/32	K6461/33	K6461/34	K6461/35	K6461/36
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.61	6.98	5.23	6.38	6.87	5.98
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.017	0.016	0.074	0.026	0.037	0.029
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	6.0	3.7	3.3	9.0	11	10
	(kg/ha)		2,710	1,673	1,476	4,041	4,782	4,539
	(mg/kg)		1,210	747	659	1,804	2,135	2,026
Exchangeable Magnesium	(cmol$_+$/kg)		3.0	3.0	0.76	6.8	12	13
	(kg/ha)		816	820	206	1,850	3,320	3,646
	(mg/kg)		364	366	92	826	1,482	1,628
Exchangeable Potassium	(cmol$_+$/kg)		0.46	0.25	0.53	0.66	0.78	0.62
	(kg/ha)		401	223	464	580	684	539
	(mg/kg)		179	100	207	259	305	241
Exchangeable Sodium	(cmol$_+$/kg)		0.08	0.10	<0.065	0.15	0.90	1.1
	(kg/ha)		39	54	<33	78	462	559
	(mg/kg)		17	24	<15	35	206	249
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.06	0.02	0.24	0.02	0.02	0.83
	(kg/ha)		11	4.9	48	4.9	4.5	167
	(mg/kg)		5.0	2.2	21	2.2	2.0	74
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.43	0.08	<0.01	1.2
	(kg/ha)		<1	<1	9.5	1.7	<1	26
	(mg/kg)		<1	<1	4.3	<1	<1	12
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	9.6	7.1	5.3	17	25	27
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	63	52	62	54	43	37
Magnesium (%)			31	42	14	41	50	49
Potassium (%)			4.8	3.6	10	4.0	3.2	2.3
Sodium - ESP (%)			0.78	1.5	0.83	0.91	3.7	4.0
Aluminium (%)			0.58	0.34	4.5	0.15	0.09	3.0
Hydrogen (%)			0.00	0.00	8.1	0.46	0.00	4.3
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	2.0	1.2	4.4	1.3	0.87	0.75
Moist Munsell Colour		**Inhouse Munsell Soil Colour Classification	5YR 4/4 Reddish brown	10YR 5/4 Yellowish brown	7.5YR 3/4 Dark brown	7.5YR 4/6 Strong brown	5YR 4/6 Yellowish red	10YR 5/2 Greyish brown
Mottles Munsell Colour			.. ..	.. ..	.. ..	.. ..	.. ..	2.5YR 3/6 Dark red
Degree of Mottling (%)			..	..	..	..	..	30

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
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		Sample 31	Sample 32	Sample 33	Sample 34	Sample 35	Sample 36
	Sample ID:	10 40-50cm	10 65-75cm	11 0-10cm	11 20-30cm	11 40-50cm	11 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/31	K6461/32	K6461/33	K6461/34	K6461/35	K6461/36

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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			Sample 37	Sample 38	Sample 39	Sample 40	Sample 41	Sample 42
		Sample ID:	12 0-10cm	12 20-30cm	12 40-50cm	12 65-75cm	13 0-10cm	13 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/37	K6461/38	K6461/39	K6461/40	K6461/41	K6461/42
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.18	5.86	6.34	6.78	4.85	5.79
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.098	0.063	0.095	0.078	0.190	0.033
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	2.9	4.5	6.4	6.8	3.5	5.5
	Exchangeable Calcium (kg/ha)		1,284	2,026	2,853	3,038	1,578	2,464
	Exchangeable Calcium (mg/kg)		573	905	1,274	1,356	704	1,100
	Exchangeable Magnesium (cmol+/kg)		0.68	1.4	2.8	4.1	0.66	1.0
	Exchangeable Magnesium (kg/ha)		186	387	765	1,114	181	277
	Exchangeable Magnesium (mg/kg)		83	173	341	497	81	124
	Exchangeable Potassium (cmol+/kg)		1.6	1.6	1.7	1.0	0.97	0.24
	Exchangeable Potassium (kg/ha)		1,375	1,420	1,486	894	847	210
	Exchangeable Potassium (mg/kg)		614	634	663	399	378	94
	Exchangeable Sodium (cmol+/kg)		<0.065	<0.065	0.10	0.21	<0.065	0.07
	Exchangeable Sodium (kg/ha)		<33	<33	52	108	<33	36
	Exchangeable Sodium (mg/kg)		<15	<15	23	48	<15	16
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.46	0.07	0.01	0.01	0.28	0.12
	Exchangeable Aluminium (kg/ha)		93	14	2.9	2.8	57	24
	Exchangeable Aluminium (mg/kg)		41	6.1	1.3	1.2	25	11
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.64	0.12	0.04	<0.01	0.47	0.18
	Exchangeable Hydrogen (kg/ha)		14	2.6	<1	<1	11	3.9
	Exchangeable Hydrogen (mg/kg)		6.4	1.2	<1	<1	4.7	1.8
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	6.2	7.8	11	12	5.9	7.1
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	46	58	58	56	59	77
	Magnesium (%)		11	18	25	34	11	14
	Potassium (%)		25	21	15	8.4	16	3.4
	Sodium - ESP (%)		0.45	0.60	0.92	1.7	0.62	0.97
	Aluminium (%)		7.4	0.87	0.13	0.11	4.8	1.7
	Hydrogen (%)		10	1.5	0.40	0.00	8.0	2.5
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	4.2	3.2	2.3	1.7	5.3	5.4
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	7.5YR 3/4 Dark brown	5YR 4/6 Yellowish red	5YR 4/6 Yellowish red	5YR 4/6 Yellowish red	7.5YR 3/4 Dark brown	5YR 4/4 Reddish brown
	Mottles Munsell Colour		..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 37	Sample 38	Sample 39	Sample 40	Sample 41	Sample 42
	Sample ID:	12 0-10cm	12 20-30cm	12 40-50cm	12 65-75cm	13 0-10cm	13 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter / Method reference	K6461/37	K6461/38	K6461/39	K6461/40	K6461/41	K6461/42

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: Collingwo
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 res
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-estimat
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17. This report was issued on 09/07/2021.

Quality Checked: Kris Saville
Agricultural Co-Ordinator KS

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

Parameter		Method reference	Sample 43	Sample 44	Sample 45	Sample 46	Sample 47	Sample 48
Sample ID:			13 40-50cm	13 65-75cm	18 0-10cm	18 20-30cm	18 40-50cm	18 65-75cm
Crop:			Soil	Soil	Soil	Soil	Soil	Soil
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			K6461/43	K6461/44	K6461/45	K6461/46	K6461/47	K6461/48
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.71	6.97	6.38	6.59	7.62	7.62
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.024	0.017	0.197	0.270	0.134	0.186
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.2	6.1	11	7.6	6.0	16
	(kg/ha)		3,240	2,728	4,938	3,422	2,710	7,362
	(mg/kg)		1,446	1,218	2,204	1,528	1,210	3,287
Exchangeable Magnesium	(cmol$_+$/kg)		2.3	3.5	8.3	6.6	6.6	19
	(kg/ha)		622	956	2,247	1,805	1,784	5,136
	(mg/kg)		278	427	1,003	806	796	2,293
Exchangeable Potassium	(cmol$_+$/kg)		0.30	0.27	0.20	0.16	0.23	0.65
	(kg/ha)		264	237	179	142	200	566
	(mg/kg)		118	106	80	63	89	253
Exchangeable Sodium	(cmol$_+$/kg)		0.10	0.17	0.56	0.49	0.38	0.69
	(kg/ha)		51	86	291	254	198	355
	(mg/kg)		23	39	130	113	88	159
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.02	0.01	<0.01	<0.01	<0.01	<0.01
	(kg/ha)		3.8	2.4	1.1	1.3	1.1	<1
	(mg/kg)		1.7	1.1	<1	<1	<1	<1
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.13	<0.01	<0.01	<0.01
	(kg/ha)		<1	<1	2.9	<1	<1	<1
	(mg/kg)		<1	<1	1.3	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	9.9	10	20	15	13	37
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	73	61	55	51	46	45
Magnesium (%)			23	35	41	44	50	52
Potassium (%)			3.0	2.7	1.0	1.1	1.7	1.8
Sodium - ESP (%)			0.99	1.7	2.8	3.3	2.9	1.9
Aluminium (%)			0.19	0.12	0.03	0.04	0.04	0.01
Hydrogen (%)			0.00	0.00	0.64	0.00	0.00	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	3.2	1.7	1.3	1.1	0.92	0.87
Moist Munsell Colour		**Inhouse Munsell Soil Colour Classification	5YR 4/4 Reddish brown	5YR 4/4 Reddish brown	10YR 2/2 Very dark brown	10YR 2/1 Black	10YR 4/2 Dark greyish brown	10YR 2/1 Black
Mottles Munsell Colour			..	..	..	..	..	..
			..	..	..	..	..	..
Degree of Mottling (%)			..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 43	Sample 44	Sample 45	Sample 46	Sample 47	Sample 48
	Sample ID:	13 40-50cm	13 65-75cm	18 0-10cm	18 20-30cm	18 40-50cm	18 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/43	K6461/44	K6461/45	K6461/46	K6461/47	K6461/48

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: Collingwo
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 res
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
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PO BOX 11034 TAMWORTH NSW 2340

			Sample 49	Sample 50	Sample 51	Sample 52	Sample 53	Sample 54
		Sample ID:	19 0-10cm	19 20-30cm	19 40-50cm	19 65-75cm	20 0-10cm	20 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/49	K6461/50	K6461/51	K6461/52	K6461/53	K6461/54
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.61	8.12	8.03	8.11	7.19	8.43
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.143	0.108	1.271	3.544	0.145	0.103
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	11	5.1	18	66	7.3	2.6
	Exchangeable Calcium (kg/ha)		4,728	2,294	7,892	29,780	3,287	1,170
	Exchangeable Calcium (mg/kg)		2,111	1,024	3,523	13,295	1,467	522
	Exchangeable Magnesium (cmol+/kg)		6.2	5.5	25	24	6.8	4.0
	Exchangeable Magnesium (kg/ha)		1,675	1,496	6,864	6,593	1,841	1,077
	Exchangeable Magnesium (mg/kg)		748	668	3,064	2,943	822	481
	Exchangeable Potassium (cmol+/kg)		0.27	0.14	0.61	0.49	0.30	<0.12
	Exchangeable Potassium (kg/ha)		233	123	531	429	265	<112
	Exchangeable Potassium (mg/kg)		104	55	237	192	118	<50
	Exchangeable Sodium (cmol+/kg)		0.44	0.90	4.1	4.4	0.22	0.22
	Exchangeable Sodium (kg/ha)		226	464	2,096	2,271	113	115
	Exchangeable Sodium (mg/kg)		101	207	936	1,014	50	51
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Exchangeable Aluminium (kg/ha)		<1	1.0	<1	<1	<1	<1
	Exchangeable Aluminium (mg/kg)		<1	<1	<1	<1	<1	<1
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	<1	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	17	12	47	95	15	6.9
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	61	44	37	69	50	38
	Magnesium (%)		35	47	53	25	46	57
	Potassium (%)		1.5	1.2	1.3	0.51	2.1	1.6
	Sodium - ESP (%)		2.5	7.7	8.6	4.6	1.5	3.2
	Aluminium (%)		0.03	0.04	0.01	0.00	0.03	0.05
	Hydrogen (%)		0.00	0.00	0.00	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	1.7	0.93	0.70	2.7	1.1	0.66
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	7.5YR 3/1 Very dark grey	10YR 4/1 Dark grey	10YR 3/1 Very dark grey	10YR 4/1 Dark grey	10YR 2/2 Very dark brown	10YR 5/2 Greyish brown
	Mottles Munsell Colour		..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 49	Sample 50	Sample 51	Sample 52	Sample 53	Sample 54
	Sample ID:	19 0-10cm	19 20-30cm	19 40-50cm	19 65-75cm	20 0-10cm	20 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/49	K6461/50	K6461/51	K6461/52	K6461/53	K6461/54

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: Collingwo
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.
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11. Conversions to kg/ha = mg/kg x 2.24
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			Sample 55	Sample 56	Sample 57	Sample 58	Sample 59	Sample 60
		Sample ID:	20 40-50cm	20 65-75cm	21 0-10cm	21 15-25cm	21 40-50cm	21 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/55	K6461/56	K6461/57	K6461/58	K6461/59	K6461/60
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	8.51	8.48	5.09	5.83	7.35	8.20
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.195	0.180	0.089	0.029	0.057	0.076
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.3	5.1	3.5	3.0	11	11
	Exchangeable Calcium (kg/ha)		3,262	2,287	1,568	1,365	5,041	4,999
	Exchangeable Calcium (mg/kg)		1,456	1,021	700	609	2,251	2,232
	Exchangeable Magnesium (cmol+/kg)		24	18	2.3	2.8	25	27
	Exchangeable Magnesium (kg/ha)		6,637	4,956	616	761	6,681	7,430
	Exchangeable Magnesium (mg/kg)		2,963	2,213	275	340	2,983	3,317
	Exchangeable Potassium (cmol+/kg)		0.58	0.39	0.45	0.24	0.54	0.44
	Exchangeable Potassium (kg/ha)		512	340	397	210	476	389
	Exchangeable Potassium (mg/kg)		229	152	177	94	213	174
	Exchangeable Sodium (cmol+/kg)		1.3	0.72	0.18	0.15	1.0	1.6
	Exchangeable Sodium (kg/ha)		689	370	93	79	526	825
	Exchangeable Sodium (mg/kg)		308	165	42	35	235	368
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	<0.01	<0.01	0.52	0.10	<0.01	<0.01
	Exchangeable Aluminium (kg/ha)		<1	1.1	104	19	<1	<1
	Exchangeable Aluminium (mg/kg)		<1	<1	46	8.6	<1	<1
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.74	0.30	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	17	6.7	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	7.4	3.0	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	34	24	7.6	6.6	37	40
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	22	21	46	46	30	28
	Magnesium (%)		73	75	30	42	66	67
	Potassium (%)		1.7	1.6	5.9	3.6	1.5	1.1
	Sodium - ESP (%)		4.0	2.9	2.4	2.3	2.7	4.0
	Aluminium (%)		0.01	0.02	6.8	1.4	0.01	0.00
	Hydrogen (%)		0.00	0.00	9.6	4.5	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	0.30	0.28	1.5	1.1	0.46	0.41
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	10YR 4/3 Brown	10YR 5/2 Greyish brown	7.5YR 3/4 Dark brown	7.5YR 3/3 Dark brown	10YR 4/4 Dark yellowish brown	10YR 5/4 Yellowish brown
	Mottles Munsell Colour		7.5YR 4/6 Strong brown	10YR 5/6 Yellowish brown	..	..	..	..
	Degree of Mottling (%)		40	30	..	..	..	..

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PO BOX 11034 TAMWORTH NSW 2340

		Sample 55	Sample 56	Sample 57	Sample 58	Sample 59	Sample 60
	Sample ID:	20 40-50cm	20 65-75cm	21 0-10cm	21 15-25cm	21 40-50cm	21 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/55	K6461/56	K6461/57	K6461/58	K6461/59	K6461/60

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: Collingwo
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.
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Parameter		Method reference	Sample 61	Sample 62	Sample 63	Sample 64	Sample 65	Sample 66
Sample ID:			22 0-10cm	22 20-30cm	22 40-50cm	22 65-75cm	24 0-10cm	24 20-30cm
Crop:			Soil	Soil	Soil	Soil	Soil	Soil
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			K6461/61	K6461/62	K6461/63	K6461/64	K6461/65	K6461/66
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	4.85	6.91	7.21	7.63	7.70	6.49
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.373	0.032	0.025	0.037	0.262	0.292
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	6.3	8.0	6.7	7.7	26	7.9
	(kg/ha)		2,833	3,595	3,006	3,449	11,610	3,528
	(mg/kg)		1,265	1,605	1,342	1,540	5,183	1,575
Exchangeable Magnesium	(cmol$_+$/kg)		2.4	14	14	16	0.83	3.2
	(kg/ha)		655	3,761	3,764	4,343	226	874
	(mg/kg)		293	1,679	1,680	1,939	101	390
Exchangeable Potassium	(cmol$_+$/kg)		0.84	0.39	0.36	0.39	1.3	0.88
	(kg/ha)		732	342	312	340	1,150	773
	(mg/kg)		327	153	139	152	513	345
Exchangeable Sodium	(cmol$_+$/kg)		0.20	0.38	0.65	1.2	<0.065	0.10
	(kg/ha)		104	197	334	620	<33	52
	(mg/kg)		46	88	149	277	<15	23
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.11	0.01	0.01	<0.01	0.02	<0.01
	(kg/ha)		23	2.7	2.6	1.7	3.7	<1
	(mg/kg)		10	1.2	1.2	<1	1.7	<1
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.49	<0.01	<0.01	<0.01	<0.01	0.04
	(kg/ha)		11	<1	<1	<1	<1	<1
	(mg/kg)		4.9	<1	<1	<1	<1	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	10	23	22	25	28	12
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	61	35	31	30	92	65
Magnesium (%)			23	61	64	63	3.0	27
Potassium (%)			8.1	1.7	1.7	1.5	4.7	7.3
Sodium - ESP (%)			1.9	1.7	3.0	4.8	0.23	0.83
Aluminium (%)			1.1	0.06	0.06	0.03	0.07	0.04
Hydrogen (%)			4.7	0.00	0.00	0.00	0.00	0.31
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	2.6	0.58	0.48	0.48	31	2.4
Moist Munsell Colour		**Inhouse Munsell Soil Colour Classification	7.5YR 3/4 Dark brown	7.5YR 4/6 Strong brown	10YR 5/8 Yellowish brown	7.5YR 6/8 Reddish yellow	10YR 2/2 Very dark brown	5YR 5/8 Yellowish red
Mottles Munsell Colour			..	..	..	..	..	..
			..	..	..	..	..	..
Degree of Mottling (%)			..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

