

Explaining Operational Sampling Lead Levels

What are Magellan's lead monitoring requirements?

Magellan's approval to export sealed shipments of lead carbonate through Fremantle is subject to the implementation conditions set out in Statement 783 published on 2 February 2009 by the Minister for Environment. Condition 9-1 of Statement 783 requires implementation of a Health, Hygiene and Environmental Monitoring Program (Program). One of the key requirements is that lead monitoring results during transport operations must not exceed the baseline levels along the 1250 kilometre long road and rail corridor from the company's mine site near Wiluna to the Fremantle Port.

The approved Program to verify compliance with this condition has been designed to determine whether Magellan lead has entered the environment. The transport corridor has been used to transport a range of materials over many years. Those materials would have included many materials which would have contained lead including lead in petrol and lead based paints. Therefore, prior to commencing transport of Magellan lead, Magellan Metals carried out systematic sampling along the transport route from Wiluna to Fremantle to determine the existing levels of lead in the environment.

The pre-commencement sampling program established baseline lead trigger levels, which, if they are exceeded (once transport commences), trigger contingency measures as required under Statement 783. The monitoring undertaken includes soil, water, air, static dust deposition and benthic sediment monitoring at Fremantle Port.

Sampling program

Baseline sampling and derivation of 'trigger' levels is described under the Baseline Sampling section of this website. The trigger levels with which operational sampling (that is, samples taken after commencement of lead carbonate transport) results are compared in the tables in the Operational Sampling section are those established during baseline sampling.

Sample sites

Sampling locations for operational monitoring are:

- 21 dust sampling sites along the rail corridor
- 2 air quality sampling sites at Fremantle Port
- 19 rainwater tank sites along the rail corridor
- 251 soil sites along the road and rail corridor
- 15 drainage sumps at Fremantle Port
- 20 marine sediment sites at Fremantle Port.

For sampling frequency, see the Health, Hygiene and Environmental Monitoring Program.

Trigger levels have been established at each site for each parameter monitored. In addition, air quality monitoring is being undertaken inside independently and randomly selected containers during the sealed shipments.

