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**Subject: Soil Sampling in the Vicinity of the Waste Isolation Pilot Plant Conducted by NMED/DOE
OB, 2009**

The New Mexico Environment Department (NMED) DOE Oversight Bureau has compiled and assessed laboratory data for soils collected during 2009. The accompanying data report includes results for soils collected from seven sites in the vicinity of the Waste Isolation Pilot plant.

The accompanying graphs for each analyte indicate the results in mBq/g, ± 2 TPU.

Soils were collected from 7 sites around the WIPP at three sampling depths. They were sent to ALS Labs for analysis of ^{241}Am , ^{137}Cs , ^{238}Pu , $^{239/240}\text{Pu}$, ^{90}Sr , ^{234}U , ^{235}U and ^{238}U . There were no findings of the nuclides of interest above the requested detection concentration, except for Uranium, which is a common element in soil. There were no findings of ^{235}U above the minimal detection concentration. The results for ^{234}U ran from a minimum of 3.70 mBq/g at Farfield (5-10 cm), to a maximum of 12.58 mBq/g at Mills Ranch (0-2 cm). The results for ^{238}U showed a minimum of 3.70 mBq/g at WIPP South (5-10 cm) and WIPP North (2-5 cm and 5-10 cm) and a maximum of 12.58 mBq/g at Mills Ranch (2-5 cm).

All of the Uranium results were within the historical range of reported results around the WIPP site and certainly within average range of Uranium found naturally in soils worldwide.

Response

Questions and or comments may be addressed to Thomas Kesterson by phone at (575)-887-6851, by e-mail at thomasl.kesterson@state.nm.us, or to the address in the above letterhead.

- Enclosures: 1. Graph 1 – Am-241 From Soil Collected in the Vicinity of the WIPP.
2. Graph 2 – Cs-137 From Soil Collected in the Vicinity of the WIPP.
3. Graph 3- Pu-238 From Soil Collected in the Vicinity of the WIPP.
4. Graph 4 – Pu-239/240 From Soil Collected in the Vicinity of the WIPP.
5. Graph 5 – Sr-90 From Soil Collected in the Vicinity of the WIPP.
6. Graph 6 – U-234 From Soil Collected in the Vicinity of the WIPP
7. Graph 7 – U-235 From Soil Collected in the Vicinity of the WIPP.
8. Graph 8 – U-238 From Soil Collected in the Vicinity of the WIPP.

9. Table 1 – Analytical Laboratory Results For Soils Collected in the Vicinity of the WIPP.

10. Definitions

Distribution: Tom Skibitski, Chief, DOE-OB

Table 1: Analytical Laboratory Results For Soils Collected in the Vicinity of the WIPP.

<i>Mills Ranch</i>		<i>0-2 cm</i>			<i>Data Summaries</i>		
<i>2009</i>							
Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g		
	pCi/g			Flag	Result	Uncertainty (2σ)	
Sr 90	0.0450	0.0710	0.1500	Y1, U	1.665	2.627	
Pu-239/40	0.0064	0.0090	0.0130	U	0.237	0.333	
Pu-238	-0.0009	0.0089	0.0130	U	-0.032	0.329	
Am 241	0.0036	0.0085	0.0130	U	0.133	0.315	
Cs 137	0.19	0.15	0.22	U	7.030	5.550	
U-234	0.3400	0.0900	0.0220		12.580	3.330	
U-235	0.0170	0.0180	0.0220	U	0.629	0.666	
U-238	0.3200	0.0870	0.0270		11.840	3.219	

<i>Mills Ranch</i>		<i>2-5 cm</i>			<i>Data Summaries</i>		
<i>2009</i>							
Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g		
	pCi/g			Flag	Result	Uncertainty (2σ)	
Sr 90	0.0950	0.0820	0.1700	U	3.515	3.034	
Pu-239/40	0.0250	0.0160	0.0130	LT	0.925	0.592	
Pu-238	-0.0043	0.0089	0.0210	U	-0.159	0.329	
Am 241	0.0150	0.0140	0.0210	U	0.555	0.518	
Cs 137	0.11	0.10	0.15	U	4.070	3.700	
U-234	0.32	0.084	0.021		11.840	3.108	
U-235	0.0073	0.015	0.021	U	0.270	0.555	
U-238	0.34	0.087	0.021		12.580	3.219	

<i>Mills Ranch</i>		<i>5-10 cm</i>			<i>Data Summaries</i>		
<i>2009</i>							
Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g		
	pCi/g			Flag	Result	Uncertainty (2σ)	
Sr 90	0.0370	0.0690	0.1500	U	1.369	2.553	
Pu-239/40	0.0120	0.0100	0.0054	LT	0.444	0.370	
Pu-238	0.0013	0.0074	0.0110	U	0.048	0.274	
Am 241	0.0000	0.0076	0.0055	U	0.000	0.281	
Cs 137	0.12	0.12	0.19	U	4.440	4.440	
U-234	0.27	0.075	0.023		9.990	2.775	
U-235	0.02	0.019	0.011	LT	0.740	0.703	
U-238	0.33	0.086	0.021		12.210	3.182	

Table 1: Analytical Laboratory Results For Soils Collected in the Vicinity of the WIPP.

