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Page: 1  
Total # Pages: 3 (A - B)  
Plus Appendix Pages  
Finalized Date: 15-DEC-2017  
Account: TODRIV

## QC CERTIFICATE AD17258649

P.O. No.: WB17-02

This report is for 111 Rock samples submitted to our lab in Adelaide, SA, Australia on 27-NOV-2017.

The following have access to data associated with this certificate:

KIM GREY

GAVIN OTTO

CATH WETHERBY

## SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
PUL-23	Pulv Sample - Split/Retain
CRU-21	Crush entire sample >70% -6 mm
LOG-22	Sample login - Rcd w/o BarCode
LEV-01	Waste Disposal Levy
PUL-QC	Pulverizing QC Test

## ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-MS91	ICP-MS Analysis - Sodium Peroxide Fusion	ICP-MS
ME-ICP89	Peroxide Fusion by ICP-AES	ICP-AES

To: TODD RIVER METALS  
ATTN: KIM GREY  
LEVEL 1  
282 ROKEBY ROAD  
SUBIACO WA 6008

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

\*\*\*\*\* See Appendix Page for comments regarding this certificate \*\*\*\*\*

Signature:

Cameron Brosnan, Laboratory Manager, Perth



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Page: 2 - A  
 Total # Pages: 3 (A - B)  
 Plus Appendix Pages  
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# QC CERTIFICATE OF ANALYSIS AD17258649