	Parameter	Method reference	Sample 61	Sample 62	Sample 63	Sample 64	Sample 65	Sample 66
	Sample ID:		22 0-10cm	22 20-30cm	22 40-50cm	22 65-75cm	24 0-10cm	24 20-30cm
	Crop:		Soil	Soil	Soil	Soil	Soil	Soil
	Client:		Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			K6461/61	K6461/62	K6461/63	K6461/64	K6461/65	K6461/66

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: Collingwo
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 res
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-estimat
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Agricultural Co-Ordinator KS

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			Sample 67	Sample 68	Sample 69	Sample 70	Sample 71	Sample 72
		Sample ID:	24 40-50cm	24 65-75cm	25 0-10cm	25 20-30cm	25 40-50cm	25 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/67	K6461/68	K6461/69	K6461/70	K6461/71	K6461/72
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.87	7.14	5.06	6.69	6.91	7.20
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.348	0.188	0.232	0.022	0.034	0.038
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.7	6.9	4.0	3.7	7.4	5.8
	Exchangeable Calcium (kg/ha)		3,467	3,090	1,815	1,671	3,344	2,612
	Exchangeable Calcium (mg/kg)		1,548	1,379	810	746	1,493	1,166
	Exchangeable Magnesium (cmol+/kg)		6.1	8.1	0.90	0.88	5.1	5.8
	Exchangeable Magnesium (kg/ha)		1,670	2,209	245	241	1,379	1,586
	Exchangeable Magnesium (mg/kg)		746	986	110	107	616	708
	Exchangeable Potassium (cmol+/kg)		0.87	0.72	1.1	0.28	0.32	0.29
	Exchangeable Potassium (kg/ha)		760	633	980	241	284	254
	Exchangeable Potassium (mg/kg)		339	283	438	108	127	114
	Exchangeable Sodium (cmol+/kg)		0.17	0.32	<0.065	0.11	0.20	0.53
	Exchangeable Sodium (kg/ha)		85	166	<33	59	103	271
	Exchangeable Sodium (mg/kg)		38	74	<15	26	46	121
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	<0.01	<0.01	0.14	0.01	<0.01	0.02
	Exchangeable Aluminium (kg/ha)		1.3	1.0	29	2.1	<1	3.1
	Exchangeable Aluminium (mg/kg)		<1	<1	13	<1	<1	1.4
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.33	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	7.4	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	3.3	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	15	16	6.6	5.0	13	12
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	52	43	61	74	57	47
	Magnesium (%)		41	51	14	18	39	47
	Potassium (%)		5.8	4.5	17	5.5	2.5	2.3
	Sodium - ESP (%)		1.1	2.0	0.78	2.3	1.5	4.2
	Aluminium (%)		0.04	0.03	2.2	0.21	0.04	0.12
	Hydrogen (%)		0.00	0.00	5.0	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	1.3	0.85	4.5	4.2	1.5	1.00
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	2.5YR 2.5/4 Dark reddish brown	5YR 4/6 Yellowish red	5Y 4/1 Dark grey	2.5Y 4/2 Dark greyish brown	10YR 5/4 Yellowish brown	2.5Y 5/3 Light olive brown
	Mottles Munsell Colour		..	..	..	..	2.5Y 2.5/1 Black	2.5YR 2.5/3 Dark reddish brown
	Degree of Mottling (%)		..	..	..	..	5	5

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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 67	Sample 68	Sample 69	Sample 70	Sample 71	Sample 72
	Sample ID:	24 40-50cm	24 65-75cm	25 0-10cm	25 20-30cm	25 40-50cm	25 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/67	K6461/68	K6461/69	K6461/70	K6461/71	K6461/72

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: Collingwo
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 res
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-estimat
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Parameter		Method reference	Sample 73	Sample 74	Sample 75	Sample 76	Sample 77	Sample 78
Sample ID:			26 0-10cm	26 20-30cm	26 40-50cm	26 65-75cm	28 0-10cm	28 20-30cm
Crop:			Soil	Soil	Soil	Soil	Soil	Soil
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			K6461/73	K6461/74	K6461/75	K6461/76	K6461/77	K6461/78
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	4.85	5.82	6.37	7.13	5.29	5.70
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.108	0.036	0.047	0.040	0.101	0.027
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	4.4	8.0	11	18	3.9	1.6
	(kg/ha)		1,968	3,583	5,132	8,040	1,772	714
	(mg/kg)		879	1,599	2,291	3,589	791	319
Exchangeable Magnesium	(cmol$_+$/kg)		1.00	5.9	13	23	0.84	0.31
	(kg/ha)		272	1,606	3,498	6,179	228	83
	(mg/kg)		122	717	1,562	2,758	102	37
Exchangeable Potassium	(cmol$_+$/kg)		0.47	0.44	0.48	0.41	0.29	<0.12
	(kg/ha)		413	385	417	356	257	<112
	(mg/kg)		185	172	186	159	115	<50
Exchangeable Sodium	(cmol$_+$/kg)		<0.065	0.11	0.72	1.3	0.21	0.14
	(kg/ha)		<33	58	371	676	107	70
	(mg/kg)		<15	26	166	302	48	31
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.30	0.15	0.06	0.01	0.08	0.07
	(kg/ha)		60	30	12	2.3	16	15
	(mg/kg)		27	13	5.3	1.0	7.2	6.6
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.55	0.26	0.16	<0.01	0.25	0.13
	(kg/ha)		12	5.9	3.6	<1	5.6	2.9
	(mg/kg)		5.5	2.6	1.6	<1	2.5	1.3
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	6.7	15	26	42	5.6	2.3
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	65	54	44	42	70	69
Magnesium (%)			15	40	50	54	15	13
Potassium (%)			7.0	3.0	1.9	0.96	5.2	3.6
Sodium - ESP (%)			0.66	0.76	2.8	3.1	3.7	5.9
Aluminium (%)			4.4	1.0	0.23	0.03	1.4	3.2
Hydrogen (%)			8.2	1.8	0.62	0.00	4.4	5.6
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	4.4	1.4	0.89	0.79	4.7	5.2
Moist Munsell Colour		**Inhouse Munsell Soil Colour Classification	10YR 3/2 Very dark greyish brown	2.5YR 3/2 Dusky red	10R 4/8 Red	2.5Y 4/2 Dark greyish brown	2.5Y 4/2 Dark greyish brown	5Y 7/1 Light grey
Mottles Munsell Colour			..	..	..	10R 4/6	..	..
			..	..	..	Red	..	..
Degree of Mottling (%)			..	..	..	25	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 73	Sample 74	Sample 75	Sample 76	Sample 77	Sample 78
	Sample ID:	26 0-10cm	26 20-30cm	26 40-50cm	26 65-75cm	28 0-10cm	28 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/73	K6461/74	K6461/75	K6461/76	K6461/77	K6461/78

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: Collingwo
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 res
10. Conversions for 1 $cmol_+/kg$ = 230 mg/kg Sodium, 390 mg/kg Potassium,
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11. Conversions to kg/ha = mg/kg x 2.24
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			Sample 79	Sample 80	Sample 81	Sample 82	Sample 83	Sample 84
		Sample ID:	28 40-50cm	28 65-75cm	29 0-10cm	29 20-30cm	29 40-50cm	29 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/79	K6461/80	K6461/81	K6461/82	K6461/83	K6461/84
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.73	7.00	4.63	5.26	6.71	7.06
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.037	0.067	0.168	0.134	0.023	0.032
	Exchangeable Calcium (cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	3.9	6.4	3.7	5.0	6.0	8.5
	Exchangeable Calcium (kg/ha)		1,769	2,851	1,647	2,252	2,708	3,834
	Exchangeable Calcium (mg/kg)		790	1,273	735	1,005	1,209	1,712
	Exchangeable Magnesium (cmol$_+$/kg)		7.7	14	1.1	2.5	5.5	11
	Exchangeable Magnesium (kg/ha)		2,093	3,855	296	671	1,491	2,877
	Exchangeable Magnesium (mg/kg)		934	1,721	132	300	666	1,284
	Exchangeable Potassium (cmol$_+$/kg)		0.25	0.35	0.19	0.35	0.24	0.39
	Exchangeable Potassium (kg/ha)		221	309	162	305	207	342
	Exchangeable Potassium (mg/kg)		99	138	72	136	92	153
	Exchangeable Sodium (cmol$_+$/kg)		0.94	2.2	0.15	0.16	0.17	0.45
	Exchangeable Sodium (kg/ha)		483	1,117	75	83	89	232
	Exchangeable Sodium (mg/kg)		216	499	34	37	40	104
	Exchangeable Aluminium (cmol$_+$/kg)	**Inhouse S37 (KCl)	0.02	<0.01	0.86	0.13	0.01	<0.01
	Exchangeable Aluminium (kg/ha)		4.0	1.4	173	25	2.1	1.1
	Exchangeable Aluminium (mg/kg)		1.8	<1	77	11	<1	<1
	Exchangeable Hydrogen (cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	1.1	0.17	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	24	3.8	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	11	1.7	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	13	23	7.0	8.3	12	20
	Calcium (%)	**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	31	28	52	61	51	43
	Magnesium (%)		60	61	16	30	46	53
	Potassium (%)		2.0	1.5	2.6	4.2	2.0	2.0
	Sodium - ESP (%)		7.3	9.4	2.1	1.9	1.5	2.3
	Aluminium (%)		0.15	0.03	12	1.5	0.09	0.03
	Hydrogen (%)		0.00	0.00	15	2.0	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol$_+$/kg)	0.51	0.45	3.4	2.0	1.1	0.81
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	2.5Y 4/2 Dark greyish brown	10YR 4/2 Dark greyish brown	10YR 3/4 Dark yellowish brown	10YR 4/3 Brown	10YR 3/4 Dark yellowish brown	2.5Y 6/6 Olive yellow
	Mottles Munsell Colour		10R 4/6 Red	10R 4/6 Red	.. ..	.. ..	.. ..	2.5 YR 3/6 Dark red
	Degree of Mottling (%)		10	25	..	..	..	10

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
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		Sample 79	Sample 80	Sample 81	Sample 82	Sample 83	Sample 84
	Sample ID:	28 40-50cm	28 65-75cm	29 0-10cm	29 20-30cm	29 40-50cm	29 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/79	K6461/80	K6461/81	K6461/82	K6461/83	K6461/84

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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Parameter		Method reference	Sample 85	Sample 86	Sample 87	Sample 88	Sample 89	Sample 90
Sample ID:			30 0-10cm	30 20-30cm	30 40-50cm	30 65-75cm	31 0-10cm	31 20-30cm
Crop:			Soil	Soil	Soil	Soil	Soil	Soil
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			K6461/85	K6461/86	K6461/87	K6461/88	K6461/89	K6461/90
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.80	7.33	8.49	8.59	5.38	6.65
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.098	0.081	0.183	0.288	0.172	0.033
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	21	28	36	31	9.6	9.1
	(kg/ha)		9,237	12,549	15,967	13,823	4,290	4,095
	(mg/kg)		4,124	5,602	7,128	6,171	1,915	1,828
Exchangeable Magnesium	(cmol$_+$/kg)		9.5	15	16	18	1.6	1.6
	(kg/ha)		2,581	4,037	4,402	4,838	439	435
	(mg/kg)		1,152	1,802	1,965	2,160	196	194
Exchangeable Potassium	(cmol$_+$/kg)		2.9	1.3	0.64	0.50	1.00	0.28
	(kg/ha)		2,558	1,109	560	441	874	247
	(mg/kg)		1,142	495	250	197	390	110
Exchangeable Sodium	(cmol$_+$/kg)		0.28	0.63	1.1	2.2	0.09	0.08
	(kg/ha)		146	324	565	1,145	49	43
	(mg/kg)		65	145	252	511	22	19
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.02	<0.01	<0.01	<0.01	0.02	<0.01
	(kg/ha)		3.4	<1	<1	<1	4.1	<1
	(mg/kg)		1.5	<1	<1	<1	1.8	<1
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.19	<0.01	<0.01	<0.01	0.17	<0.01
	(kg/ha)		4.3	<1	<1	<1	3.9	<1
	(mg/kg)		1.9	<1	<1	<1	1.7	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	33	45	53	51	12	11
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	61	63	67	60	77	82
Magnesium (%)			28	33	30	35	13	14
Potassium (%)			8.7	2.8	1.2	0.98	8.0	2.5
Sodium - ESP (%)			0.85	1.4	2.1	4.3	0.76	0.75
Aluminium (%)			0.05	0.01	0.01	0.01	0.16	0.04
Hydrogen (%)			0.58	0.00	0.00	0.00	1.4	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	2.2	1.9	2.2	1.7	5.9	5.7
Moist Munsell Colour		**Inhouse Munsell Soil Colour Classification	10YR 2/2 Very dark brown	10YR 3/2 Very dark greyish brown	2.5Y 3/3 Dark olive brown	5Y 3/1 Very dark grey	10R 3/4 Dusky red	10R 3/6 Dark red
Mottles Munsell Colour			..	..	..	..	..	..
			..	..	..	..	..	..
Degree of Mottling (%)			..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 85	Sample 86	Sample 87	Sample 88	Sample 89	Sample 90
	Sample ID:	30 0-10cm	30 20-30cm	30 40-50cm	30 65-75cm	31 0-10cm	31 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/85	K6461/86	K6461/87	K6461/88	K6461/89	K6461/90

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: Collingwo
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 res
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-estimat
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Agricultural Co-Ordinator KS

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PO BOX 11034 TAMWORTH NSW 2340

			Sample 91	Sample 92	Sample 93	Sample 94	Sample 95	Sample 96
		Sample ID:	31 40-50cm	31 65-75cm	32 0-10cm	32 20-30cm	32 40-50cm	32 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/91	K6461/92	K6461/93	K6461/94	K6461/95	K6461/96
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.83	7.32	5.62	6.37	6.65	7.22
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.040	0.033	0.085	0.066	0.095	0.043
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	11	9.4	6.6	6.7	7.1	7.4
	Exchangeable Calcium (kg/ha)		4,746	4,240	2,949	3,013	3,196	3,336
	Exchangeable Calcium (mg/kg)		2,119	1,893	1,317	1,345	1,427	1,489
	Exchangeable Magnesium (cmol+/kg)		2.1	3.2	1.1	1.5	2.0	4.7
	Exchangeable Magnesium (kg/ha)		577	864	300	410	558	1,291
	Exchangeable Magnesium (mg/kg)		257	386	134	183	249	576
	Exchangeable Potassium (cmol+/kg)		0.31	0.31	1.7	1.8	1.4	0.50
	Exchangeable Potassium (kg/ha)		273	273	1,480	1,564	1,218	438
	Exchangeable Potassium (mg/kg)		122	122	661	698	544	195
	Exchangeable Sodium (cmol+/kg)		0.10	0.09	<0.065	<0.065	0.16	0.13
	Exchangeable Sodium (kg/ha)		54	45	<33	<33	83	69
	Exchangeable Sodium (mg/kg)		24	20	<15	<15	37	31
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	<0.01	<0.01	0.06	<0.01	<0.01	<0.01
	Exchangeable Aluminium (kg/ha)		1.2	1.3	12	1.5	1.1	1.5
	Exchangeable Aluminium (mg/kg)		<1	<1	5.5	<1	<1	<1
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.16	0.04	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	3.5	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	1.6	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	13	13	9.6	10	11	13
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	81	73	68	66	66	58
	Magnesium (%)		16	24	11	15	19	37
	Potassium (%)		2.4	2.4	18	18	13	3.9
	Sodium - ESP (%)		0.80	0.67	0.54	0.51	1.5	1.0
	Aluminium (%)		0.04	0.05	0.63	0.07	0.05	0.06
	Hydrogen (%)		0.00	0.00	1.6	0.43	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	5.0	3.0	6.0	4.5	3.5	1.6
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	10R 3/6 Dark red	10R 3/6 Dark red	5YR 3/3 Dark reddish brown	10R 3/6 Dark red	10R 3/6 Dark red	10R 4/6 Red
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 91	Sample 92	Sample 93	Sample 94	Sample 95	Sample 96
	Sample ID:	31 40-50cm	31 65-75cm	32 0-10cm	32 20-30cm	32 40-50cm	32 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/91	K6461/92	K6461/93	K6461/94	K6461/95	K6461/96

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: Collingwo
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 res
10. Conversions for 1 $cmol_+/kg$ = 230 mg/kg Sodium, 390 mg/kg Potassium,
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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-estimat
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			Sample 97	Sample 98	Sample 99	Sample 100	Sample 101	Sample 102
		Sample ID:	33 0-10cm	33 20-30cm	33 40-50cm	33 65-75cm	34 0-10cm	34 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/97	K6461/98	K6461/99	K6461/100	K6461/101	K6461/102
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.28	6.45	6.68	6.99	5.97	6.79
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.075	0.047	0.061	0.027	0.068	0.043
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.2	8.1	8.1	5.6	7.0	7.1
	Exchangeable Calcium (kg/ha)		3,218	3,619	3,622	2,516	3,141	3,181
	Exchangeable Calcium (mg/kg)		1,437	1,616	1,617	1,123	1,402	1,420
	Exchangeable Magnesium (cmol+/kg)		1.3	3.5	4.9	7.3	2.0	1.9
	Exchangeable Magnesium (kg/ha)		367	959	1,325	1,977	545	525
	Exchangeable Magnesium (mg/kg)		164	428	592	883	243	234
	Exchangeable Potassium (cmol+/kg)		0.78	0.53	0.31	0.26	1.7	1.3
	Exchangeable Potassium (kg/ha)		683	467	273	228	1,497	1,171
	Exchangeable Potassium (mg/kg)		305	208	122	102	668	523
	Exchangeable Sodium (cmol+/kg)		<0.065	<0.065	0.10	0.15	0.08	0.09
	Exchangeable Sodium (kg/ha)		<33	<33	50	76	43	46
	Exchangeable Sodium (mg/kg)		<15	<15	22	34	19	20
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.19	0.01	0.02	<0.01	0.01	<0.01
	Exchangeable Aluminium (kg/ha)		37	2.5	3.0	1.1	2.8	<1
	Exchangeable Aluminium (mg/kg)		17	1.1	1.4	<1	1.2	<1
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.32	0.05	<0.01	<0.01	0.06	<0.01
	Exchangeable Hydrogen (kg/ha)		7.1	1.0	<1	<1	1.4	<1
	Exchangeable Hydrogen (mg/kg)		3.2	<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	9.8	12	13	13	11	10
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	73	66	60	42	64	68
	Magnesium (%)		14	29	36	55	18	18
	Potassium (%)		7.9	4.4	2.3	2.0	16	13
	Sodium - ESP (%)		0.38	0.51	0.73	1.1	0.76	0.85
	Aluminium (%)		1.9	0.10	0.11	0.04	0.13	0.05
	Hydrogen (%)		3.2	0.38	0.00	0.00	0.57	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	5.3	2.3	1.7	0.77	3.5	3.7
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	7.5YR 3/3 Dark brown	10R 4/8 Red	2.5YR 4/8 Red	2.5YR 6/8 Light red	7.5YR 3/4 Dark brown	7.5YR 3/4 Dark brown
	Mottles Munsell Colour		..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 97	Sample 98	Sample 99	Sample 100	Sample 101	Sample 102
	Sample ID:	33 0-10cm	33 20-30cm	33 40-50cm	33 65-75cm	34 0-10cm	34 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/97	K6461/98	K6461/99	K6461/100	K6461/101	K6461/102

