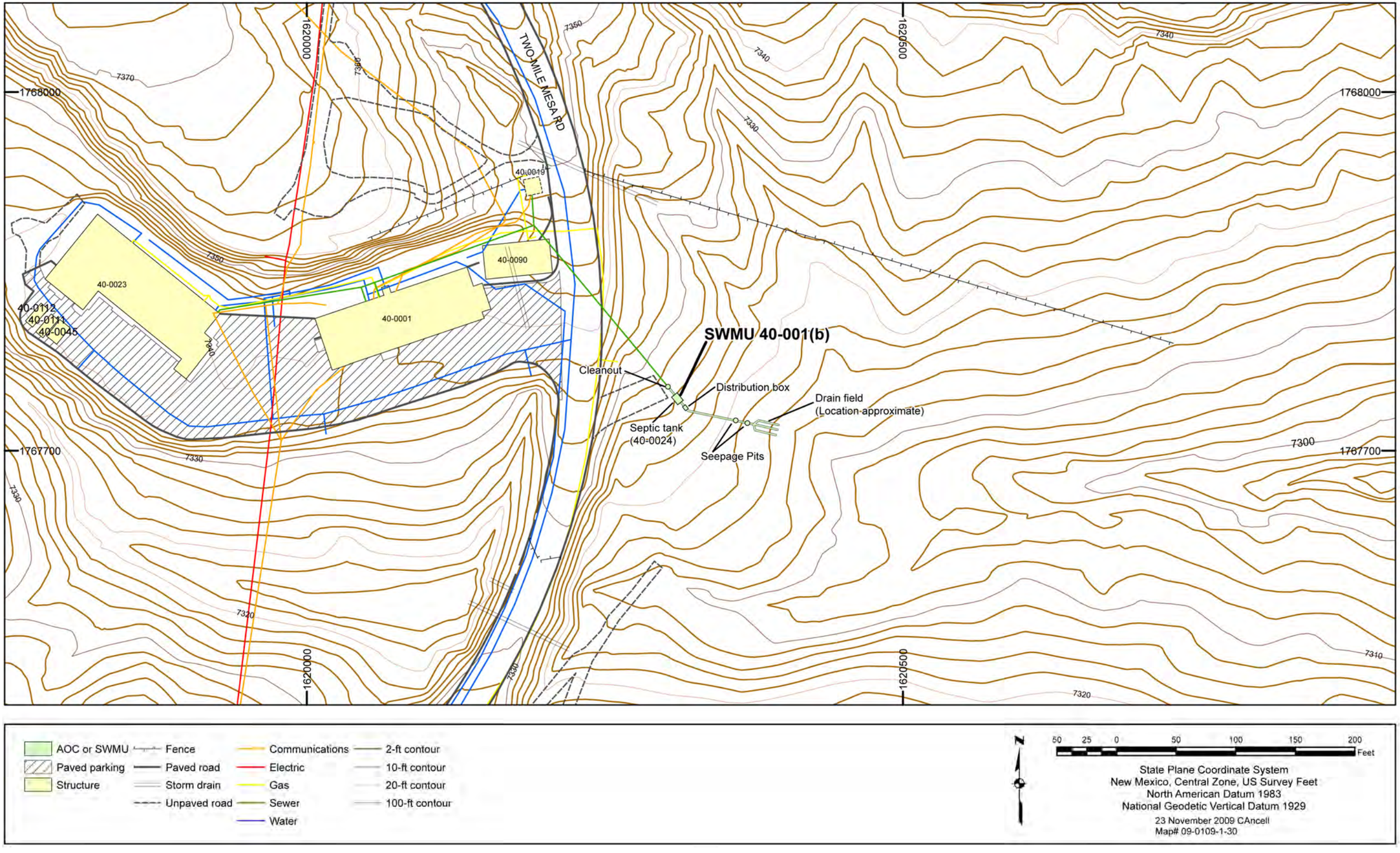


Figure 4.5-1 Site features for SWMU 40-001(b)