Soil Sampling

Soil Site	WGS84 East	WGS84 North	Site Location	Lead Results (ppm) Trigger Level	Dec-09	Mar-10
DMTRS01	792743	7060941	Mine to Wiluna	69	68	72 [^]
DMTRS02	204474	7058310	Mine to Wiluna	80	60	45
DMTRS03	213120	7055743	Mine to Wiluna	33	26	21
DMTRS04	223327	7055326	Mine to Wiluna	36	31	27
DMTRS05	222387	7048207	Wiluna to Leonora	27	24	25
DMTRS06	224583	7038858	Wiluna to Leonora	24	23	20
DMTRS07	229681	7030283	Wiluna to Leonora	20	11	15
DMTRS08	233941	7021241	Wiluna to Leonora	7	X	X
DMTRS09	238904	7012571	Wiluna to Leonora	12	9	10
DMTRS10	243982	7004011	Wiluna to Leonora	13	11	9
DMTRS11	249473	6995954	Wiluna to Leonora	22	18	19
DMTRS12	253330	6986739	Wiluna to Leonora	10	10	9
DMTRS13	254139	6976372	Wiluna to Leonora	13	X	6
DMTRS14	254305	6968324	Wiluna to Leonora	17	7	X
DMTRS15	256456	6958563	Wiluna to Leonora	15	13	8
DMTRS16	256016	6949717	Wiluna to Leonora	15	8	8
DMTRS17	258394	6939549	Wiluna to Leonora	13	9	X
DMTRS18	257418	6930393	Wiluna to Leonora	10	7	5
DMTRS19	261192	6921246	Wiluna to Leonora	15	15	13
DMTRS20	266271	6913106	Wiluna to Leonora	17	12	15
DMTRS21	274079	6907225	Wiluna to Leonora	16	7	7
DMTRS22	282203	6901419	Wiluna to Leonora	11	8	6
DMTRS23	289582	6895196	Wiluna to Leonora	11	7	7
DMTRS24	296184	6887142	Wiluna to Leonora	16	11	9
DMTRS25	304282	6882275	Wiluna to Leonora	22	18	13
DMTRS26	312125	6876130	Wiluna to Leonora	13	8	X
DMTRS27	317790	6868001	Wiluna to Leonora	9	5	X
DMTRS28	319897	6858772	Wiluna to Leonora	10	X	X
DMTRS29	323269	6849590	Wiluna to Leonora	16	18 [^]	10
DMTRS30	324162	6839884	Wiluna to Leonora	17	12	9
DMTRS31	325049	6830127	Wiluna to Leonora	16	11	10
DMTRS32	329720	6821420	Wiluna to Leonora	30	15	25
DMTRS33	332200	6811960	Wiluna to Leonora	19	13	12
DMTRS34	336121	6805728	Leonora	42	19	18
DMTRS35	336194	6805661	Leonora	82	71	68
DMTRS36	336247	6805555	Leonora	205	51	86
DMTRS37	336343	6805300	Leonora	245	87	78
DMTRS38	336369	6805237	Leonora	178	67	58
DMTRS39	336393	6805163	Leonora	72	22	62
DMTRS40	336688	6804526	Leonora	38	22	27
DMTRS41	336754	6803953	Leonora	40	29	26
DMTRS42	336722	6803448	Leonora	239	111	130
DMTRS43	336742	6802929	Leonora	51	44	44
DMTRS44	339882	6799578	Leonora	35	20	29
DMTRS45	350134	6799194	Leonora to Menzies	23	14	18
DMTRS46	354893	6794056	Leonora to Menzies	20	15	12
DMTRS47	352712	6785422	Leonora to Menzies	44	25	30
DMTRS48	351580	6775052	Leonora to Menzies	23	20	18
DMTRS49	351510	6764892	Leonora to Menzies	14	8	9
DMTRS50	353618	6754862	Leonora to Menzies	20	9	11
DMTRS51	346211	6748748	Leonora to Menzies	23	X	11
DMTRS52	338605	6741938	Leonora to Menzies	14	7	9
DMTRS53	332395	6735705	Leonora to Menzies	13	11	9
DMTRS54	325051	6728418	Leonora to Menzies	24	X	9
DMTRS55	317647	6721114	Leonora to Menzies	26	26 [#]	7
DMTRS56	309805	6714665	Menzies	75	33	42
DMTRS57	309474	6713190	Menzies	150	38	39
DMTRS58	312484	6705560	Menzies	25	20	19
DMTRS59	315825	6695884	Menzies to Kalgoorlie	10	6	7
DMTRS60	318756	6686513	Menzies to Kalgoorlie	19	14	12
DMTRS61	322672	6677746	Menzies to Kalgoorlie	8	8 [#]	X
DMTRS62	322008	6667654	Menzies to Kalgoorlie	19	X	X
DMTRS63	324272	6657937	Menzies to Kalgoorlie	14	9	6
DMTRS64	330561	6650207	Menzies to Kalgoorlie	14	7	7
DMTRS65	335966	6642835	Menzies to Kalgoorlie	18	11	7
DMTRS66	339444	6631974	Menzies to Kalgoorlie	40	15	13
DMTRS67	343381	6624181	Menzies to Kalgoorlie	37	36	30
DMTRS68	349023	6616577	Menzies to Kalgoorlie	14	10	8
DMTRS69	351037	6606863	Menzies to Kalgoorlie	19	17	12
DMTRS70	353084	6599778	Kalgoorlie	32	27	34 [^]
DMTRS71	353294	6599238	Kalgoorlie	45	28	21
DMTRS72	353430	6598765	Kalgoorlie	24	16	22
DMTRS73	353717	6598341	Kalgoorlie	76	19	39
DMTRS74	353597	6597960	Kalgoorlie	70	25	19
DMTRS75	353193	6597467	Kalgoorlie	319	241	173
DMTRS76	352622	6597027	Kalgoorlie	31	28	27

