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Subject: Soil Sampling in the Vicinity of the Waste Isolation Pilot Plant Conducted by NMED/DOE OB/WOS, 2012.

The New Mexico Environment Department (NMED) DOE Oversight Bureau (DOE OB) has compiled and assessed laboratory data for soils collected during 2012. The accompanying data report includes results for soils collected from four sites and a field duplicate in the vicinity of the Waste Isolation Pilot plant (WIPP).

These four sites from which samples were collected include Far Field, WIPP East, WIPP North, and Smith Ranch, with a field duplicate collected from WIPP North. At each location, independent samples were collected from three depths: 0-2 cm, 2- 5 cm, and 5-10 cm. Upon collection, these samples were shipped to an independent contract laboratory for analysis of Am-241, Cs-137, Pu-238, Pu-239/240, Sr-90, U-234, U-235 and U-238.

This year, there were no detections above the sample Minimum Detectable Concentration (MDC) of Am-241, Pu-238, Pu-239/240 or U-235 from any of the locations or depths from which soil was collected.

Sr-90 was detected in soils collected from the 5-10 cm depth at Far Field this year. This analyte was not detected by the DOE OB during previous sampling events, nor did the Permittees detect Sr-90 at Far Field in their sampling this year. It should be noted, however, that most Sr-90 found in soils is primarily a result of past atmospheric nuclear tests. Current Sr-90 levels in surface soil typically range from 0.01 to 1 picocurie per gram (pCi/g), with most levels between 0.05 and 0.5 pCi/g”, and DOE OB’s detection at Far Field was within this range.

This year, Cs-137 was detected above the sample MDC in samples collected from all three depths at Far Field, WIPP East at the 2-5 cm depth, and at WIPP North at the 0-2 cm and 5-10 cm depth. This analyte was not detected at Far Field during previous OB sampling projects. It was, however, previously detected at WIPP North 0-2 cm and 5-10 cm, and at WIPP East 2-5 cm. The Permittees also detected Cs-137 at all three depths at Far Field and WIPP East. The Permittees did not collect samples from WIPP North. As with Sr-90, Cs-137 is present in soils around the world largely as a result of fallout from past atmospheric weapons tests, averaging less than 0.4 pCi/g. The DOE OB’s detections of Cs-137 are below this average.

U-234 was found this year in activities exceeding the sample MDC at WIPP East at the 2-5 cm depth, Smith Ranch at all depths, and at the WIPP North 2-5 cm depth. During the DOE OB's sampling programs of 2009 and 2010, U-234 was found in samples from Smith Ranch at all depths and from WIPP East at all depths. In 2011, U-234 was also detected in samples collected from WIPP North. This year, the Permittees found this analyte at Smith ranch and WIPP East. They did not collect samples from WIPP north.

This year, the DOE OB found detections of U-238 in samples from Far Field at depths of 0-2 cm and 2-5 cm, and in the Smith Ranch samples from all depths. Similar detections were found at Far Field during the DOE OB's sampling in 2009, and at Smith Ranch in 2009 and 2010. The Permittees, this year, found detections of this analyte in their samples collected from both Far Field and Smith Ranch, and from all depths.

Uranium occurs naturally in the environmental at low concentrations. All results obtained by the DOE OB this year were within the historical range of reported results around the WIPP site prior to emplacement and within the average range of uranium found in soils world-wide.

Response

Questions and/or comments may be addressed to Thomas Kesterson, at 575-885-9023.

Enclosures: (1) Table 1 – Analytical Laboratory Results for Soils Collected Near the WIPP, 2012.

Cc: Thomas Skibitski Bureau Chief, NMED/DOE OB

Table 1 – Analytical Laboratory Results for Soils Collected Near the WIPP, 2012.

WIPP East 2012		2 s TPU (±)	Sample MDC	Lab Flag	Data Summaries		
Analyte	Result				Result	2 s TPU (±)	Sample MDC
		pCi/g		Bq/g			
Sr-90	-1.72E-03	5.10E-02	1.19E-01	U	-6.36E-05	1.89E-03	4.40E-03
Pu-239/240	-8.32E-04	1.70E-02	3.47E-02	U	-3.08E-05	6.29E-04	1.28E-03
Pu-238	8.31E-03	1.70E-02	3.47E-02	U	3.07E-04	6.29E-04	1.28E-03
Am-241	0.00E+00	1.70E-02	3.47E-02	U	0.00E+00	6.29E-04	1.28E-03
Cs-137	5.83E-02	1.70E-02	1.58E-02		2.16E-03	6.29E-04	5.85E-04
U-234	5.75E-02	6.00E-02	6.17E-02	U	2.13E-03	2.22E-03	2.28E-03
U-235	-4.43E-03	3.00E-02	7.76E-02	U	-1.64E-04	1.11E-03	2.87E-03
U-238	2.36E-02	4.20E-02	8.34E-02	U	8.73E-04	1.55E-03	3.09E-03