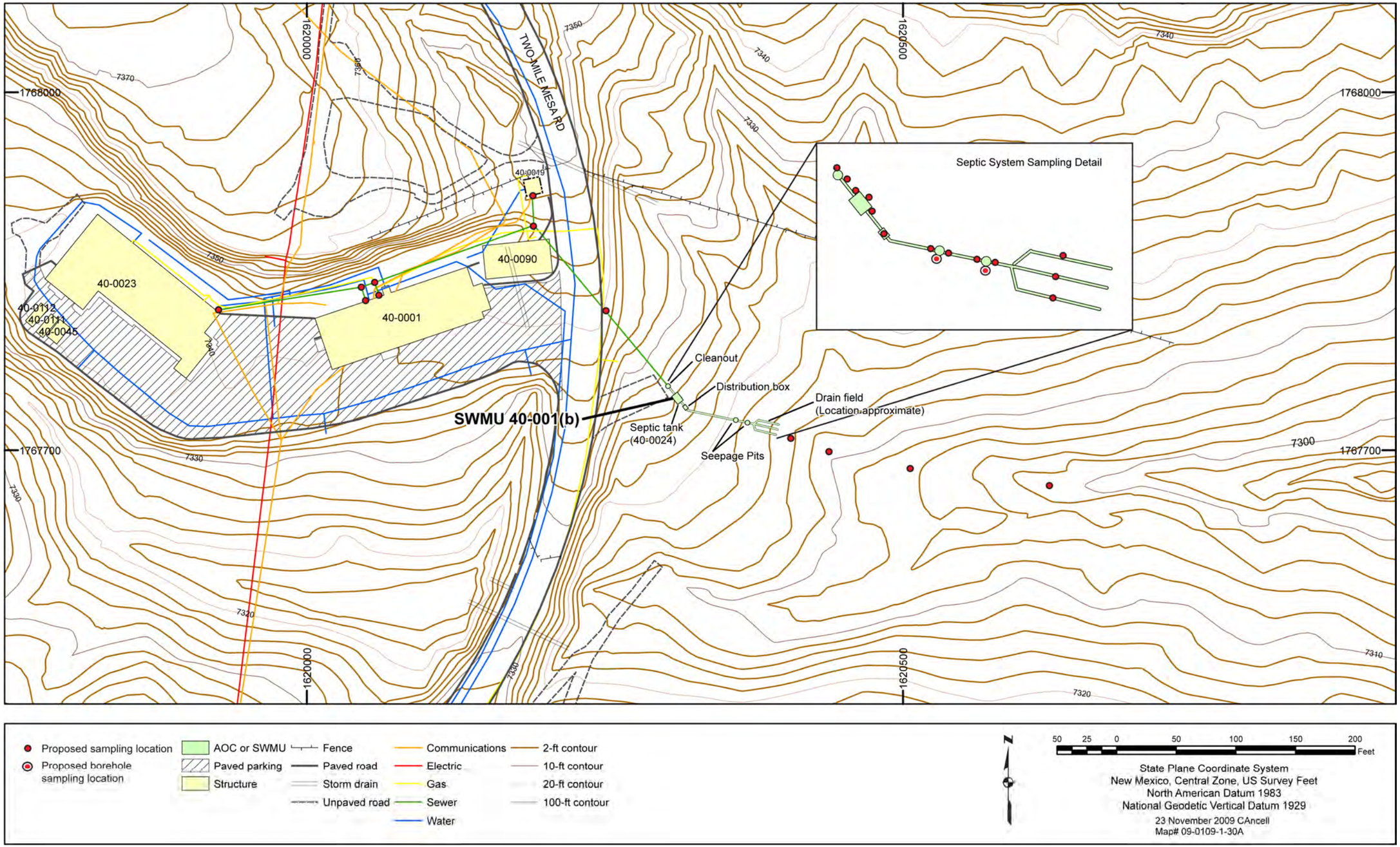


Figure 4.5-2 Proposed sampling locations at SWMU 40-001(b)

