



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. 13-0057

Parameter	Method	Result +/- CE	MDA 95	Units
<b>Lab No: 13-0057-01</b>	Sample ID: 4th Qtr 2012	Time Collected: 11/14/2012 10:31	Sampling Point: Eureka	
	Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.0504 +/- 0.00156	0.00265	pCi/m3
Potassium-40	HASL Ga-01-R	-0.000348 +/- 0.000598	0.00283	pCi/m3
Niobium-95	HASL Ga-01-R	-0.0000681 +/- 0.000176	0.000460	pCi/m3
Zirconium-95	HASL Ga-01-R	0.00000191 +/- 0.000184	0.000392	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.0000574 +/- 0.000128	0.000350	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.0000636 +/- 0.000359	0.00100	pCi/m3
Cesium-137	HASL Ga-01-R	0.0000377 +/- 0.0000351	0.000102	pCi/m3
Cerium-141	HASL Ga-01-R	0.000450 +/- 0.000196	0.000620	pCi/m3
Cerium-144	HASL Ga-01-R	-0.0000951 +/- 0.000202	0.000608	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 divided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particular 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 square root of the instrument background count rate.



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**FINAL Analysis Results Report for Task ID. 13-0058**

Parameter	Method	Result +/- CE	MDA 95	Units
<b>Lab No: 13-0058-01</b>	Sample ID: 4th Qtr 2012 Sample Type: Air Composite	Time Collected: 11/16/2013 12:07	Sampling Point: Humboldt Bay	
Beryllium-7	HASL Ga-01-R	0.0584 +/- 0.00166	0.00206	pCi/m3
Potassium-40	HASL Ga-01-R	0.000922 +/- 0.000451	0.00207	pCi/m3
Niobium-95	HASL Ga-01-R	0.000107 +/- 0.000108	0.000340	pCi/m3
Zirconium-95	HASL Ga-01-R	-0.000159 +/- 0.000102	0.000292	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.000124 +/- 0.0000971	0.000246	pCi/m3
Ruthenium-106	HASL Ga-01-R	-0.000112 +/- 0.000314	0.000796	pCi/m3
Cesium-137	HASL Ga-01-R	-0.0000204 +/- 0.0000311	0.0000777	pCi/m3
Cerium-141	HASL Ga-01-R	0.000120 +/- 0.000156	0.000438	pCi/m3
Cerium-144	HASL Ga-01-R	0.00000915 +/- 0.000146	0.000423	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 divided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particular 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 square root of the instrument background count rate.



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FINAL Analysis Results Report for Task ID. 13-0060

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 13-0060-01	Sample ID: 4th Qtr 2012	Time Collected: 11/13/2012 09:20	Sampling Point: Richmond	
	Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.0856 +/- 0.00250	0.00392	pCi/m3
Potassium-40	HASL Ga-01-R	-0.0000786 +/- 0.000667	0.00314	pCi/m3
Niobium-95	HASL Ga-01-R	0.0000121 +/- 0.000184	0.000494	pCi/m3
Zirconium-95	HASL Ga-01-R	0.000316 +/- 0.000141	0.000422	pCi/m3
Ruthenium-103	HASL Ga-01-R	0.0000762 +/- 0.000137	0.000387	pCi/m3
Ruthenium-106	HASL Ga-01-R	-0.000101 +/- 0.000415	0.00115	pCi/m3
Cesium-137	HASL Ga-01-R	0.0000313 +/- 0.0000388	0.000112	pCi/m3
Cerium-141	HASL Ga-01-R	-0.000146 +/- 0.000172	0.000808	pCi/m3
Cerium-144	HASL Ga-01-R	-0.000317 +/- 0.000223	0.000657	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 divided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particular 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 square root of the instrument background count rate.



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FINAL Analysis Results Report for Task ID. 13-0059

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 13-0059-01	Sample ID: 4th Qtr 2012	Time Collected: 11/13/2012 11:35	Sampling Point: Livermore	
	Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.108 +/- 0.00298	0.00337	pCi/m3
Potassium-40	HASL Ga-01-R	-0.000322 +/- 0.000597	0.00282	pCi/m3
Niobium-95	HASL Ga-01-R	0.000359 +/- 0.000141	0.000442	pCi/m3
Zirconium-95	HASL Ga-01-R	-0.000124 +/- 0.000141	0.000378	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.000113 +/- 0.000112	0.000315	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.000210 +/- 0.000367	0.00105	pCi/m3
Cesium-137	HASL Ga-01-R	-0.0000397 +/- 0.0000362	0.0000959	pCi/m3
Cerium-141	HASL Ga-01-R	0.000261 +/- 0.000179	0.000589	pCi/m3
Cerium-144	HASL Ga-01-R	0.0000383 +/- 0.000183	0.000591	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 divided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particular 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 square root of the instrument background count rate.



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**FINAL Analysis Results Report for Task ID. 13-0062**

Parameter	Method	Result +/- CE	MDA 95	Units
Lab No: 13-0062-01	Sample ID: 4th Qtr 2012 Sample Type: Air Composite	Time Collected: 11/16/2012 08:40	Sampling Point: San Luis Obispo	
Beryllium-7	HASL Ga-01-R	0.106 +/- 0.00295	0.00335	pCi/m3
Potassium-40	HASL Ga-01-R	-0.000598 +/- 0.000558	0.00266	pCi/m3
Niobium-95	HASL Ga-01-R	0.000151 +/- 0.000153	0.000447	pCi/m3
Zirconium-95	HASL Ga-01-R	0.0000700 +/- 0.000133	0.000382	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.0000750 +/- 0.000120	0.000340	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.000125 +/- 0.000378	0.00107	pCi/m3
Cesium-137	HASL Ga-01-R	0.0000656 +/- 0.0000363	0.000109	pCi/m3
Cerium-141	HASL Ga-01-R	0.000442 +/- 0.000121	0.000548	pCi/m3
Cerium-144	HASL Ga-01-R	0.000263 +/- 0.000184	0.000604	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 divided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particular 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 square root of the instrument background count rate.