WIPP East 2012		2 s TPU (±)	Sample MDC	Lab Flag	Data Summaries		
Analyte	Result				Result	2 s TPU (±)	Sample MDC
		pCi/g		Bq/g			
Sr-90	-6.94E-03	5.00E-02	1.17E-01	U	-2.57E-04	1.85E-03	4.33E-03
Pu-239/240	0.00E+00	1.70E-02	3.43E-02	U	0.00E+00	6.29E-04	1.27E-03
Pu-238	0.00E+00	1.70E-02	3.43E-02	U	0.00E+00	6.29E-04	1.27E-03
Am-241	0.00E+00	1.70E-02	3.43E-02	U	0.00E+00	6.29E-04	1.27E-03
Cs-137	5.16E-02	2.40E-02	2.85E-02		1.91E-03	8.88E-04	1.05E-03
U-234	7.74E-02	6.30E-02	6.07E-02		2.86E-03	2.33E-03	2.25E-03
U-235	5.78E-03	1.70E-02	4.83E-02	U	2.14E-04	6.29E-04	1.79E-03
U-238	4.62E-03	1.70E-02	4.83E-02	U	1.71E-04	6.29E-04	1.79E-03

WIPP East 2012		2 s TPU (±)	Sample MDC	Lab Flag	Data Summaries		
Analyte	Result				Result	2 s TPU (±)	Sample MDC
		pCi/g		Bq/g			
Sr-90	8.60E-02	6.40E-02	1.17E-01	U	3.18E-03	2.37E-03	4.33E-03
Pu-239/240	6.06E-03	1.50E-02	3.30E-02	U	2.24E-04	5.55E-04	1.22E-03
Pu-238	-1.44E-03	1.50E-02	3.46E-02	U	-5.33E-05	5.55E-04	1.28E-03
Am-241	6.35E-03	1.50E-02	3.12E-02	U	2.35E-04	5.55E-04	1.15E-03
Cs-137	4.70E-02	2.80E-02	1.96E-02		1.74E-03	1.04E-03	7.25E-04
U-234	2.40E-02	3.60E-02	5.28E-02	U	8.88E-04	1.33E-03	1.95E-03
U-235	1.26E-02	2.50E-02	5.28E-02	U	4.66E-04	9.25E-04	1.95E-03
U-238	3.79E-02	4.40E-02	5.28E-02	U	1.40E-03	1.63E-03	1.95E-03

Table 1 (cont'd) – Analytical Laboratory Results for Soils Collected Near the WIPP, 2012.

<i>WIPP Farfield 2012</i>				Lab Flag	<i>Data Summaries</i>		
<i>0-2 cm</i>		2 s TPU (±)	Sample MDC		Result	2 s TPU (±)	Sample MDC
Analyte	Result				Result	2 s TPU (±)	MDC
	pCi/g				Bq/g		
Sr-90	7.31E-03	5.60E-02	1.27E-01	U	2.70E-04	2.07E-03	4.70E-03
Pu-239/240	7.15E-03	1.60E-02	3.32E-02	U	2.65E-04	5.92E-04	1.23E-03
Pu-238	0.00E+00	1.60E-02	3.32E-02	U	0.00E+00	5.92E-04	1.23E-03
Am-241	0.00E+00	1.50E-02	3.18E-02	U	0.00E+00	5.55E-04	1.18E-03
Cs-137	6.42E-02	1.80E-02	1.65E-02		2.38E-03	6.66E-04	6.11E-04
U-234	8.62E-02	7.70E-02	8.70E-02	U	3.19E-03	2.85E-03	3.22E-03
U-235	0.00E+00	3.10E-02	6.44E-02	U	0.00E+00	1.15E-03	2.38E-03
U-238	7.70E-02	7.00E-02	6.44E-02		2.85E-03	2.59E-03	2.38E-03