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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			Sample 103	Sample 104	Sample 105	Sample 106	Sample 107	Sample 108
		Sample ID:	34 40-50cm	34 65-75cm	36 0-10cm	36 20-30cm	36 40-50cm	36 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/103	K6461/104	K6461/105	K6461/106	K6461/107	K6461/108
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.34	7.82	7.09	6.45	7.18	8.17
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.054	0.049	0.084	0.054	0.048	0.050
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	9.8	8.1	10	4.9	14	15
	Exchangeable Calcium (kg/ha)		4,378	3,622	4,492	2,217	6,236	6,692
	Exchangeable Calcium (mg/kg)		1,955	1,617	2,005	990	2,784	2,988
	Exchangeable Magnesium (cmol+/kg)		3.2	6.0	0.85	1.7	11	15
	Exchangeable Magnesium (kg/ha)		864	1,636	232	470	2,980	4,193
	Exchangeable Magnesium (mg/kg)		386	730	103	210	1,331	1,872
	Exchangeable Potassium (cmol+/kg)		0.56	0.55	0.27	0.19	0.54	0.61
	Exchangeable Potassium (kg/ha)		494	481	239	167	476	533
	Exchangeable Potassium (mg/kg)		221	215	107	74	212	238
	Exchangeable Sodium (cmol+/kg)		0.18	0.60	0.22	0.08	0.44	1.0
	Exchangeable Sodium (kg/ha)		92	311	112	41	225	521
	Exchangeable Sodium (mg/kg)		41	139	50	18	100	233
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Exchangeable Aluminium (kg/ha)		1.1	1.1	<1	<1	<1	<1
	Exchangeable Aluminium (mg/kg)		<1	<1	<1	<1	<1	<1
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	<0.01	0.04	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	<1	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	14	15	11	7.0	26	32
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	71	53	88	71	54	47
	Magnesium (%)		23	39	7.5	25	42	48
	Potassium (%)		4.1	3.6	2.4	2.7	2.1	1.9
	Sodium - ESP (%)		1.3	4.0	1.9	1.1	1.7	3.2
	Aluminium (%)		0.04	0.04	0.02	0.05	0.01	0.01
	Hydrogen (%)		0.00	0.00	0.00	0.55	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	3.1	1.3	12	2.9	1.3	0.97
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	10YR 3/3 Dark brown	10YR 4/3 Brown	2.5Y 3/2 Very dark greyish brown	2.5Y 4/3 Olive brown	10YR 4/1 Dark grey	5Y 4/3 Olive
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 103	Sample 104	Sample 105	Sample 106	Sample 107	Sample 108
	Sample ID:	34 40-50cm	34 65-75cm	36 0-10cm	36 20-30cm	36 40-50cm	36 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/103	K6461/104	K6461/105	K6461/106	K6461/107	K6461/108

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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   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 res
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-estimat
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Agricultural Co-Ordinator KS

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

			Sample 109	Sample 110	Sample 111	Sample 112	Sample 113	Sample 114
		Sample ID:	37 0-10cm	37 20-30cm	37 40-50cm	37 65-75cm	39 0-10cm	39 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/109	K6461/110	K6461/111	K6461/112	K6461/113	K6461/114
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	4.94	6.67	7.32	7.54	8.02	6.87
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.094	0.015	0.079	0.045	0.078	0.031
	Exchangeable Calcium (cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	3.9	3.75	9.5	9.70	12.51	9.13
	Exchangeable Calcium (kg/ha)		1,759	1684	4,268	4354	5615	4100
	Exchangeable Calcium (mg/kg)		785	752	1,905	1944	2507	1830
	Exchangeable Magnesium (cmol$_+$/kg)		0.87	0.50	10	10.69	15.68	3.71
	Exchangeable Magnesium (kg/ha)		238	135	2,845	2911	4269	1011
	Exchangeable Magnesium (mg/kg)		106	60	1,270	1300	1906	451
	Exchangeable Potassium (cmol$_+$/kg)		0.45	0.14	0.39	0.40	0.46	0.64
	Exchangeable Potassium (kg/ha)		394	127	345	349	399	563
	Exchangeable Potassium (mg/kg)		176	57	154	156	178	251
	Exchangeable Sodium (cmol$_+$/kg)		0.16	0.08	0.69	0.69	1.35	0.10
	Exchangeable Sodium (kg/ha)		83	43	353	356	693	54
	Exchangeable Sodium (mg/kg)		37	19	158	159	310	24
	Exchangeable Aluminium (cmol$_+$/kg)	**Inhouse S37 (KCl)	0.48	0.04	0.07	0.07	0.06	0.04
	Exchangeable Aluminium (kg/ha)		97	9	15	13	13	8
	Exchangeable Aluminium (mg/kg)		43	4	6.7	6	6	4
	Exchangeable Hydrogen (cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.64	<0.01	<0.01	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		14	<1	<1	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		6.4	<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	6.5	4.52	21	21.55	30.06	13.63
	Calcium (%)	**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	60	83.0	45	45.0	41.6	67.0
	Magnesium (%)		13	11.0	50	49.6	52.2	27.2
	Potassium (%)		6.9	3.2	1.9	1.9	1.5	4.7
	Sodium - ESP (%)		2.5	1.8	3.2	3.2	4.5	0.8
	Aluminium (%)		7.4	0.9	0.35	0.3	0.2	0.3
	Hydrogen (%)		9.7	0.0	0.00	0.0	0.0	0.0
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol$_+$/kg)	4.5	7.5	0.91	0.9	0.8	2.5
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	10YR 3/2 Vey dark greyish brown	5Y 6/1 Grey	2.5Y 5/3 Light olive brown	2.5Y 3/2 Very dark greyish brown	5YR 3/3 Dark reddish brown	7.5YR 3/4 Dark brown
	Mottles Munsell Colour		..	..	2.5YR 2.5/2	..	..	..
	Degree of Mottling (%)		..	..	Very dusky red	..	..	..
			..	..	5	..	..	..

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 109	Sample 110	Sample 111	Sample 112	Sample 113	Sample 114
	Sample ID:	37 0-10cm	37 20-30cm	37 40-50cm	37 65-75cm	39 0-10cm	39 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/109	K6461/110	K6461/111	K6461/112	K6461/113	K6461/114

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: Collingwo
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 res
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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-estimat
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224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

			Sample 115	Sample 116	Sample 117	Sample 118	Sample 119	Sample 120
		Sample ID:	39 40-50cm	39 65-75cm	40 0-10cm	40 20-30cm	40 40-50cm	40 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/115	K6461/116	K6461/117	K6461/118	K6461/119	K6461/120
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.72	8.23	5.87	7.09	7.89	8.33
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.045	0.056	0.080	0.046	0.060	0.112
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	15.77	17.24	15.76	20.41	20.52	22.76
	Exchangeable Calcium (kg/ha)		7079	7739	7074	9163	9210	10218
	Exchangeable Calcium (mg/kg)		3160	3455	3158	4091	4112	4562
	Exchangeable Magnesium (cmol+/kg)		8.66	11.19	7.41	11.62	13.36	15.67
	Exchangeable Magnesium (kg/ha)		2358	3047	2016	3163	3638	4267
	Exchangeable Magnesium (mg/kg)		1053	1360	900	1412	1624	1905
	Exchangeable Potassium (cmol+/kg)		0.67	0.72	1.16	0.55	0.50	0.53
	Exchangeable Potassium (kg/ha)		586	627	1017	486	436	462
	Exchangeable Potassium (mg/kg)		262	280	454	217	195	206
	Exchangeable Sodium (cmol+/kg)		0.36	0.63	0.21	0.46	0.83	1.37
	Exchangeable Sodium (kg/ha)		184	325	110	235	427	704
	Exchangeable Sodium (mg/kg)		82	145	49	105	190	314
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.09	0.10	0.08	0.11	0.09	0.09
	Exchangeable Aluminium (kg/ha)		17	21	17	22	19	17
	Exchangeable Aluminium (mg/kg)		8	9	8	10	8	8
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.49	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	11	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	5	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	25.54	29.88	25.11	33.15	35.30	40.42
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	61.7	57.7	62.8	61.6	58.1	56.3
	Magnesium (%)		33.9	37.5	29.5	35.0	37.9	38.8
	Potassium (%)		2.6	2.4	4.6	1.7	1.4	1.3
	Sodium - ESP (%)		1.4	2.1	0.8	1.4	2.3	3.4
	Aluminium (%)		0.3	0.3	0.3	0.3	0.3	0.2
	Hydrogen (%)		0.0	0.0	1.9	0.0	0.0	0.0
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	1.8	1.5	2.1	1.8	1.5	1.5
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	2.5YR 3/4 Dark reddish brown	10YR 3/6 Dark yellowish brown	7.5YR 2.5/3 Very dark brown	7.5YR 2.5/1 Black	10YR 2/2 Very dark brown	5Y 2.5/2 Black
	Mottles Munsell Colour		..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 115	Sample 116	Sample 117	Sample 118	Sample 119	Sample 120
	Sample ID:	39 40-50cm	39 65-75cm	40 0-10cm	40 20-30cm	40 40-50cm	40 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/115	K6461/116	K6461/117	K6461/118	K6461/119	K6461/120

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: Collingwo
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.
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			Sample 121	Sample 122	Sample 123	Sample 124	Sample 125	Sample 126
		Sample ID:	41 0-10cm	41 10-20cm	41 30-40cm	41 65-75cm	42 0-10cm	42 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/121	K6461/122	K6461/123	K6461/124	K6461/125	K6461/126
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.00	5.60	7.28	8.78	5.97	6.58
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.075	0.023	0.049	0.088	0.091	0.070
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	3.62	2.44	10.65	10.06	13.03	14.62
	Exchangeable Calcium (kg/ha)		1626	1093	4782	4514	5849	6564
	Exchangeable Calcium (mg/kg)		726	488	2135	2015	2611	2930
	Exchangeable Magnesium (cmol+/kg)		0.83	0.76	16.32	19.71	3.21	11.17
	Exchangeable Magnesium (kg/ha)		226	207	4441	5365	875	3042
	Exchangeable Magnesium (mg/kg)		101	92	1983	2395	391	1358
	Exchangeable Potassium (cmol+/kg)		0.17	<0.12	0.42	0.42	1.14	0.72
	Exchangeable Potassium (kg/ha)		152	<112	367	364	997	629
	Exchangeable Potassium (mg/kg)		68	<50	164	162	445	281
	Exchangeable Sodium (cmol+/kg)		0.23	0.11	1.09	2.10	0.38	0.36
	Exchangeable Sodium (kg/ha)		118	56	561	1081	196	187
	Exchangeable Sodium (mg/kg)		53	25	250	483	87	84
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.74	0.11	0.08	0.09	0.12	0.12
	Exchangeable Aluminium (kg/ha)		150	23	17	17	23	24
	Exchangeable Aluminium (mg/kg)		67	10	8	8	10	11
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	1.50	0.66	<0.01	<0.01	0.30	<0.01
	Exchangeable Hydrogen (kg/ha)		34	15	<1	<1	7	<1
	Exchangeable Hydrogen (mg/kg)		15	7	<1	<1	3	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	7.10	4.14	28.56	32.37	18.17	27.00
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	51.0	58.8	37.3	31.1	71.7	54.2
	Magnesium (%)		11.7	18.3	57.1	60.9	17.7	41.4
	Potassium (%)		2.4	1.7	1.5	1.3	6.3	2.7
	Sodium - ESP (%)		3.2	2.6	3.8	6.5	2.1	1.3
	Aluminium (%)		10.5	2.8	0.3	0.3	0.6	0.4
	Hydrogen (%)		21.1	15.9	0.0	0.0	1.6	0.0
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	4.4	3.2	0.7	0.5	4.1	1.3
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	7.5YR 2.5/3 Very dark brown	5Y 7/1 Light grey	2.5Y 4/3 Olive brown	2.5Y 5/3 Light olive brown	10YR 3/1 Very dark grey	7.5YR 3/2 Dark brown
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 121	Sample 122	Sample 123	Sample 124	Sample 125	Sample 126
	Sample ID:	41 0-10cm	41 10-20cm	41 30-40cm	41 65-75cm	42 0-10cm	42 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/121	K6461/122	K6461/123	K6461/124	K6461/125	K6461/126

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: Collingwo
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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    122 mg/kg Magnesium, 200 mg/kg Calcium
11. Conversions to kg/ha = mg/kg x 2.24
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			Sample 127	Sample 128	Sample 129	Sample 130	Sample 131	Sample 132
		Sample ID:	42 40-50cm	42 65-75cm	43 0-10cm	43 20-30cm	43 40-50cm	43 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/127	K6461/128	K6461/129	K6461/130	K6461/131	K6461/132
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.41	8.21	6.24	6.27	6.97	8.14
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.068	0.089	0.107	0.040	0.125	0.143
	Exchangeable Calcium (cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	14.86	15.09	8.46	5.1	11	12
	Exchangeable Calcium (kg/ha)		6672	6773	3797	2,307	4,989	5,307
	Exchangeable Calcium (mg/kg)		2979	3024	1695	1,030	2,227	2,369
	Exchangeable Magnesium (cmol$_+$/kg)		13.72	16.93	0.89	1.1	12	19
	Exchangeable Magnesium (kg/ha)		3734	4609	241	304	3,207	5,146
	Exchangeable Magnesium (mg/kg)		1667	2058	108	136	1,432	2,297
	Exchangeable Potassium (cmol$_+$/kg)		0.64	0.60	0.22	0.17	0.44	0.50
	Exchangeable Potassium (kg/ha)		562	522	193	147	386	441
	Exchangeable Potassium (mg/kg)		251	233	86	66	172	197
	Exchangeable Sodium (cmol$_+$/kg)		0.74	1.48	0.19	0.16	1.7	3.8
	Exchangeable Sodium (kg/ha)		383	764	97	82	853	1,979
	Exchangeable Sodium (mg/kg)		171	341	43	37	381	884
	Exchangeable Aluminium (cmol$_+$/kg)	**Inhouse S37 (KCl)	0.12	0.12	0.06	0.14	0.15	0.14
	Exchangeable Aluminium (kg/ha)		24	24	12	27	31	28
	Exchangeable Aluminium (mg/kg)		11	11	6	12	14	12
	Exchangeable Hydrogen (cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.14	0.10	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	3	2.2	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	30.08	34.22	9.95	6.8	25	35
	Calcium (%)	**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	49.4	44.1	85.0	75	44	34
	Magnesium (%)		45.6	49.5	8.9	16	47	54
	Potassium (%)		2.1	1.7	2.2	2.5	1.8	1.4
	Sodium - ESP (%)		2.5	4.3	1.9	2.3	6.6	11
	Aluminium (%)		0.4	0.3	0.6	2.0	0.61	0.39
	Hydrogen (%)		0.0	0.0	1.4	1.5	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol$_+$/kg)	1.1	0.9	9.5	4.6	0.94	0.63
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	5Y 4/2 Olive grey	2.5Y 4/2 Dark greyish brown	2.5Y 4/2 Dark greyish brown	5Y 5/1 Grey	7.5YR 4/2 Brown	2.5Y 5/3 Light olive brown
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 127	Sample 128	Sample 129	Sample 130	Sample 131	Sample 132
	Sample ID:	42 40-50cm	42 65-75cm	43 0-10cm	43 20-30cm	43 40-50cm	43 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/127	K6461/128	K6461/129	K6461/130	K6461/131	K6461/132

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: Collingwo
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 res
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-estimat
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17. This report was issued on 09/07/2021.