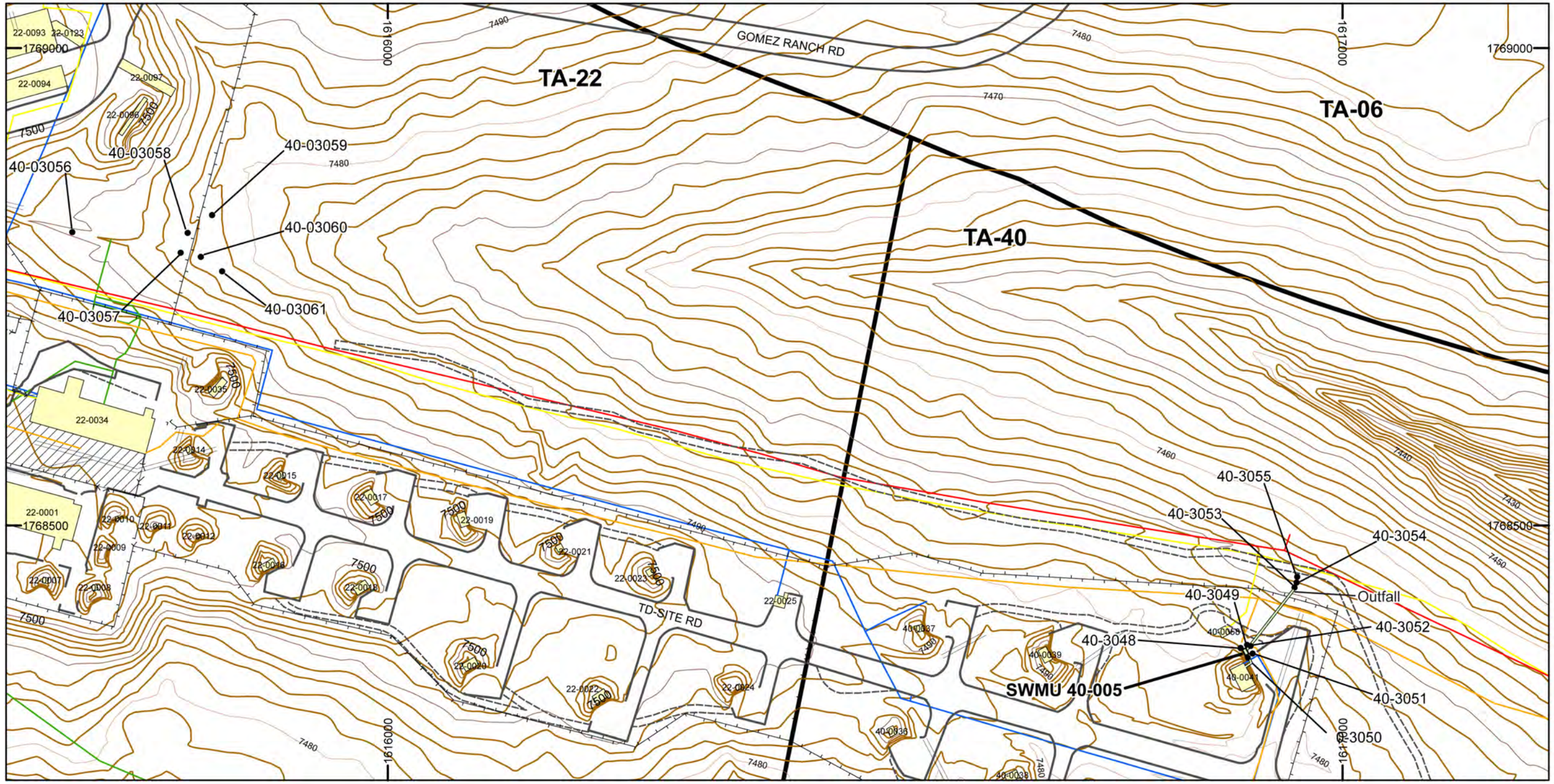


Figure 4.5-3 Site features and historical sampling locations for SWMU 40-005

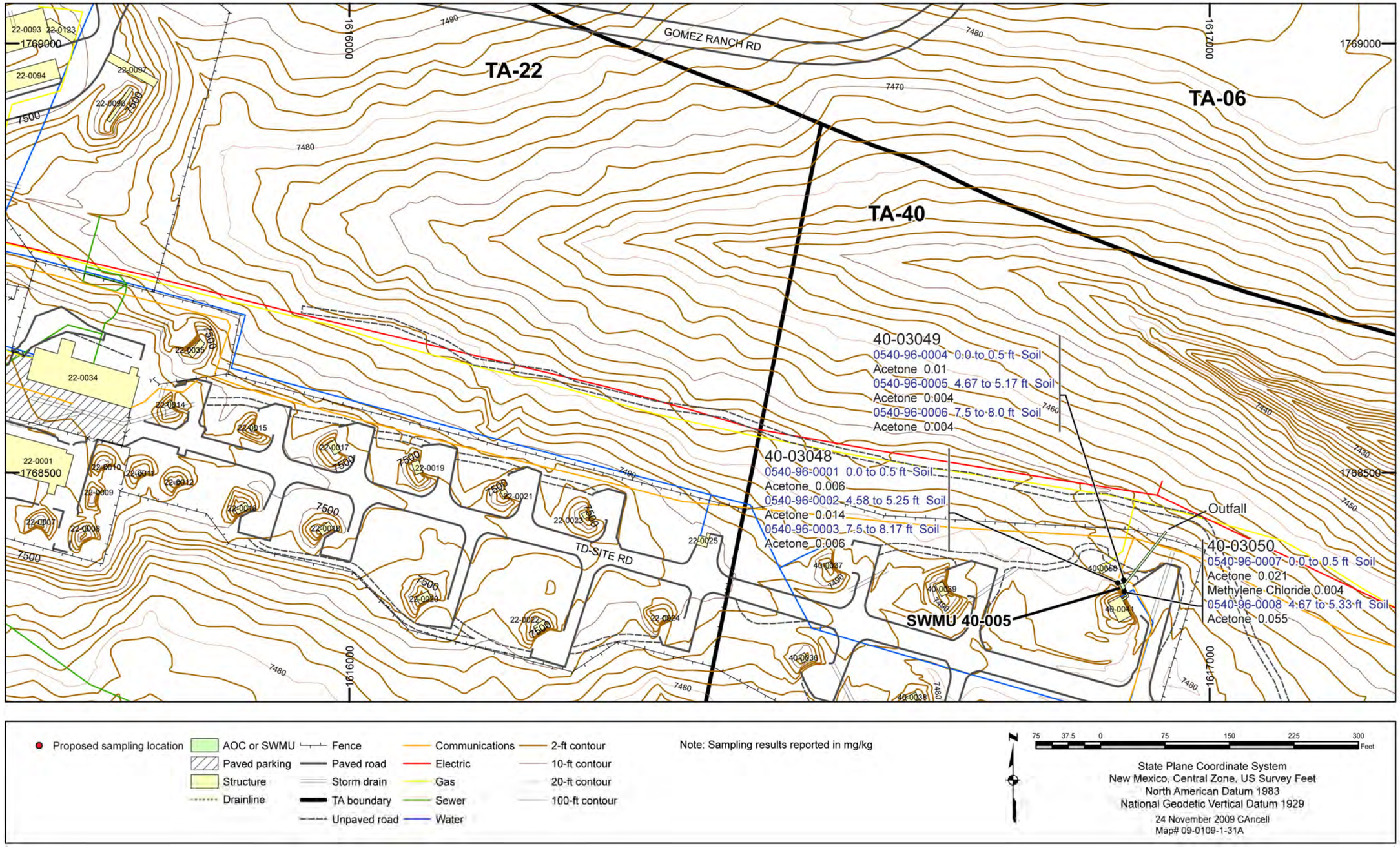