Method Analyte Units LOR	ME-ICP89 Al2O3	ME-ICP89 As	ME-ICP89 CaO	ME-ICP89 Co	ME-ICP89 Cr2O3	ME-ICP89 Cu	ME-ICP89 Fe2O3	ME-ICP89 K	ME-ICP89 Li	ME-ICP89 MgO	ME-ICP89 MnO	ME-ICP89 Ni	ME-ICP89 Pb	ME-ICP89 S	ME-ICP89 SiO2
Sample Description	0.02	0.01	0.01	0.005	0.01	0.01	0.01	0.01	0.001	0.01	0.01	0.005	0.01	0.01	0.2
STANDARDS															
AMIS0339	23.0	<0.01	0.67	<0.005	0.09	0.02	2.39	1.26	2.30	0.40	0.31	<0.005	<0.01	0.01	62.7
AMIS0339	23.2	<0.01	0.70	<0.005	0.09	0.02	2.37	1.32	2.31	0.40	0.31	<0.005	<0.01	0.02	66.1
AMIS0339	22.8	0.01	0.66	<0.005	0.07	0.02	2.32	1.23	2.28	0.40	0.33	<0.005	<0.01	0.03	67.6
AMIS0339	22.9	0.01	0.66	<0.005	0.07	0.02	2.10	1.25	2.25	0.38	0.32	<0.005	<0.01	0.01	62.5
Target Range - Lower Bound	21.3	<0.01	0.60	<0.005	0.05	<0.01	2.04	1.13	2.10	0.38	0.30	<0.005	<0.01	<0.01	59.0
Upper Bound	24.8	0.02	0.72	0.010	0.09	0.04	2.39	1.34	2.44	0.46	0.36	0.010	0.02	0.04	69.0
NCSDC86304	19.65	<0.01	0.07	<0.005	<0.01	<0.01	0.33	4.15	1.110	0.02	0.26	<0.005	<0.01	<0.01	66.3
NCSDC86304	20.3	0.02	0.08	<0.005	0.01	<0.01	0.31	4.04	1.105	0.05	0.26	<0.005	<0.01	0.01	67.2
NCSDC86304	19.85	<0.01	0.06	<0.005	0.01	<0.01	0.27	4.13	1.085	0.04	0.25	<0.005	<0.01	0.01	67.8
NCSDC86304	19.85	0.01	0.07	<0.005	<0.01	<0.01	0.33	4.02	1.110	0.03	0.26	<0.005	<0.01	0.02	66.5
Target Range - Lower Bound	17.65	<0.01	0.05	<0.005	<0.01	<0.01	0.27	3.67	0.980	<0.01	0.23	<0.005	<0.01	<0.01	59.6
Upper Bound	20.6	0.02	0.09	0.010	0.02	0.02	0.33	4.29	1.140	0.05	0.29	0.010	0.02	0.02	69.7
REE-1	6.80	0.02	3.37	<0.005	0.06	<0.01	6.33	3.27	0.023	1.49	0.21	<0.005	0.12	0.02	67.0
REE-1	6.76	0.02	3.39	<0.005	0.05	<0.01	6.30	3.29	0.024	1.48	0.21	0.005	0.12	0.04	68.9
REE-1	6.95	0.02	3.36	<0.005	0.04	<0.01	6.18	3.28	0.022	1.53	0.21	<0.005	0.12	0.04	70.0
REE-1	6.82	0.01	3.29	<0.005	0.04	0.01	5.86	3.16	0.023	1.43	0.21	<0.005	0.11	0.02	66.7
Target Range - Lower Bound	6.25	<0.01	2.97	<0.005	0.02	<0.01	5.49	2.85		1.36	0.18	<0.005	0.09	<0.01	61.9
Upper Bound	7.31	0.03	3.47	0.010	0.06	0.03	6.40	3.33		1.61	0.23	0.013	0.14	0.05	72.3
RTS-3a	9.98	0.01	3.25	0.015	0.03	0.23	30.9	0.48	0.003	4.33	0.20	<0.005	0.02	10.40	40.6
RTS-3a	9.54	0.01	3.02	0.017	0.03	0.23	28.9	0.49	0.002	3.98	0.20	<0.005	0.02	9.82	38.5
RTS-3a	9.94	0.02	3.13	0.014	0.03	0.24	29.0	0.47	0.004	4.10	0.21	<0.005	0.03	9.93	42.1
RTS-3a	10.15	0.01	3.22	0.017	0.03	0.24	29.7	0.49	0.003	4.20	0.21	0.007	0.02	10.45	41.1
Target Range - Lower Bound	8.93	<0.01	2.76	<0.005	<0.01	0.21	27.1	0.42		3.80	0.18	<0.005	<0.01	8.86	36.0
Upper Bound	10.40	0.03	3.23	0.025	0.05	0.26	31.5	0.50		4.44	0.23	0.016	0.04	10.30	42.2
BLANKS															
BLANK	0.04	0.04	<0.01	<0.005	0.09	<0.01	0.60	0.04	0.003	<0.02	<0.01	<0.005	<0.01	0.01	<0.2
BLANK	0.02	<0.01	0.03	<0.005	0.01	<0.01	0.01	0.02	0.001	0.10	<0.01	<0.005	0.01	0.02	0.2
BLANK	0.02	<0.01	<0.01	<0.005	0.03	<0.01	0.01	<0.01	0.001	0.01	<0.01	<0.005	<0.01	0.01	<0.2
BLANK	<0.02	<0.01	<0.01	<0.005	0.04	<0.01	0.26	0.02	0.002	<0.02	<0.01	<0.005	<0.01	0.01	0.2
Target Range - Lower Bound	<0.02		<0.01				<0.01	<0.01		<0.01				<0.01	<0.2
Upper Bound	0.04		0.02				0.02	0.02		0.02				0.02	0.4



