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. 14-0050

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0050-01	Sample ID: 4th Qtr 2013 Time Collected: 11/12/2013 13:24 Sampling Point: Eureka Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.0863 +/- 0.00248	0.00268	pCi/m3
Potassium-40	HASL Ga-01-R	-0.00260 +/- 0.000653	0.00318	pCi/m3
Niobium-95	HASL Ga-01-R	0.0000813 +/- 0.0000856	0.000403	pCi/m3
Zirconium-95	HASL Ga-01-R	-0.000102 +/- 0.0000891	0.000293	pCi/m3
Ruthenium-103	HASL Ga-01-R	0.00000172 +/- 0.0000542	0.000242	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.000268 +/- 0.000159	0.000754	pCi/m3
Cesium-137	HASL Ga-01-R	0.00000984 +/- 0.0000156	0.0000728	pCi/m3
Cerium-141	HASL Ga-01-R	0.000514 +/- 0.000167	0.000762	pCi/m3
Cerium-144	HASL Ga-01-R	-0.000107 +/- 0.0000964	0.000417	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. 14-0051

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0051-01	Sample ID: 4th Qtr 2013 Time Collected: 11/8/2013 13:06 Sampling Point: Humboldt Bay Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.0867 +/- 0.00262	0.00234	pCi/m3
Potassium-40	HASL Ga-01-R	0.000260 +/- 0.000497	0.00232	pCi/m3
Niobium-95	HASL Ga-01-R	0.000163 +/- 0.0000740	0.000360	pCi/m3
Zirconium-95	HASL Ga-01-R	-0.000122 +/- 0.0000714	0.000241	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.0000962 +/- 0.0000537	0.000232	pCi/m3
Ruthenium-106	HASL Ga-01-R	-0.0000787 +/- 0.000123	0.000551	pCi/m3
Cesium-137	HASL Ga-01-R	0.0000256 +/- 0.0000119	0.0000577	pCi/m3
Cerium-141	HASL Ga-01-R	0.000174 +/- 0.000171	0.000797	pCi/m3
Cerium-144	HASL Ga-01-R	0.0000155 +/- 0.0000805	0.000358	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. 14-0053

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0053-01	Sample ID: First Quaterly Time Collected: 11/5/2013 9:35 Sampling Point: Richmond Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.133 +/- 0.00364	0.00282	pCi/m3
Potassium-40	HASL Ga-01-R	-0.000919 +/- 0.000588	0.00280	pCi/m3
Niobium-95	HASL Ga-01-R	0.000107 +/- 0.0000883	0.000415	pCi/m3
Zirconium-95	HASL Ga-01-R	0.0000231 +/- 0.0000599	0.000289	pCi/m3
Ruthenium-103	HASL Ga-01-R	0.0000414 +/- 0.0000591	0.000270	pCi/m3
Ruthenium-106	HASL Ga-01-R	-0.000348 +/- 0.000147	0.000622	pCi/m3
Cesium-137	HASL Ga-01-R	0.00000374 +/- 0.0000136	0.0000616	pCi/m3
Cerium-141	HASL Ga-01-R	0.000521 +/- 0.000189	0.000868	pCi/m3
Cerium-144	HASL Ga-01-R	0.0000525 +/- 0.0000887	0.000394	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. 14-0052

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0052-01	Sample ID: 4th Qtr 2013 Time Collected: 11/6/2013 9:55 Sampling Point: Livermore Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.152 +/- 0.00431	0.00236	pCi/m3
Potassium-40	HASL Ga-01-R	-0.000293 +/- 0.000488	0.00231	pCi/m3
Niobium-95	HASL Ga-01-R	-0.0000145 +/- 0.0000746	0.000339	pCi/m3
Zirconium-95	HASL Ga-01-R	-0.000120 +/- 0.0000713	0.000250	pCi/m3
Ruthenium-103	HASL Ga-01-R	0.0000653 +/- 0.0000554	0.000259	pCi/m3
Ruthenium-106	HASL Ga-01-R	-0.0000673 +/- 0.000126	0.000554	pCi/m3
Cesium-137	HASL Ga-01-R	0.00000548 +/- 0.0000116	0.0000538	pCi/m3
Cerium-141	HASL Ga-01-R	-0.000479 +/- 0.000240	0.00113	pCi/m3
Cerium-144	HASL Ga-01-R	0.0000913 +/- 0.0000765	0.000343	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. 14-0055