Figure 4.5-4 Organic chemicals detected at SWMU 40-005

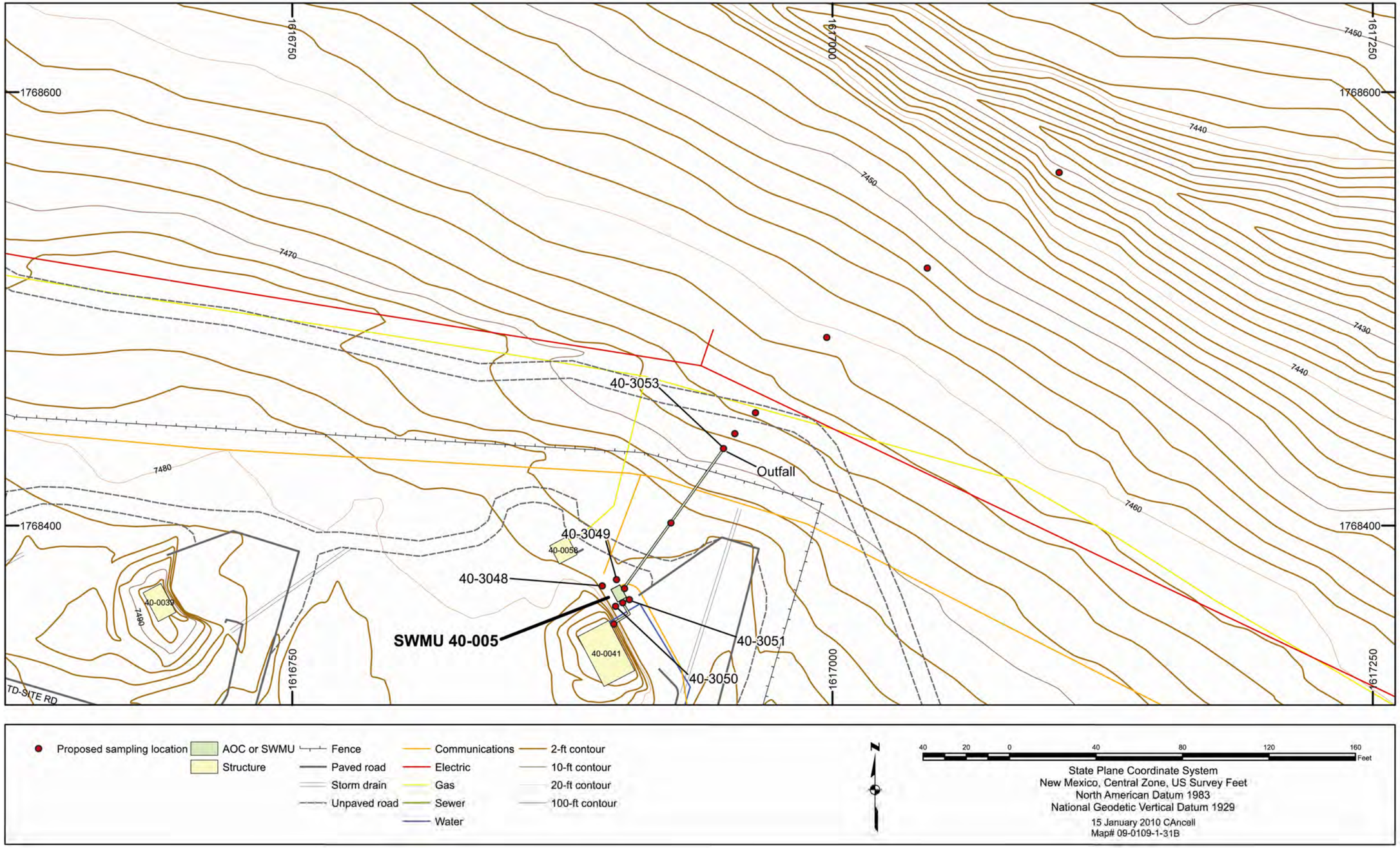


Figure 4.5-5 Proposed sampling locations at SWMU 40-005

