



Hanford Plume Assessment and Tracking Team Sampling Locations

- Contamination surveys were performed at all field sampling locations and detected no elevated readings.
- Radiation surveys were performed at all field sampling locations and detected no elevated readings.
- Air sampling was performed at all locations and detected no elevated activity above background.



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Sampling information related to Hanford Site PUREX tunnel partial collapse

Produced by the Department of Energy and Washington State Department of Health, May 2017

Results of air sampling, contamination surveys, and radiation surveys are provided below and on the following pages. Results of environmental dosimeters will be added to the map and results after they are available.

Air sampling was done to look for particles of radioactive material in the air. This was done by using a pump (air sampler) to pull air through the sample collection/filter media. The media was then screened for contamination using hand held survey meters and then sent to a laboratory for radiometric analysis.

Results of Cs-137 radioactivity in environmental air samples collected around the Hanford Site on May 9, 2017 by Washington State Department of Health

Site	Collect Date	Analyte	Result (pCi/m ³)	Error	Sample Volume (m ³)	MDC
WDOH Office	5/9/2017	Cs-137	<MDC (-0.02)	0.034	30.582	0.048
WA1-001	5/9/2017	Cs-137	<MDC (-0.005)	0.013	28.317	0.022
WA1-002	5/9/2017	Cs-137	<MDC (-0.003)	0.018	28.317	0.03
WA1-003	5/9/2017	Cs-137	<MDC (-0.007)	0.014	28.317	0.024
WA2-001	5/9/2017	Cs-137	<MDC (-0.017)	0.014	28.317	0.024
WA2-002	5/9/2017	Cs-137	<MDC (-0.09)	0.1	4.78	0.16
WA3-003	5/9/2017	Cs-137	<MDC (0.003)	0.033	28.317	0.05
WA2-004	5/9/2017	Cs-137	<MDC (0.002)	0.015	28.317	0.026

Results from air samples collected at at near field stations near PUREX

Site	Collect Date	Analyte	Result (pCi/m ³)	Error	Sample Volume (m ³)	MDC
N158	5/8/2017	Alpha	5.200E-04	2.706E-04	1068	2.800E-04
N158	5/8/2017	Beta	4.600E-03	5.187E-04	1068	5.468E-04
N158	5/11/2017	Alpha	1.800E-03	1.285E-03	214	1.509E-03
N158	5/11/2017	Beta	2.000E-02	2.607E-03	214	2.042E-03
N969	5/8/2017	Alpha	5.100E-04	3.359E-04	1042	4.760E-04
N969	5/8/2017	Beta	1.700E-02	1.017E-03	1042	3.186E-04
N969	5/11/2017	Alpha	2.800E-03	1.511E-03	231	1.766E-03
N969	5/11/2017	Beta	2.700E-02	2.736E-03	231	1.472E-03
N970	5/8/2017	Alpha	5.600E-04	2.734E-04	1068	2.800E-04
N970	5/8/2017	Beta	6.600E-03	6.816E-04	1068	5.178E-04
N970	5/11/2017	Alpha	2.300E-03	1.486E-03	208	1.962E-03
N970	5/11/2017	Beta	1.800E-02	2.495E-03	208	1.726E-03
N977	5/8/2017	Alpha	8.000E-04	3.970E-04	937	3.447E-04
N977	5/8/2017	Beta	1.400E-02	9.787E-04	937	4.664E-04
N977	5/11/2017	Alpha	1.900E-03	1.433E-03	231	2.087E-03
N977	5/11/2017	Beta	2.200E-02	2.502E-03	231	1.615E-03
N978	5/8/2017	Alpha	7.400E-04	3.532E-04	1042	3.916E-04
N978	5/8/2017	Beta	6.300E-03	6.228E-04	1042	3.263E-04
N978	5/11/2017	Alpha	1.500E-03	1.119E-03	226	1.173E-03
N978	5/11/2017	Beta	1.700E-02	2.624E-03	226	2.695E-03
N984	5/8/2017	Alpha	1.200E-03	4.698E-04	860	4.907E-04
N984	5/8/2017	Beta	5.600E-03	6.860E-04	860	5.070E-04
N984	5/11/2017	Alpha	2.100E-03	1.355E-03	203	1.714E-03
N984	5/11/2017	Beta	2.200E-02	2.571E-03	203	1.409E-03

Results from air samples collected at far field stations near PUREX (GEL data)

These results are from analysis 4 days after collection, after naturally occurring radon has decayed.