<i>Farfield</i> 2009 Analyte	0-2 cm Result				<i>Data Summaries</i>	
		2 s TPU (\pm)	MDC	Lab	mBq/g	
	pCi/g			Flag	Result	Uncertainty (2σ)
Sr 90	0.0054	0.1000	0.2400	U	0.200	3.700
Pu-239/40	0.0200	0.0160	0.0160	LT	0.740	0.592
Pu-238	0.0021	0.0110	0.0160	U	0.078	0.407
Am 241	0.0120	0.0140	0.0200	U	0.444	0.518
Cs 137	0.05	0.09	0.16	U	1.813	3.441
U-234	0.0860	0.0410	0.0330	LT	3.182	1.517
U-235	0.0140	0.0200	0.0340	U	0.518	0.740
U-238	0.1200	0.0500	0.0330		4.440	1.850

<i>Farfield</i> 2009 Analyte	2-5 cm Result				<i>Data Summaries</i>	
		2 s TPU (\pm)	MDC	Lab	mBq/g	
	pCi/g			Flag	Result	Uncertainty (2σ)
Sr 90	0.0350	0.1000	0.2300	U	1.295	3.700
Pu-239/40	0.0100	0.0110	0.0140	U	0.370	0.407
Pu-238	-0.0014	0.0099	0.0230	U	-0.052	0.366
Am 241	0.0026	0.0096	0.0069	U	0.096	0.355
Cs 137	0.13	0.11	0.15	U	4.810	4.070
U-234	0.11	0.046	0.028		4.070	1.702
U-235	0.022	0.021	0.023	U	0.814	0.777
U-238	0.18	0.061	0.023		6.660	2.257

<i>Farfield</i> 2009 Analyte	5-10 cm Result				<i>Data Summaries</i>	
		2 s TPU (\pm)	MDC	Lab	mBq/g	
	pCi/g			Flag	Result	Uncertainty (2σ)
Sr 90	0.0530	0.1100	0.2500	U	1.961	4.070
Pu-239/40	-0.0021	0.0096	0.0230	U	-0.078	0.355
Pu-238	0.0017	0.0096	0.0140	U	0.063	0.355
Am 241	0.0016	0.0100	0.0160	U	0.059	0.370
Cs 137	0.05	0.10	0.17	U	1.702	3.700
U-234	0.1	0.043	0.023		3.700	1.591
U-235	0.0079	0.016	0.022	U	0.292	0.592
U-238	0.14	0.052	0.019		5.180	1.924

Table 1: Analytical Laboratory Results For Soils Collected in the Vicinity of the WIPP.

<i>Smith Ranch</i>		<i>2-5 cm</i>			<i>Data Summaries</i>	
<i>2009</i>						
Analyte	Result	2 s TPU (\pm)	MDC	Lab Flag	mBq/g	
	pCi/g				Result	Uncertainty (2σ)
Sr 90	0.0270	0.0780	0.1700	U	0.999	2.886
Pu-239/40	0.0065	0.0091	0.0130	U	0.241	0.337
Pu-238	0.0016	0.0090	0.0130	U	0.059	0.333
Am 241	0.0260	0.0160	0.0065	LT	0.962	0.592
Cs 137	0.11	0.12	0.09	U	4.070	4.440
U-234	0.2100	0.0640	0.0170		7.770	2.368
U-235	0.0082	0.0150	0.0110	U	0.303	0.555
U-238	0.1800	0.0590	0.0170		6.660	2.183