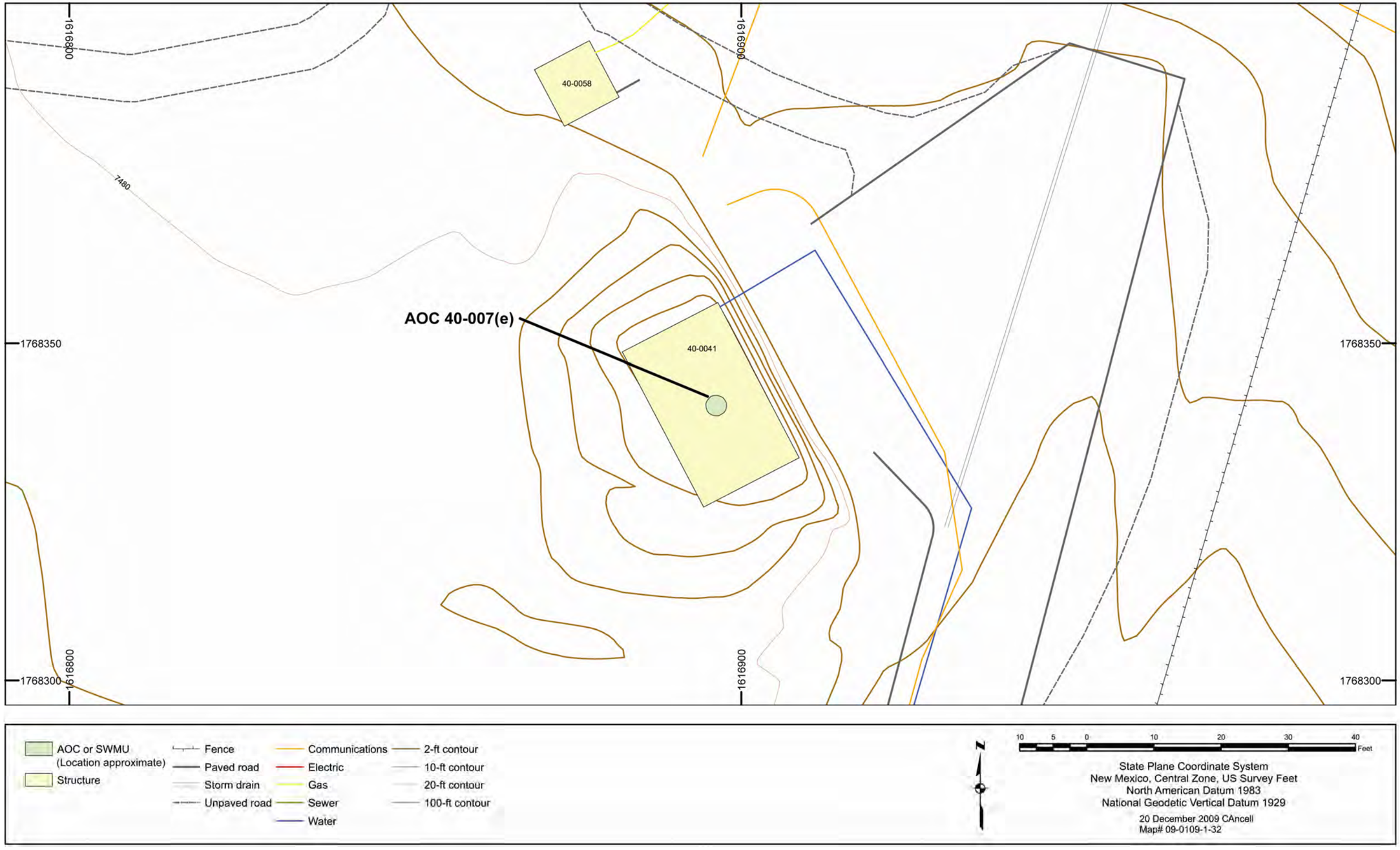


Figure 4.5-6 Site features for AOC 40-007(e)

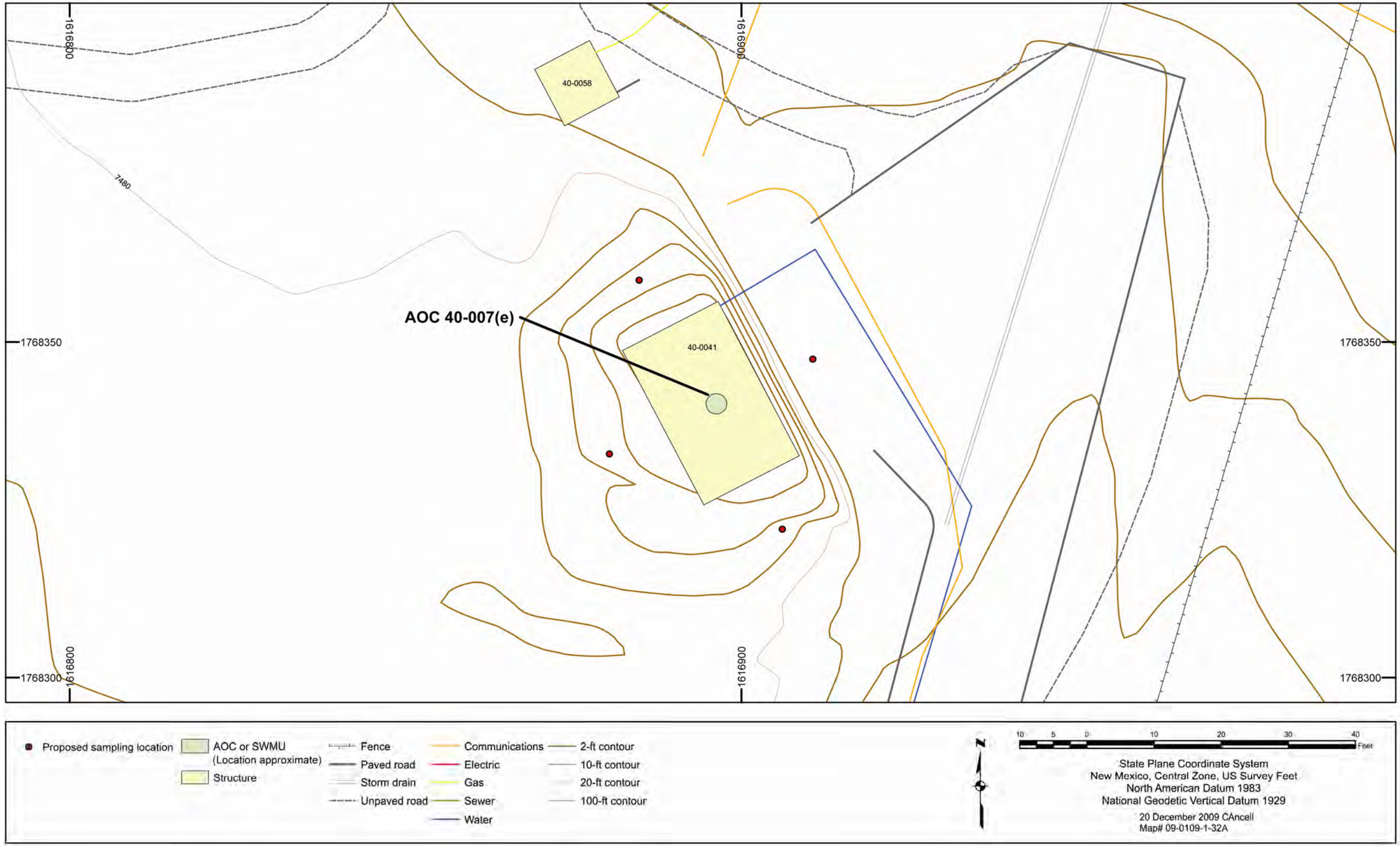


Figure 4.5-7 Proposed sampling locations at AOC 40-007(e)