Soil Site	WGS84 East	WGS84 North	Site Location	Lead Results (ppm) Trigger Level	Dec-09	Mar-10
DMTRS77	352150	6596451	Kalgoorlie	44	35	39
DMTRS78	351867	6596116	Kalgoorlie	18	12	16
DMTRS79	351545	6595761	Kalgoorlie	16	15	8
DMTRS80	351189	6595385	Kalgoorlie	62	13	16
DMTRS81	350666	6595044	Kalgoorlie	26	14	14
DMTRS82	350167	6594767	Kalgoorlie	13	11	9
DMTRS83	349805	6594437	Kalgoorlie	25	16	19
DMTRS84	349107	6593984	Kalgoorlie	23	11	9
DMTRS85	348287	6593467	Kalgoorlie	14	9	8
DMTRS86	347841	6593182	Kalgoorlie	17	8	8
DMTRS87	340488	6589047	Kalgoorlie to Southern Cross	14	9	7
DMTRS88	331028	6586674	Kalgoorlie to Southern Cross	34	25	24
DMTRS89	321210	6585574	Kalgoorlie to Southern Cross	22	16	16
DMTRS90	311962	6581892	Kalgoorlie to Southern Cross	9	7	7
DMTRS91	300999	6581064	Kalgoorlie to Southern Cross	15	12	10
DMTRS92	292455	6578582	Kalgoorlie to Southern Cross	12	7	8
DMTRS93	284611	6582902	Kalgoorlie to Southern Cross	<5	6	X
DMTRS94	275439	6583501	Kalgoorlie to Southern Cross	<5	X	X
DMTRS95	265756	6581875	Kalgoorlie to Southern Cross	7	X	X
DMTRS96	255884	6582759	Kalgoorlie to Southern Cross	6	X	X
DMTRS97	247014	6587303	Kalgoorlie to Southern Cross	18	9	8
DMTRS98	237184	6586140	Kalgoorlie to Southern Cross	28	24	27
DMTRS99	228409	6585694	Kalgoorlie to Southern Cross	20	18	21 [^]
DMTRS100	220001	6580399	Kalgoorlie to Southern Cross	15	8	8
DMTRS101	784345	6582934	Kalgoorlie to Southern Cross	19	10	14
DMTRS102	774403	6583272	Kalgoorlie to Southern Cross	10	6	7
DMTRS103	764580	6584877	Kalgoorlie to Southern Cross	15	7	7
DMTRS104	754966	6585420	Kalgoorlie to Southern Cross	21	16	17
DMTRS105	745369	6587219	Kalgoorlie to Southern Cross	20	17	20
DMTRS106	736580	6583871	Kalgoorlie to Southern Cross	6	X	7 [^]
DMTRS107	729295	6578215	Kalgoorlie to Southern Cross	15	11	15
DMTRS108	723722	6569863	Kalgoorlie to Southern Cross	9	6	9
DMTRS109	723156	6559976	Kalgoorlie to Southern Cross	19	14	18
DMTRS110	722316	6550108	Kalgoorlie to Southern Cross	11	5	10
DMTRS111	720462	6544748	Southern Cross	46	46#	20
DMTRS112	720212	6544399	Southern Cross	16	12	14
DMTRS113	719761	6543765	Southern Cross	17	7	12
DMTRS114	719489	6543442	Southern Cross	19	15	19
DMTRS115	718139	6541218	Southern Cross to Merredin	10	8	13 [^]
DMTRS116	708848	6538876	Southern Cross to Merredin	21	15	20
DMTRS117	699535	6535795	Southern Cross to Merredin	23	17	19
DMTRS118	692371	6530755	Southern Cross to Merredin	13	X	6
DMTRS119	683876	6528650	Southern Cross to Merredin	<5	X	X
DMTRS120	674687	6529421	Southern Cross to Merredin	30	25	27
DMTRS121	664992	6527526	Southern Cross to Merredin	6	X	X
DMTRS122	658258	6526090	Southern Cross to Merredin	5	X	X
DMTRS123	648985	6528448	Southern Cross to Merredin	10	X	5
DMTRS124	639379	6526010	Southern Cross to Merredin	16	17 [^]	15
DMTRS125	633618	6521095	Southern Cross to Merredin	24	15	16
DMTRS126	626490	6517373	Southern Cross to Merredin	10	5	8
DMTRS127	622867	6516024	Merredin	145	17	25
DMTRS128	622310	6516069	Merredin	87	53	37
DMTRS129	621767	6516114	Merredin	81	62	71
DMTRS130	621189	6516158	Merredin	249	249#	61
DMTRS131	620715	6516262	Merredin	144	48	19
DMTRS132	620166	6516335	Merredin	34	26	37 [^]
DMTRS133	619603	6516399	Merredin	36	30	33
DMTRS134	619111	6516184	Merredin	35	27	24
DMTRS135	616523	6515220	Merredin	35	24	23
DMTRS136	608214	6513169	Merredin to Kellerberrin	30	21	27
DMTRS137	599092	6510549	Merredin to Kellerberrin	33	22	28
DMTRS138	590453	6505613	Merredin to Kellerberrin	52	42	42
DMTRS139	580807	6501530	Merredin to Kellerberrin	620	16	22
DMTRS140	571404	6500370	Merredin to Kellerberrin	48	42	31
DMTRS141	568994	6500101	Kellerberrin	103	42	41
DMTRS142	568441	6500035	Kellerberrin	92	20	62
DMTRS143	567874	6499947	Kellerberrin	49	37	45
DMTRS144	567342	6499855	Kellerberrin	42	24	35
DMTRS145	561828	6498743	Kellerberrin	21	12	11
DMTRS146	553238	6500021	Kellerberrin to Northam	19	9	10
DMTRS147	544431	6499028	Kellerberrin to Northam	194	68	43
DMTRS148	534616	6499244	Kellerberrin to Northam	197	165	68
DMTRS149	524657	6498417	Kellerberrin to Northam	29	24	32 [^]
DMTRS150	514868	6500082	Kellerberrin to Northam	28	23	21
DMTRS151	505161	6502440	Kellerberrin to Northam	42	23	24
DMTRS152	496031	6499439	Kellerberrin to Northam	16	13	9
DMTRS153	486318	6499411	Kellerberrin to Northam	23	16	7
DMTRS154	476965	6498924	Northam	15	12	9

