State of California - Health and Human Services Agency
California Department of Public Health

Drinking Water and Radiation Laboratory Branch
850 Marina Bay Parkway, Richmond, CA 94804
Phone: (510) 620-2911 Fax: (510) 620-2940

FINAL Analysis Results Report for Task ID. 14-0301

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0301-01	Sample ID: 1st Qtr 2014 Time Collected: 2/11/2014 9:05 Sampling Point: Eureka Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.0652 +/- 0.00259	0.00269	pCi/m3
Potassium-40	HASL Ga-01-R	0.00137 +/- 0.000707	0.00326	pCi/m3
Niobium-95	HASL Ga-01-R	0.00000164 +/- 0.0000858	0.000391	pCi/m3
Zirconium-95	HASL Ga-01-R	0.0000736 +/- 0.0000639	0.000305	pCi/m3
Ruthenium-103	HASL Ga-01-R	0.0000255 +/- 0.0000648	0.000296	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.00000796 +/- 0.000164	0.000745	pCi/m3
Cesium-137	HASL Ga-01-R	0.00000521 +/- 0.0000168	0.0000777	pCi/m3
Cerium-141	HASL Ga-01-R	-0.0000364 +/- 0.000123	0.000535	pCi/m3
Cerium-144	HASL Ga-01-R	-0.0000768 +/- 0.000100	0.000433	pCi/m3

(1) Precision criteria for these method were determined to be acceptable.

(2) CE is the counting error at the 95% confidence level as defined in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August 1980.

(3) MDA95 is the sample specific minimum detectable activity at the 95% confidence level which is the LLD95 devided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particilar radio-nuclide. LLD95 is defined in section 7010G, Standard Methods for the Examination of Water and Wastewater, American Water Works Association, 21st Ed., 2005, where Sb is the aquare root of the instrument background count rate.

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FINAL Analysis Results Report for Task ID. 14-0302

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0302-01	Sample ID: 1st Qtr 2014 Time Collected: 2/18/2014 15:58 Sampling Point: Humboldt Bay Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.0630 +/- 0.00197	0.00212	pCi/m3
Potassium-40	HASL Ga-01-R	0.000729 +/- 0.000505	0.00234	pCi/m3
Niobium-95	HASL Ga-01-R	-0.0000495 +/- 0.0000676	0.000300	pCi/m3
Zirconium-95	HASL Ga-01-R	0.0000761 +/- 0.0000479	0.000232	pCi/m3
Ruthenium-103	HASL Ga-01-R	0.00000805 +/- 0.0000532	0.000241	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.000164 +/- 0.000129	0.000604	pCi/m3
Cesium-137	HASL Ga-01-R	0.0000162 +/- 0.0000122	0.0000576	pCi/m3
Cerium-141	HASL Ga-01-R	0.000136 +/- 0.000117	0.000542	pCi/m3
Cerium-144	HASL Ga-01-R	0.00000318 +/- 0.0000800	0.000353	pCi/m3

(1) Precision criteria for these method were determined to be acceptable.

(2) CE is the counting error at the 95% confidence level as defined in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August 1980.

(3) MDA95 is the sample specific minimum detectable activity at the 95% confidence level which is the LLD95 devided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particilar radio-nuclide. LLD95 is defined in section 7010G, Standard Methods for the Examination of Water and Wastewater, American Water Works Association, 21st Ed., 2005, where Sb is the aquare root of the instrument background count rate.

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FINAL Analysis Results Report for Task ID. 14-0304

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0304-01	Sample ID: 1st Qtr 2014 Time Collected: 2/11/2014 9:15 Sampling Point: Richmond Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.0952 +/- 0.00286	0.00244	pCi/m3
Potassium-40	HASL Ga-01-R	-0.000321 +/- 0.000548	0.00259	pCi/m3
Niobium-95	HASL Ga-01-R	-0.0000781 +/- 0.0000699	0.000309	pCi/m3
Zirconium-95	HASL Ga-01-R	0.0000869 +/- 0.0000527	0.000256	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.000107 +/- 0.0000558	0.000241	pCi/m3
Ruthenium-106	HASL Ga-01-R	-0.000180 +/- 0.000132	0.000580	pCi/m3
Cesium-137	HASL Ga-01-R	0.0000120 +/- 0.0000132	0.0000621	pCi/m3
Cerium-141	HASL Ga-01-R	0.000668 +/- 0.000178	0.000808	pCi/m3
Cerium-144	HASL Ga-01-R	0.000151 +/- 0.0000889	0.000401	pCi/m3

(1) Precision criteria for these method were determined to be acceptable.