<i>Smith Ranch</i>		<i>2-5 cm</i>			<i>Data Summaries</i>	
<i>2009</i>						
Analyte	Result	2 s TPU (\pm)	MDC	Lab Flag	mBq/g	
	pCi/g				Result	Uncertainty (2σ)
Sr 90	0.0250	0.0710	0.1600	U	0.925	2.627
Pu-239/40	0.0022	0.0120	0.0170	U	0.081	0.444
Pu-238	-0.0006	0.0120	0.0250	U	-0.024	0.444
Am 241	0.0055	0.0100	0.0210	U	0.204	0.370
Cs 137	-0.01	0.12	0.22	U	-0.363	4.440
U-234	0.17	0.057	0.01		6.290	2.109
U-235	0.0033	0.015	0.022	U	0.122	0.555
U-238	0.18	0.06	0.022		6.660	2.220

<i>Smith Ranch</i>		<i>5-10 cm</i>			<i>Data Summaries</i>	
<i>2009</i>						
Analyte	Result	2 s TPU (\pm)	MDC	Lab Flag	mBq/g	
	pCi/g				Result	Uncertainty (2σ)
Sr 90	0.0890	0.0280	0.1700	U	3.293	1.036
Pu-239/40	0.0024	0.0120	0.0180	U	0.089	0.444
Pu-238	-0.0010	0.0120	0.0180	U	-0.037	0.444
Am 241	0.0048	0.0090	0.0064	U	0.178	0.333
Cs 137	0.04	0.09	0.17	U	1.554	3.478
U-234	0.2	0.062	0.018		7.400	2.294
U-235	0.0042	0.015	0.012	U	0.155	0.555
U-238	0.2	0.063	0.021		7.400	2.331

Table 1: Analytical Laboratory Results For Soils Collected in the Vicinity of the WIPP.

<i>WIPP East</i>		<i>0-2 cm</i>			<i>Data Summaries</i>	
2009 Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
					Result	Uncertainty (2σ)
	pCi/g			Flag		
Sr 90	0.0026	0.0920	0.2200	U	0.096	3.404
Pu-239/40	0.0140	0.0130	0.0170	U	0.518	0.481
Pu-238	0.0026	0.0097	0.0071	U	0.096	0.359
Am 241	0.0025	0.0095	0.0069	U	0.093	0.352
Cs 137	0.02	0.10	0.19	U	0.740	3.700
U-234	0.1400	0.0640	0.0450		5.180	2.368
U-235	0.0120	0.0250	0.0350	U	0.444	0.925
U-238	0.1500	0.0640	0.0160		5.550	2.368

<i>WIPP East</i>		<i>2-5 cm</i>			<i>Data Summaries</i>	
2009 Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
					Result	Uncertainty (2σ)
	pCi/g			Flag		
Sr 90	0.1600	0.1200	0.2300	U	5.920	4.440
Pu-239/40	0.0071	0.0100	0.0180	U	0.263	0.370
Pu-238	-0.0009	0.0099	0.0130	U	-0.033	0.366
Am 241	0.0032	0.0100	0.0190	U	0.118	0.370
Cs 137	0.03	0.10	0.19	U	1.036	3.700
U-234	0.16	0.056	0.031		5.920	2.072
U-235	-0.00088	0.016	0.034	U	-0.033	0.592
U-238	0.18	0.06	0.025		6.660	2.220

<i>WIPP East</i>		<i>5-10 cm</i>			<i>Data Summaries</i>	
2009 Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
					Result	Uncertainty (2σ)
	pCi/g			Flag		
Sr 90	-0.0710	0.1100	0.2800	U	-2.627	4.070
Pu-239/40	0.0062	0.0110	0.0084	U	0.229	0.407
Pu-238	0.0000	0.0110	0.0084	U	0.000	0.407
Am 241	0.0005	0.0110	0.0210	U	0.018	0.407
Cs 137	0.11	0.10	0.16	U	4.070	3.700
U-234	0.096	0.044	0.034	LT	3.552	1.628
U-235	0.0097	0.017	0.035	U	0.359	0.629
U-238	0.16	0.059	0.034		5.920	2.183

Table 1: Analytical Laboratory Results For Soils Collected in the Vicinity of the WIPP.

<i>WIPP South</i>		<i>0-2 cm</i>			<i>Data Summaries</i>	
2009 Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
	Flag	Result	Uncertainty (2σ)			
Sr 90	0.0360	0.0750	0.1600	U	1.332	2.775
Pu-239/40	-0.0026	0.0160	0.0270	U	-0.096	0.592
Pu-238	-0.0039	0.0160	0.0310	U	-0.144	0.592
Am 241	0.0004	0.0100	0.0190	U	0.016	0.370
Cs 137	0.20	0.13	0.17	LT, TI	7.400	4.810
U-234	0.1300	0.0480	0.0300		4.810	1.776
U-235	0.0054	0.0150	0.0280	U	0.200	0.555
U-238	0.1200	0.0460	0.0180		4.440	1.702