Soil Site	WGS84 East	WGS84 North	Site Location	Lead Results (ppm) Trigger Level	Dec-09	Mar-10
DMTRS155	470684	6498261	Northam	852	34	23
DMTRS156	470085	6498256	Northam	43	24	27
DMTRS157	469620	6498330	Northam	142	100	109
DMTRS158	469086	6498602	Northam	623	90	51
DMTRS159	468509	6499035	Northam	25	X	12
DMTRS160	467822	6499226	Northam	51	18	17
DMTRS161	462225	6498732	Northam	17	12	9
DMTRS162	454352	6504256	Toodyay	27	17	15
DMTRS163	450191	6508480	Toodyay	12	11	8
DMTRS164	450070	6508751	Toodyay	37	31	38^
DMTRS165	449725	6509018	Toodyay	30	26	18
DMTRS166	449177	6509142	Toodyay	34	31	28
DMTRS167	445253	6509265	Toodyay to Midland	26	19	20
DMTRS168	438675	6506482	Toodyay to Midland	18	15	11
DMTRS169	434452	6508113	Toodyay to Midland	20	14	11
DMTRS170	412403	6488969	Toodyay to Midland	17	8	6
DMTRS171	418005	6482857	Toodyay to Midland	68	47	60
DMTRS172	408583	6473315	Toodyay to Midland	19	X	X
DMTRS173	408785	6472667	Toodyay to Midland	58	48	21
DMTRS174	408806	6471996	Toodyay to Midland	22	11	24^
DMTRS175	409045	6471284	Toodyay to Midland	37	22	16
DMTRS176	408698	6470505	Toodyay to Midland	30	19	21
DMTRS177	408118	6470341	Toodyay to Midland	30	11	28
DMTRS178	407475	6470525	Toodyay to Midland	212	101	151
DMTRS179	406831	6470708	Toodyay to Midland	84	39	72
DMTRS180	405613	6471060	Toodyay to Midland	62	44	52
DMTRS181	406225	6470936	Midland to Hazelmere	273	267	15
DMTRS182	404765	6471113	Midland to Hazelmere	77	82^	80^
DMTRS183	404476	6470259	Midland to Hazelmere	25	5	11
DMTRS184	404447	6469422	Midland to Hazelmere	12	X	8
DMTRS185	404529	6468997	Midland to Hazelmere	45	X	X
DMTRS186	404651	6468518	Midland to Hazelmere	7	X	X
DMTRS187	405001	6467167	Hazelmere to Welshpool	22	12	16
DMTRS188	404871	6466673	Hazelmere to Welshpool	13	X	X
DMTRS189	404709	6466140	Hazelmere to Welshpool	15	X	X
DMTRS190	404624	6465332	Hazelmere to Welshpool	31	11	23
DMTRS191	404769	6464586	Hazelmere to Welshpool	30	13	13
DMTRS192	404783	6464043	Hazelmere to Welshpool	12	X	X
DMTRS193	404661	6463302	Hazelmere to Welshpool	53	53#	33
DMTRS194	404549	6462699	Hazelmere to Welshpool	43	32	27
DMTRS195	404398	6461992	Hazelmere to Welshpool	50	35	47
DMTRS196	404171	6461411	Hazelmere to Welshpool	41	17	30
DMTRS197	403648	6460923	Welshpool to Canning Vale	20	X	7
DMTRS198	403449	6459850	Welshpool to Canning Vale	416	251	115
DMTRS199	403459	6459274	Welshpool to Canning Vale	14	X	X
DMTRS200	403448	6458713	Welshpool to Canning Vale	36	10	12
DMTRS201	403215	6458240	Welshpool to Canning Vale	11	X	X
DMTRS202	402975	6457603	Welshpool to Canning Vale	8	X	X
DMTRS203	402988	6457124	Welshpool to Canning Vale	10	X	X
DMTRS204	402993	6456753	Welshpool to Canning Vale	16	X	X
DMTRS205	402391	6455462	Welshpool to Canning Vale	29	X	X
DMTRS206	402037	6455049	Welshpool to Canning Vale	11	X	X
DMTRS207	401241	6454065	Welshpool to Canning Vale	15	X	X
DMTRS208	400224	6453058	Welshpool to Canning Vale	21	8	X
DMTRS209	399608	6452462	Welshpool to Canning Vale	43	17	26
DMTRS210	398959	6451791	Canning Vale	15	X	X
DMTRS211	398528	6451407	Canning Vale	11	X	X
DMTRS212	397957	6451133	Canning Vale	115	115#	X
DMTRS213	397358	6451000	Canning Vale	9	X	7
DMTRS214	396385	6450780	Canning Vale	8	X	X
DMTRS215	393937	6449791	Jandakot	58	X	X
DMTRS216	392497	6449033	Jandakot	20	X	11
DMTRS217	391951	6448761	Jandakot	<5	X	X
DMTRS218	391555	6448543	Jandakot	7	X	X
DMTRS219	391366	6448392	South Lake	6	X	X
DMTRS220	390742	6448007	South Lake	8	X	X
DMTRS221	390285	6447690	South Lake	7	X	X
DMTRS222	389788	6447483	South Lake	7	X	6
DMTRS223	389186	6447076	South Lake	6	X	X
DMTRS224	388860	6446747	Yangebup	9	X	X
DMTRS225	388362	6446249	Yangebup	11	X	X
DMTRS226	387897	6445838	Yangebup	10	X	7
DMTRS227	386547	6446042	Yangebup	216	10	16
DMTRS228	386313	6446706	Yangebup	31	23	21
DMTRS229	385733	6447090	Spearwood	15	6	15#
DMTRS230	385193	6447366	Spearwood	58	23	53
DMTRS231	384787	6447428	Spearwood	15	7	7
DMTRS232	384471	6447609	Spearwood	15	8	9

