**NEW MEXICO**
**ENVIRONMENT DEPARTMENT**

***DOE Oversight Bureau***

BILL RICHARDSON
Governor
DIANNE DENNISH
Lieutenant Governor

604B N Canal Street
Carlsbad, NM 88220
Phone (575) 887-6851 Fax (575) 887-6862
www.nmenv.state.nm.us

RON CURRY
Secretary
SARAH COTTRELL
Deputy Secretary

**Ambient Air Monitoring at the Waste Isolation Pilot Plant**
**Conducted by NMED/DOE OB for CY 2010 Q-1**

The New Mexico Environment Department (NMED), DOE Oversight Bureau (Bureau) has compiled and assessed ambient air data collected during CY 2010 Q-1. The Bureau collected independent low-volume air samples from four stations at the WIPP site and one at the Bureau office in Carlsbad (see Map at enclosure (6)). Samples were collected using standard Bureau procedures (Sampling and Analysis Plan, Environmental Monitoring of Radioparticulates in Ambient Air, and Procedure: Environmental Monitoring of Radioparticulates in Ambient Air Using Low-Volume Air Samplers (WOS-SOP-05)). Air filters from these stations were collected bi-weekly, and they were composited at the end of the quarter. The samples were sent to an independent analytical laboratory for analysis of americium-241, cesium-137, plutonium-238, plutonium-239/240, and strontium-90. All measured values were below the requested minimum detectable concentrations (MDCs).

Data Assessment

The protocols were developed in support of DOE Order 5400.5 for Environmental Surveillance defined as "…the collection and analysis of samples of air…from DOE sites and their environs and the measurement of external radiation for purposes of demonstrating compliance with applicable standards, assessing radiation exposures of members of the public, and assessing effects, if any, on the local environment." Data results were compared to the EPA National Emission Standards for Hazardous Air Pollutants document, 40 CFR 61I Appendix E Table 2, "Concentration Levels for Environmental Compliance."

Results

Analytical results for air samples collected at LVAS 1 (WIPP Salt Shaft) are listed in Table 1. All measured values were qualified (U) as below the sample specific MDC.

Analytical results for air samples collected at LVAS 2 (Farfield) are listed in Table 2. All measured values were qualified (U) as below the sample specific MDC.

Analytical results for air samples collected at LVAS 3 (Met Tower) are listed in Table 3. All measured values were qualified (U) as below the sample specific MDC.

Analytical results for air samples collected at LVAS 5 (Carlsbad) are listed in Table 4. All measured values were qualified (U) as below the sample specific MDC except Am-241, which was qualified (LT) as above the MDC but below the requested MDC.

Analytical results for air samples collected at LVAS 7 (Met Tower Duplicate) are listed in Table 5. All measured values were qualified (U) as below the sample specific MDC.

Conclusion

Sampling these sites has been an ongoing effort by the Bureau to identify and characterize specific radioparticulates, if present, associated with WIPP operations that could impact the environment or public health. Only Am-241 exceeded the MDC at the Carlsbad station, but the result was below the requested MDC. This result was about an order of magnitude higher than in CY 2009.

Questions and or comments may be addressed to Barry S. Birch by phone at (505) 845-5933, or by e-mail at barry.birch@state.nm.us.

Enclosures:
(1) Table 1 LVAS 1 WIPP Salt Shaft
(2) Table 2 LVAS 2 Far Field
(3) Table 3 LVAS 3 Met Tower
(4) Table 4 LVAS 5 Carlsbad
(5) Table 5 LVAS 7 Met Tower Duplicate
(6) Map of LVAS Locations

Distribution:
George Basabilvazo, DOE/CBFO
Dan Ferguson, DOE/CBFO
Thomas Skibitski, Chief, DOE OB
Barry S. Birch, Program Manager, DOE OB/WOS
Julia Marple, Environmental Scientist, DOE OB/WOS

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Table 1

***LVAS 1*** *WIPP Salt Shaft* ***Data Summaries***

| | pCi/sample | | | | | nBq/m$^3$ | |
|---|---|---|---|---|---|---|---|
| Analyte | Result | ±2 s TPU | MDC | Requested MDC | Lab Flag | Result | ±2 s TPU |
| Am-241 | -0.0034 | 0.020 | 0.032 | 0.1 | U | -18 | 106 |
| Cs-137 | 0.058 | 3.0 | 5.1 | 10 | U | 307 | 15857 |
| Pu-238 | 0.0014 | 0.022 | 0.034 | 0.1 | U | 7 | 116 |
| Pu-239/240 | 0.033 | 0.031 | 0.042 | 0.1 | U | 174 | 164 |
| Sr-90 | 0.54 | 0.37 | 0.69 | 1 | U | 2854 | 1956 |
| | | | | | Total Air Volume (m³) | 7000 | |