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0055-01	Sample ID: 4th Qtr 2014 Time Collected: 11/8/2013 16:00 Sampling Point: San Luis Obispo Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.127 +/- 0.00350	0.00289	pCi/m3
Potassium-40	HASL Ga-01-R	-0.0000147 +/- 0.000641	0.00301	pCi/m3
Niobium-95	HASL Ga-01-R	0.0000776 +/- 0.0000927	0.000436	pCi/m3
Zirconium-95	HASL Ga-01-R	0.00000783 +/- 0.0000438	0.000269	pCi/m3
Ruthenium-103	HASL Ga-01-R	0.0000285 +/- 0.0000593	0.000269	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.0000927 +/- 0.000156	0.000718	pCi/m3
Cesium-137	HASL Ga-01-R	0.00000584 +/- 0.0000152	0.0000683	pCi/m3
Cerium-141	HASL Ga-01-R	0.000101 +/- 0.000140	0.000622	pCi/m3
Cerium-144	HASL Ga-01-R	0.00000242 +/- 0.0000954	0.000420	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 radionuclide. 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. 14-0049

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0049-01	Sample ID: 4th Qtr 2013 Time Collected: 11/8/2013 14:30 Sampling Point: Diablo Canyon Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.114 +/- 0.00331	0.00239	pCi/m3
Potassium-40	HASL Ga-01-R	0.000281 +/- 0.000505	0.00237	pCi/m3
Niobium-95	HASL Ga-01-R	0.0000987 +/- 0.0000672	0.000324	pCi/m3
Zirconium-95	HASL Ga-01-R	-0.000102 +/- 0.0000699	0.000244	pCi/m3
Ruthenium-103	HASL Ga-01-R	0.0000910 +/- 0.0000535	0.000251	pCi/m3
Ruthenium-106	HASL Ga-01-R	-0.0000673 +/- 0.000121	0.000547	pCi/m3
Cesium-137	HASL Ga-01-R	-0.0000121 +/- 0.0000129	0.0000568	pCi/m3
Cerium-141	HASL Ga-01-R	-0.0000804 +/- 0.000219	0.00103	pCi/m3
Cerium-144	HASL Ga-01-R	-0.0000800 +/- 0.0000747	0.000323	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. 14-0056

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0056-01	Sample ID: 4th Qtr 2013 Time Collected: 11/6/2014 12:15 Sampling Point: San Onofre Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.131 +/- 0.00382	0.00237	pCi/m3
Potassium-40	HASL Ga-01-R	-0.000568 +/- 0.000482	0.00230	pCi/m3
Niobium-95	HASL Ga-01-R	0.000139 +/- 0.0000756	0.000366	pCi/m3
Zirconium-95	HASL Ga-01-R	-0.000223 +/- 0.0000746	0.000256	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.0000400 +/- 0.0000598	0.000268	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.0000402 +/- 0.000126	0.000581	pCi/m3
Cesium-137	HASL Ga-01-R	0.00000625 +/- 0.0000123	0.0000574	pCi/m3
Cerium-141	HASL Ga-01-R	0.000674 +/- 0.000204	0.000933	pCi/m3
Cerium-144	HASL Ga-01-R	0.0000358 +/- 0.0000837	0.000372	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. 14-0054

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 14-0054-01	Sample ID: 4th Qtr 2013 Time Collected: 11/8/2013 14:11 Sampling Point: San Diego Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.137 +/- 0.00403	0.00268	pCi/m3
Potassium-40	HASL Ga-01-R	-0.0000561 +/- 0.000545	0.00257	pCi/m3
Niobium-95	HASL Ga-01-R	0.0000238 +/- 0.0000837	0.000389	pCi/m3
Zirconium-95	HASL Ga-01-R	-0.000101 +/- 0.0000814	0.000264	pCi/m3
Ruthenium-103	HASL Ga-01-R	0.0000167 +/- 0.0000666	0.000305	pCi/m3
Ruthenium-106	HASL Ga-01-R	-0.0000345 +/- 0.000141	0.000637	pCi/m3
Cesium-137	HASL Ga-01-R	0.0000121 +/- 0.0000133	0.0000627	pCi/m3
Cerium-141	HASL Ga-01-R	-0.000125 +/- 0.000134	0.000580	pCi/m3
Cerium-144	HASL Ga-01-R	-0.0000476 +/- 0.0000933	0.000408	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.