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# **2020 Annual Terrestrial Sampling Plan for Sandia National Laboratories/New Mexico on Kirtland Air Force Base**

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## **Abstract**

The 2020 Annual Terrestrial Sampling Plan for Sandia National Laboratories/New Mexico on Kirtland Air Force Base has been prepared in accordance with the “Letter of Agreement Between Department of Energy, National Nuclear Security Administration, Sandia Field Office (DOE/NNSA/SFO) and 377th Air Base Wing (ABW), Kirtland Air Force Base (KAFB) for Terrestrial Sampling” (signed January 2017), Sandia National Laboratories, New Mexico (SNL/NM). The Letter of Agreement requires submittal of an annual terrestrial sampling plan.

**2020 Annual Terrestrial Sampling Plan for  
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Kirtland Air Force Base**

The *“Letter of Agreement Between Department of Energy, National Nuclear Security Administration, Sandia Field Office (DOE/NNSA/SFO) and 377<sup>th</sup> Air Base Wing (ABW), Kirtland Air Force Base (KAFB) for Terrestrial Sampling”* (signed January 2017), Sandia National Laboratories, New Mexico (SNL/NM) requires submittal of an annual terrestrial sampling plan by January 31 of the subject year.

This document details the 2020 collection of environmental media and deployment of dosimeters at locations on KAFB.

Sampling activities are performed throughout the year. Sampling consists of collecting appropriate volumes of soil, sediment, and vegetation as well as submitting the samples for analysis. In general, soil, sediment, and vegetation samples will be analyzed for select suite of metals, radionuclides, and tritium. High explosive analyses will be included at a limited number of sites. Any abnormalities in analytical results that could result in regulatory compliance issues will be coordinated with the 377<sup>th</sup> ABW, KAFB. In addition, coordination with the 377<sup>th</sup> ABW, KAFB will occur for the preparation of any press release. After analysis, validation, and review, the data will be published in the SNL/NM Annual Site Environmental Report (ASER). A copy of the ASER will be made available to the 377<sup>th</sup> ABW, KAFB and the public at the following website:

<http://www.sandia.gov/news/publications/environmental/index.html>

Specifics of the sampling locations, media, analytical parameters, and methods are provided in the attached tables. A map of the sampling locations is also provided. The following are included:

- Table 1 Terrestrial Sampling Location Information
- Table 2 Sampling Media and Analytical Parameters
- Table 3 Analytical Methods
- Figure 1 Terrestrial Sampling Locations on KAFB

**Table 1. Terrestrial Sampling Location Information**

Location Number	Sampling Location	Township, Range, Section	X-East (NAD 83)	Y-Northing (NAD 83)
S-1	Pennsylvania Ave	9N, 4E, 8	1551156.93	1465679.31
S-7	Unnamed Arroyo (north of TA-V)	9N, 4E, 17	1555133.55	1455506.98
S-20	TA-IV (southwest)	9N, 4E, 5	1551789.48	1467245.18
S-33	Coyote Springs	9N, 4E, 24	1574275.53	1455014.85
S-34	Lurance Canyon Burn Site	9N, 5E, 16	1593567.21	1457230.81
S-48	Tijeras Arroyo (east of TA-II)	9N, 4E, 5	1555575.75	1468811.67
S-51	TA-V (north of culvert)	9N, 4E, 17	1554602.09	1455450.10
S-55	Large Melt Facility, Building 9939	9N, 4E, 27	1563282.88	1446748.74
S-72	Arroyo del Coyote (midstream)	9N, 4E, 24	1574951.62	1455094.59
S-74N	TA-IV, Tijeras Arroyo, midstream	9N, 4E, 5	1554778.75	1467420.93
S-75	Arroyo del Coyote (downstream)	9N, 4E, 16	1555742.95	1459371.34
S-76	Thunder Range (north)	9N, 4E, 21	1558297.09	1450369.73
S-77	Thunder Range (south)	9N, 4E, 33	1560186.31	1443176.24
S-83	Tijeras Arroyo Groundwater Well	9N, 4E, 5	1554069.66	1468689.55
S-85	Arroyo del Coyote Cable Site	9N, 5E, 17	1587981.92	1456933.89
S-86	Corner of Wyoming and S Street	9N, 4E, 5	1550552.83	1468894.92
S-91	Background Arroyo Near SWMU-87	9N, 4E, 25	1577654.49	1449275.82
S-93	Thunder Range Explosive Test Area	9N, 4E, 32	1554775.09	1441102.63
S-94	Thunder Range, southeast of Range 5	9N, 4E, 33	1557329.16	1440451.75
P-4	Isleta Reservation Gate	8N, 4E, 5	1555448.68	1436450.75
P-5	McCormick Gate	9N, 4E, 31	1544925.55	1444470.49
P-16	Four Hills	9N, 4E, 3	1562799.41	1470976.79
P-19	USGS Seismic Center Gate	8N, 5E	1577549.79	1436162.97
P-39	Northwest DOE Complex	10N, 4E, 31	1547832.67	1474537.64
P-40	TA-I, northeast	10N, 4E, 32	1552607.61	1475432.05
P-58	North KAFB Housing	10N, 4E, 32	1554019.71	1476010.64
P-59	Zia Park (southeast)	10N, 4E, 31	1547530.39	1472786.53
P-63	No Sweat Boulevard	9N, 5E, 8	1588636.54	1462325.75
P-64	North Manzano Base	9N, 4E, 1	1571570.17	1469827.95
P-73	Tijeras Arroyo (upstream)	9N, 4E, 4	1557105.68	1470960.41
P-81	KAFB (west fence)	9N, 4E, 18	1544940.74	1455690.35
P-82	Commissary	10N, 4E, 30	1546847.95	1477248.01
P-95	Southwest corner of KAFB	8N, 4E, 6	1544878.82	1436313.38