<i>WIPP Farfield 2012</i>				Lab Flag	<i>Data Summaries</i>		
<i>2-5 cm</i>		2 s TPU (±)	Sample MDC		Result	2 s TPU (±)	Sample MDC
Analyte	Result				Result	2 s TPU (±)	MDC
	pCi/g				Bq/g		
Sr-90	-1.07E-03	5.40E-02	1.24E-01	U	-3.96E-05	2.00E-03	4.59E-03
Pu-239/240	-7.21E-04	1.40E-02	3.01E-02	U	-2.67E-05	5.18E-04	1.11E-03
Pu-238	6.47E-03	1.50E-02	3.01E-02	U	2.39E-04	5.55E-04	1.11E-03
Am-241	-7.18E-04	1.40E-02	3.00E-02	U	-2.66E-05	5.18E-04	1.11E-03
Cs-137	4.72E-02	2.50E-02	2.85E-02		1.75E-03	9.25E-04	1.05E-03
U-234	4.00E-02	5.20E-02	7.79E-02	U	1.48E-03	1.92E-03	2.88E-03
U-235	1.33E-02	3.00E-02	6.20E-02	U	4.92E-04	1.11E-03	2.29E-03
U-238	7.26E-02	6.80E-02	6.20E-02		2.69E-03	2.52E-03	2.29E-03

<i>WIPP Farfield 2012</i>				Lab Flag	<i>Data Summaries</i>		
<i>5-10 cm</i>		2 s TPU (±)	Sample MDC		Result	2 s TPU (±)	Sample MDC
Analyte	Result				Result	2 s TPU (±)	MDC
	pCi/g				Bq/g		
Sr-90	1.13E-01	6.50E-02	1.05E-01		4.18E-03	2.41E-03	3.89E-03
Pu-239/240	1.92E-02	2.70E-02	4.01E-02	U	7.10E-04	9.99E-04	1.48E-03
Pu-238	-9.63E-04	1.90E-02	4.02E-02	U	-3.56E-05	7.03E-04	1.49E-03
Am-241	3.07E-02	3.20E-02	3.29E-02	U	1.14E-03	1.18E-03	1.22E-03
Cs-137	6.78E-02	1.90E-02	1.84E-02		2.51E-03	7.03E-04	6.81E-04
U-234	4.16E-02	5.10E-02	6.24E-02	U	1.54E-03	1.89E-03	2.31E-03
U-235	-1.16E-03	2.90E-02	5.81E-02	U	-4.29E-05	1.07E-03	2.15E-03
U-238	4.04E-02	5.10E-02	6.92E-02	U	1.49E-03	1.89E-03	2.56E-03

Table 1 (cont'd) – Analytical Laboratory Results for Soils Collected Near the WIPP, 2012.

WIPP North 2012		2 s TPU (±)	Sample MDC	Lab Flag	Data Summaries		
Analyte	Result				Result	2 s TPU (±)	Sample MDC
		pCi/g			Bq/g		
Sr-90	9.13E-02	6.70E-02	1.21E-01	U	3.38E-03	2.48E-03	4.48E-03
Pu-239/240	-8.45E-04	1.70E-02	3.53E-02	U	-3.13E-05	6.29E-04	1.31E-03
Pu-238	0.00E+00	1.70E-02	3.53E-02	U	0.00E+00	6.29E-04	1.31E-03
Am-241	8.72E-03	1.80E-02	3.64E-02	U	3.23E-04	6.66E-04	1.35E-03
Cs-137	4.84E-02	1.80E-02	1.61E-02		1.79E-03	6.66E-04	5.96E-04
U-234	2.24E-02	4.00E-02	7.92E-02	U	8.29E-04	1.48E-03	2.93E-03
U-235	0.00E+00	2.80E-02	5.86E-02	U	0.00E+00	1.04E-03	2.17E-03
U-238	2.66E-02	4.00E-02	5.86E-02	U	9.84E-04	1.48E-03	2.17E-03

WIPP North 2012		2 s TPU (±)	Sample MDC	Lab Flag	Data Summaries		
Analyte	Result				Result	2 s TPU (±)	Sample MDC
		pCi/g			Bq/g		
Sr-90	-1.97E-02	4.80E-02	1.17E-01	U	-7.29E-04	1.78E-03	4.33E-03
Pu-239/240	6.65E-03	1.50E-02	3.09E-02	U	2.46E-04	5.55E-04	1.14E-03
Pu-238	-7.40E-04	1.50E-02	3.09E-02	U	-2.74E-05	5.55E-04	1.14E-03
Am-241	6.31E-03	1.40E-02	2.93E-02	U	2.33E-04	5.18E-04	1.08E-03
Cs-137	3.59E-02	1.60E-02	1.47E-02		1.33E-03	5.92E-04	5.44E-04
U-234	8.29E-02	6.70E-02	6.50E-02		3.07E-03	2.48E-03	2.41E-03
U-235	2.35E-02	3.50E-02	5.17E-02	U	8.70E-04	1.30E-03	1.91E-03
U-238	3.59E-02	4.30E-02	5.17E-02	U	1.33E-03	1.59E-03	1.91E-03