Quality Checked: Kris Saville
Agricultural Co-Ordinator KS

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			Sample 133	Sample 134	Sample 135	Sample 136	Sample 137	Sample 138
		Sample ID:	46 0-10cm	46 20-30cm	46 40-50cm	46 65-75cm	47 0-10cm	47 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/133	K6461/134	K6461/135	K6461/136	K6461/137	K6461/138
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.59	6.74	7.08	8.09	5.43	6.62
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.109	0.041	0.086	0.052	0.050	0.028
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.9	6.6	9.8	15	9.1	16
	Exchangeable Calcium (kg/ha)		3,541	2,976	4,396	6,756	4,088	7,015
	Exchangeable Calcium (mg/kg)		1,581	1,329	1,962	3,016	1,825	3,132
	Exchangeable Magnesium (cmol+/kg)		1.2	2.4	6.7	13	3.2	6.9
	Exchangeable Magnesium (kg/ha)		322	648	1,821	3,540	861	1,872
	Exchangeable Magnesium (mg/kg)		144	289	813	1,580	384	836
	Exchangeable Potassium (cmol+/kg)		0.91	0.55	0.38	0.51	1.2	0.49
	Exchangeable Potassium (kg/ha)		799	482	333	447	1,036	427
	Exchangeable Potassium (mg/kg)		357	215	149	200	463	191
	Exchangeable Sodium (cmol+/kg)		0.13	0.11	0.34	0.75	0.14	0.27
	Exchangeable Sodium (kg/ha)		65	57	177	387	74	141
	Exchangeable Sodium (mg/kg)		29	25	79	173	33	63
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.16	0.11	0.12	0.15	0.32	0.16
	Exchangeable Aluminium (kg/ha)		33	22	23	30	65	33
	Exchangeable Aluminium (mg/kg)		15	9.7	10	13	29	15
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.48	<0.01	<0.01	<0.01	0.88	<0.01
	Exchangeable Hydrogen (kg/ha)		11	<1	<1	<1	20	<1
	Exchangeable Hydrogen (mg/kg)		4.8	<1	<1	<1	8.8	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	11	9.8	17	29	15	23
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	73	68	57	51	62	67
	Magnesium (%)		11	24	39	44	21	29
	Potassium (%)		8.5	5.6	2.2	1.7	8.0	2.1
	Sodium - ESP (%)		1.2	1.1	2.0	2.6	0.97	1.2
	Aluminium (%)		1.5	1.1	0.67	0.50	2.2	0.69
	Hydrogen (%)		4.5	0.00	0.00	0.00	6.0	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	6.7	2.8	1.5	1.2	2.9	2.3
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	5YR 4/2 Dark reddish grey	2.5YR 4/4 Reddish brown	2.5YR 4/4 Reddish brown	2.5Y 4/3 Olive brown	2.5YR 2.5/2 Very dusky red	2.5YR 2.5/3 Dark reddish brown
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 133	Sample 134	Sample 135	Sample 136	Sample 137	Sample 138
	Sample ID:	46 0-10cm	46 20-30cm	46 40-50cm	46 65-75cm	47 0-10cm	47 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter / Method reference	K6461/133	K6461/134	K6461/135	K6461/136	K6461/137	K6461/138

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: Collingwo
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.
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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 res
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    122 mg/kg Magnesium, 200 mg/kg Calcium
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12. The chloride calculation of Cl mg/L = EC x 640 is considered an estimate, and most likely an over-estimat
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PO BOX 11034 TAMWORTH NSW 2340

			Sample 139	Sample 140	Sample 141	Sample 142	Sample 143	Sample 144
		Sample ID:	47 40-50cm	47 65-75cm	49 0-10cm	49 20-30cm	49 40-50cm	49 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/139	K6461/140	K6461/141	K6461/142	K6461/143	K6461/144
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.19	7.48	5.20	6.37	7.24	7.96
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.025	0.032	0.086	0.035	0.037	0.057
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	14	16	6.5	10	39	16
	Exchangeable Calcium (kg/ha)		6,096	7,084	2,900	4,664	17,337	7,207
	Exchangeable Calcium (mg/kg)		2,721	3,162	1,295	2,082	7,740	3,217
	Exchangeable Magnesium (cmol+/kg)		7.3	11	3.1	8.5	44	20
	Exchangeable Magnesium (kg/ha)		1,990	2,914	839	2,321	11,858	5,523
	Exchangeable Magnesium (mg/kg)		888	1,301	375	1,036	5,294	2,466
	Exchangeable Potassium (cmol+/kg)		0.30	0.39	0.48	0.48	1.4	0.44
	Exchangeable Potassium (kg/ha)		261	339	421	419	1,186	384
	Exchangeable Potassium (mg/kg)		116	151	188	187	529	171
	Exchangeable Sodium (cmol+/kg)		0.23	0.52	0.11	0.27	1.4	1.0
	Exchangeable Sodium (kg/ha)		118	270	58	138	746	530
	Exchangeable Sodium (mg/kg)		53	120	26	62	333	237
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.17	0.16	0.25	0.12	0.12	0.12
	Exchangeable Aluminium (kg/ha)		34	33	51	24	25	23
	Exchangeable Aluminium (mg/kg)		15	15	23	11	11	10
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	1.1	0.49	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	25	11	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	11	4.9	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	22	28	11	20	85	38
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	63	57	56	51	45	42
	Magnesium (%)		34	39	27	42	51	53
	Potassium (%)		1.4	1.4	4.2	2.4	1.6	1.2
	Sodium - ESP (%)		1.1	1.9	0.98	1.3	1.7	2.7
	Aluminium (%)		0.79	0.59	2.2	0.58	0.15	0.30
	Hydrogen (%)		0.00	0.00	9.6	2.4	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	1.9	1.5	2.1	1.2	0.89	0.79
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	5YR 3/4 Dark reddish brown	10R 3/2 Dusky red	2.5YR 3/1 Dark reddish grey	2.5YR 4/3 Reddish brown	7.5YR 5/3 Brown	2.5Y 5/3 Light olive brown
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 139	Sample 140	Sample 141	Sample 142	Sample 143	Sample 144
	Sample ID:	47 40-50cm	47 65-75cm	49 0-10cm	49 20-30cm	49 40-50cm	49 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/139	K6461/140	K6461/141	K6461/142	K6461/143	K6461/144

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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			Sample 145	Sample 146	Sample 147	Sample 148	Sample 149	Sample 150
		Sample ID:	50 0-10cm	50 20-30cm	50 40-50cm	50 65-75cm	51 0-10cm	51 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/145	K6461/146	K6461/147	K6461/148	K6461/149	K6461/150
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.21	7.07	7.76	8.38	5.40	6.39
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.064	0.051	0.072	0.059	0.126	0.013
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	10	11	14	16	3.7	2.0
	Exchangeable Calcium (kg/ha)		4,519	4,896	6,253	6,995	1,652	913
	Exchangeable Calcium (mg/kg)		2,017	2,186	2,792	3,123	737	407
	Exchangeable Magnesium (cmol+/kg)		2.2	5.2	8.7	12	0.62	0.58
	Exchangeable Magnesium (kg/ha)		608	1,402	2,371	3,347	168	157
	Exchangeable Magnesium (mg/kg)		271	626	1,059	1,494	75	70
	Exchangeable Potassium (cmol+/kg)		1.9	0.56	0.65	0.67	0.18	<0.12
	Exchangeable Potassium (kg/ha)		1,631	486	566	585	156	<112
	Exchangeable Potassium (mg/kg)		728	217	253	261	70	<50
	Exchangeable Sodium (cmol+/kg)		<0.065	0.15	0.36	0.91	0.13	0.07
	Exchangeable Sodium (kg/ha)		<33	79	187	466	65	36
	Exchangeable Sodium (mg/kg)		<15	35	83	208	29	16
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.17	0.17	0.17	0.15	0.16	0.04
	Exchangeable Aluminium (kg/ha)		35	35	34	31	32	8.9
	Exchangeable Aluminium (mg/kg)		16	16	15	14	14	4.0
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.18	<0.01	<0.01	<0.01	0.60	0.15
	Exchangeable Hydrogen (kg/ha)		4.0	<1	<1	<1	13	3.3
	Exchangeable Hydrogen (mg/kg)		1.8	<1	<1	<1	6.0	1.5
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	15	17	24	30	5.4	3.0
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	69	64	58	53	69	69
	Magnesium (%)		15	30	37	42	11	19
	Potassium (%)		13	3.3	2.7	2.3	3.3	3.0
	Sodium - ESP (%)		0.42	0.90	1.5	3.1	2.4	2.4
	Aluminium (%)		1.2	1.0	0.71	0.51	3.0	1.5
	Hydrogen (%)		1.2	0.00	0.00	0.00	11	5.0
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	4.5	2.1	1.6	1.3	6.0	3.5
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	2.5Y 3/2 Very dark greyish brown	10YR 3/2 Very dark greyish brown	10YR 4/6 Dark yellowish brown	10YR 5/4 Yellowish brown	5Y 4/1 Dark grey	5Y 6/1 Grey
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
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		Sample 145	Sample 146	Sample 147	Sample 148	Sample 149	Sample 150
	Sample ID:	50 0-10cm	50 20-30cm	50 40-50cm	50 65-75cm	51 0-10cm	51 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter / Method reference	K6461/145	K6461/146	K6461/147	K6461/148	K6461/149	K6461/150

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: Collingwo
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.
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			Sample 151	Sample 152	Sample 153	Sample 154	Sample 155	Sample 156
		Sample ID:	51 40-50cm	51 65-75cm	52 0-10cm	52 20-30cm	52 40-50cm	52 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/151	K6461/152	K6461/153	K6461/154	K6461/155	K6461/156
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.71	8.28	5.54	6.50	7.24	8.00
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.038	0.088	0.076	0.080	0.065	0.049
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	6.2	9.4	10	17	18	18
	Exchangeable Calcium (kg/ha)		2,769	4,223	4,652	7,562	7,951	7,959
	Exchangeable Calcium (mg/kg)		1,236	1,885	2,077	3,376	3,550	3,553
	Exchangeable Magnesium (cmol+/kg)		7.7	16	3.0	9.4	12	13
	Exchangeable Magnesium (kg/ha)		2,088	4,417	830	2,554	3,195	3,545
	Exchangeable Magnesium (mg/kg)		932	1,972	371	1,140	1,426	1,582
	Exchangeable Potassium (cmol+/kg)		0.27	0.43	1.5	1.2	0.92	0.60
	Exchangeable Potassium (kg/ha)		239	373	1,286	1,045	807	524
	Exchangeable Potassium (mg/kg)		107	166	574	467	360	234
	Exchangeable Sodium (cmol+/kg)		1.3	3.1	0.13	0.23	0.43	0.63
	Exchangeable Sodium (kg/ha)		673	1,612	68	116	224	327
	Exchangeable Sodium (mg/kg)		300	720	30	52	100	146
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.07	0.07	0.11	0.08	0.06	0.08
	Exchangeable Aluminium (kg/ha)		14	15	22	16	13	15
	Exchangeable Aluminium (mg/kg)		6.4	6.5	10.0	7.0	5.6	6.9
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.70	0.12	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	16	2.6	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	7.0	1.2	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	15	29	16	28	31	32
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	40	32	66	61	57	55
	Magnesium (%)		50	55	19	34	38	41
	Potassium (%)		1.8	1.5	9.3	4.3	3.0	1.9
	Sodium - ESP (%)		8.4	11	0.84	0.81	1.4	2.0
	Aluminium (%)		0.46	0.25	0.70	0.28	0.20	0.24
	Hydrogen (%)		0.00	0.00	4.4	0.42	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	0.80	0.58	3.4	1.8	1.5	1.4
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	2.5Y 5/1 Grey	2.5Y 6/2 Light brownish grey	7.5YR 2.5/3 Very dark brown	2.5Y 6/6 Olive yellow	10YR 4/2 Dark greyish brown	10YR 5/4 Yellowish brown
	Mottles Munsell Colour		2.5Y 7/6 Yellow	2.5Y 7/8 Yellow	..	..	..	..
	Degree of Mottling (%)		10	25	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 151	Sample 152	Sample 153	Sample 154	Sample 155	Sample 156
	Sample ID:	51 40-50cm	51 65-75cm	52 0-10cm	52 20-30cm	52 40-50cm	52 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/151	K6461/152	K6461/153	K6461/154	K6461/155	K6461/156

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: Collingwo
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 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-estimat
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17. This report was issued on 09/07/2021.

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Agricultural Co-Ordinator KS

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

			Sample 157	Sample 158	Sample 159	Sample 160	Sample 161	Sample 162
		Sample ID:	53 0-10cm	53 20-30cm	53 40-50cm	53 65-75cm	54 0-10cm	54 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/157	K6461/158	K6461/159	K6461/160	K6461/161	K6461/162
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.51	6.82	6.81	7.44	5.15	6.17
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.128	0.027	0.029	0.040	0.084	0.027
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.5	5.6	5.4	14	5.4	7.8
	Exchangeable Calcium (kg/ha)		3,373	2,493	2,411	6,359	2,408	3,514
	Exchangeable Calcium (mg/kg)		1,506	1,113	1,077	2,839	1,075	1,569
	Exchangeable Magnesium (cmol+/kg)		1.9	1.3	1.3	11	1.2	3.7
	Exchangeable Magnesium (kg/ha)		505	358	361	2,948	327	1,005
	Exchangeable Magnesium (mg/kg)		225	160	161	1,316	146	449
	Exchangeable Potassium (cmol+/kg)		0.26	0.14	0.13	0.40	0.22	0.22
	Exchangeable Potassium (kg/ha)		228	120	114	353	195	191
	Exchangeable Potassium (mg/kg)		102	54	51	158	87	85
	Exchangeable Sodium (cmol+/kg)		0.17	0.14	0.15	0.50	0.19	0.12
	Exchangeable Sodium (kg/ha)		85	73	77	257	96	61
	Exchangeable Sodium (mg/kg)		38	32	34	115	43	27
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.08	0.04	0.04	0.06	0.16	0.08
	Exchangeable Aluminium (kg/ha)		16	7.3	8.6	11	31	16
	Exchangeable Aluminium (mg/kg)		7.1	3.2	3.9	5.1	14	7.0
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.59	<0.01	<0.01	<0.01	1.1	0.28
	Exchangeable Hydrogen (kg/ha)		13	<1	<1	<1	24	6.2
	Exchangeable Hydrogen (mg/kg)		5.9	<1	<1	<1	11	2.8
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	10	7.2	7.0	26	8.2	12
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	72	77	76	55	66	64
	Magnesium (%)		18	18	19	42	15	30
	Potassium (%)		2.5	1.9	1.9	1.6	2.7	1.8
	Sodium - ESP (%)		1.6	2.0	2.1	1.9	2.3	0.97
	Aluminium (%)		0.76	0.50	0.61	0.22	1.9	0.64
	Hydrogen (%)		5.7	0.00	0.00	0.00	13	2.3
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	4.1	4.2	4.0	1.3	4.5	2.1
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	2.5Y 4/3 Olive brown	10YR 3/3 Dark brown	2.5Y 5/6 Light olive brown	2.5Y 5/4 Light olive brown	7.5YR 3/1 Very dark grey	2.5YR 4/4 Reddish brown
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 157	Sample 158	Sample 159	Sample 160	Sample 161	Sample 162
	Sample ID:	53 0-10cm	53 20-30cm	53 40-50cm	53 65-75cm	54 0-10cm	54 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/157	K6461/158	K6461/159	K6461/160	K6461/161	K6461/162

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: Collingwo
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.
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9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil res
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11. Conversions to kg/ha = mg/kg x 2.24
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Agricultural Co-Ordinator KS

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224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

			Sample 163	Sample 164	Sample 165	Sample 166	Sample 167	Sample 168
		Sample ID:	54 40-50cm	54 65-75cm	55 0-10cm	55 20-30cm	55 40-50cm	55 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/163	K6461/164	K6461/165	K6461/166	K6461/167	K6461/168
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.80	7.28	4.95	5.94	7.13	7.84
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.065	0.047	0.117	0.041	0.028	0.035
	Exchangeable Calcium (cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	12	12	5.1	5.1	7.4	15
	Exchangeable Calcium (kg/ha)		5,517	5,307	2,302	2,280	3,344	6,603
	Exchangeable Calcium (mg/kg)		2,463	2,369	1,028	1,018	1,493	2,948
	Exchangeable Magnesium (cmol$_+$/kg)		12	14	1.2	1.6	3.6	13
	Exchangeable Magnesium (kg/ha)		3,365	3,929	336	432	972	3,439
	Exchangeable Magnesium (mg/kg)		1,502	1,754	150	193	434	1,535
	Exchangeable Potassium (cmol$_+$/kg)		0.37	0.42	1.3	0.94	0.76	0.59
	Exchangeable Potassium (kg/ha)		327	366	1,150	825	668	518
	Exchangeable Potassium (mg/kg)		146	163	514	369	298	231
	Exchangeable Sodium (cmol$_+$/kg)		0.65	1.1	0.13	0.10	0.17	0.62
	Exchangeable Sodium (kg/ha)		332	573	69	50	86	317
	Exchangeable Sodium (mg/kg)		148	256	31	22	39	142
	Exchangeable Aluminium (cmol$_+$/kg)	**Inhouse S37 (KCl)	0.08	0.08	0.33	0.08	0.07	0.07
	Exchangeable Aluminium (kg/ha)		15	16	66	16	13	15
	Exchangeable Aluminium (mg/kg)		6.8	7.3	29	7.1	5.9	6.5
	Exchangeable Hydrogen (cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	1.3	0.42	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	28	9.3	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	13	4.2	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	26	28	9.4	8.2	12	29
	Calcium (%)	**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	48	42	55	62	62	51
	Magnesium (%)		48	52	13	19	30	44
	Potassium (%)		1.4	1.5	14	11	6.3	2.1
	Sodium - ESP (%)		2.5	4.0	1.4	1.2	1.4	2.2
	Aluminium (%)		0.29	0.29	3.5	0.96	0.55	0.25
	Hydrogen (%)		0.00	0.00	13	5.1	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol$_+$/kg)	0.99	0.82	4.1	3.2	2.1	1.2
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	10YR 6/8 Brownish yellow	5YR 5/6 Yellowish red	7.5YR 4/3 Brown	5YR 5/6 Yellowish red	5YR 4/4 Reddish brown	2.5Y 6/6 Olive yellow
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 163	Sample 164	Sample 165	Sample 166	Sample 167	Sample 168
	Sample ID:	54 40-50cm	54 65-75cm	55 0-10cm	55 20-30cm	55 40-50cm	55 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/163	K6461/164	K6461/165	K6461/166	K6461/167	K6461/168

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: Collingwo
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 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
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PO BOX 11034 TAMWORTH NSW 2340