Table 2

***LVAS 2*** *Far Field* ***Data Summaries***

| | pCi/sample | | | | | nBq/m$^3$ | |
|---|---|---|---|---|---|---|---|
| Analyte | Result | ±2 s TPU | MDC | Requested MDC | Lab Flag | Result | ±2 s TPU |
| Am 241 | 0.011 | 0.020 | 0.031 | 0.1 | U | 60 | 109 |
| Cs-137 | -0.41 | 3.2 | 5.5 | 10 | U | -2241 | 17494 |
| Pu-238 | 0.0051 | 0.022 | 0.014 | 0.1 | U | 28 | 120 |
| Pu-239/240 | 0.0020 | 0.026 | 0.059 | 0.1 | U | 11 | 142 |
| Sr-90 | 0.21 | 0.33 | 0.67 | 1 | U | 1148 | 1804 |
| | | | | | Total Air Volume (m³) | 6768 | |

Table 3

***LVAS 3** Met Tower* ***Data Summaries***

| | pCi/sample | | | | | nBq/m$^3$ | |
|---|---|---|---|---|---|---|---|
| Analyte | Result | ±2 s TPU | MDC | Requested MDC | Lab Flag | Result | ±2 s TPU |
| Am-241 | 0 | 0.020 | 0.013 | 0.1 | U | 0 | 108 |
| Cs-137 | 1.5 | 3.9 | 6.6 | 10 | U | 8106 | 21075 |
| Pu-238 | -0.0039 | 0.023 | 0.036 | 0.1 | U | -21 | 124 |
| Pu-239/240 | 0.0046 | 0.023 | 0.052 | 0.1 | U | 25 | 124 |
| Sr-90 | 0.21 | 0.34 | 0.69 | 1 | U | 1135 | 1837 |
| | | | | | Total Air Volume (m³) | 6847 | |

Table 4

***LVAS 5** Carlsbad* ***Data Summaries***

| | pCi/sample | | | | | nBq/m$^3$ | |
|---|---|---|---|---|---|---|---|
| Analyte | Result | ±2 s TPU | MDC | Requested MDC | Lab Flag | Result | ±2 s TPU |
| Am-241 | 0.038 | 0.028 | 0.013 | 0.1 | LT | 209 | 154 |
| Cs-137 | 1.1 | 3.8 | 6.4 | 10 | U | 6040 | 20867 |
| Pu-238 | 0.0015 | 0.022 | 0.034 | 0.1 | U | 8 | 121 |
| Pu-239/240 | 0.0066 | 0.022 | 0.034 | 0.1 | U | 36 | 121 |
| Sr-90 | 0.017 | 0.34 | 0.71 | 1 | U | 93 | 1867 |
| | | | | | Total Air Volume (m³) | 6738 | |

Table 5

***LVAS 7** Met Tower*
*Duplicate*

***Data Summaries***

| | pCi/sample | | | | | nBq/m$^3$ | |
|---|---|---|---|---|---|---|---|
| Analyte | Result | ±2 s TPU | MDC | Requested MDC | Lab Flag | Result | ±2 s TPU |
| Am-241 | 0.015 | 0.028 | 0.052 | 0.1 | U | 79 | 148 |
| Cs-137 | -2.8 | 3.9 | 7.1 | 10 | U | -14825 | 20650 |
| Pu-238 | -0.0044 | 0.026 | 0.041 | 0.1 | U | -23 | 138 |
| Pu-239/240 | 0.0017 | 0.026 | 0.041 | 0.1 | U | 9 | 138 |
| Sr-90 | 0.24 | 0.35 | 0.69 | 1 | U | 1271 | 1853 |
| | | | | | Total Air Volume (m³) | 6988 | |

**Abbreviations**

TPU – Total Propagated Uncertainty

MDC – Minimum Detectable Concentration

**Qualifiers/Flags**

U – Result is less than the sample specific MDC.

LT – Result is less than Requested MDC, greater than sample specific MDC.