Site	Collect Date	Analyte	Result (pCi/m ³)	Error	Sample Volume (m ³)	MDC
N932	5/9/2017	Alpha	1.177E-03	6.056E-04	497	6.398E-04
N932	5/9/2017	Beta	1.276E-02	1.288E-03	497	7.384E-04
N929	5/9/2017	Alpha	9.351E-04	6.067E-04	478	5.544E-04
N929	5/9/2017	Beta	1.429E-02	1.519E-03	478	1.274E-03
N920	5/9/2017	Alpha	8.263E-04	6.586E-04	495	9.737E-04
N920	5/9/2017	Beta	1.440E-02	1.372E-03	495	7.535E-04

This table shows the observed background range for the fixed sampling locations. All results were within the typically observed range.

Site	Analyte	Minimum (pCi/m ³)	Maximum (pCi/m ³)
N158	Alpha	0.00025	0.0063
	Beta	0.0046	0.18
N969	Alpha	0.00034	0.0049
	Beta	0.0027	0.057
N970	Alpha	0.00043	0.0064
	Beta	0.005	0.07
N977	Alpha	0.00032	0.0062
	Beta	0.0046	0.061
N978	Alpha	0.00024	0.0067
	Beta	0.0041	0.057
N984	Alpha	0.00022	0.0067
	Beta	0.0049	0.12

This table shows the observed background range for the fixed sampling locations. All results were within the typically observed range.

Site	Analyte	Minimum (pCi/m ³)	Maximum (pCi/m ³)
N932	Alpha	0.000058	0.0079
	Beta	0.0061	0.088
N929	Alpha	0.00013	0.0039
	Beta	0.0061	0.091
N920	Alpha	0.00006	0.0081
	Beta	0.0055	0.084

MDC = Minimum Detectable Concentration

pCi/m³ = picocuries per cubic meter

m³ = cubic meter

Sampling information related to Hanford Site PUREX tunnel partial collapse

Produced by the Department of Energy and Washington State Department of Health, May 2017

**Results from air samples collected at far field stations near PUREX
(RadCon Count Room)**

These results are from analysis 21 hours after collection, before naturally occurring radon has decayed away.

Site	Collect Date	Analyte	Result (pCi/m ³)	Error	Sample Volume (m ³)	MDC
N932	5/9/2017	Alpha	8.640E-02	6.780E-03	506	2.380E-03
N932	5/9/2017	Beta	1.820E-01	8.500E-03	506	4.150E-03
N932	5/9/2017	Cs-137	<MDC (0.00235)	not given	506	1.590E-02
N929	5/9/2017	Alpha	5.230E-02	5.370E-03	486	2.480E-03
N929	5/9/2017	Beta	1.660E-01	8.290E-03	486	4.320E-03
N929	5/9/2017	Cs-137	<MDC (0.0124)	not given	486	1.710E-02
N920	5/9/2017	Alpha	4.150E-02	4.700E-03	504	2.390E-03
N920	5/9/2017	Beta	1.230E-01	7.020E-03	504	4.160E-03
N920	5/9/2017	Cs-137	<MDC (0.0111)	not given	504	1.530E-02

Results from air sampling by plume tracking teams

This table will be updated after additional results on americium-241 and plutonium-239/240 analytes are available.