			Sample 169	Sample 170	Sample 171	Sample 172	Sample 173	Sample 174
		Sample ID:	59 0-10cm	59 20-30cm	59 40-50cm	59 65-75cm	60 0-10cm	60 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter		Method reference	K6461/169	K6461/170	K6461/171	K6461/172	K6461/173	K6461/174
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.98	6.67	7.15	7.36	5.87	6.88
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.062	0.051	0.030	0.027	0.050	0.025
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	10	21	24	24	12	12
	(kg/ha)		4,677	9,565	10,593	10,642	5,448	5,564
	(mg/kg)		2,088	4,270	4,729	4,751	2,432	2,484
Exchangeable Magnesium	(cmol$_+$/kg)		3.4	14	17	16	3.3	4.2
	(kg/ha)		935	3,941	4,752	4,230	905	1,155
	(mg/kg)		417	1,760	2,121	1,888	404	516
Exchangeable Potassium	(cmol$_+$/kg)		0.85	0.61	0.46	0.20	0.70	0.69
	(kg/ha)		744	536	406	179	616	608
	(mg/kg)		332	239	181	80	275	272
Exchangeable Sodium	(cmol$_+$/kg)		0.09	0.28	0.48	0.65	0.09	0.12
	(kg/ha)		45	147	245	337	47	64
	(mg/kg)		20	65	109	150	21	29
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.06	0.06	0.06	0.09	0.05	0.05
	(kg/ha)		12	13	12	19	11	11
	(mg/kg)		5.5	5.8	5.4	8.3	4.7	4.8
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.53	<0.01	<0.01	<0.01	0.42	<0.01
	(kg/ha)		12	<1	<1	<1	9.4	<1
	(mg/kg)		5.3	<1	<1	<1	4.2	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	15	37	42	40	17	18
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	68	58	56	59	73	71
Magnesium (%)			22	39	42	39	20	24
Potassium (%)			5.5	1.7	1.1	0.51	4.2	4.0
Sodium - ESP (%)			0.57	0.77	1.1	1.6	0.55	0.71
Aluminium (%)			0.40	0.17	0.14	0.23	0.31	0.30
Hydrogen (%)			3.4	0.00	0.00	0.00	2.5	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	3.0	1.5	1.4	1.5	3.6	2.9
Moist Munsell Colour		**Inhouse Munsell Soil Colour Classification	7.5YR 3/3 Dark brown	2.5YR 3/4 Dark reddish brown	10YR 4/6 Dark yellowish brown	10YR 5/6 Yellowish brown	7.5YR 2.5/3 Very dark brown	5YR 2.5/2 Dark reddish brown
Mottles Munsell Colour			..	..	..	5YR 2.5/1	..	..
			..	..	..	Black	..	..
Degree of Mottling (%)			..	..	..	5	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 169	Sample 170	Sample 171	Sample 172	Sample 173	Sample 174
	Sample ID:	59 0-10cm	59 20-30cm	59 40-50cm	59 65-75cm	60 0-10cm	60 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/169	K6461/170	K6461/171	K6461/172	K6461/173	K6461/174

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: Collingwo
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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PO BOX 11034 TAMWORTH NSW 2340

			Sample 175	Sample 176	Sample 177	Sample 178	Sample 179	Sample 180
		Sample ID:	60 40-50cm	60 65-75cm	61 0-10cm	61 20-30cm	61 40-50cm	61 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/175	K6461/176	K6461/177	K6461/178	K6461/179	K6461/180
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.72	8.17	5.68	6.84	7.25	7.71
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.035	0.051	0.108	0.024	0.025	0.030
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	20	22	11	20	19	18
	Exchangeable Calcium (kg/ha)		8,900	9,686	5,093	8,774	8,501	8,215
	Exchangeable Calcium (mg/kg)		3,973	4,324	2,274	3,917	3,795	3,667
	Exchangeable Magnesium (cmol+/kg)		11	13	4.4	15	17	17
	Exchangeable Magnesium (kg/ha)		2,968	3,550	1,185	4,156	4,614	4,685
	Exchangeable Magnesium (mg/kg)		1,325	1,585	529	1,855	2,060	2,092
	Exchangeable Potassium (cmol+/kg)		1.0	0.95	2.1	0.43	0.40	0.31
	Exchangeable Potassium (kg/ha)		904	830	1,860	378	354	268
	Exchangeable Potassium (mg/kg)		403	370	831	169	158	120
	Exchangeable Sodium (cmol+/kg)		0.51	1.0	0.11	0.24	0.29	0.42
	Exchangeable Sodium (kg/ha)		264	519	55	123	148	218
	Exchangeable Sodium (mg/kg)		118	232	25	55	66	97
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.05	0.05	0.10	0.06	0.06	0.05
	Exchangeable Aluminium (kg/ha)		9.4	10	20	11	11	9.2
	Exchangeable Aluminium (mg/kg)		4.2	4.5	8.8	5.0	5.0	4.1
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.70	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	16	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	7.0	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	32	37	19	36	37	36
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	61	59	61	55	52	50
	Magnesium (%)		34	36	23	43	46	47
	Potassium (%)		3.2	2.6	11	1.2	1.1	0.84
	Sodium - ESP (%)		1.6	2.8	0.57	0.67	0.78	1.2
	Aluminium (%)		0.14	0.14	0.52	0.16	0.15	0.13
	Hydrogen (%)		0.00	0.00	3.7	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	1.8	1.7	2.6	1.3	1.1	1.1
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	10 YR 3/2 Very dark greyish brown	2.5Y 4/3 Olive brown	7.5YR 3/2 Dark brown	2.5YR 4/3 Reddish brown	5Y 6/4 Pale olive	5Y 4/4 Olive
	Mottles Munsell Colour		10YR 2/1 Black	..	..	..	..	..
	Degree of Mottling (%)		3	..	..	..	..	..

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224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 175	Sample 176	Sample 177	Sample 178	Sample 179	Sample 180
	Sample ID:	60 40-50cm	60 65-75cm	61 0-10cm	61 20-30cm	61 40-50cm	61 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/175	K6461/176	K6461/177	K6461/178	K6461/179	K6461/180

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: Collingwo
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 res
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-estimat
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Agricultural Co-Ordinator KS

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224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

			Sample 181	Sample 182	Sample 183	Sample 184	Sample 185	Sample 186
		Sample ID:	62 0-10cm	62 20-30cm	62 40-50cm	62 65-75cm	63 0-10cm	63 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/181	K6461/182	K6461/183	K6461/184	K6461/185	K6461/186
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.63	6.75	7.65	8.21	5.57	6.93
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.057	0.050	0.053	0.056	0.092	0.030
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	9.6	16	18	17	14	19
	Exchangeable Calcium (kg/ha)		4,302	7,067	8,040	7,471	6,251	8,648
	Exchangeable Calcium (mg/kg)		1,921	3,155	3,589	3,335	2,791	3,861
	Exchangeable Magnesium (cmol+/kg)		2.3	9.6	15	17	5.1	13
	Exchangeable Magnesium (kg/ha)		629	2,613	4,089	4,528	1,395	3,554
	Exchangeable Magnesium (mg/kg)		281	1,167	1,826	2,021	623	1,587
	Exchangeable Potassium (cmol+/kg)		0.84	0.69	0.87	0.82	1.6	0.68
	Exchangeable Potassium (kg/ha)		739	606	765	720	1,427	599
	Exchangeable Potassium (mg/kg)		330	271	341	322	637	268
	Exchangeable Sodium (cmol+/kg)		<0.065	0.17	0.48	0.82	0.10	0.27
	Exchangeable Sodium (kg/ha)		<33	85	247	425	49	137
	Exchangeable Sodium (mg/kg)		<15	38	110	190	22	61
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.05	0.06	0.06	0.06	0.12	0.07
	Exchangeable Aluminium (kg/ha)		9.7	12	12	11	24	15
	Exchangeable Aluminium (mg/kg)		4.3	5.2	5.3	5.1	11	6.5
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.52	<0.01	<0.01	<0.01	0.71	<0.01
	Exchangeable Hydrogen (kg/ha)		12	<1	<1	<1	16	<1
	Exchangeable Hydrogen (mg/kg)		5.2	<1	<1	<1	7.1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	13	26	34	35	22	33
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	72	60	52	48	64	58
	Magnesium (%)		17	37	44	48	24	39
	Potassium (%)		6.3	2.6	2.5	2.4	7.5	2.1
	Sodium - ESP (%)		0.42	0.63	1.4	2.4	0.44	0.80
	Aluminium (%)		0.36	0.22	0.17	0.16	0.54	0.22
	Hydrogen (%)		3.9	0.00	0.00	0.00	3.3	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	4.1	1.6	1.2	1.0	2.7	1.5
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	5YR 3/2 Dark reddish brown	7.5YR 3/2 Dark brown	10YR 3/2 Very dark greyish brown	5Y 4/4 Olive	5YR 3/1 Very dark grey	2.5YR 3/4 Dark reddish brown
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 181	Sample 182	Sample 183	Sample 184	Sample 185	Sample 186
	Sample ID:	62 0-10cm	62 20-30cm	62 40-50cm	62 65-75cm	63 0-10cm	63 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/181	K6461/182	K6461/183	K6461/184	K6461/185	K6461/186

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: Collingwo
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 res
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-estimat
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PO BOX 11034 TAMWORTH NSW 2340

			Sample 187	Sample 188	Sample 189	Sample 190	Sample 191	Sample 192
		Sample ID:	63 40-50cm	63 65-75cm	64 0-10cm	64 20-30cm	64 40-50cm	64 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/187	K6461/188	K6461/189	K6461/190	K6461/191	K6461/192
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.31	7.57	6.53	6.59	7.12	7.61
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.032	0.038	0.046	0.035	0.029	0.030
	Exchangeable Calcium (cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	19	23	14	17	18	23
	Exchangeable Calcium (kg/ha)		8,742	10,415	6,460	7,458	8,143	10,181
	Exchangeable Calcium (mg/kg)		3,903	4,650	2,884	3,330	3,635	4,545
	Exchangeable Magnesium (cmol$_+$/kg)		15	18	4.3	9.8	12	14
	Exchangeable Magnesium (kg/ha)		4,023	4,804	1,167	2,662	3,333	3,917
	Exchangeable Magnesium (mg/kg)		1,796	2,145	521	1,189	1,488	1,749
	Exchangeable Potassium (cmol$_+$/kg)		0.51	0.42	1.0	0.64	0.68	0.66
	Exchangeable Potassium (kg/ha)		445	369	912	558	597	577
	Exchangeable Potassium (mg/kg)		199	165	407	249	266	257
	Exchangeable Sodium (cmol$_+$/kg)		0.46	0.75	0.09	0.15	0.18	0.26
	Exchangeable Sodium (kg/ha)		235	387	45	77	93	136
	Exchangeable Sodium (mg/kg)		105	173	20	35	41	61
	Exchangeable Aluminium (cmol$_+$/kg)	**Inhouse S37 (KCl)	0.06	0.07	0.08	0.06	0.06	0.05
	Exchangeable Aluminium (kg/ha)		11	13	15	12	12	11
	Exchangeable Aluminium (mg/kg)		5.1	6.0	6.8	5.5	5.5	4.9
	Exchangeable Hydrogen (cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	<1	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	<1	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	35	42	20	27	31	38
	Calcium (%)	**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	55	55	72	61	58	60
	Magnesium (%)		42	42	22	36	39	38
	Potassium (%)		1.4	1.0	5.2	2.3	2.2	1.7
	Sodium - ESP (%)		1.3	1.8	0.44	0.55	0.57	0.69
	Aluminium (%)		0.16	0.16	0.38	0.22	0.20	0.14
	Hydrogen (%)		0.00	0.00	0.00	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol$_+$/kg)	1.3	1.3	3.4	1.7	1.5	1.6
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	2.5Y 4/3 Reddish brown	5YR 4/2 Dark reddish grey	2.5YR 3/1 Dark reddish grey	2.5YR 3/3 Dusky red	7.5YR 3/2 Dark brown	10YR 4/6 Dark yellowish brown
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 187	Sample 188	Sample 189	Sample 190	Sample 191	Sample 192
	Sample ID:	63 40-50cm	63 65-75cm	64 0-10cm	64 20-30cm	64 40-50cm	64 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/187	K6461/188	K6461/189	K6461/190	K6461/191	K6461/192

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: Collingwo
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.
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.
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11. Conversions to kg/ha = mg/kg x 2.24
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			Sample 193	Sample 194	Sample 195	Sample 196	Sample 197	Sample 198
		Sample ID:	66 0-10cm	66 20-30cm	66 40-50cm	66 65-75cm	67 0-10cm	67 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/193	K6461/194	K6461/195	K6461/196	K6461/197	K6461/198
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.86	6.72	7.84	8.41	5.36	6.25
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.089	0.078	0.054	0.077	0.059	0.022
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	12	17	20	20	7.0	7.0
	Exchangeable Calcium (kg/ha)		5,263	7,449	8,769	8,865	3,144	3,134
	Exchangeable Calcium (mg/kg)		2,350	3,325	3,915	3,958	1,404	1,399
	Exchangeable Magnesium (cmol+/kg)		3.4	7.7	12	15	1.7	2.2
	Exchangeable Magnesium (kg/ha)		937	2,094	3,367	4,097	456	603
	Exchangeable Magnesium (mg/kg)		418	935	1,503	1,829	204	269
	Exchangeable Potassium (cmol+/kg)		2.7	0.97	0.66	0.62	0.56	0.28
	Exchangeable Potassium (kg/ha)		2,332	845	574	544	493	244
	Exchangeable Potassium (mg/kg)		1,041	377	256	243	220	109
	Exchangeable Sodium (cmol+/kg)		0.23	0.25	0.65	1.4	0.08	0.11
	Exchangeable Sodium (kg/ha)		120	131	334	700	43	58
	Exchangeable Sodium (mg/kg)		54	58	149	313	19	26
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.08	0.06	0.06	0.05	0.18	0.06
	Exchangeable Aluminium (kg/ha)		16	13	12	10	36	12
	Exchangeable Aluminium (mg/kg)		7.0	5.8	5.1	4.6	16	5.4
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.58	<0.01	<0.01	<0.01	0.87	0.28
	Exchangeable Hydrogen (kg/ha)		13	<1	<1	<1	19	6.2
	Exchangeable Hydrogen (mg/kg)		5.8	<1	<1	<1	8.7	2.8
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	19	26	33	37	10	9.9
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	63	65	59	54	68	70
	Magnesium (%)		18	30	37	41	16	22
	Potassium (%)		14	3.8	2.0	1.7	5.4	2.8
	Sodium - ESP (%)		1.2	0.99	1.9	3.7	0.80	1.1
	Aluminium (%)		0.42	0.25	0.17	0.14	1.7	0.60
	Hydrogen (%)		3.1	0.00	0.00	0.00	8.4	2.8
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	3.4	2.2	1.6	1.3	4.2	3.2
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	10YR 3/1 Very dark grey	10YR 2/2 Very dark brown	10YR 3/2 Very dark greyish brown	5Y 3/2 Dark olive grey	2.5YR 2.5/2 Very dusky red	2.5YR 3/3 Dark reddish brown
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 193	Sample 194	Sample 195	Sample 196	Sample 197	Sample 198
	Sample ID:	66 0-10cm	66 20-30cm	66 40-50cm	66 65-75cm	67 0-10cm	67 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/193	K6461/194	K6461/195	K6461/196	K6461/197	K6461/198

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: Collingwo
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.
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9. Information relating to testing colour codes is available on sheet 2 - 'Understanding your agricultural soil res
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-estimat
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Agricultural Co-Ordinator KS

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

			Sample 199	Sample 200	Sample 201	Sample 202	Sample 203	Sample 204
		Sample ID:	67 40-50cm	67 65-75cm	68 0-10cm	68 20-30cm	68 40-50cm	68 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/199	K6461/200	K6461/201	K6461/202	K6461/203	K6461/204
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.84	7.17	5.54	6.72	7.16	8.36
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.012	0.022	0.045	0.032	0.039	0.074
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.7	9.4	7.0	13	15	19
	Exchangeable Calcium (kg/ha)		3,442	4,218	3,134	6,017	6,534	8,653
	Exchangeable Calcium (mg/kg)		1,537	1,883	1,399	2,686	2,917	3,863
	Exchangeable Magnesium (cmol+/kg)		4.2	5.7	1.9	8.6	12	18
	Exchangeable Magnesium (kg/ha)		1,155	1,565	518	2,354	3,286	4,816
	Exchangeable Magnesium (mg/kg)		515	698	231	1,051	1,467	2,150
	Exchangeable Potassium (cmol+/kg)		0.26	0.25	0.47	0.58	0.55	0.46
	Exchangeable Potassium (kg/ha)		229	216	410	504	483	399
	Exchangeable Potassium (mg/kg)		102	96	183	225	216	178
	Exchangeable Sodium (cmol+/kg)		0.25	1.1	0.12	0.33	0.66	2.0
	Exchangeable Sodium (kg/ha)		129	586	64	169	341	1,055
	Exchangeable Sodium (mg/kg)		57	261	28	75	152	471
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.06	0.04	0.11	0.06	0.06	0.06
	Exchangeable Aluminium (kg/ha)		11	9.0	23	12	12	12
	Exchangeable Aluminium (mg/kg)		5.0	4.0	10	5.4	5.4	5.3
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.75	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	17	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	7.5	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	12	17	10	23	28	40
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	61	57	68	58	52	49
	Magnesium (%)		34	35	18	38	43	45
	Potassium (%)		2.1	1.5	4.5	2.5	2.0	1.2
	Sodium - ESP (%)		2.0	6.9	1.2	1.4	2.4	5.2
	Aluminium (%)		0.45	0.27	1.1	0.26	0.22	0.15
	Hydrogen (%)		0.00	0.00	7.3	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	1.8	1.6	3.7	1.6	1.2	1.1
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	5YR 3/4 Dark reddish brown	10YR 3/2 Very dark greyish brown	10YR 3/1 Very dark grey	2.5Y 3/2 Very dark greyish brown	2.5Y 3/1 Very dark grey	5Y 4/3 Olive
	Mottles Munsell Colour		..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 199	Sample 200	Sample 201	Sample 202	Sample 203	Sample 204
	Sample ID:	67 40-50cm	67 65-75cm	68 0-10cm	68 20-30cm	68 40-50cm	68 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/199	K6461/200	K6461/201	K6461/202	K6461/203	K6461/204

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: Collingwo
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 res
10. Conversions for 1 $cmol_+/kg$ = 230 mg/kg Sodium, 390 mg/kg Potassium, 122 mg/kg Magnesium, 200 mg/kg Calcium
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224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
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PO BOX 11034 TAMWORTH NSW 2340