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Page: 2 - B  
 Total # Pages: 3 (A - B)  
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Method Analyte Units LOR	ME-ICP89 TiO2 %	ME-ICP89 Zn %	ME-MS91 Cs ppm	ME-MS91 Nb ppm	ME-MS91 Rb ppm	ME-MS91 Sn ppm	ME-MS91 Ta ppm	ME-MS91 Th ppm	ME-MS91 U ppm
Sample Description	0.02	0.01	0.2	5	0.5	5	0.5	0.5	0.5
STANDARDS									
AMISO339	0.04	<0.01	258	105	1375	156	328	1.7	5.3
AMISO339	0.04	0.01	259	101	1340	159	328	1.5	5.2
AMISO339	0.05	0.01	256	102	1340	152	328	1.7	5.5
AMISO339	0.04	0.01	266	108	1310	163	331	1.8	5.7
Target Range - Lower Bound	<0.02	<0.01	247	87	1235	147	299	0.9	4.6
Upper Bound	0.08	0.02	302	117	1510	191	367	3.1	7.2
NCSDC86304	0.03	0.01	1625	59	6660	106	80.8	2.4	2.8
NCSDC86304	0.03	0.01	1625	54	6620	102	82.2	2.1	2.9
NCSDC86304	0.03	0.01	1575	48	6630	101	77.9	2.2	3.0
NCSDC86304	0.03	0.01	1870	62	7350	114	93.6	3.0	3.7
Target Range - Lower Bound	<0.02	<0.01		40	6120		75.7	1.4	2.0
Upper Bound	0.07	0.04		66	7480		93.7	3.6	4.4
REE-1	0.67	0.19	1.2	>2500	980	479	218	647	128.0
REE-1	0.67	0.19	1.9	>2500	993	484	215	651	129.5
REE-1	0.67	0.20	2.3	>2500	954	466	215	676	125.5
REE-1	0.64	0.19	2.6	>2500	979	480	223	738	140.5
Target Range - Lower Bound	0.57	0.16	0.6	3640	942	443	207	647	123.0
Upper Bound	0.71	0.21	1.5	>2500	1150	553	255	791	151.0
RTS-3a	0.67	0.31	0.8	6	15.9	235	0.9	0.8	<0.5
RTS-3a	0.63	0.30	1.4	5	13.6	235	<0.5	0.7	<0.5
RTS-3a	0.65	0.31	1.1	7	14.3	256	0.6	0.9	0.6
RTS-3a	0.66	0.31	1.0	5	16.0	311	<0.5	1.2	0.6
Target Range - Lower Bound	0.58	0.26	0.6	<5	13.4	233	<0.5	<0.5	<0.5
Upper Bound	0.72	0.32	1.6	10	17.4	295	1.2	2.1	1.2
BLANKS									
BLANK	<0.02	<0.01	4.8	49	23.6	6	1.0	<0.5	0.6
BLANK	<0.02	<0.01	<0.2	<5	1.2	<5	<0.5	<0.5	<0.5
BLANK	<0.02	0.01	<0.2	<5	1.5	<5	<0.5	<0.5	<0.5
BLANK	<0.02	<0.01	0.5	<5	<0.5	<5	<0.5	<0.5	<0.5
Target Range - Lower Bound	<0.02		<0.2	<5	<0.5	<5	<0.5	<0.5	<0.5
Upper Bound	0.04		0.4	10	1.0	10	1.0	1.0	1.0