(2) CE is the counting error at the 95% confidence level as defined in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August 1980.

(3) MDA95 is the sample specific minimum detectable activity at the 95% confidence level which is the LLD95 devided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particilar radio-nuclide. LLD95 is defined in section 7010G, Standard Methods for the Examination of Water and Wastewater, American Water Works Association, 21st Ed., 2005, where Sb is the aquare root of the instrument background count rate.

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FINAL Analysis Results Report for Task ID. 14-0303

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0303-01	Sample ID: 1st Qtr 2014 Time Collected: 2/10/2014 13:56 Sampling Point: Livermore Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.0942 +/- 0.00357	0.00237	pCi/m3
Potassium-40	HASL Ga-01-R	0.000536 +/- 0.000604	0.00282	pCi/m3
Niobium-95	HASL Ga-01-R	0.000265 +/- 0.000127	0.000580	pCi/m3
Zirconium-95	HASL Ga-01-R	0.0000142 +/- 0.0000605	0.000280	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.0000901 +/- 0.0000546	0.000237	pCi/m3
Ruthenium-106	HASL Ga-01-R	-0.0000444 +/- 0.000136	0.000617	pCi/m3
Cesium-137	HASL Ga-01-R	0.00000579 +/- 0.0000143	0.0000650	pCi/m3
Cerium-141	HASL Ga-01-R	0.000192 +/- 0.000145	0.000671	pCi/m3
Cerium-144	HASL Ga-01-R	0.0000998 +/- 0.0000873	0.000393	pCi/m3

(1) Precision criteria for these method were determined to be acceptable.

(2) CE is the counting error at the 95% confidence level as defined in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August 1980.

(3) MDA95 is the sample specific minimum detectable activity at the 95% confidence level which is the LLD95 devided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particilar radio-nuclide. LLD95 is defined in section 7010G, Standard Methods for the Examination of Water and Wastewater, American Water Works Association, 21st Ed., 2005, where Sb is the aquare root of the instrument background count rate.

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FINAL Analysis Results Report for Task ID. 14-0306

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0306-01	Sample ID: 1st Qtr 2014 Time Collected: 2/14/2014 15:30 Sampling Point: San Luis Obispo Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.115 +/- 0.00431	0.00237	pCi/m3
Potassium-40	HASL Ga-01-R	0.00202 +/- 0.000635	0.00289	pCi/m3
Niobium-95	HASL Ga-01-R	0.0000697 +/- 0.0000739	0.000345	pCi/m3
Zirconium-95	HASL Ga-01-R	0.000103 +/- 0.0000541	0.000263	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.0000158 +/- 0.0000578	0.000259	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.0000199 +/- 0.000147	0.000673	pCi/m3
Cesium-137	HASL Ga-01-R	0.00000441 +/- 0.0000155	0.0000716	pCi/m3
Cerium-141	HASL Ga-01-R	0.000365 +/- 0.000167	0.000768	pCi/m3
Cerium-144	HASL Ga-01-R	-0.0000807 +/- 0.0000930	0.000403	pCi/m3

(1) Precision criteria for these method were determined to be acceptable.

(2) CE is the counting error at the 95% confidence level as defined in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August 1980.

(3) MDA95 is the sample specific minimum detectable activity at the 95% confidence level which is the LLD95 devided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particilar radio-nuclide. LLD95 is defined in section 7010G, Standard Methods for the Examination of Water and Wastewater, American Water Works Association, 21st Ed., 2005, where Sb is the aquare root of the instrument background count rate.