			Sample 205	Sample 206	Sample 207	Sample 208	Sample 209	Sample 210
		Sample ID:	69 0-10cm	69 20-30cm	69 40-50cm	69 65-75cm	70 0-10cm	70 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/205	K6461/206	K6461/207	K6461/208	K6461/209	K6461/210
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.79	6.56	7.07	7.58	5.84	6.73
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.066	0.052	0.046	0.056	0.104	0.043
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	8.0	7.4	15	19	9.0	7.0
	Exchangeable Calcium (kg/ha)		3,573	3,344	6,611	8,405	4,021	3,129
	Exchangeable Calcium (mg/kg)		1,595	1,493	2,951	3,752	1,795	1,397
	Exchangeable Magnesium (cmol+/kg)		2.3	3.8	11	16	3.2	4.5
	Exchangeable Magnesium (kg/ha)		633	1,032	3,007	4,370	875	1,215
	Exchangeable Magnesium (mg/kg)		282	461	1,343	1,951	391	543
	Exchangeable Potassium (cmol+/kg)		1.4	0.86	0.81	0.57	1.1	0.59
	Exchangeable Potassium (kg/ha)		1,185	752	706	495	932	518
	Exchangeable Potassium (mg/kg)		529	336	315	221	416	231
	Exchangeable Sodium (cmol+/kg)		0.08	0.15	0.44	0.97	0.16	0.22
	Exchangeable Sodium (kg/ha)		43	79	225	500	82	112
	Exchangeable Sodium (mg/kg)		19	35	101	223	36	50
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.07	0.04	0.07	0.05	0.06	0.06
	Exchangeable Aluminium (kg/ha)		14	7.6	14	9.9	13	12
	Exchangeable Aluminium (mg/kg)		6.1	3.4	6.1	4.4	5.7	5.2
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.70	<0.01	<0.01	<0.01	0.51	<0.01
	Exchangeable Hydrogen (kg/ha)		16	<1	<1	<1	11	<1
	Exchangeable Hydrogen (mg/kg)		7.0	<1	<1	<1	5.1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	12	12	27	36	14	12
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	64	61	54	51	64	57
	Magnesium (%)		19	31	41	44	23	36
	Potassium (%)		11	7.0	3.0	1.6	7.6	4.8
	Sodium - ESP (%)		0.66	1.3	1.6	2.7	1.1	1.8
	Aluminium (%)		0.55	0.31	0.25	0.13	0.45	0.47
	Hydrogen (%)		5.6	0.00	0.00	0.00	3.6	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	3.4	2.0	1.3	1.2	2.8	1.6
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	7.5YR 3/2 Dark brown	10YR 3/2 Very dark greyish brown	5YR 3/2 Dark reddish brown	5Y 4/2 Olive grey	7.5YR 3/3 Dark brown	2.5YR 3/6 Dark red
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 205	Sample 206	Sample 207	Sample 208	Sample 209	Sample 210
	Sample ID:	69 0-10cm	69 20-30cm	69 40-50cm	69 65-75cm	70 0-10cm	70 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/205	K6461/206	K6461/207	K6461/208	K6461/209	K6461/210

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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			Sample 211	Sample 212	Sample 213	Sample 214	Sample 215	Sample 216
		Sample ID:	70 40-50cm	70 65-75cm	71 0-10cm	71 20-30cm	71 40-50cm	71 65-75cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/211	K6461/212	K6461/213	K6461/214	K6461/215	K6461/216
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.57	8.02	5.88	6.82	6.92	7.18
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.036	0.057	0.064	0.033	0.056	0.041
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	13	12	13	11	14	14
	Exchangeable Calcium (kg/ha)		5,758	5,586	5,830	5,105	6,290	6,468
	Exchangeable Calcium (mg/kg)		2,571	2,494	2,603	2,279	2,808	2,887
	Exchangeable Magnesium (cmol+/kg)		14	18	3.1	4.8	13	16
	Exchangeable Magnesium (kg/ha)		3,941	4,767	854	1,307	3,473	4,363
	Exchangeable Magnesium (mg/kg)		1,760	2,128	381	583	1,551	1,948
	Exchangeable Potassium (cmol+/kg)		0.59	0.45	1.7	0.47	0.53	0.60
	Exchangeable Potassium (kg/ha)		517	390	1,490	411	466	522
	Exchangeable Potassium (mg/kg)		231	174	665	184	208	233
	Exchangeable Sodium (cmol+/kg)		0.77	1.6	0.07	0.10	0.24	0.42
	Exchangeable Sodium (kg/ha)		395	814	34	52	126	219
	Exchangeable Sodium (mg/kg)		176	363	15	23	56	98
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.06	0.06	0.06	0.05	0.06	0.07
	Exchangeable Aluminium (kg/ha)		12	12	12	9.8	13	14
	Exchangeable Aluminium (mg/kg)		5.2	5.4	5.5	4.4	5.6	6.1
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.55	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	12	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	5.5	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	29	32	19	17	28	32
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	45	39	70	68	51	46
	Magnesium (%)		50	55	17	29	46	51
	Potassium (%)		2.1	1.4	9.2	2.8	1.9	1.9
	Sodium - ESP (%)		2.7	4.9	0.36	0.60	0.88	1.3
	Aluminium (%)		0.20	0.19	0.33	0.29	0.22	0.21
	Hydrogen (%)		0.00	0.00	3.0	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	0.89	0.71	4.1	2.4	1.1	0.90
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	2.5YR 4/8 Red	2.5YR 3/4 Dark reddish brown	10YR 2/2 Very dark brown	5YR 2.5/2 Dark reddish brown	2.5YR 3/4 Dark reddish brown	2.5Y 4/4 Olive brown
	Mottles Munsell Colour		..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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		Sample 211	Sample 212	Sample 213	Sample 214	Sample 215	Sample 216
	Sample ID:	70 40-50cm	70 65-75cm	71 0-10cm	71 20-30cm	71 40-50cm	71 65-75cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/211	K6461/212	K6461/213	K6461/214	K6461/215	K6461/216

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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5. Guidelines for phosphorus have been reduced for Australian soils.
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			Sample 217	Sample 218	Sample 219	Sample 220	Sample 221	Sample 222
		Sample ID:	72 0-10cm	72 20-30cm	72 40-50cm	72 65-75cm	73 0-10cm	73 20-30cm
		Crop:	Soil	Soil	Soil	Soil	Soil	Soil
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K6461/217	K6461/218	K6461/219	K6461/220	K6461/221	K6461/222
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	4.97	6.26	6.79	7.02	5.98	6.96
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.058	0.014	0.013	0.013	0.050	0.031
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	2.5	4.5	6.7	5.3	9.7	15
	Exchangeable Calcium (kg/ha)		1,143	2,003	2,999	2,397	4,349	6,739
	Exchangeable Calcium (mg/kg)		510	894	1,339	1,070	1,941	3,008
	Exchangeable Magnesium (cmol+/kg)		0.81	1.1	3.4	3.9	4.4	14
	Exchangeable Magnesium (kg/ha)		220	303	915	1,062	1,207	3,729
	Exchangeable Magnesium (mg/kg)		98	135	409	474	539	1,665
	Exchangeable Potassium (cmol+/kg)		0.33	0.16	0.28	0.28	1.3	0.63
	Exchangeable Potassium (kg/ha)		285	142	246	243	1,151	552
	Exchangeable Potassium (mg/kg)		127	64	110	109	514	246
	Exchangeable Sodium (cmol+/kg)		0.08	0.08	0.07	0.07	0.09	0.21
	Exchangeable Sodium (kg/ha)		40	41	35	38	46	109
	Exchangeable Sodium (mg/kg)		18	18	16	17	20	49
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.56	0.07	0.07	0.06	0.07	0.06
	Exchangeable Aluminium (kg/ha)		113	14	15	13	13	13
	Exchangeable Aluminium (mg/kg)		50	6.3	6.7	5.6	5.9	5.7
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	1.4	0.37	<0.01	<0.01	0.54	<0.01
	Exchangeable Hydrogen (kg/ha)		32	8.2	<1	<1	12	<1
	Exchangeable Hydrogen (mg/kg)		14	3.7	<1	<1	5.4	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	5.8	6.3	10	9.7	16	30
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	44	71	64	55	60	51
	Magnesium (%)		14	18	32	40	27	46
	Potassium (%)		5.7	2.6	2.7	2.9	8.1	2.1
	Sodium - ESP (%)		1.4	1.3	0.65	0.77	0.55	0.71
	Aluminium (%)		9.7	1.1	0.71	0.64	0.40	0.22
	Hydrogen (%)		25	5.9	0.00	0.00	3.3	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	3.2	4.0	2.0	1.4	2.2	1.1
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	7.5YR 3/3 Dark brown	10R 3/4 Dusky red	2.5YR 4/8 Red	2.5YR 4/8 Red	7.5YR 2.5/2 Very dark brown	7.5YR 3/2 Dark brown
	Mottles Munsell Colour		..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

		Sample 217	Sample 218	Sample 219	Sample 220	Sample 221	Sample 222
	Sample ID:	72 0-10cm	72 20-30cm	72 40-50cm	72 65-75cm	73 0-10cm	73 20-30cm
	Crop:	Soil	Soil	Soil	Soil	Soil	Soil
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K6461/217	K6461/218	K6461/219	K6461/220	K6461/221	K6461/222

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: Collingwo
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 res
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-estimat
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 sc
17. This report was issued on 09/07/2021.

Quality Checked: Kris Saville
Agricultural Co-Ordinator KS

Environmental Analysis Laboratory

Southern Cross University
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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

	Parameter		Method reference	Sample 223 73 40-50cm Soil Umwelt K6461/223	Sample 224 73 65-75cm Soil Umwelt K6461/224	*Heavy Soil* *Clay* Indicative guidelines - refer to Notes 6 and 8	*Medium Soil* *Clay Loam*	*Light Soil* *Loam*	*Sandy Soil* *Loamy Sand*
	pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.42	7.76	*6.5*	*6.5*	*6.3*	*6.3*
	Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.033	0.041	*0.200*	*0.150*	*0.120*	*0.100*
	Exchangeable Calcium	**(cmol$_+$/kg)**	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	18	18	*15.6*	*10.8*	*5.0*	*1.9*
		(kg/ha)		8,146	7,904	*7000*	*4816*	*2240*	*840*
		(mg/kg)		3,637	3,529	*3125*	*2150*	*1000*	*375*
	Exchangeable Magnesium	**(cmol$_+$/kg)**		21	23	*2.4*	*1.7*	*1.2*	*0.60*
		(kg/ha)		5,701	6,309	*650*	*448*	*325*	*168*
		(mg/kg)		2,545	2,817	*290*	*200*	*145*	*75*
	Exchangeable Potassium	**(cmol$_+$/kg)**		0.43	0.37	*0.60*	*0.50*	*0.40*	*0.30*
		(kg/ha)		380	320	*526*	*426*	*336*	*224*
		(mg/kg)		170	143	*235*	*190*	*150*	*100*
	Exchangeable Sodium	**(cmol$_+$/kg)**		0.27	0.46	*0.3*	*0.26*	*0.22*	*0.11*
		(kg/ha)		140	235	*155*	*134*	*113*	*57*
		(mg/kg)		62	105	*69*	*60*	*51*	*25*
	Exchangeable Aluminium	**(cmol$_+$/kg)**	**Inhouse S37 (KCl)	0.04	0.06	*0.6*	*0.5*	*0.4*	*0.2*
		(kg/ha)		9.0	12	*121*	*101*	*73*	*30*
		(mg/kg)		4.0	5.3	*54*	*45*	*32*	*14*
	Exchangeable Hydrogen	**(cmol$_+$/kg)**	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	*0.6*	*0.5*	*0.4*	*0.2*
		(kg/ha)		<1	<1	*13*	*11*	*8*	*3*
		(mg/kg)		<1	<1	*6*	*5*	*4*	*2*
	Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	40	42	*20.1*	*14.3*	*7.8*	*3.3*
	Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	46	42	*77.6*	*75.7*	*65.6*	*57.4*
	Magnesium (%)			53	56	*11.9*	*11.9*	*15.7*	*18.1*
	Potassium (%)			1.1	0.88	*3.0*	*3.5*	*5.2*	*9.1*
	Sodium - ESP (%)			0.68	1.1	*1.5*	*1.8*	*2.9*	*3.3*
	Aluminium (%)			0.11	0.14	*6.0*	*7.1*	*10.5*	*12.1*
	Hydrogen (%)			0.00	0.00				
	Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	0.87	0.76	*6.5*	*6.4*	*4.2*	*3.2*
	Moist Munsell Colour		**Inhouse Munsell Soil Colour Classification	10YR 4/6 Dark yellowish brown	5Y 5/4 Olive	..			
	Mottles Munsell Colour			..	..	..			
	Degree of Mottling (%)			..	..	..			

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AGRICULTURAL SOIL ANALYSIS REPORT

224 samples supplied by Minesoils Pty. Ltd. on 3/05/2021 . Lab Job No.K6461
Analysis requested by Clayton Richards. Your Job: MS-051 BSAL
PO BOX 11034 TAMWORTH NSW 2340

			Sample 223	Sample 224	*Heavy Soil*	*Medium Soil*	*Light Soil*	*Sandy Soil*
		Sample ID:	73 40-50cm	73 65-75cm				
		Crop:	Soil	Soil				
		Client:	Umwelt	Umwelt	*Clay*	*Clay Loam*	*Loam*	*Loamy Sand*
	Parameter	Method reference	K6461/223	K6461/224	Indicative guidelines - refer to Notes 6 and 8			

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: Collingwo
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 res
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-estimat
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 sc
17. This report was issued on 09/07/2021.

Quality Checked: Kris Saville
Agricultural Co-Ordinator KS

GRAIN SIZE ANALYSIS (hydrometer and sieving techniques)

48 soil samples supplied by Minesoils Pty Ltd on 12 July, 2021 - Lab Job No. K9074.
Analysis requested by Clayton Richards. Client reference: MS-051-BSAL Stage2.
PO Box 11034 TAMWORTH NSW 2340