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Page: 3 - A  
 Total # Pages: 3 (A - B)  
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Sample Description	Method Analyte Units LOR	ME-ICP89 Al2O3	ME-ICP89 As	ME-ICP89 CaO	ME-ICP89 Co	ME-ICP89 Cr2O3	ME-ICP89 Cu	ME-ICP89 Fe2O3	ME-ICP89 K	ME-ICP89 Li	ME-ICP89 MgO	ME-ICP89 MnO	ME-ICP89 Ni	ME-ICP89 Pb	ME-ICP89 S	ME-ICP89 SiO2
		0.02	0.01	0.01	0.005	0.01	0.01	0.01	0.01	0.001	0.01	0.01	0.005	0.01	0.01	0.2
DUPLICATES																
B099		16.40	<0.01	0.57	<0.005	<0.01	<0.01	0.49	2.01	0.039	<0.01	0.02	<0.005	<0.01	<0.01	77.2
DUP		16.25	0.01	0.52	<0.005	<0.01	<0.01	0.59	1.99	0.038	0.02	0.02	<0.005	<0.01	0.02	74.4
Target Range - Lower Bound		15.70	<0.01	0.51	<0.005	<0.01	<0.01	0.51	1.92	0.036	<0.01	<0.01	<0.005	<0.01	<0.01	72.8
Upper Bound		16.95	0.02	0.58	0.010	0.02	0.02	0.57	2.09	0.041	0.02	0.03	0.010	0.02	0.02	78.8
B114		16.00	0.01	0.49	<0.005	<0.01	<0.01	0.89	4.39	0.009	0.13	0.01	<0.005	0.01	0.01	75.7
DUP		15.95	<0.01	0.50	<0.005	<0.01	<0.01	0.86	4.30	0.008	0.13	0.02	<0.005	<0.01	<0.01	77.0
Target Range - Lower Bound		15.35	<0.01	0.47	<0.005	<0.01	<0.01	0.83	4.17	0.007	0.12	<0.01	<0.005	<0.01	<0.01	73.3
Upper Bound		16.60	0.02	0.52	0.010	0.02	0.02	0.92	4.52	0.010	0.14	0.02	0.010	0.02	0.02	79.4
B131		16.00	<0.01	1.01	<0.005	0.01	<0.01	0.41	0.83	0.006	<0.01	0.03	<0.005	<0.01	<0.01	75.5
DUP		15.30	<0.01	0.99	<0.005	0.01	<0.01	0.37	0.82	0.005	<0.02	0.03	<0.005	<0.01	0.01	72.5
Target Range - Lower Bound		15.05	<0.01	0.95	<0.005	<0.01	<0.01	0.37	0.78	0.004	<0.01	0.02	<0.005	<0.01	<0.01	71.0
Upper Bound		16.25	0.02	1.05	0.010	0.02	0.02	0.41	0.87	0.007	0.02	0.04	0.010	0.02	0.02	77.0
B145		15.50	<0.01	0.20	<0.005	0.01	<0.01	0.41	0.49	0.004	<0.01	0.01	<0.005	<0.01	0.01	73.4
DUP		15.90	<0.01	0.18	<0.005	0.01	<0.01	0.47	0.50	0.006	<0.02	0.01	<0.005	<0.01	0.01	74.7
Target Range - Lower Bound		15.10	<0.01	0.17	<0.005	<0.01	<0.01	0.41	0.47	0.004	<0.01	<0.01	<0.005	<0.01	<0.01	71.1
Upper Bound		16.30	0.02	0.21	0.010	0.02	0.02	0.47	0.52	0.006	0.02	0.02	0.010	0.02	0.02	77.0
B163		16.15	0.01	0.20	<0.005	<0.01	<0.01	0.23	1.01	0.005	0.02	0.01	<0.005	<0.01	0.01	75.5
DUP		16.40	<0.01	0.15	<0.005	0.01	<0.01	0.31	0.99	0.005	0.02	<0.01	<0.005	<0.01	0.01	72.7
Target Range - Lower Bound		15.65	<0.01	0.16	<0.005	<0.01	<0.01	0.25	0.95	0.004	<0.01	<0.01	<0.005	<0.01	<0.01	71.1
Upper Bound		16.90	0.02	0.19	0.010	0.02	0.02	0.29	1.05	0.006	0.03	0.02	0.010	0.02	0.02	77.1
B177		17.25	0.01	0.25	<0.005	<0.01	<0.01	0.49	4.10	0.003	0.02	0.01	<0.005	<0.01	0.02	74.9
DUP		17.10	<0.01	0.24	<0.005	<0.01	<0.01	0.50	4.09	0.003	0.02	0.01	<0.005	<0.01	0.01	73.6
Target Range - Lower Bound		16.50	<0.01	0.23	<0.005	<0.01	<0.01	0.47	3.93	0.002	<0.01	<0.01	<0.005	<0.01	<0.01	71.3
Upper Bound		17.85	0.02	0.26	0.010	0.02	0.02	0.52	4.26	0.004	0.03	0.02	0.010	0.02	0.02	77.2
B194		16.50	<0.01	0.15	<0.005	<0.01	<0.01	0.34	2.64	0.008	0.02	0.02	<0.005	<0.01	<0.01	72.7
DUP		16.25	<0.01	0.14	<0.005	<0.01	<0.01	0.43	2.56	0.008	0.02	0.02	<0.005	<0.01	<0.01	71.4
Target Range - Lower Bound		15.75	<0.01	0.13	<0.005	<0.01	<0.01	0.36	2.49	0.007	<0.01	<0.01	<0.005	<0.01	<0.01	69.1
Upper Bound		17.00	0.02	0.16	0.010	0.02	0.02	0.41	2.71	0.009	0.03	0.03	0.010	0.02	0.02	75.0