See notes at end of tables.

**Table 2. Sampling Media and Analytical Parameters**

Location Number	Sampling Location	Sample Media				Analytical Parameter			
		Soil	Sed	Veg	OSD	Tritium	Gamma Spec	TS Metals	Other
S-1	Pennsylvania Ave	1			1	*	*	*	
S-7	Unnamed Arroyo (north of TA-V)				1				
S-20	TA-IV (southwest)				1				
S-33	Coyote Springs (triplicate/duplicate)	3		2		*	*	*	
S-34	Lurance Canyon Burn Site	1		1		*	*	*	
S-48	Tijeras Arroyo (east of TA-II)				1				
S-51	TA-V (north of culvert)	1		1		*	*	*	
S-55	Large Melt Facility, Building 9939	1		1		*	*	*	
S-72	Arroyo del Coyote (midstream)		1			*	*	*	
S-74N	TA-IV, Tijeras Arroyo (triplicate)		3			*	*	*	
S-75	Arroyo del Coyote (downstream)		1			*	*	*	
S-76	Thunder Range (north)	1				*	*		
S-77	Thunder Range (south)	1				*	*		
S-83	Tijeras Arroyo Groundwater Well		1			*	*	*	
S-85	Arroyo del Coyote Cable Site		1			*	*	*	
S-86	Corner of Wyoming and S Street	1		1		*	*		
S-91	Background Arroyo Near SWMU-87		1			*	*	*	
S-93	Thunder Range Explosive Test Area	1							HE
S-94	Thunder Range, southeast of Range 5	1							HE
P-4	Isleta Reservation Gate	1		1	1	*	*	*	
P-5	McCormick Gate	1		1	1	*	*	*	
P-16	Four Hills	1		1	1	*	*	*	
P-19	USGS Seismic Center Gate	1			1	*	*	*	
P-39	Northwest DOE Complex				1				
P-40	TA-I, northeast				1				
P-58	North KAFB Housing	1		1		*	*	*	
P-59	Zia Park (southeast)	1				*	*		
P-63	No Sweat Boulevard	1				*	*	*	
P-64	North Manzano Base (triplicate)	3				*	*	*	
P-73	Tijeras Arroyo (upstream)		1			*	*	*	
P-81	KAFB (west fence)	1			1	*	*	*	
P-82	Commissary	1		1		*	*	*	
P-95	Southwest corner KAFB	1				*	*	*	

See notes at end of tables.