SAMPLE ID	Lab Code	MOIST MUNSELL COLOUR		MOISTURE CONTENT (% of water in air-dry sample)	TOTAL GRAVEL > 2 mm (% of total oven-dry equivalent)	GRAVEL > 4.75 mm (% of total oven-dry equivalent)	GRAVEL 2.00-4.75 mm (% of total oven-dry equivalent)	COARSE SAND 200-2000 µm (0.2-2.0 mm) (% of total oven-dry equivalent)	FINE SAND 20-200 µm (0.02-0.2 mm) (% of total oven-dry equivalent)	SILT 2-20 µm ISSS (% of total oven-dry equivalent)	CLAY < 2 µm (% of total oven-dry equivalent)	Total soil fractions (incl. Gravel)
1 0-10	K9074/1	2.5YR 3/3	dark reddish brown	22.2%	2.2%	0.0%	2.2%	12.1%	48.7%	18.0%	19.0%	100.0%
1 20-30	K9074/2	2.5YR 3/4	dark reddish brown	18.4%	12.1%	4.5%	7.6%	7.2%	37.4%	15.1%	28.3%	100.0%
1 40-50	K9074/3	2.5Y 5/6	light olive brown	22.0%	1.5%	0.0%	1.5%	4.8%	22.2%	16.4%	55.1%	100.0%
1 65-75	K9074/4	5Y 4/3	olive	17.4%	2.9%	2.1%	0.8%	5.3%	21.2%	12.4%	58.2%	100.0%
5 0-10	K9074/5	7.5YR 2.5/3	very dark brown	25.2%	6.2%	1.8%	4.4%	40.4%	23.8%	19.8%	9.8%	100.0%
5 20-30	K9074/6	5YR 3/2	dark reddish brown	14.4%	5.1%	0.1%	5.0%	39.5%	15.1%	24.7%	15.7%	100.0%
5 40-50	K9074/7	5YR 3/4	dark reddish brown	8.9%	8.5%	0.5%	8.1%	40.7%	14.6%	23.2%	13.0%	100.0%
5 65-75	K9074/8	2.5YR 4/8	red	7.8%	7.3%	0.4%	6.9%	45.8%	11.9%	19.8%	15.3%	100.0%
6 0-10	K9074/9	7.5YR 2.5/3	very dark brown	18.5%	3.7%	0.0%	3.7%	25.6%	28.8%	26.6%	15.3%	100.0%
6 20-30	K9074/10	10YR 2/2	very dark brown	17.2%	4.3%	0.0%	4.3%	21.3%	29.6%	27.1%	17.7%	100.0%
6 40-50	K9074/11	5YR 3/4	dark reddish brown	14.2%	11.9%	0.9%	11.0%	25.6%	26.4%	20.1%	16.0%	100.0%
6 65-75	K9074/12	10YR 3/6	dark yellowish brown	11.6%	7.0%	1.3%	5.7%	21.5%	31.3%	22.6%	17.6%	100.0%
8 0-10	K9074/13	10YR 2/2	very dark brown	17.6%	1.7%	0.0%	1.7%	6.4%	48.9%	21.7%	21.2%	100.0%
8 20-30	K9074/14	5YR 3/4	dark reddish brown	20.2%	0.3%	0.0%	0.3%	4.0%	30.0%	14.7%	51.0%	100.0%
8 40-50	K9074/15	7.5YR 3/2	dark brown	23.8%	0.2%	0.0%	0.2%	2.3%	20.5%	14.5%	62.5%	100.0%
8 65-75	K9074/16	2.5Y 5/6	light olive brown	17.4%	0.6%	0.0%	0.6%	3.5%	23.9%	16.4%	55.6%	100.0%
9 0-10	K9074/17	7.5YR 2.5/3	very dark brown	20.4%	3.1%	0.5%	2.6%	8.2%	40.7%	24.2%	23.7%	100.0%
9 20-30	K9074/18	2.5YR 3/3	dark reddish brown	22.2%	10.4%	3.4%	7.0%	6.9%	20.9%	14.4%	47.3%	100.0%
9 40-50	K9074/19	5Y 5/6	olive	23.2%	1.1%	0.0%	1.1%	3.9%	15.6%	13.1%	66.3%	100.0%
9 65-75	K9074/20	2.5Y 4/3	olive brown	19.0%	0.2%	0.0%	0.2%	3.0%	14.7%	11.3%	70.7%	100.0%
10 0-10	K9074/21	10YR 2/2	very dark brown	16.8%	0.7%	0.0%	0.7%	21.0%	41.0%	24.6%	12.7%	100.0%
10 20-30	K9074/22	5YR 4/4	reddish brown	14.9%	1.3%	0.2%	1.1%	25.9%	38.0%	18.6%	16.2%	100.0%
10 40-50	K9074/23	2.5YR 3/3	dark reddish brown	15.0%	2.4%	0.2%	2.2%	21.2%	38.9%	15.4%	22.0%	100.0%
10 65-75	K9074/24	10YR 2/2	very dark brown	16.0%	0.1%	0.0%	0.1%	15.2%	39.0%	16.1%	29.5%	100.0%
11 0-10	K9074/25	7.5YR 2.5/2	very dark brown	16.1%	4.8%	1.9%	2.8%	9.3%	55.6%	20.3%	10.0%	100.0%
11 20-30	K9074/26	5YR 4/4	reddish brown	14.1%	4.8%	1.8%	3.0%	9.3%	55.0%	21.8%	9.1%	100.0%
11 40-50	K9074/27	10R 4/8	red	13.5%	3.7%	1.6%	2.1%	7.4%	47.1%	19.6%	22.3%	100.0%
11 65-75	K9074/28	10R 4/8	red	16.6%	5.1%	1.6%	3.5%	5.6%	33.3%	15.1%	40.8%	100.0%
12 0-10	K9074/29	7.5YR 3/4	dark brown	37.4%	0.1%	0.0%	0.1%	3.8%	24.2%	33.6%	38.4%	100.0%
12 20-30	K9074/30	2.5YR 4/8	red	24.9%	0.0%	0.0%	0.0%	1.5%	7.9%	20.4%	70.1%	100.0%
12 40-50	K9074/31	5YR 6/8	reddish yellow	21.3%	0.0%	0.0%	0.0%	1.6%	11.8%	25.7%	60.9%	100.0%
12 65-75	K9074/32	5YR 5/8	yellowish red	22.5%	0.0%	0.0%	0.0%	1.7%	6.2%	25.6%	66.5%	100.0%
17 0-10	K9074/33	7.5YR 2.5/2	very dark brown	20.8%	7.1%	1.7%	5.3%	11.4%	43.6%	26.1%	11.8%	100.0%
17 20-30	K9074/34	10YR 5/8	yellowish brown	16.9%	4.2%	1.6%	2.6%	10.4%	35.7%	17.7%	32.0%	100.0%
17 40-50	K9074/35	5YR 5/8	yellowish red	20.0%	0.7%	0.0%	0.7%	2.9%	11.6%	11.3%	73.6%	100.0%
17 65-75	K9074/36	2.5Y 5/6	light olive brown	18.4%	2.8%	0.7%	2.1%	3.1%	13.1%	16.5%	64.5%	100.0%
18 0-10	K9074/37	10YR 2/2	very dark brown	25.9%	0.8%	0.0%	0.8%	4.4%	39.3%	22.1%	33.5%	100.0%
18 20-30	K9074/38	10YR 3/2	very dark greyish brown	25.9%	0.5%	0.0%	0.5%	2.6%	23.3%	15.3%	58.4%	100.0%
18 40-50	K9074/39	5Y 3/2	dark olive grey	24.5%	0.2%	0.0%	0.2%	3.1%	23.2%	12.4%	61.1%	100.0%
18 65-75	K9074/40	5Y 3/2	dark olive grey	22.8%	0.5%	0.0%	0.5%	3.3%	25.1%	11.0%	60.1%	100.0%
19 0-10	K9074/41	7.5YR 4/1	dark grey	18.2%	0.7%	0.0%	0.7%	1.5%	60.2%	27.9%	9.7%	100.0%
19 20-30	K9074/42	2.5Y 4/4	olive brown	12.6%	0.0%	0.0%	0.0%	0.9%	64.4%	24.1%	10.6%	100.0%
19 40-50	K9074/43	10R 4/8	red	21.3%	0.0%	0.0%	0.0%	0.3%	28.4%	10.9%	60.3%	100.0%
19 65-75	K9074/44	10R 3/6	dark red	19.5%	0.3%	0.0%	0.3%	0.5%	33.8%	15.1%	50.3%	100.0%
20 0-10	K9074/45	5YR 4/6	yellowish red	17.5%	0.2%	0.0%	0.2%	2.6%	62.7%	19.8%	14.8%	100.0%
20 20-30	K9074/46	10R 4/8	red	16.0%	0.0%	0.0%	0.0%	3.0%	48.6%	21.1%	27.2%	100.0%
20 40-50	K9074/47	10R 3/6	dark red	14.4%	0.1%	0.0%	0.1%	1.3%	38.0%	16.9%	43.7%	100.0%
20 65-75	K9074/48	10R 4/8	red	16.9%	0.0%	0.0%	0.0%	0.6%	29.4%	13.6%	56.4%	100.0%

Note:

1: The Hydrometer Analysis method was used to determine the percentage sand, silt and clay,
modified from SOP meth004 (California Dept of Pesticide Regulation), using method of Gee & Bauder (1986),
in *Methods of Soil Analysis. Part 1* Agron. Monogr. 9 (2nd Ed). Klute, A., American Soc. of Agronomy Inc., Soil Sci. Soc. America Inc., Madison WI: 383-411.

2: Australian Standard 1289.3.8.1-1997 (see attached)

3. Analysis conducted between sample arrival date and reporting date.

4. This report is not to be reproduced except in full. Results only relate to the item tested.

5. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal).

6. This report was issued on 30/08/2021

Environmental Analysis Laboratory, Southern Cross University,
Tel. 02 6620 3678, website: scu.edu.au/eal

[redacted]

checked: .....
Graham Lancaster (Nata signatory)
Laboratory Manager

Environmental Analysis Laboratory

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AGRICULTURAL SOIL ANALYSIS REPORT

48 samples supplied by Minesoils Pty. Ltd. on 12/07/2021. Lab Job No.K9074
Analysis requested by Clayton Richards. Your Job: MS-051-BSAL Stage2
PO BOX 11034 TAMWORTH NSW 2340

			Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
		Sample ID:	1 0-10	1 20-30	1 40-50	1 65-75	5 0-10	5 20-30
		Crop:	N/G	N/G	N/G	N/G	N/G	N/G
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K9074/1	K9074/2	K9074/3	K9074/4	K9074/5	K9074/6
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.35	6.65	8.03	8.53	6.50	7.01
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.089	0.046	0.068	0.205	0.126	0.056
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	6.7	9.9	15	25	16	9.8
	Exchangeable Calcium (kg/ha)		3,011	4,456	6,725	11,108	7,081	4,418
	Exchangeable Calcium (mg/kg)		1,344	1,989	3,002	4,959	3,161	1,972
	Exchangeable Magnesium (cmol+/kg)		2.1	4.0	11	16	3.3	2.0
	Exchangeable Magnesium (kg/ha)		559	1,085	3,056	4,256	910	557
	Exchangeable Magnesium (mg/kg)		250	484	1,364	1,900	406	248
	Exchangeable Potassium (cmol+/kg)		1.8	0.67	0.42	0.41	2.2	0.54
	Exchangeable Potassium (kg/ha)		1,620	584	364	360	1,958	472
	Exchangeable Potassium (mg/kg)		723	261	163	161	874	211
	Exchangeable Sodium (cmol+/kg)		0.11	0.14	0.72	1.1	0.13	0.22
	Exchangeable Sodium (kg/ha)		59	73	371	591	65	114
	Exchangeable Sodium (mg/kg)		26	32	166	264	29	51
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.11	0.02	0.02	0.02	0.03	0.02
	Exchangeable Aluminium (kg/ha)		21	4.8	3.9	3.7	6.0	4.3
	Exchangeable Aluminium (mg/kg)		9.5	2.1	1.7	1.6	2.7	1.9
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	1.5	<0.01	<0.01	<0.01	0.32	<0.01
	Exchangeable Hydrogen (kg/ha)		33	<1	<1	<1	7.2	<1
	Exchangeable Hydrogen (mg/kg)		15	<1	<1	<1	3.2	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	12	15	27	42	22	13
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	55	67	55	59	72	78
	Magnesium (%)		17	27	41	37	15	16
	Potassium (%)		15	4.5	1.5	0.98	10	4.3
	Sodium - ESP (%)		0.93	0.96	2.6	2.7	0.58	1.7
	Aluminium (%)		0.86	0.16	0.07	0.04	0.14	0.17
	Hydrogen (%)		12	0.00	0.00	0.00	1.5	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	3.3	2.5	1.3	1.6	4.7	4.8
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	2.5YR 3/3 dark reddish brown	2.5YR 3/4 dark reddish brown	2.5Y 5/6 light olive brown	5Y 4/3 olive	7.5YR 2.5/3 very dark brown	5YR 3/2 dark reddish brown
	Mottles Munsell Colour		..	..	..	..	..	..
			..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

48 samples supplied by Minesoils Pty. Ltd. on 12/07/2021. Lab Job No.K9074
Analysis requested by Clayton Richards. Your Job: MS-051-BSAL Stage2
PO BOX 11034 TAMWORTH NSW 2340

		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
	Sample ID:	1 0-10	1 20-30	1 40-50	1 65-75	5 0-10	5 20-30
	Crop:	N/G	N/G	N/G	N/G	N/G	N/G
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K9074/1	K9074/2	K9074/3	K9074/4	K9074/5	K9074/6

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 30/07/2021.

NATA
WORLD RECOGNISED ACCREDITATION
Accreditation No. 14960
Accredited for compliance with ISO/IEC 17025 - Testing

Quality Checked: Kris Saville
Agricultural Co-Ordinator KS

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Analysis requested by Clayton Richards. Your Job: MS-051-BSAL Stage2
PO BOX 11034 TAMWORTH NSW 2340

			Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Sample 12
		Sample ID:	5 40-50	5 65-75	6 0-10	6 20-30	6 40-50	6 65-75
		Crop:	N/G	N/G	N/G	N/G	N/G	N/G
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K9074/7	K9074/8	K9074/9	K9074/10	K9074/11	K9074/12
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.88	6.96	6.11	6.88	7.17	7.15
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.060	0.026	0.048	0.024	0.019	0.022
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	8.3	8.4	8.2	7.7	6.6	7.0
	Exchangeable Calcium (kg/ha)		3,741	3,793	3,678	3,443	2,979	3,156
	Exchangeable Calcium (mg/kg)		1,670	1,693	1,642	1,537	1,330	1,409
	Exchangeable Magnesium (cmol+/kg)		2.1	2.4	1.8	2.4	3.2	3.8
	Exchangeable Magnesium (kg/ha)		581	645	499	663	868	1,036
	Exchangeable Magnesium (mg/kg)		259	288	223	296	388	463
	Exchangeable Potassium (cmol+/kg)		0.41	0.23	0.70	0.22	0.20	0.20
	Exchangeable Potassium (kg/ha)		359	203	617	195	177	176
	Exchangeable Potassium (mg/kg)		160	90	275	87	79	78
	Exchangeable Sodium (cmol+/kg)		0.20	0.34	0.28	0.14	0.17	0.19
	Exchangeable Sodium (kg/ha)		104	176	142	70	89	99
	Exchangeable Sodium (mg/kg)		47	79	63	31	40	44
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.02	0.02	0.02	0.02	0.02	0.02
	Exchangeable Aluminium (kg/ha)		4.5	3.8	3.6	3.4	3.4	3.6
	Exchangeable Aluminium (mg/kg)		2.0	1.7	1.6	1.5	1.5	1.6
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.25	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	5.5	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	2.5	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	11	11	11	10	10	11
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	75	74	73	73	65	63
	Magnesium (%)		19	21	16	23	31	34
	Potassium (%)		3.7	2.0	6.2	2.1	2.0	1.8
	Sodium - ESP (%)		1.8	3.0	2.4	1.3	1.7	1.7
	Aluminium (%)		0.20	0.17	0.16	0.16	0.16	0.16
	Hydrogen (%)		0.00	0.00	2.2	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	3.9	3.6	4.5	3.2	2.1	1.8
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	5YR 3/4 dark reddish brown	2.5YR 4/8 red	7.5YR 2.5/3 very dark brown	10YR 2/2 very dark brown	5YR 3/4 dark reddish brown	10YR 3/6 dark yellowish brown
	Mottles Munsell Colour		..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by Clayton Richards. Your Job: MS-051-BSAL Stage2
PO BOX 11034 TAMWORTH NSW 2340

		Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Sample 12
	Sample ID:	5 40-50	5 65-75	6 0-10	6 20-30	6 40-50	6 65-75
	Crop:	N/G	N/G	N/G	N/G	N/G	N/G
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter / Method reference	K9074/7	K9074/8	K9074/9	K9074/10	K9074/11	K9074/12

Notes:

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2. Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia.* CSIRO Publishing: Collingwo
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.
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PO BOX 11034 TAMWORTH NSW 2340

Parameter		Method reference	Sample 13	Sample 14	Sample 15	Sample 16	Sample 17	Sample 18
Sample ID:			8 0-10	8 20-30	8 40-50	8 65-75	9 0-10	9 20-30
Crop:			N/G	N/G	N/G	N/G	N/G	N/G
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			K9074/13	K9074/14	K9074/15	K9074/16	K9074/17	K9074/18
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.99	6.82	7.30	7.66	5.66	7.18
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.039	0.023	0.048	0.055	0.047	0.048
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	7.2	14	16	14	8.7	13
	(kg/ha)		3,215	6,411	7,072	6,458	3,926	5,978
	(mg/kg)		1,435	2,862	3,157	2,883	1,753	2,669
Exchangeable Magnesium	(cmol$_+$/kg)		2.6	6.9	9.5	11	2.9	6.1
	(kg/ha)		694	1,873	2,594	2,867	791	1,668
	(mg/kg)		310	836	1,158	1,280	353	744
Exchangeable Potassium	(cmol$_+$/kg)		0.24	0.34	0.39	0.39	1.1	0.95
	(kg/ha)		209	298	339	340	940	831
	(mg/kg)		94	133	151	152	420	371
Exchangeable Sodium	(cmol$_+$/kg)		0.19	0.22	0.31	0.54	0.16	0.25
	(kg/ha)		96	116	158	278	82	131
	(mg/kg)		43	52	70	124	37	59
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.03	0.02	0.02	0.02	0.04	0.03
	(kg/ha)		5.3	4.2	3.7	3.8	8.6	5.7
	(mg/kg)		2.4	1.9	1.7	1.7	3.8	2.6
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.43	<0.01	<0.01	<0.01	0.90	<0.01
	(kg/ha)		9.7	<1	<1	<1	20	<1
	(mg/kg)		4.3	<1	<1	<1	9.0	<1
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	11	22	26	26	14	21
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	68	66	61	56	63	64
Magnesium (%)			24	32	37	41	21	30
Potassium (%)			2.3	1.6	1.5	1.5	7.8	4.6
Sodium - ESP (%)			1.8	1.0	1.2	2.1	1.1	1.2
Aluminium (%)			0.25	0.10	0.07	0.07	0.31	0.14
Hydrogen (%)			4.1	0.00	0.00	0.00	6.5	0.00
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	2.8	2.1	1.7	1.4	3.0	2.2
Moist Munsell Colour		**Inhouse Munsell Soil Colour Classification	10YR 2/2 very dark brown	5YR 3/4 dark reddish brown	7.5YR 3/2 dark brown	2.5Y 5/6 light olive brown	7.5YR 2.5/3 very dark brown	2.5YR 3/3 dark reddish brown
Mottles Munsell Colour			..	..	..	..	..	..
			..	..	..	..	..	..
Degree of Mottling (%)			..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

48 samples supplied by Minesoils Pty. Ltd. on 12/07/2021. Lab Job No.K9074
Analysis requested by Clayton Richards. Your Job: MS-051-BSAL Stage2
PO BOX 11034 TAMWORTH NSW 2340

		Sample 13	Sample 14	Sample 15	Sample 16	Sample 17	Sample 18
	Sample ID:	8 0-10	8 20-30	8 40-50	8 65-75	9 0-10	9 20-30
	Crop:	N/G	N/G	N/G	N/G	N/G	N/G
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter / Method reference	K9074/13	K9074/14	K9074/15	K9074/16	K9074/17	K9074/18

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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			Sample 19	Sample 20	Sample 21	Sample 22	Sample 23	Sample 24
		Sample ID:	9 40-50	9 65-75	10 0-10	10 20-30	10 40-50	10 65-75
		Crop:	N/G	N/G	N/G	N/G	N/G	N/G
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K9074/19	K9074/20	K9074/21	K9074/22	K9074/23	K9074/24
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.94	8.43	5.97	6.62	6.90	7.13
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.057	0.094	0.037	0.055	0.041	0.026
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	16	17	6.5	7.0	9.4	12
	Exchangeable Calcium (kg/ha)		7,228	7,776	2,916	3,151	4,228	5,270
	Exchangeable Calcium (mg/kg)		3,227	3,472	1,302	1,407	1,888	2,353
	Exchangeable Magnesium (cmol+/kg)		10	13	1.3	1.1	1.8	2.5
	Exchangeable Magnesium (kg/ha)		2,754	3,587	350	313	483	690
	Exchangeable Magnesium (mg/kg)		1,229	1,601	156	140	216	308
	Exchangeable Potassium (cmol+/kg)		0.49	0.48	0.60	0.37	0.38	0.41
	Exchangeable Potassium (kg/ha)		426	421	521	321	332	357
	Exchangeable Potassium (mg/kg)		190	188	233	143	148	159
	Exchangeable Sodium (cmol+/kg)		0.45	0.83	0.11	0.11	0.12	0.15
	Exchangeable Sodium (kg/ha)		231	427	55	57	60	79
	Exchangeable Sodium (mg/kg)		103	191	25	26	27	35
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.03	0.03	0.03	0.03	0.03	0.04
	Exchangeable Aluminium (kg/ha)		5.8	5.4	5.2	5.5	6.0	8.7
	Exchangeable Aluminium (mg/kg)		2.6	2.4	2.3	2.5	2.7	3.9
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.57	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	13	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	5.7	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	27	32	9.1	8.7	12	15
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	59	54	72	81	80	79
	Magnesium (%)		37	41	14	13	15	17
	Potassium (%)		1.8	1.5	6.6	4.2	3.2	2.7
	Sodium - ESP (%)		1.6	2.6	1.2	1.3	1.0	1.0
	Aluminium (%)		0.11	0.08	0.28	0.31	0.25	0.29
	Hydrogen (%)		0.00	0.00	6.2	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	1.6	1.3	5.1	6.1	5.3	4.6
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	5Y 5/6 olive	2.5Y 4/3 olive brown	10YR 2/2 very dark brown	5YR 4/4 reddish brown	2.5YR 3/3 dark reddish brown	10YR 2/2 very dark brown
	Mottles Munsell Colour		..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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		Sample 19	Sample 20	Sample 21	Sample 22	Sample 23	Sample 24
	Sample ID:	9 40-50	9 65-75	10 0-10	10 20-30	10 40-50	10 65-75
	Crop:	N/G	N/G	N/G	N/G	N/G	N/G
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K9074/19	K9074/20	K9074/21	K9074/22	K9074/23	K9074/24