Site	Collect Date	Analyte	Result (pCi/m ³)	Error	Sample Volume (m ³)	MDC
P1	5/9/2017	Cs-137	<MDC (0.551)	not given	11.327	7.32E-01
P2	5/9/2017	Cs-137	<MDC (-0.0582)	not given	11.327	7.09E-01
P3	5/9/2017	Cs-137	<MDC (0.234)	not given	11.327	7.53E-01
P4	5/9/2017	Cs-137	<MDC (0.169)	not given	11.327	5.83E-01
P5	5/9/2017	Cs-137	<MDC (0.00389)	not given	11.327	5.38E-01
P6	5/9/2017	Cs-137	<MDC (0.0918)	not given	11.327	6.24E-01
P7	5/9/2017	Cs-137	<MDC (1.22)	not given	11.327	4.85E+00
P8	5/9/2017	Cs-137	<MDC (-0.0519)	not given	11.327	6.24E-01
P9	5/9/2017	Cs-137	<MDC (-0.00714)	not given	11.327	6.10E-01
P10	5/9/2017	Cs-137	<MDC (0.58)	not given	11.327	7.09E-01
P11	5/9/2017	Cs-137	<MDC (-0.147)	not given	11.327	6.10E-01
P12	5/9/2017	Cs-137	<MDC (0.0445)	not given	11.327	5.97E-01
P13	5/9/2017	Cs-137	<MDC (0.0145)	not given	11.327	6.98E-01
P14	5/9/2017	Cs-137	<MDC (0.29)	not given	11.327	7.95E-01
P15	5/9/2017	Cs-137	<MDC (0.449)	not given	11.327	7.53E-01
P16	5/9/2017	Cs-137	<MDC (0.112)	not given	11.327	6.37E-01
P17	5/9/2017	Cs-137	<MDC (0.13)	not given	11.327	6.86E-01
P18	5/9/2017	Cs-137	<MDC (-0.268)	not given	11.327	5.53E-01
P19	5/9/2017	Cs-137	<MDC (0.0247)	not given	11.327	6.24E-01
P20	5/9/2017	Cs-137	<MDC (0.376)	not given	11.327	6.86E-01
P21	5/9/2017	Cs-137	<MDC (0.324)	not given	11.327	6.62E-01
P22	5/9/2017	Cs-137	<MDC (0.0973)	not given	11.327	6.24E-01

MDC = Minimum Detectable Concentration

pCi/m³ = picocuries per cubic meter

m³ = cubic meter

Sampling information related to Hanford Site PUREX tunnel partial collapse

Produced by the Department of Energy and Washington State Department of Health, May 2017

Contamination surveys were performed to look for particles of radioactive material, contamination, on a surface. Removable contamination surveys were done by wiping a surface using moderate pressure and then using a hand-held survey meter (radiation detector) to measure the wipe for radioactivity. Total contamination surveys were performed using a survey meter to directly measure a flat surface (typically the ground).

Radiation surveys were performed to look for dose/exposure rates from radioactive materials. This was done by using hand-held survey meters (ion chambers) to measure the dose rate at one meter at each of the field sampling locations.

Acceptable removable contamination levels identified in Washington Administrative Code (WAC) 246-232-140 Schedule D are 20 dpm/100 cm² transuranic (alpha) and 1000 dpm/100 cm² beta.

Acceptable total contamination levels identified in Washington Administrative Code (WAC) 246-232-140 Schedule D are 100 dpm/100 cm² transuranic (alpha) and 5000 dpm/100 cm² beta.

Team	Site	Date	Total (dpm/100 cm ²)		Removable (dpm/100 cm ²)		Exposure (μR/hr)
			Beta	Alpha	Beta	Alpha	
1	P1	5/9/2017	< DET	< DET	NA	NA	7
1	P2	5/9/2017	< DET	< DET	NA	NA	7
1	P3	5/9/2017	< DET	< DET	NA	NA	4
1	P4	5/9/2017	< DET	< DET	NA	NA	5
1	P5	5/9/2017	< DET	< DET	NA	NA	6
1	P6	5/9/2017	< DET	< DET	NA	NA	6
1	P7	5/9/2017	< DET	< DET	NA	NA	4
1	P8	5/9/2017	< DET	< DET	NA	NA	7
1	P9	5/9/2017	< DET	< DET	NA	NA	8
2	P10	5/9/2017	<5000	<500	<1000	<20	6
2	P11	5/9/2017	50	30	<1000	<20	6
2	P12	5/9/2017	160	20	<1000	10	7
2	P13	5/9/2017	230	10	<1000	<20	6
2	P14	5/9/2017	90	10	<1000	<20	7
2	P15	5/9/2017	180	30	<1000	20	7
2	P16	5/9/2017	120	40	<1000	<20	6
2	P17	5/9/2017	180	20	<1000	<20	7
2	P18	5/9/2017	290	<500	<1000	<20	6
3	P19	5/9/2017	870	20	<1000	<20	10
3	P20	5/9/2017	600	<500	<1000	<20	10
3	P21	5/9/2017	<5000	<500	<1000	<20	8
3	P22	5/9/2017	1450	10	370	<20	8

dpm = disintegrations per minute

μR/hr = microrentgen per hour

<DET = Less than detectable

cm² = square centimeter