

Quarterly Report of Analytical Results for the CEMP Air Sampling Network

The CEMP air sampling network is designed to monitor and collect radioactive airborne particles from NTS and non-NTS activities, as well as background environmental sources. This report is provided to the station managers as a summary of the results from the analysis of the air samples they have collected as part of the environmental monitoring program.

In general, the CEMP air sampling network is comprised of 24 continuously operating sampling stations. 22 stations are equipped with a low volume air sampler to collect particulate radionuclides on glass fiber filter papers. Ideally, the samples are collected on a weekly basis with a target collection time of 168 hours. The samplers are calibrated on a monthly basis by DRI to maintain a collection rate of 2.0 cfm (@ STP). All relevant information such as actual collection times, variations in flow rate, power outages, or other information which documents the integrity of the sample is recorded by the station managers. This allows for the proper interpretation of the analytical results. In addition, beginning in January 2002 the air sampling network was fully outfitted with digital air flow calibrators (aka. totalizers). These units allow for the constant monitoring of actual flow rates and total volume of air sample collected. This information is now being used for the calculation of final results. The air filters are analyzed at a commercial laboratory for gross alpha/beta activity as well as by high-resolution gamma spectrometry. The filters are composited on a quarterly basis for the gamma analysis only after the gross alpha/beta analyses have been completed. As a result of the lag time, the gamma results for the first quarter of CY2002 are not yet available.

The principle reporting units used in the U.S. for the measurement of radioactivity in the atmospheric environment is pCi/m³ (picocuries per cubic meter). DRI receives its data from the lab as microcuries per filter which is then recalculated to microcuries per milliliter based on the information provided by the station managers as well as monthly calibration results. This is the notation used for DRI internal data bases and annual reports to DOE. For the ease in constructing the tables contained in this report, as well as hopefully the ease of comparison among stations and previous results, the units of pCi/m³ are used.

A summary of the first quarter CY2002 analytical results for gross alpha and beta are found in Tables 1 and 2. These tables show the minimum, maximum, and average values for each of the stations of the air sampling network. The last column shows an average annual value from previous years (in this case 2000) for comparison purposes. Overall the gross alpha and beta results for the first quarter of CY2001 appear significantly lower than the previous quarter as well as the average CY2000 results. This is mainly due to the fact that actual flow data from the totalizers are being used for calculating results instead of assuming STP conditions reflected by previous data.

The TLD results for the first quarter of CY2002 are shown in Table 3. Overall, the current results are consistent with previous years data with CY2001 shown for comparison. The 2001 PIC exposure rate is also shown for comparison, and as with

historical data, the TLD's are lower than the PIC results. As previously noted, this is due to the differences in the two techniques of gamma detection.

Finally, as station managers, your input on the contents of these reports are welcome and encouraged. We are interested in anything you feel would be helpful for you to interpret the data or to enable you to explain the information to someone in your community not familiar with the program.

Table 1. Gross Alpha Analytical Results for the First Quarter of Calendar Year 2002
(Average analytical error, +/- 0.0007)

Station	Minimum (pCi/m ³)	Maximum (pCi/m ³)	Average (pCi/m ³)	2000 Average (pCi/m ³)
Las Vegas	0.0005	0.0046	0.0023	0.0028
Henderson	0.0006	0.0039	0.0017	0.0027
Boulder City	0.0016	0.0057	0.0033	0.0036
Overton	0.0008	0.0037	0.0021	0.0029
St. George	0.0011	0.0022	0.0015	0.0026
Cedar City	0.0007	0.0037	0.0021	0.0038
Milford	0.0009	0.0021	0.0015	0.0023
Delta	0.0008	0.0022	0.0014	0.0022
Pioche	0.0004	0.0017	0.0010	0.0022
Caliente	0.0010	0.0020	0.0015	0.0025
Alamo	0.0009	0.0039	0.0019	0.0032
Rachel	0.0009	0.0024	0.0016	0.0029
Tonopah	0.0007	0.0028	0.0013	0.0023
Goldfield	0.0008	0.0022	0.0013	0.0026
Beatty	0.0007	0.0033	0.0017	0.0028
Indian Springs	0.0008	0.0017	0.0019	0.0021
Amargosa	0.0005	0.0045	0.0021	0.0031
Pahrump	0.0007	0.0031	0.0015	0.0022

Garden Valley	0.0004	0.0020	0.0013	---
Nyala	0.0005	0.0024	0.0011	---
Twin Springs	0.0003	0.0029	0.0014	---
Stone Cabin	0.0017	0.0051	0.0030	---

Table 2. Gross Beta Analytical Results for the First Quarter of Calendar Year 2002.
(Average analytical error, +/- 0.003)

Station	Minimum (pCi/m ³)	Maximum (pCi/m ³)	Average (pCi/m ³)	2000 Average (pCi/m ³)
Las Vegas	0.015	0.034	0.023	0.025
Henderson	0.015	0.034	0.023	0.024
Boulder City	0.014	0.040	0.026	0.027
Overton	0.015	0.036	0.025	0.026
St. George	0.017	0.039	0.026	0.025
Cedar City	0.012	0.026	0.019	0.024
Milford	0.016	0.031	0.024	0.024
Delta	0.012	0.032	0.022	0.025
Pioche	0.012	0.023	0.018	0.022
Caliente	0.015	0.031	0.022	0.025
Alamo	0.014	0.027	0.021	0.025
Rachel	0.014	0.033	0.022	0.025
Tonopah	0.013	0.025	0.019	0.024
Goldfield	0.013	0.029	0.020	0.024
Beatty	0.015	0.029	0.021	0.024
Indian Springs	0.013	0.025	0.019	0.022
Amargosa	0.014	0.029	0.022	0.025
Pahrump	0.015	0.029	0.020	0.023

Garden Valley	0.015	0.026	0.019	---
Nyala	0.013	0.024	0.019	---
Twin Springs	0.012	0.041	0.025	---
Stone Cabin	0.016	0.029	0.022	---

Table 3. TLD Analytical Results for the First Quarter of Calendar Year 2002.

Station	First Quarter Exposure (mR)	Est. Annual Exposure (mR/yr)	2001 TLD Exposure (mR/yr)	2001 PIC Exposure (mR/yr)
Las Vegas	24	95	77	97
Henderson	24	100	107	131
Boulder City	22	90	94	121
Overton	19	78	81	88
St. George	17	68	76	75
Cedar City	22	88	84	86
Milford	33	133	126	153
Delta	23	92	93	103
Pioche	25	100	95	104
Caliente	26	104	115	145
Alamo	24	95	103	109
Rachel	34	135	120	133
Tonopah	32	129	128	147
Goldfield	27	110	113	129
Beatty	33	134	138	153
Indian Springs	20	85	86	90
Amargosa	21	89	94	108
Pahrump	16	68	71	71
Medlins	30	119	125	135
Sarcobatus	34	138	133	148

Garden Valley	31	125	145
Nyala	24	96	91
Twin Springs	36	145	134
Stone Cabin	31	125	118