Notes:

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			Sample 25	Sample 26	Sample 27	Sample 28	Sample 29	Sample 30
		Sample ID:	11 0-10	11 20-30	11 40-50	11 65-75	12 0-10	12 20-30
		Crop:	N/G	N/G	N/G	N/G	N/G	N/G
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K9074/25	K9074/26	K9074/27	K9074/28	K9074/29	K9074/30
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	4.77	5.18	5.65	5.74	5.95	6.41
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.033	0.017	0.017	0.017	0.084	0.049
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	1.2	1.5	2.1	2.9	17	24
	Exchangeable Calcium (kg/ha)		554	660	964	1,291	7,696	10,975
	Exchangeable Calcium (mg/kg)		247	295	431	576	3,436	4,900
	Exchangeable Magnesium (cmol+/kg)		0.44	0.44	1.7	3.7	7.6	11
	Exchangeable Magnesium (kg/ha)		120	120	476	1,007	2,078	2,944
	Exchangeable Magnesium (mg/kg)		54	54	212	449	928	1,314
	Exchangeable Potassium (cmol+/kg)		0.34	0.18	0.18	0.25	1.8	0.73
	Exchangeable Potassium (kg/ha)		296	155	155	217	1,541	639
	Exchangeable Potassium (mg/kg)		132	69	69	97	688	285
	Exchangeable Sodium (cmol+/kg)		<0.065	<0.065	0.08	0.19	0.27	0.36
	Exchangeable Sodium (kg/ha)		<33	<33	43	96	139	186
	Exchangeable Sodium (mg/kg)		<15	<15	19	43	62	83
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.92	0.35	0.13	0.18	0.05	0.05
	Exchangeable Aluminium (kg/ha)		185	70	27	37	9.5	11
	Exchangeable Aluminium (mg/kg)		83	31	12	16	4.3	4.8
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	3.4	1.7	0.96	1.1	0.82	0.63
	Exchangeable Hydrogen (kg/ha)		77	39	22	25	18	14
	Exchangeable Hydrogen (mg/kg)		34	17	9.6	11	8.2	6.3
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	6.4	4.2	5.3	8.3	28	37
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	19	35	41	35	62	66
	Magnesium (%)		6.9	11	33	45	28	29
	Potassium (%)		5.3	4.2	3.4	3.0	6.4	2.0
	Sodium - ESP (%)		0.26	0.68	1.6	2.2	0.98	0.97
	Aluminium (%)		14	8.2	2.5	2.2	0.17	0.14
	Hydrogen (%)		54	41	18	13	3.0	1.7
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	2.8	3.3	1.2	0.78	2.2	2.3
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	7.5YR 2.5/2 very dark brown	5YR 4/4 reddish brown	10R 4/8 red	10R 4/8 red	7.5YR 3/4 dark brown	2.5YR 4/8 red
	Mottles Munsell Colour		..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

48 samples supplied by Minesoils Pty. Ltd. on 12/07/2021. Lab Job No.K9074
Analysis requested by Clayton Richards. Your Job: MS-051-BSAL Stage2
PO BOX 11034 TAMWORTH NSW 2340

		Sample 25	Sample 26	Sample 27	Sample 28	Sample 29	Sample 30
	Sample ID:	11 0-10	11 20-30	11 40-50	11 65-75	12 0-10	12 20-30
	Crop:	N/G	N/G	N/G	N/G	N/G	N/G
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter / Method reference	K9074/25	K9074/26	K9074/27	K9074/28	K9074/29	K9074/30

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: Collingwo
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 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
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Agricultural Co-Ordinator KS

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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by Clayton Richards. Your Job: MS-051-BSAL Stage2
PO BOX 11034 TAMWORTH NSW 2340

			Sample 31	Sample 32	Sample 33	Sample 34	Sample 35	Sample 36
		Sample ID:	12 40-50	12 65-75	17 0-10	17 20-30	17 40-50	17 65-75
		Crop:	N/G	N/G	N/G	N/G	N/G	N/G
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K9074/31	K9074/32	K9074/33	K9074/34	K9074/35	K9074/36
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.69	6.73	5.67	7.37	8.05	8.21
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.053	0.057	0.057	0.067	0.060	0.074
	Exchangeable Calcium (cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	24	25	7.9	10	18	17
	Exchangeable Calcium (kg/ha)		10,610	11,121	3,527	4,611	8,245	7,669
	Exchangeable Calcium (mg/kg)		4,737	4,965	1,575	2,059	3,681	3,424
	Exchangeable Magnesium (cmol$_+$/kg)		11	12	1.2	3.2	11	13
	Exchangeable Magnesium (kg/ha)		3,128	3,309	329	870	2,877	3,589
	Exchangeable Magnesium (mg/kg)		1,396	1,477	147	388	1,284	1,602
	Exchangeable Potassium (cmol$_+$/kg)		0.31	0.24	0.81	0.25	0.48	0.36
	Exchangeable Potassium (kg/ha)		268	211	710	221	422	316
	Exchangeable Potassium (mg/kg)		120	94	317	99	188	141
	Exchangeable Sodium (cmol$_+$/kg)		0.53	0.59	0.13	0.10	0.31	0.52
	Exchangeable Sodium (kg/ha)		274	304	66	51	158	269
	Exchangeable Sodium (mg/kg)		122	136	30	23	70	120
	Exchangeable Aluminium (cmol$_+$/kg)	**Inhouse S37 (KCl)	0.06	0.06	0.04	0.03	0.03	0.03
	Exchangeable Aluminium (kg/ha)		11	11	8.5	6.3	6.4	6.3
	Exchangeable Aluminium (mg/kg)		5.0	5.0	3.8	2.8	2.8	2.8
	Exchangeable Hydrogen (cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	<0.01	<0.01	0.87	<0.01	<0.01	<0.01
	Exchangeable Hydrogen (kg/ha)		<1	<1	19	<1	<1	<1
	Exchangeable Hydrogen (mg/kg)		<1	<1	8.7	<1	<1	<1
	Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	36	38	11	14	30	31
	Calcium (%)	**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	66	66	72	74	62	55
	Magnesium (%)		32	32	11	23	36	42
	Potassium (%)		0.85	0.64	7.4	1.8	1.6	1.2
	Sodium - ESP (%)		1.5	1.6	1.2	0.71	1.0	1.7
	Aluminium (%)		0.15	0.15	0.39	0.23	0.11	0.10
	Hydrogen (%)		0.00	0.00	7.9	0.00	0.00	0.00
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol$_+$/kg)	2.1	2.0	6.5	3.2	1.7	1.3
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	5YR 6/8 reddish yellow	5YR 5/8 yellowish red	7.5YR 2.5/2 very dark brown	10YR 5/8 yellowish brown	5YR 5/8 yellowish red	2.5Y 5/6 light olive brown
	Mottles Munsell Colour		..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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Analysis requested by Clayton Richards. Your Job: MS-051-BSAL Stage2
PO BOX 11034 TAMWORTH NSW 2340

		Sample 31	Sample 32	Sample 33	Sample 34	Sample 35	Sample 36
	Sample ID:	12 40-50	12 65-75	17 0-10	17 20-30	17 40-50	17 65-75
	Crop:	N/G	N/G	N/G	N/G	N/G	N/G
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter / Method reference	K9074/31	K9074/32	K9074/33	K9074/34	K9074/35	K9074/36

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: Collingwo
3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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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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AGRICULTURAL SOIL ANALYSIS REPORT

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Analysis requested by Clayton Richards. Your Job: MS-051-BSAL Stage2
PO BOX 11034 TAMWORTH NSW 2340

Parameter		Method reference	Sample 37	Sample 38	Sample 39	Sample 40	Sample 41	Sample 42
Sample ID:			18 0-10	18 20-30	18 40-50	18 65-75	19 0-10	19 20-30
Crop:			N/G	N/G	N/G	N/G	N/G	N/G
Client:			Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
			K9074/37	K9074/38	K9074/39	K9074/40	K9074/41	K9074/42
pH		Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.14	7.16	8.38	8.46	6.00	6.02
Electrical Conductivity (dS/m)		Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.055	0.039	0.074	0.089	0.035	0.016
Exchangeable Calcium	(cmol$_+$/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	17	22	24	22	2.3	0.80
	(kg/ha)		7,530	9,972	10,865	10,039	1,046	358
	(mg/kg)		3,362	4,452	4,851	4,482	467	160
Exchangeable Magnesium	(cmol$_+$/kg)		5.3	7.4	12	14	0.76	0.39
	(kg/ha)		1,451	2,022	3,348	3,811	206	107
	(mg/kg)		648	903	1,494	1,701	92	48
Exchangeable Potassium	(cmol$_+$/kg)		0.52	0.48	0.44	0.42	0.55	0.35
	(kg/ha)		456	423	384	364	480	311
	(mg/kg)		204	189	172	163	215	139
Exchangeable Sodium	(cmol$_+$/kg)		0.36	0.20	0.44	0.76	<0.065	<0.065
	(kg/ha)		183	102	225	393	<33	<33
	(mg/kg)		82	46	100	176	<15	<15
Exchangeable Aluminium	(cmol$_+$/kg)	**Inhouse S37 (KCl)	0.04	0.03	0.03	0.03	0.05	0.05
	(kg/ha)		7.8	6.8	6.6	6.7	9.2	11
	(mg/kg)		3.5	3.0	3.0	3.0	4.1	4.9
Exchangeable Hydrogen	(cmol$_+$/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.47	<0.01	<0.01	<0.01	0.59	0.38
	(kg/ha)		11	<1	<1	<1	13	8.5
	(mg/kg)		4.7	<1	<1	<1	5.9	3.8
Effective Cation Exchange Capacity (ECEC) (cmol$_+$/kg)		**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol$_+$/kg)	23	30	37	38	4.3	2.0
Calcium (%)		**Base Saturation Calculations - Cation cmol$_+$/kg / ECEC x 100	71	73	65	60	54	40
Magnesium (%)			23	24	33	37	17	20
Potassium (%)			2.2	1.6	1.2	1.1	13	18
Sodium - ESP (%)			1.5	0.65	1.2	2.0	1.1	1.3
Aluminium (%)			0.17	0.11	0.09	0.09	1.1	2.7
Hydrogen (%)			2.0	0.00	0.00	0.00	14	19
Calcium/Magnesium Ratio		**Calculation: Calcium / Magnesium (cmol$_+$/kg)	3.1	3.0	2.0	1.6	3.1	2.0
Moist Munsell Colour		**Inhouse Munsell Soil Colour Classification	10YR 2/2 very dark brown	10YR 3/2 very dark greyish brown	5Y 3/2 dark olive grey	5Y 3/2 dark olive grey	7.5YR 4/1 dark grey	2.5Y 4/4 olive brown
Mottles Munsell Colour			..	..	..	..	..	..
			..	..	..	..	..	..
Degree of Mottling (%)			..	..	..	..	..	..

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AGRICULTURAL SOIL ANALYSIS REPORT

48 samples supplied by Minesoils Pty. Ltd. on 12/07/2021. Lab Job No.K9074
Analysis requested by Clayton Richards. Your Job: MS-051-BSAL Stage2
PO BOX 11034 TAMWORTH NSW 2340

		Sample 37	Sample 38	Sample 39	Sample 40	Sample 41	Sample 42
	Sample ID:	18 0-10	18 20-30	18 40-50	18 65-75	19 0-10	19 20-30
	Crop:	N/G	N/G	N/G	N/G	N/G	N/G
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter / Method reference	K9074/37	K9074/38	K9074/39	K9074/40	K9074/41	K9074/42

Notes:

1. All results presented as a 40°C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
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3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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			Sample 43	Sample 44	Sample 45	Sample 46	Sample 47	Sample 48
		Sample ID:	19 40-50	19 65-75	20 0-10	20 20-30	20 40-50	20 65-75
		Crop:	N/G	N/G	N/G	N/G	N/G	N/G
		Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
	Parameter	Method reference	K9074/43	K9074/44	K9074/45	K9074/46	K9074/47	K9074/48
	pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	5.77	5.88	5.30	5.86	5.96	6.05
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.021	0.009	0.049	0.023	0.023	0.013
	Exchangeable Calcium (cmol+/kg)	Rayment & Lyons 2011 - 15D3 (Ammonium Acetate)	4.4	3.9	2.2	4.4	5.8	5.7
	Exchangeable Calcium (kg/ha)		1,978	1,755	978	1,993	2,613	2,577
	Exchangeable Calcium (mg/kg)		883	783	437	890	1,167	1,151
	Exchangeable Magnesium (cmol+/kg)		2.3	2.9	0.84	0.92	1.8	3.2
	Exchangeable Magnesium (kg/ha)		625	793	230	249	493	871
	Exchangeable Magnesium (mg/kg)		279	354	103	111	220	389
	Exchangeable Potassium (cmol+/kg)		1.7	0.85	0.59	0.34	0.32	0.47
	Exchangeable Potassium (kg/ha)		1,456	742	513	301	276	408
	Exchangeable Potassium (mg/kg)		650	331	229	134	123	182
	Exchangeable Sodium (cmol+/kg)		0.07	<0.065	<0.065	<0.065	0.10	0.09
	Exchangeable Sodium (kg/ha)		35	<33	<33	<33	49	45
	Exchangeable Sodium (mg/kg)		16	<15	<15	<15	22	20
	Exchangeable Aluminium (cmol+/kg)	**Inhouse S37 (KCl)	0.07	0.05	0.18	0.05	0.05	0.05
	Exchangeable Aluminium (kg/ha)		15	9.8	36	11	11	11
	Exchangeable Aluminium (mg/kg)		6.5	4.4	16	4.9	4.8	4.8
	Exchangeable Hydrogen (cmol+/kg)	**Rayment & Lyons 2011 - 15G1 (Acidity Titration)	0.34	0.18	1.4	0.53	0.22	0.14
	Exchangeable Hydrogen (kg/ha)		7.7	4.1	32	12	4.9	3.1
	Exchangeable Hydrogen (mg/kg)		3.4	1.8	14	5.3	2.2	1.4
	Effective Cation Exchange Capacity (ECEC) (cmol+/kg)	**Calculation: Sum of Ca,Mg,K,Na,Al,H (cmol+/kg)	8.8	8.0	5.2	6.3	8.3	9.7
	Calcium (%)	**Base Saturation Calculations - Cation cmol+/kg / ECEC x 100	50	49	42	70	70	59
	Magnesium (%)		26	37	16	14	22	33
	Potassium (%)		19	11	11	5.4	3.8	4.8
	Sodium - ESP (%)		0.77	0.78	0.83	0.85	1.2	0.91
	Aluminium (%)		0.81	0.61	3.4	0.87	0.64	0.56
	Hydrogen (%)		3.9	2.3	27	8.3	2.6	1.5
	Calcium/Magnesium Ratio	**Calculation: Calcium / Magnesium (cmol+/kg)	1.9	1.3	2.6	4.8	3.2	1.8
	Moist Munsell Colour	**Inhouse Munsell Soil Colour Classification	10R 4/8 red	10R 3/6 dark red	5YR 4/6 yellowish red	10R 4/8 red	10R 3/6 dark red	10R 4/8 red
	Mottles Munsell Colour		..	..	..	..	..	..
	Degree of Mottling (%)		..	..	..	..	..	..

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Analysis requested by Clayton Richards. Your Job: MS-051-BSAL Stage2
PO BOX 11034 TAMWORTH NSW 2340

		Sample 43	Sample 44	Sample 45	Sample 46	Sample 47	Sample 48
	Sample ID:	19 40-50	19 65-75	20 0-10	20 20-30	20 40-50	20 65-75
	Crop:	N/G	N/G	N/G	N/G	N/G	N/G
	Client:	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt	Umwelt
Parameter	Method reference	K9074/43	K9074/44	K9074/45	K9074/46	K9074/47	K9074/48

Notes:

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3. Soluble Salts included in Exchangeable Cations - NO PRE-WASH (unless requested).
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	Parameter		Method reference	Heavy Soil	Medium Soil	Light Soil	Sandy Soil
	Sample ID:						
	Crop:						
	Client:			Clay	Clay Loam	Loam	Loamy Sand
				Indicative guidelines - refer to Notes 6 and 8			
	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
	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
	Moist Munsell Colour		**Inhouse Munsell Soil Colour Classification	..			
	Mottles Munsell Colour			..			
	Degree of Mottling (%)			..			

Environmental Analysis Laboratory

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AGRICULTURAL SOIL ANALYSIS REPORT

48 samples supplied by Minesoils Pty. Ltd. on 12/07/2021. Lab Job No.K9074
Analysis requested by Clayton Richards. Your Job: MS-051-BSAL Stage2
PO BOX 11034 TAMWORTH NSW 2340

			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			
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: Collingwo
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 res
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-estimat
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 Conditio
17. This report was issued on 30/07/2021.

Quality Checked: Kris Saville
Agricultural Co-Ordinator
[redacted]