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FINAL Analysis Results Report for Task ID. 14-0300

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0300-01	Sample ID: 1st Qtr 2014 Time Collected: 2/14/2014 11:00 Sampling Point: Diablo Canyon Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.0978 +/- 0.00357	0.00239	pCi/m3
Potassium-40	HASL Ga-01-R	0.00137 +/- 0.000533	0.00243	pCi/m3
Niobium-95	HASL Ga-01-R	0.0000201 +/- 0.0000549	0.000251	pCi/m3
Zirconium-95	HASL Ga-01-R	0.0000263 +/- 0.0000441	0.000207	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.0000238 +/- 0.0000444	0.000200	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.0000409 +/- 0.000117	0.000537	pCi/m3
Cesium-137	HASL Ga-01-R	0.000105 +/- 0.0000193	0.0000829	pCi/m3
Cerium-141	HASL Ga-01-R	-0.000344 +/- 0.000169	0.000801	pCi/m3
Cerium-144	HASL Ga-01-R	0.0000577 +/- 0.0000712	0.000317	pCi/m3

(1) Precision criteria for these method were determined to be acceptable.

(2) CE is the counting error at the 95% confidence level as defined in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August 1980.

(3) MDA95 is the sample specific minimum detectable activity at the 95% confidence level which is the LLD95 devided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particilar radio-nuclide. LLD95 is defined in section 7010G, Standard Methods for the Examination of Water and Wastewater, American Water Works Association, 21st Ed., 2005, where Sb is the aquare root of the instrument background count rate.

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FINAL Analysis Results Report for Task ID. 14-0307

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0307-01	Sample ID: 1st Qtr 2014 Time Collected: 2/20/2014 12:00 Sampling Point: San Onofre Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.0992 +/- 0.00292	0.00194	pCi/m3
Potassium-40	HASL Ga-01-R	0.000179 +/- 0.000532	0.00249	pCi/m3
Niobium-95	HASL Ga-01-R	0.0000264 +/- 0.0000598	0.000276	pCi/m3
Zirconium-95	HASL Ga-01-R	0.0000514 +/- 0.0000482	0.000226	pCi/m3
Ruthenium-103	HASL Ga-01-R	0.00000282 +/- 0.0000470	0.000213	pCi/m3
Ruthenium-106	HASL Ga-01-R	-0.0000248 +/- 0.000133	0.000608	pCi/m3
Cesium-137	HASL Ga-01-R	0.00000767 +/- 0.0000128	0.0000596	pCi/m3
Cerium-141	HASL Ga-01-R	0.000524 +/- 0.000136	0.000615	pCi/m3
Cerium-144	HASL Ga-01-R	0.00000924 +/- 0.0000850	0.000374	pCi/m3

(1) Precision criteria for these method were determined to be acceptable.

(2) CE is the counting error at the 95% confidence level as defined in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August 1980.

(3) MDA95 is the sample specific minimum detectable activity at the 95% confidence level which is the LLD95 devided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particilar radio-nuclide. LLD95 is defined in section 7010G, Standard Methods for the Examination of Water and Wastewater, American Water Works Association, 21st Ed., 2005, where Sb is the aquare root of the instrument background count rate.

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FINAL Analysis Results Report for Task ID. 14-0305

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0305-01	Sample ID: 1st Qtr 2014 Time Collected: 2/14/2014 12:11 Sampling Point: San Diego Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.120 +/- 0.00438	0.00254	pCi/m3
Potassium-40	HASL Ga-01-R	-0.00138 +/- 0.000605	0.00291	pCi/m3
Niobium-95	HASL Ga-01-R	0.0000269 +/- 0.0000672	0.000312	pCi/m3
Zirconium-95	HASL Ga-01-R	-0.0000312 +/- 0.0000555	0.000249	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.0000508 +/- 0.0000537	0.000238	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.0000350 +/- 0.000133	0.000616	pCi/m3
Cesium-137	HASL Ga-01-R	0.0000122 +/- 0.0000142	0.0000665	pCi/m3
Cerium-141	HASL Ga-01-R	-0.000173 +/- 0.000206	0.000968	pCi/m3
Cerium-144	HASL Ga-01-R	-0.0000490 +/- 0.0000838	0.000363	pCi/m3

(1) Precision criteria for these method were determined to be acceptable.

(2) CE is the counting error at the 95% confidence level as defined in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August 1980.

(3) MDA95 is the sample specific minimum detectable activity at the 95% confidence level which is the LLD95 devided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particilar radio-nuclide. LLD95 is defined in section 7010G, Standard Methods for the Examination of Water and Wastewater, American Water Works Association, 21st Ed., 2005, where Sb is the aquare root of the instrument background count rate.