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**FINAL Analysis Results Report for Task ID. 13-0056**

Parameter	Method	Result +/- CE	MDA 95	Units
<b>Lab No: 13-0056-01</b>	Sample ID: 4th Qtr 2012	Time Collected: 11/16/2012 10:00	Sampling Point: Diablo Canyon	
	Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.0840 +/- 0.00238	0.00312	pCi/m3
Potassium-40	HASL Ga-01-R	-0.000614 +/- 0.000531	0.00253	pCi/m3
Niobium-95	HASL Ga-01-R	0.000293 +/- 0.000133	0.000406	pCi/m3
Zirconium-95	HASL Ga-01-R	-0.000336 +/- 0.000137	0.000337	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.000107 +/- 0.000107	0.000299	pCi/m3
Ruthenium-106	HASL Ga-01-R	-0.000136 +/- 0.000339	0.000930	pCi/m3
Cesium-137	HASL Ga-01-R	-0.0000198 +/- 0.0000349	0.0000947	pCi/m3
Cerium-141	HASL Ga-01-R	0.000177 +/- 0.000164	0.000536	pCi/m3
Cerium-144	HASL Ga-01-R	-0.0000959 +/- 0.000169	0.000536	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 divided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particular 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 square root of the instrument background count rate.



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**FINAL Analysis Results Report for Task ID. 13-0055**

Parameter	Method	Result +/- CE	MDA 95	Units
<b>Lab No: 13-0055-01</b>	Sample ID: 4th Qtr 2012	Time Collected: 11/5/2012 08:15	Sampling Point: Los Angeles	
	Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.0987 +/- 0.00285	0.00364	pCi/m3
Potassium-40	HASL Ga-01-R	0.00185 +/- 0.000791	0.00364	pCi/m3
Niobium-95	HASL Ga-01-R	0.000194 +/- 0.000246	0.000680	pCi/m3
Zirconium-95	HASL Ga-01-R	0.00000407 +/- 0.000203	0.000538	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.0000210 +/- 0.000182	0.000503	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.0000546 +/- 0.000477	0.00133	pCi/m3
Cesium-137	HASL Ga-01-R	-0.0000228 +/- 0.0000485	0.000132	pCi/m3
Cerium-141	HASL Ga-01-R	0.000503 +/- 0.000296	0.000929	pCi/m3
Cerium-144	HASL Ga-01-R	0.0000333 +/- 0.000258	0.000788	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 divided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particular 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 square root of the instrument background count rate.



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**FINAL Analysis Results Report for Task ID. 13-0063**

Parameter	Method	Result +/- CE	MDA 95	Units
<b>Lab No: 13-0063-01</b> Sample ID: 4th Qtr 2012    Time Collected: 11/14/2012 11:00    Sampling Point: San Onofre Sample Type: Air Composite				
Beryllium-7	HASL Ga-01-R	0.0988 +/- 0.00281	0.00388	pCi/m3
Potassium-40	HASL Ga-01-R	0.000569 +/- 0.000642	0.00299	pCi/m3
Niobium-95	HASL Ga-01-R	0.000211 +/- 0.000169	0.000479	pCi/m3
Zirconium-95	HASL Ga-01-R	-0.0000193 +/- 0.000151	0.000400	pCi/m3
Ruthenium-103	HASL Ga-01-R	0.0000937 +/- 0.000129	0.000369	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.0000674 +/- 0.000373	0.00105	pCi/m3
Cesium-137	HASL Ga-01-R	-0.0000607 +/- 0.0000404	0.000105	pCi/m3
Cerium-141	HASL Ga-01-R	0.000329 +/- 0.000219	0.000684	pCi/m3
Cerium-144	HASL Ga-01-R	0.000448 +/- 0.000209	0.000655	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 divided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particular 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 square root of the instrument background count rate.



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**FINAL Analysis Results Report for Task ID. 13-0061**

Parameter	Method	Result +/- CE	MDA 95	Units
<b>Lab No: 13-0061-01</b>	Sample ID: 4th Qtr 2012	Time Collected: 11/16/2012 12:17	Sampling Point: San Diego	
	Sample Type: Air Composite			
Beryllium-7	HASL Ga-01-R	0.116 +/- 0.00315	0.00224	pCi/m3
Potassium-40	HASL Ga-01-R	-0.00138 +/- 0.000573	0.00276	pCi/m3
Niobium-95	HASL Ga-01-R	-0.000132 +/- 0.000160	0.000431	pCi/m3
Zirconium-95	HASL Ga-01-R	0.0000187 +/- 0.000141	0.000396	pCi/m3
Ruthenium-103	HASL Ga-01-R	-0.000149 +/- 0.000116	0.000320	pCi/m3
Ruthenium-106	HASL Ga-01-R	0.000508 +/- 0.000357	0.00105	pCi/m3
Cesium-137	HASL Ga-01-R	0.0000678 +/- 0.0000370	0.000112	pCi/m3
Cerium-141	HASL Ga-01-R	0.000369 +/- 0.000107	0.000487	pCi/m3
Cerium-144	HASL Ga-01-R	0.000391 +/- 0.000183	0.000607	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 divided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particular 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 square root of the instrument background count rate.