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Page: 3 - B  
 Total # Pages: 3 (A - B)  
 Plus Appendix Pages  
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Sample Description	Method Analyte Units LOR	ME-ICP89 TiO2 %	ME-ICP89 Zn %	ME-MS91 Cs ppm	ME-MS91 Nb ppm	ME-MS91 Rb ppm	ME-MS91 Sn ppm	ME-MS91 Ta ppm	ME-MS91 Th ppm	ME-MS91 U ppm
		0.02	0.01	0.2	5	0.5	5	0.5	0.5	0.5
DUPLICATES										
B099		<0.02	<0.01	433	31	1465	194	80.3	<0.5	1.7
DUP		<0.02	<0.01	427	33	1465	206	81.4	<0.5	1.8
Target Range - Lower Bound		<0.02	<0.01	408	25	1390	185	76.3	<0.5	1.2
Upper Bound		0.04	0.02	452	39	1540	215	85.4	1.0	2.3
B114		0.05	<0.01	126.5	40	1160	261	60.3	0.6	1.3
DUP		0.05	<0.01	124.0	52	1170	253	63.8	0.7	1.2
Target Range - Lower Bound		0.03	<0.01	119.0	39	1105	239	58.4	<0.5	0.7
Upper Bound		0.07	0.02	131.5	53	1225	275	65.7	1.0	1.8
B131		<0.02	<0.01							
DUP		<0.02	<0.01							
Target Range - Lower Bound		<0.02	<0.01							
Upper Bound		0.04	0.02							
B145		<0.02	<0.01	52.4	22	280	80	40.2	<0.5	1.7
DUP		<0.02	<0.01	58.3	29	287	90	63.1	<0.5	1.8
Target Range - Lower Bound		<0.02	<0.01	52.4	19	269	76	48.6	<0.5	1.2
Upper Bound		0.04	0.02	58.3	32	298	94	54.7	1.0	2.3
B163		<0.02	<0.01	51.3	7	418	35	14.5	<0.5	0.8
DUP		<0.02	<0.01	54.3	6	427	41	10.2	<0.5	0.9
Target Range - Lower Bound		<0.02	<0.01	50.0	<5	401	31	11.2	<0.5	<0.5
Upper Bound		0.04	0.02	55.6	10	444	45	13.5	1.0	1.0
B177		<0.02	<0.01	19.0	48	658	39	190.5	0.6	3.6
DUP		<0.02	0.01	18.4	46	664	46	191.0	0.7	3.5
Target Range - Lower Bound		<0.02	<0.01	17.6	40	627	35	180.5	<0.5	2.9
Upper Bound		0.04	0.02	19.8	54	695	50	201	1.0	4.2
B194		<0.02	<0.01	118.0	51	1290	992	91.3	0.5	1.9
DUP		<0.02	<0.01	113.0	51	1250	986	91.1	<0.5	1.8
Target Range - Lower Bound		<0.02	<0.01	109.5	43	1205	935	86.1	<0.5	1.3
Upper Bound		0.04	0.02	121.5	59	1335	1045	96.3	1.0	2.4



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Page: Appendix 1  
Total # Appendix Pages: 1  
Finalized Date: 15-DEC-2017  
Account: TODRIV

**QC CERTIFICATE OF ANALYSIS AD17258649**

**CERTIFICATE COMMENTS**

**LABORATORY ADDRESSES**

Applies to Method:

Processed at ALS Perth located at 31 Denninup Way, Malaga, Australia. NATA Accreditation does not cover the performance of ALS Perth Sample Preparation which is processed at 79 Distinction Road, Wangara, WA, Australia  
ME-ICP89 ME-MS91

Applies to Method:

Processed at ALS Adelaide located at Unit 1, 1 Burma Road, Pooraka, Adelaide, SA, Australia.  
CRU-21 LEV-01 LOG-22  
PUL-QC WEI-21

PUL-23