WIPP North 2012		2 s TPU (±)	Sample MDC	Lab Flag	Data Summaries		
Analyte	Result				Result	2 s TPU (±)	Sample MDC
		pCi/g			Bq/g		
Sr-90	-6.27E-03	4.90E-02	1.16E-01	U	-2.32E-04	1.81E-03	4.29E-03
Pu-239/240	7.86E-03	1.80E-02	3.65E-02	U	2.91E-04	6.66E-04	1.35E-03
Pu-238	0.00E+00	1.80E-02	3.66E-02	U	0.00E+00	6.66E-04	1.35E-03
Am-241	7.70E-03	1.60E-02	3.22E-02	U	2.85E-04	5.92E-04	1.19E-03
Cs-137	5.44E-02	2.60E-02	2.85E-02		2.01E-03	9.62E-04	1.05E-03
U-234	5.07E-02	5.40E-02	6.39E-02	U	1.88E-03	2.00E-03	2.36E-03
U-235	1.27E-02	2.70E-02	5.00E-02	U	4.70E-04	9.99E-04	1.85E-03
U-238	1.27E-02	2.70E-02	5.00E-02	U	4.70E-04	9.99E-04	1.85E-03

Table 1 (cont'd) – Analytical Laboratory Results for Soils Collected Near the WIPP, 2012.

<i>WIPP North Dup 2012</i>				Lab Flag	<i>Data Summaries</i>		
<i>0-2 cm</i>		2 s TPU (\pm)	Sample MDC		Result	2 s TPU (\pm)	Sample MDC
Analyte	Result						
		pCi/g		Bq/g			
Sr-90	4.89E-02	6.20E-02	1.27E-01	U	1.81E-03	2.29E-03	4.70E-03
Pu-239/240	0.00E+00	1.90E-02	3.89E-02	U	0.00E+00	7.03E-04	1.44E-03
Pu-238	-9.34E-04	1.90E-02	3.89E-02	U	-3.46E-05	7.03E-04	1.44E-03
Am-241	-7.93E-04	1.60E-02	3.31E-02	U	-2.93E-05	5.92E-04	1.22E-03
Cs-137	3.55E-02	1.50E-02	2.84E-02	U	1.31E-03	5.55E-04	1.05E-03
U-234	5.47E-02	5.80E-02	6.52E-02	U	2.02E-03	2.15E-03	2.41E-03
U-235	-1.43E-03	2.90E-02	5.96E-02	U	-5.29E-05	1.07E-03	2.21E-03
U-238	2.54E-02	4.10E-02	6.98E-02	U	9.40E-04	1.52E-03	2.58E-03

<i>WIPP North Dup 2012</i>				Lab Flag	<i>Data Summaries</i>		
<i>2-5 cm</i>		2 s TPU (\pm)	Sample MDC		Result	2 s TPU (\pm)	Sample MDC
Analyte	Result						
		pCi/g		Bq/g			
Sr-90	7.55E-02	6.20E-02	1.17E-01	U	2.79E-03	2.29E-03	4.33E-03
Pu-239/240	2.23E-03	1.50E-02	4.92E-02	U	8.25E-05	5.55E-04	1.82E-03
Pu-238	0.00E+00	1.50E-02	3.12E-02	U	0.00E+00	5.55E-04	1.15E-03
Am-241	7.07E-03	1.40E-02	2.96E-02	U	2.62E-04	5.18E-04	1.10E-03
Cs-137	5.17E-02	1.70E-02	1.78E-02		1.91E-03	6.29E-04	6.59E-04
U-234	-1.69E-03	3.40E-02	7.04E-02	U	-6.25E-05	1.26E-03	2.60E-03
U-235	-1.69E-03	3.40E-02	7.04E-02	U	-6.25E-05	1.26E-03	2.60E-03
U-238	8.40E-03	3.50E-02	1.01E-01	U	3.11E-04	1.30E-03	3.74E-03