<i>WIPP South</i>		<i>2-5 cm</i>			<i>Data Summaries</i>	
2009 Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
	Flag	Result	Uncertainty (2σ)			
Sr 90	0.0500	0.0840	0.1800	U	1.850	3.108
Pu-239/40	-0.0008	0.0150	0.0320	U	-0.030	0.555
Pu-238	-0.0012	0.0150	0.0210	U	-0.044	0.555
Am 241	-0.0007	0.0099	0.0210	U	-0.026	0.366
Cs 137	0.10	0.10	0.15	U	3.515	3.626
U-234	0.16	0.054	0.028		5.920	1.998
U-235	0.0045	0.015	0.031	U	0.167	0.555
U-238	0.14	0.051	0.03		5.180	1.887

<i>WIPP South</i>		<i>5-10 cm</i>			<i>Data Summaries</i>	
2009 Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
	Flag	Result	Uncertainty (2σ)			
Sr 90	0.0760	0.0830	0.1700	U	2.812	3.071
Pu-239/40	0.0190	0.0160	0.0180	LT	0.703	0.592
Pu-238	-0.0044	0.0110	0.0240	U	-0.163	0.407
Am 241	0.0042	0.0092	0.0190	U	0.155	0.340
Cs 137	0.09	0.09	0.14	U	3.145	3.367
U-234	0.16	0.056	0.026		5.920	2.072
U-235	0.0059	0.016	0.03	U	0.218	0.592
U-238	0.1	0.043	0.019		3.700	1.591

Table 1: Analytical Laboratory Results For Soils Collected in the Vicinity of the WIPP.

<i>WIPP North</i>	<i>0-2 cm</i>				<i>Data Summaries</i>	
<i>2009</i>	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
Analyte					pCi/g	
Sr 90	0.0730	0.0820	0.1700	U	2.701	3.034
Pu-239/40	0.0082	0.0100	0.0170	U	0.303	0.370
Pu-238	0.0000	0.0092	0.0068	U	0.000	0.340
Am 241	0.0048	0.0091	0.0066	U	0.178	0.337
Cs 137	0.05	0.07	0.11	U	1.887	2.516
U-234	0.1100	0.0470	0.0350		4.070	1.739
U-235	0.0180	0.0180	0.0120	LT	0.666	0.666
U-238	0.1200	0.0480	0.0300		4.440	1.776

<i>WIPP North</i>	<i>2-5 cm</i>				<i>Data Summaries</i>	
<i>2009</i>	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
Analyte					pCi/g	
Sr 90	0.0150	0.0750	0.1700	U	0.555	2.775
Pu-239/40	0.0055	0.0099	0.0074	U	0.204	0.366
Pu-238	0.0003	0.0099	0.0190	U	0.010	0.366
Am 241	0.0013	0.0082	0.0130	U	0.048	0.303
Cs 137	0.05	0.09	0.16	U	1.702	3.441
U-234	0.15	0.055	0.023		5.550	2.035
U-235	0.017	0.019	0.023	U	0.629	0.703
U-238	0.1	0.044	0.03		3.700	1.628

<i>WIPP North</i>	<i>5-10 cm</i>				<i>Data Summaries</i>	
<i>2009</i>	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
Analyte					pCi/g	
Sr 90	-0.0320	0.0900	0.2200	U	-1.184	3.330
Pu-239/40	0.0093	0.0130	0.0180	U	0.344	0.481
Pu-238	-0.0031	0.0120	0.0250	U	-0.115	0.444
Am 241	-0.0044	0.0080	0.0200	U	-0.163	0.296
Cs 137	-0.01	0.10	0.19	U	-0.344	3.552
U-234	0.13	0.05	0.032		4.810	1.850
U-235	0.0069	0.016	0.027	U	0.255	0.592
U-238	0.1	0.043	0.026		3.700	1.591

Table 1: Analytical Laboratory Results For Soils Collected in the Vicinity of the WIPP.