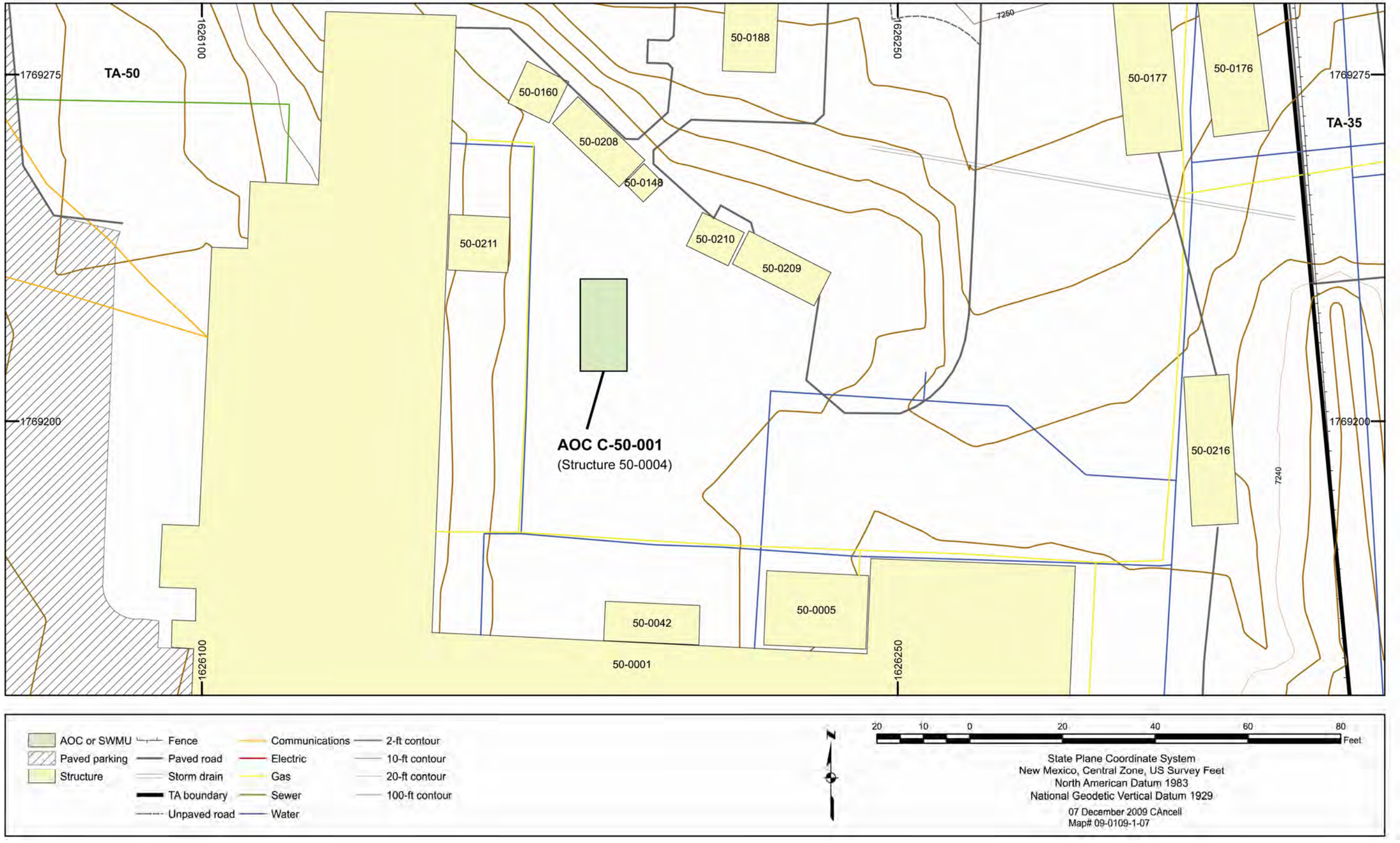


Figure 4.6-1 Site features for AOC C-50-001

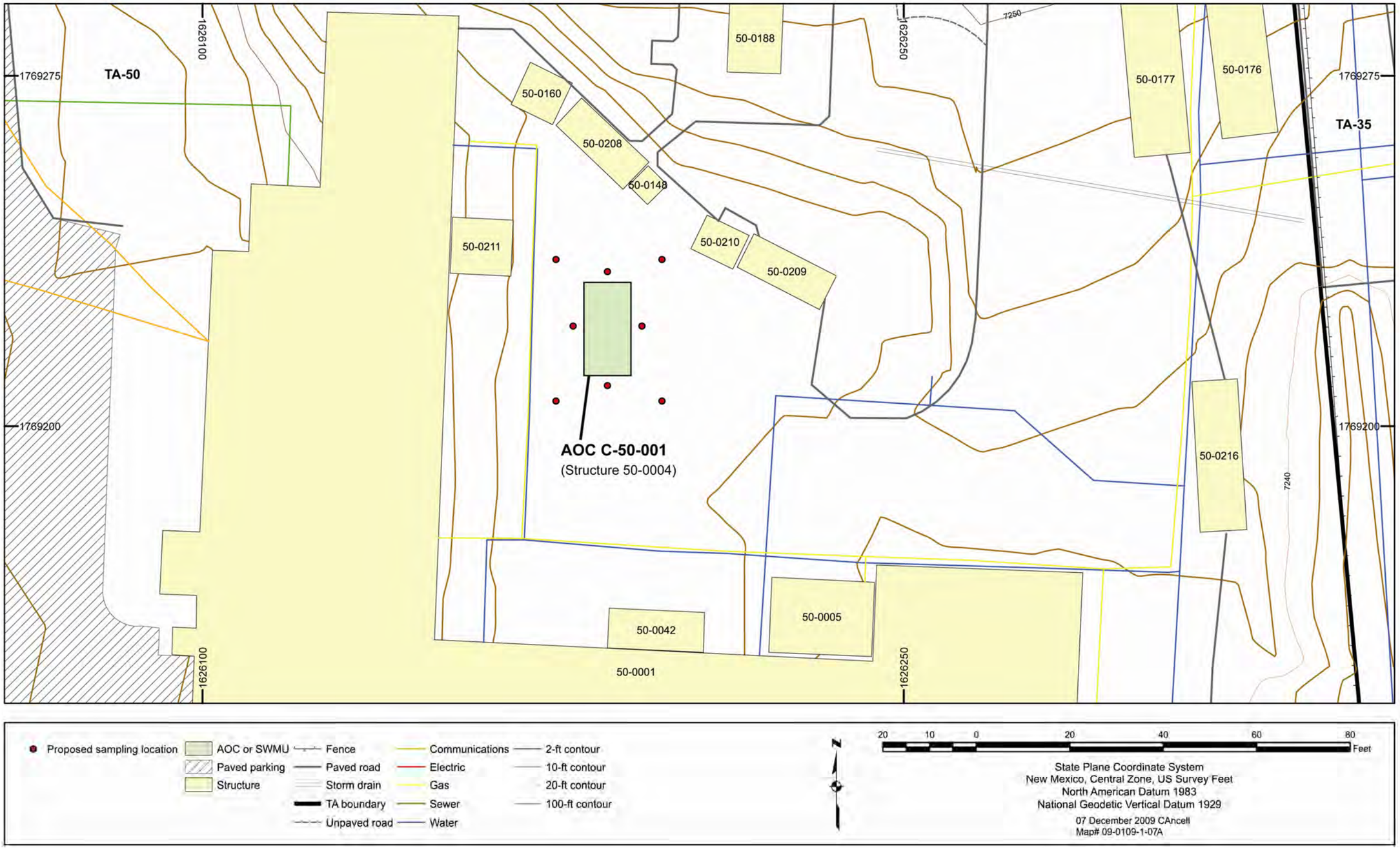