Soil Site	WGS84 East	WGS84 North	Site Location	Lead Results (ppm) Trigger Level	Dec-09	Mar-10
DMTRS233	383901	6447712	Spearwood	18	10	9
DMTRS234	383380	6447952	Coogee	9	6	X
DMTRS235	382939	6448869	Coogee	86	11	19
DMTRS236	382593	6449247	Coogee	10	7	X
DMTRS237	382355	6449767	Coogee	2467	1723	1073
DMTRS238	382301	6450404	Fremantle	47	20	47#
DMTRS239	382130	6451052	Fremantle	785	785#	111
DMTRS240	382074	6451506	Fremantle	150	44	67
DMTRS241	381907	6452126	Fremantle	219	187	163
DMTRS242	381375	6452414	Fremantle	81	41	72
DMTRS243	381204	6452777	Fremantle	139	96	73
DMTRS244	381667	6453251	Fremantle	99	X	11
DMTRS245	382015	6453711	Fremantle	168	96	118
DMTRS246	382320	6454174	Fremantle	747	8	139
DMTRS247	382331	6454585	Fremantle	65	60	44
DMTRS248	381880	6454855	Fremantle	28	12	21
DMTRS249	381249	6454321	Fremantle	32	16	X
DMTRS250	381162	6454166	Fremantle	53	44^	53#
DMTRS251	381162	6454166	Fremantle	10	X	X

^ Above baseline but within Measurement of Uncertainty (MoU). MoU is a measure of precision around monitoring data results. Some imprecision arises from laboratory analysis techniques, equipment and other sources, in particular when very low concentrations are being measured, such as those in samples from the Magellan Metals' monitoring program. For very low concentrations, the uncertainty around a particular value is typically in the order of 10-20% of the measured value, depending on the value and what is being analysed.

X Results below limit of detection.

This sample was isotopically analysed and has been determined not to be Magellan Metals' lead. The lead reading then becomes Magellan Metals' revised trigger level for the monitoring location.