<i>WIPP North Dup 2012</i>				Lab Flag	<i>Data Summaries</i>		
<i>5-10 cm</i>		2 s TPU (\pm)	Sample MDC		Result	2 s TPU (\pm)	Sample MDC
Analyte	Result						
		pCi/g		Bq/g			
Sr-90	-1.38E-02	5.00E-02	1.19E-01	U	-5.11E-04	1.85E-03	4.40E-03
Pu-239/240	-8.43E-04	1.70E-02	3.52E-02	U	-3.12E-05	6.29E-04	1.30E-03
Pu-238	0.00E+00	1.70E-02	3.52E-02	U	0.00E+00	6.29E-04	1.30E-03
Am-241	0.00E+00	1.70E-02	3.52E-02	U	0.00E+00	6.29E-04	1.30E-03
Cs-137	4.26E-02	2.00E-02	2.10E-02		1.58E-03	7.40E-04	7.77E-04
U-234	2.84E-02	4.60E-02	8.88E-02	U	1.05E-03	1.70E-03	3.29E-03
U-235	-5.17E-03	2.60E-02	7.30E-02	U	-1.91E-04	9.62E-04	2.70E-03
U-238	5.81E-02	5.90E-02	7.75E-02	U	2.15E-03	2.18E-03	2.87E-03

Table 1 (cont'd) – Analytical Laboratory Results for Soils Collected Near the WIPP, 2012.

<i>Smith Ranch</i> <i>2012</i>		2 s TPU (\pm)	Sample MDC	Lab Flag	<i>Data Summaries</i>		
Analyte	0-2 cm Result				Result	2 s TPU (\pm)	Sample MDC
	pCi/g				Bq/g		
Sr-90	4.78E-02	1.30E-01	2.75E-01	U	1.77E-03	4.81E-03	1.02E-02
Pu-239/240	9.88E-03	2.00E-02	4.46E-02	U	3.66E-04	7.40E-04	1.65E-03
Pu-238	0.00E+00	1.40E-02	2.95E-02	U	0.00E+00	5.18E-04	1.09E-03
Am-241	0.00E+00	1.40E-02	2.85E-02	U	0.00E+00	5.18E-04	1.05E-03
Cs-137	4.78E-02	2.50E-02	4.64E-02	U	1.77E-03	9.25E-04	1.72E-03
U-234	8.03E-02	7.50E-02	6.85E-02		2.97E-03	2.78E-03	2.53E-03
U-235	-1.64E-03	3.30E-02	6.85E-02	U	-6.07E-05	1.22E-03	2.53E-03
U-238	7.86E-02	7.50E-02	7.85E-02		2.91E-03	2.78E-03	2.90E-03

<i>Smith Ranch</i> <i>2012</i>		2 s TPU (\pm)	Sample MDC	Lab Flag	<i>Data Summaries</i>		
Analyte	2-5 cm Result				Result	2 s TPU (\pm)	Sample MDC
	pCi/g				Bq/g		
Sr-90	3.98E-02	7.40E-02	1.59E-01	U	1.47E-03	2.74E-03	5.88E-03
Pu-239/240	7.33E-03	1.60E-02	3.41E-02	U	2.71E-04	5.92E-04	1.26E-03
Pu-238	8.15E-03	1.60E-02	3.41E-02	U	3.02E-04	5.92E-04	1.26E-03
Am-241	0.00E+00	1.70E-02	3.62E-02	U	0.00E+00	6.29E-04	1.34E-03
Cs-137	2.89E-02	2.00E-02	3.52E-02	U	1.07E-03	7.40E-04	1.30E-03
U-234	1.35E-01	8.70E-02	8.28E-02		5.00E-03	3.22E-03	3.06E-03
U-235	-3.62E-03	2.40E-02	6.33E-02	U	-1.34E-04	8.88E-04	2.34E-03
U-238	1.02E-01	7.50E-02	7.23E-02		3.77E-03	2.78E-03	2.68E-03

<i>Smith Ranch</i> <i>2012</i>		2 s TPU (\pm)	Sample MDC	Lab Flag	<i>Data Summaries</i>		
Analyte	5-10 cm Result				Result	2 s TPU (\pm)	Sample MDC
	pCi/g				Bq/g		
Sr-90	1.64E-02	6.90E-02	1.54E-01	U	6.07E-04	2.55E-03	5.70E-03
Pu-239/240	1.34E-02	2.00E-02	2.95E-02	U	4.96E-04	7.40E-04	1.09E-03
Pu-238	0.00E+00	1.40E-02	2.95E-02	U	0.00E+00	5.18E-04	1.09E-03
Am-241	0.00E+00	1.50E-02	3.04E-02	U	0.00E+00	5.55E-04	1.12E-03
Cs-137	2.77E-02	1.80E-02	3.34E-02	U	1.02E-03	6.66E-04	1.24E-03
U-234	1.85E-01	1.00E-01	5.57E-02		6.85E-03	3.70E-03	2.06E-03
U-235	2.53E-02	3.80E-02	5.57E-02	U	9.36E-04	1.41E-03	2.06E-03
U-238	1.84E-01	1.00E-01	6.38E-02		6.81E-03	3.70E-03	2.36E-03