Figure 4.6-2 Proposed sampling locations at AOC C-50-001

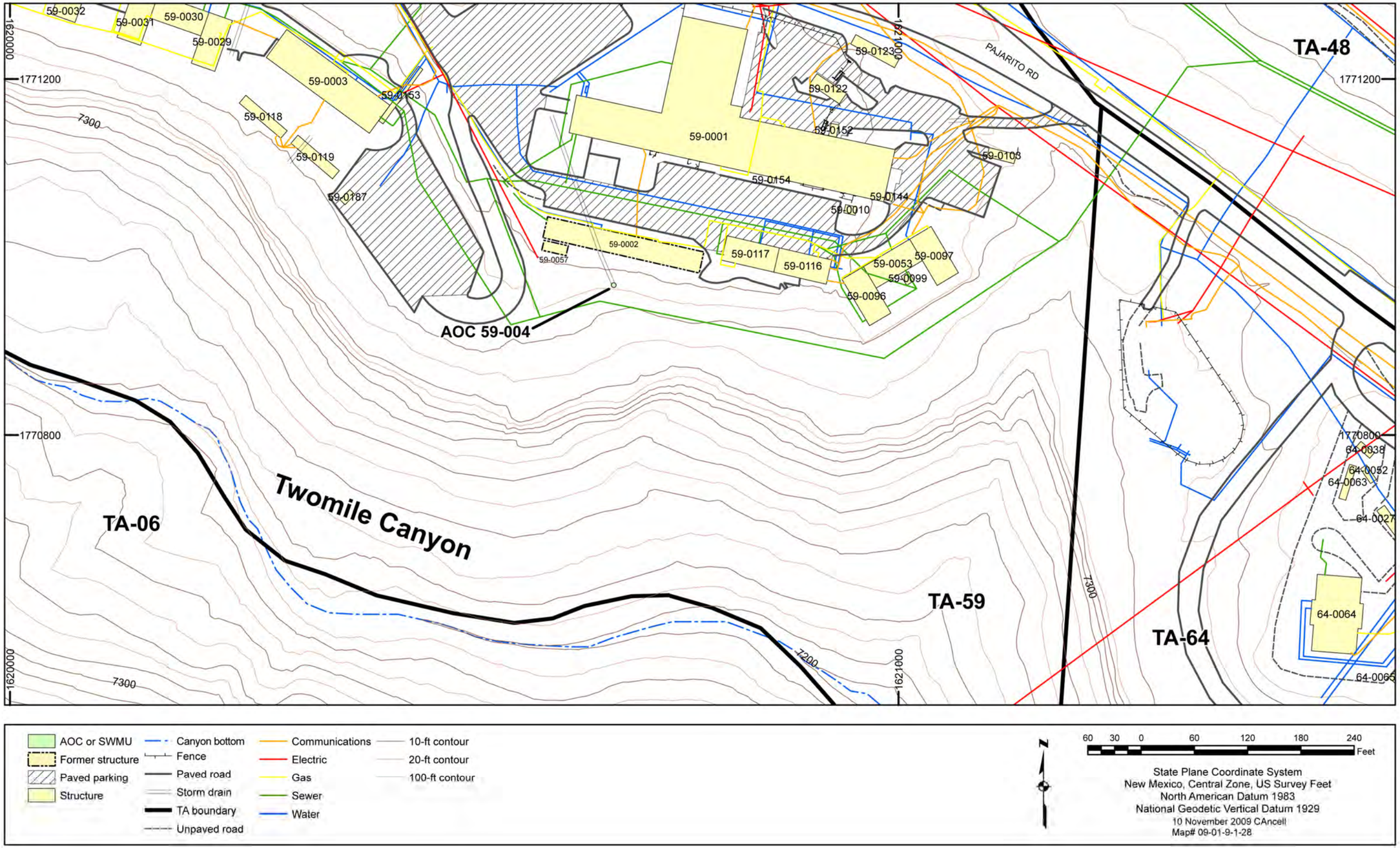


