

Estimate of Total Activity of Material at Rangehead, based on concentrations found during the Dickson studies

Parameter	U Bq	226Ra Bq	Th	210Pb	230Th	Uranium and Thorium chain	Notes
Concentration (Bq/kg)							These concentrations based on the basic statistics of the datum obtained during the Dickson studies
mean	281	207	34	358	655	4432	
standard error	25	20	5	34	94	369	
Activity in 2.7kiloton (Bq)							The mass is based on the 10,000 drums each with 275kg (ANSTO measurements)
mean	8.E+08	6.E+08	9.E+07	1.E+09	2.E+09	1.2E+10	
standard error	7.E+07	5.E+07	1.E+07	9.E+07	3.E+08	1.E+09	
Activity Exemption Levels (Bq)	1.E+04	1.E+04	1.E+03	1.E+04	1.E+04	Not applicable	The exemption level is prescribed in the ARPANS Regulation
Activity (Units: No. of Exemption Levels)							These values are calculated in accordance with Regulations 6 and 38.
mean	7.6E+04	5.6E+04	9.1E+04	9.7E+04	1.8E+05	5.2E+05	
standard error	8.7E+02	9.6E+02	1.4E+02	9.6E+02	1.4E+03	4.3E+03	

Concentrations in CSIRO Rangehead Material found during the Dickson studies

Sample	U Bq/kg	226Ra Bq/kg	Th Bq/kg	210Pb Bq/kg	230Th Bq/kg	Uranium and Thorium chain Bq/kg	Concentration (Units: Exemption Levels)
148	168	315	712	545	14023	25347	14.2
143	708	417	477	721	9388	21651	9.6
114	1287	1185	221	2050	4346	24968	4.8
147	688	1703	211	2947	4138	28059	4.6
8883	879	1438	209	2488	4102	25797	4.5
803	754	1069	206	1850	4049	21093	4.4
9710	740	652	146	1128	2873	14591	3.1
7094	332	1356	115	2345	2253	19897	2.6
9713	826	468	116	810	2270	11970	2.5
9654	1045	1199	99	2075	1931	20521	2.4
116	994	459	95	793	1859	11918	2.1
8304	46	48	103	84	2011	3763	2.0
826	1340	164	88	284	1716	9791	2.0
9448	588	605	77	1046	1496	11378	1.7
9656	330	134	76	232	1479	5054	1.6
212	560	589	69	1019	1341	10860	1.6
9696	83	93	75	161	1456	3575	1.5
9695	1826	1664	43	2879	844	27205	1.5
9714	879	275	62	475	1218	8430	1.4
9709	547	471	58	815	1123	9160	1.3
9450	293	649	55	1123	1068	10052	1.2
9452	528	875	48	1513	930	13308	1.2
2650	1505	159	44	275	845	9081	1.2
2699	986	890	39	1539	761	15053	1.1
115	331	494	49	855	944	8282	1.1
9653	268	349	48	603	936	6389	1.1
831	1275	72	40	124	774	7073	1.0
9451	290	302	47	523	918	5934	1.0
9694	591	655	41	1133	797	10897	1.0
2688	454	345	43	596	845	6952	1.0
9655	405	353	43	611	844	6850	1.0
2698	276	483	44	835	846	7789	1.0
830	496	546	41	945	793	9296	1.0
211	225	428	43	740	841	6960	1.0
113	1493	105	31	181	601	8057	0.9
8307	229	391	40	676	779	6465	0.9
7784	367	413	39	714	747	7216	0.9
97	891	121	35	209	671	5936	0.9
7785	78	183	41	316	792	3556	0.8
827	192	100	40	173	771	3053	0.8
9431	321	80	38	138	744	3307	0.8
7092	238	499	35	864	676	7562	0.8
7612	1501	69	25	119	485	7511	0.8
8306	812	125	31	216	606	5563	0.8
7786	238	250	36	433	695	4804	0.8
7787	1234	85	26	147	508	6660	0.8
9044	271	327	33	566	644	5720	0.8
9449	1138	204	25	353	484	7571	0.7
9440	410	690	28	1195	533	10177	0.7
120	183	292	33	504	632	4955	0.7
272	80	56	35	97	672	1966	0.7
9416	303	158	32	273	610	3901	0.7
2682	350	231	30	400	586	4874	0.7