**Table 3. Analytical Methods**

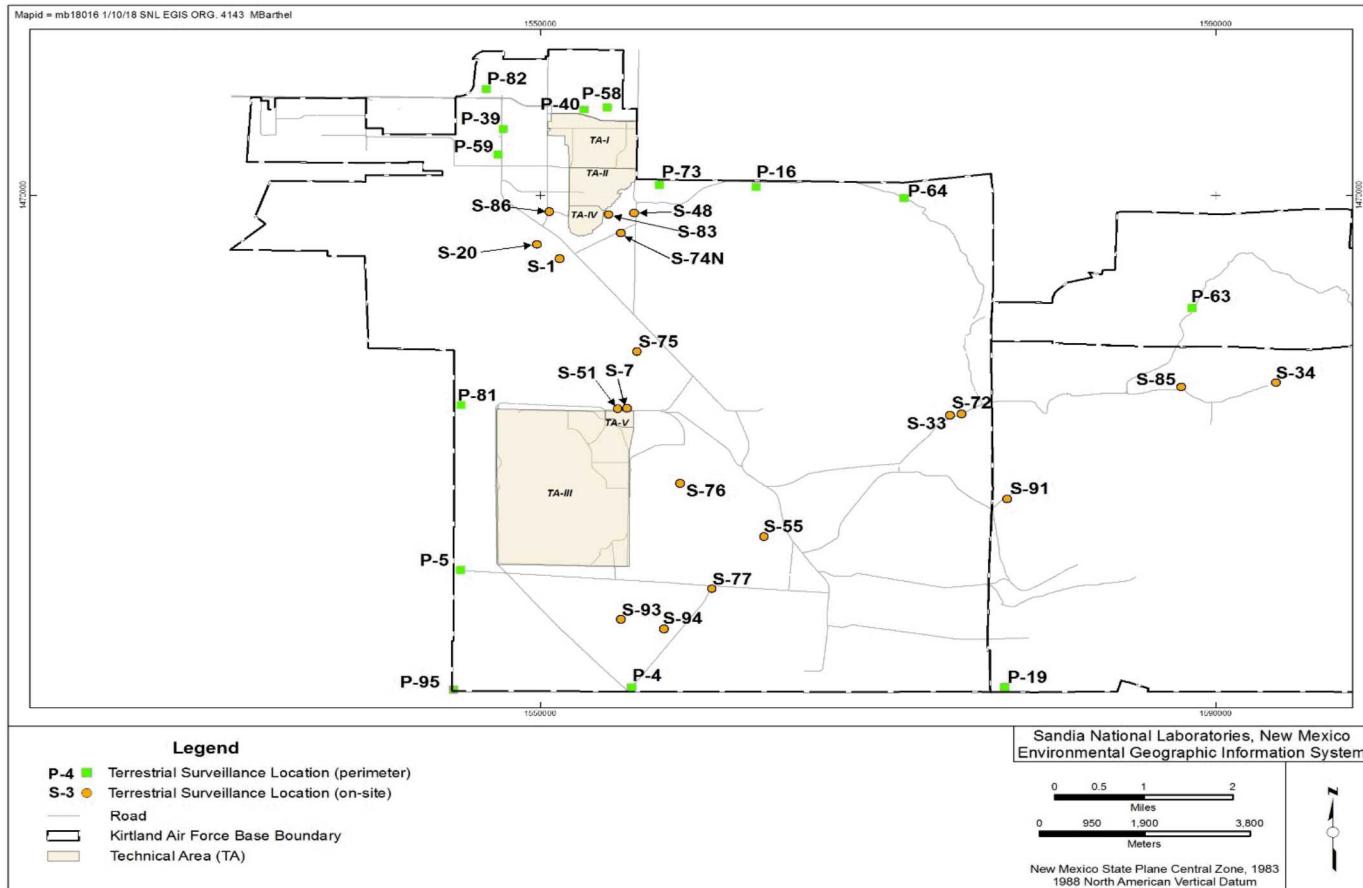
Analyte	Analytical method	Matrix	Notes
Total Analyte List (TAL) Metals + Total Uranium (minus mercury)	SW846-6010/6020 <sup>a</sup> , or equivalent	Soil, sediment, vegetation	Reporting the following: Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Magnesium, Nickel, Selenium, Silver, Thallium, Zinc
Gamma Spectroscopy (short list)	HASL-300 Ga-01-R <sup>b</sup> , or equivalent	Soil, sediment, vegetation	
Tritium	EPA 906.0 <sup>c</sup> , or equivalent	Soil, sediment, vegetation	
High Explosives	SW846 8330A <sup>a</sup> , or equivalent	Soil	

**NOTES:** <sup>a</sup>EPA 1986 (and updates), Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd ed., Rev. 1, U.S. Environmental Protection Agency, Washington, D.C.

<sup>b</sup>DOE 1997, Environmental Measurements Laboratory, 4.5.2 *Radiochemistry*, EML Procedures Manual, 28th ed., Vol. 1, HASL-300, Rev. 0, 1997.

<sup>c</sup>EPA, EMSL. 1980. "Method 906.0: Tritium in Drinking Water." *Prescribed Procedures for Measurement of Radioactivity in Drinking Water*, EPA/600/4/80/032.

Ave	= Avenue
C-	= Community (off-site) sample location with number
DOE	= U.S. Department of Energy
E	= East
EPA	= Environmental Protection Agency
Gamma Spec	= Gamma spectroscopy
HASL	= Health and Safety Laboratory
HE	= High Explosive
KAFB	= Kirtland Air Force Base
N	= North
OSD	= Optically stimulated dosimeter
P-	= Perimeter sample location with number
S-	= On-site sample location with number
Sed	= Sediment
SWMU	= Solid Waste Management Unit
TA	= Technical Area
TAL	= Total Analyte List (which includes Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Selenium, Silver, Zinc)
TS Metals	= Terrestrial Surveillance Metals (includes Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Magnesium, Nickel, Selenium, Silver, Thallium, Zinc, Uranium [total])
USGS	= United States Geological Society
Veg	= Vegetation



**Figure 1.** Terrestrial Sampling Locations on KAFB Property

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