<i>North East</i>		<i>0-2 cm</i>			<i>Data Summaries</i>	
2009 Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
					Result	Uncertainty (2σ)
	pCi/g			Flag		
Sr 90	-0.0110	0.1100	0.2700	U	-0.407	4.070
Pu-239/40	0.0052	0.0110	0.0230	U	0.192	0.407
Pu-238	0.0000	0.0110	0.0079	U	0.000	0.407
Am 241	0.0034	0.0110	0.0210	U	0.126	0.407
Cs 137	-0.01	0.09	0.19	U	-0.407	3.478
U-234	0.1400	0.0520	0.0280		5.180	1.924
U-235	0.0080	0.0160	0.0230	U	0.296	0.592
U-238	0.1600	0.0560	0.0230		5.920	2.072

<i>North East</i>		<i>2-5 cm</i>			<i>Data Summaries</i>	
2009 Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
					Result	Uncertainty (2σ)
	pCi/g			Flag		
Sr 90	0.0280	0.1200	0.2800	U	1.036	4.440
Pu-239/40	0.0020	0.0100	0.0150	U	0.074	0.370
Pu-238	-0.0026	0.0100	0.0200	U	-0.096	0.370
Am 241	0.0053	0.0100	0.0072	U	0.196	0.370
Cs 137	0.03	0.09	0.16	U	1.073	3.256
U-234	0.12	0.046	0.024		4.440	1.702
U-235	0	0.015	0.012	U	0.000	0.555
U-238	0.15	0.053	0.018		5.550	1.961

<i>North East</i>		<i>5-10 cm</i>			<i>Data Summaries</i>	
2009 Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
					Result	Uncertainty (2σ)
	pCi/g			Flag		
Sr 90	-0.0480	0.1400	0.3400	U	-1.776	5.180
Pu-239/40	0.0048	0.0100	0.0150	U	0.178	0.370
Pu-238	0.0000	0.0100	0.0077	U	0.000	0.370
Am 241	-0.0012	0.0110	0.0170	U	-0.044	0.407
Cs 137	0.03	0.08	0.15	U	1.073	3.108
U-234	0.17	0.057	0.022		6.290	2.109
U-235	0.012	0.016	0.022	U	0.444	0.592
U-238	0.21	0.064	0.027		7.770	2.368

Table 1: Analytical Laboratory Results For Soils Collected in the Vicinity of the WIPP.

<i>North East dup</i>	<i>0-2 cm</i>				<i>Data Summaries</i>		
	2009 Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
						Flag	Result
		pCi/g					
Sr 90	-0.0340	0.1300	0.3300	U		-1.258	4.810
Pu-239/40	0.0120	0.0120	0.0080	LT		0.444	0.444
Pu-238	0.0003	0.0110	0.0210	U		0.011	0.407
Am 241	0.0068	0.0120	0.0220	U		0.252	0.444
Cs 137	0.06	0.12	0.20	U		2.146	4.440
U-234	0.1500	0.0550	0.0240			5.550	2.035
U-235	0.0083	0.0170	0.0240	U		0.307	0.629
U-238	0.1700	0.0600	0.0200			6.290	2.220

<i>North East dup</i>	<i>2-5 cm</i>				<i>Data Summaries</i>		
	2009 Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
						Flag	Result
		pCi/g					
Sr 90	-0.0300	0.1400	0.3300	U		-1.110	5.180
Pu-239/40	0.0110	0.0120	0.0160	U		0.407	0.444
Pu-238	0.0030	0.0110	0.0080	U		0.111	0.407
Am 241	0.0050	0.0094	0.0067	U		0.185	0.348
Cs 137	0.07	0.10	0.16	U		2.738	3.589
U-234	0.13	0.05	0.032			4.810	1.850
U-235	0.017	0.021	0.035	U		0.629	0.777
U-238	0.15	0.053	0.026			5.550	1.961

<i>North East dup</i>	<i>5-10 cm</i>				<i>Data Summaries</i>		
	2009 Analyte	Result	2 s TPU (\pm)	MDC	Lab	mBq/g	
						Flag	Result
		pCi/g					
Sr 90	-0.0240	0.1100	0.2600	U		-0.888	4.070
Pu-239/40	0.0020	0.0100	0.0150	U		0.074	0.370
Pu-238	-0.0008	0.0100	0.0150	U		-0.031	0.370
Am 241	0.0094	0.0110	0.0150	U		0.348	0.407
Cs 137	0.06	0.10	0.16	U		2.072	3.515
U-234	0.15	0.051	0.021			5.550	1.887
U-235	0.011	0.015	0.02	U		0.407	0.555
U-238	0.17	0.056	0.021			6.290	2.072

Definitions

On Graphs:

MR – Mills Ranch

SR - Smith Ranch

DUP – Field Duplicate

On Table:

Qualifiers/Flags

U – Result is less than the sample specific MDC.

Y1 – Chemical yield is in control at 100-110%. Quantitative yield is assumed.

TI – Nuclide identification is tentative.

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

MDC – Minimum Detectable Concentration.

TPU – Total Propagated Uncertainty.