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9400	616	605	25	1047	471	9956	0.7
1760	197	322	30	557	588	5281	0.7
8286	278	258	30	446	582	4881	0.7
9443	202	89	32	154	623	2750	0.7
9693	259	131	30	226	585	3387	0.7
9664	104	296	30	512	584	4614	0.7
9680	369	164	28	284	549	4143	0.7
8221	533	35	28	60	536	3335	0.7
409a	1592	19	17	32	332	7082	0.7
9670	704	74	25	128	480	4373	0.6
7061	528	103	26	178	500	4026	0.6
9423	394	225	26	388	501	4849	0.6
9662	344	199	26	344	506	4369	0.6
409b	13	54	31	93	590	1549	0.6
9408	289	47	27	81	524	2478	0.6
9457	106	112	28	194	541	2500	0.6
8222	249	162	26	281	494	3563	0.6
9661	142	182	26	314	496	3355	0.6
8220	290	341	23	591	438	5650	0.6
9417	83	221	26	382	497	3563	0.6
2938	107	126	26	217	505	2602	0.6
9419	662	206	20	356	375	5518	0.5
9449	290	190	23	329	444	3966	0.5
2937	260	210	23	363	441	4056	0.5
2681	207	230	23	398	441	4074	0.5
84	76	141	25	245	476	2610	0.5
9035	459	304	20	527	375	5814	0.5
9458	136	111	24	192	453	2474	0.5
128	171	184	22	319	428	3399	0.5
818	126	129	23	223	432	2601	0.5
9403	159	372	20	644	380	5382	0.5
9439	348	171	20	296	374	3877	0.5
7614	336	77	20	132	391	2798	0.5
7615	284	178	20	307	381	3705	0.5
9411	124	187	21	323	404	3201	0.5
2695	255	120	20	207	389	2952	0.5
8285	447	122	17	212	326	3656	0.4
9456	239	143	19	247	359	3098	0.4
9410	134	87	20	151	386	2103	0.4
2692	58	119	21	207	393	2169	0.4
9420	157	188	19	325	354	3269	0.4
9422	297	106	18	184	341	2900	0.4
4504	127	287	18	497	342	4247	0.4
9663	766	46	14	80	257	3978	0.4
9448	102	155	19	268	358	2685	0.4
2687	88	187	19	323	353	2981	0.4
7612	66	32	20	56	379	1202	0.4
225	119	93	18	162	349	2055	0.4
1979	35	39	18	68	338	1092	0.4
7615	121	210	18	364	337	3349	0.4
9456	149	176	18	305	337	3080	0.4
1208	133	86	18	148	336	2002	0.4
228	59	76	18	132	333	1600	0.4
5996	80	51	17	89	332	1401	0.4
9418	158	97	17	167	324	2208	0.4
9669	117	225	17	390	318	3475	0.4
7614	81	160	16	277	309	2585	0.4
875	96	77	16	133	304	1712	0.3
98	49	67	16	116	302	1410	0.3
5992	84	101	16	175	302	1931	0.3
8152	97	147	16	255	299	2493	0.3
433	203	99	16	172	298	2380	0.4
9046	77	76	16	131	296	1605	0.3
9402	341	77	16	134	294	2680	0.4
5997	89	83	16	143	294	1733	0.3
9457	245	115	15	199	293	2715	0.4
9718	62	110	15	191	290	1927	0.3
101	91	97	15	169	290	1896	0.3
2061	82	54	15	94	289	1377	0.3
9441	121	84	15	145	288	1865	0.3
2708	87	201	15	347	285	3031	0.3
7058	53	79	15	137	284	1532	0.3
1757	82	100	15	172	282	1872	0.3
8223	179	95	15	165	281	2214	0.3
8287	95	281	14	486	273	3942	0.3
6032	122	106	14	183	269	2081	0.3
1758	271	54	14	93	267	2094	0.3
5976	90	132	14	229	267	2248	0.3
9401	113	223	14	387	266	3362	0.3
2063	152	54	14	94	262	1620	0.3
7517	47	98	14	169	260	1682	0.3
7085	64	83	13	144	252	1572	0.3
802	122	208	13	360	249	3200	0.3
820	68	47	13	81	243	1171	0.3

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7613	98	66	13	114	242	1502	0.3
9678	132	205	13	355	241	3197	0.3
3387	77	135	13	233	240	2183	0.3
817	103	48	13	83	235	1314	0.3
5078	126	125	12	216	231	2253	0.3
5980	99	132	12	229	229	2226	0.3
2046	55	72	12	124	223	1364	0.2
2045	82	68	12	118	222	1433	0.3
94	121	121	12	209	219	2174	0.3
8284	69	70	11	122	211	1387	0.2
5997	140	85	11	147	208	1835	0.3
8881	102	79	11	136	206	1605	0.2
9033	92	48	11	83	204	1218	0.2
2062	77	62	11	107	202	1314	0.2
2047	90	114	11	196	195	1931	0.2
6016	79	46	10	79	190	1122	0.2
7516	79	40	10	69	188	1048	0.2
9701	155	144	10	250	186	2519	0.2
806	155	65	10	112	186	1631	0.2
5975	158	25	10	43	186	1196	0.2
5991	173	158	10	273	183	2739	0.2
2621	207	62	10	107	182	1799	0.2
2018	58	54	10	93	180	1111	0.2
9430	64	54	10	94	176	1132	0.2
2022	23	55	10	95	175	979	0.2
5998	180	160	9	276	165	2763	0.2
9428	47	32	9	55	163	795	0.2
5993	21	42	9	72	162	802	0.2
9045	78	99	9	171	162	1670	0.2
829	100	72	9	125	159	1453	0.2
6031	140	27	9	47	158	1109	0.2
2021	101	43	9	74	158	1127	0.2
9677	58	31	9	54	158	822	0.2
9686	30	35	8	61	153	748	0.2
9074	76	54	8	94	152	1148	0.2
807	55	42	8	72	149	915	0.2
1980	48	19	8	32	146	625	0.2
9685	293	17	8	30	138	1582	0.2
2017	67	46	8	80	136	995	0.2
876	22	42	8	72	136	767	0.1
8305	76	64	7	110	134	1227	0.2
7101	40	52	7	91	132	954	0.1
5994	34	22	7	37	127	574	0.1
9687	72	37	7	64	125	892	0.1
6024	54	26	7	45	125	702	0.1
9679	25	15	7	26	123	457	0.1
2617	60	104	7	181	122	1599	0.2
6026	35	22	7	38	122	577	0.1
5995	21	20	7	35	121	499	0.1
9704	108	7	7	11	118	688	0.1
5061	23	16	6	28	115	455	0.1
2622	62	54	6	94	111	1031	0.1
6017	28	30	6	51	109	614	0.1
5979	20	32	6	55	109	607	0.1
6015	18	22	6	39	97	476	0.1
6023	56	11	5	20	84	485	0.1
7518	19	14	5	24	77	354	0.1
6025	8	10	5	16	77	261	0.1
6018	15	8	4	14	68	260	0.1
9702	16	6	4	10	63	231	0.1
9688	6	3	3	6	41	128	0.0

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