Figure 4.7-1 Site features for AOC 59-004

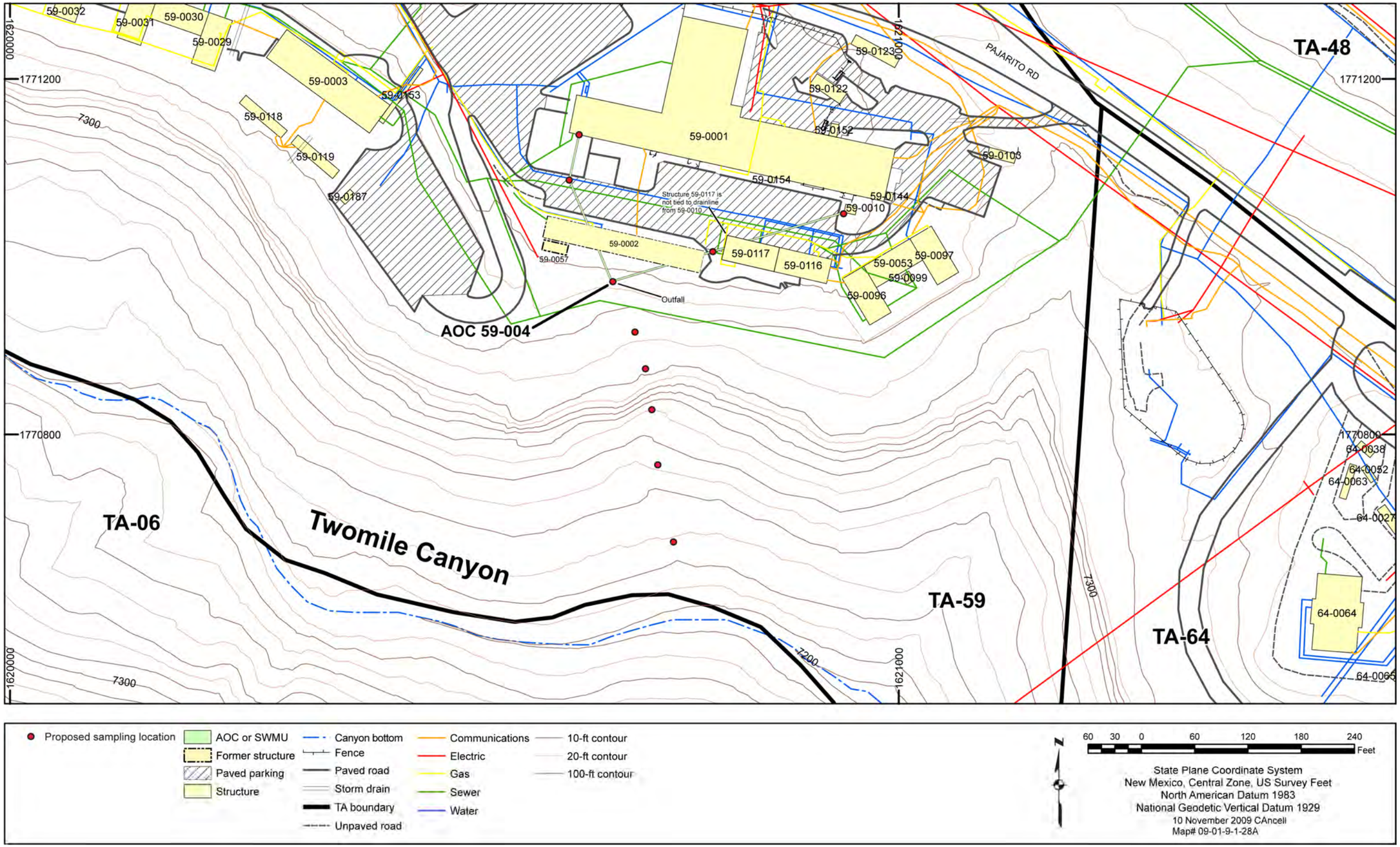


Figure 4.7-2 Proposed sampling locations at AOC 59-004

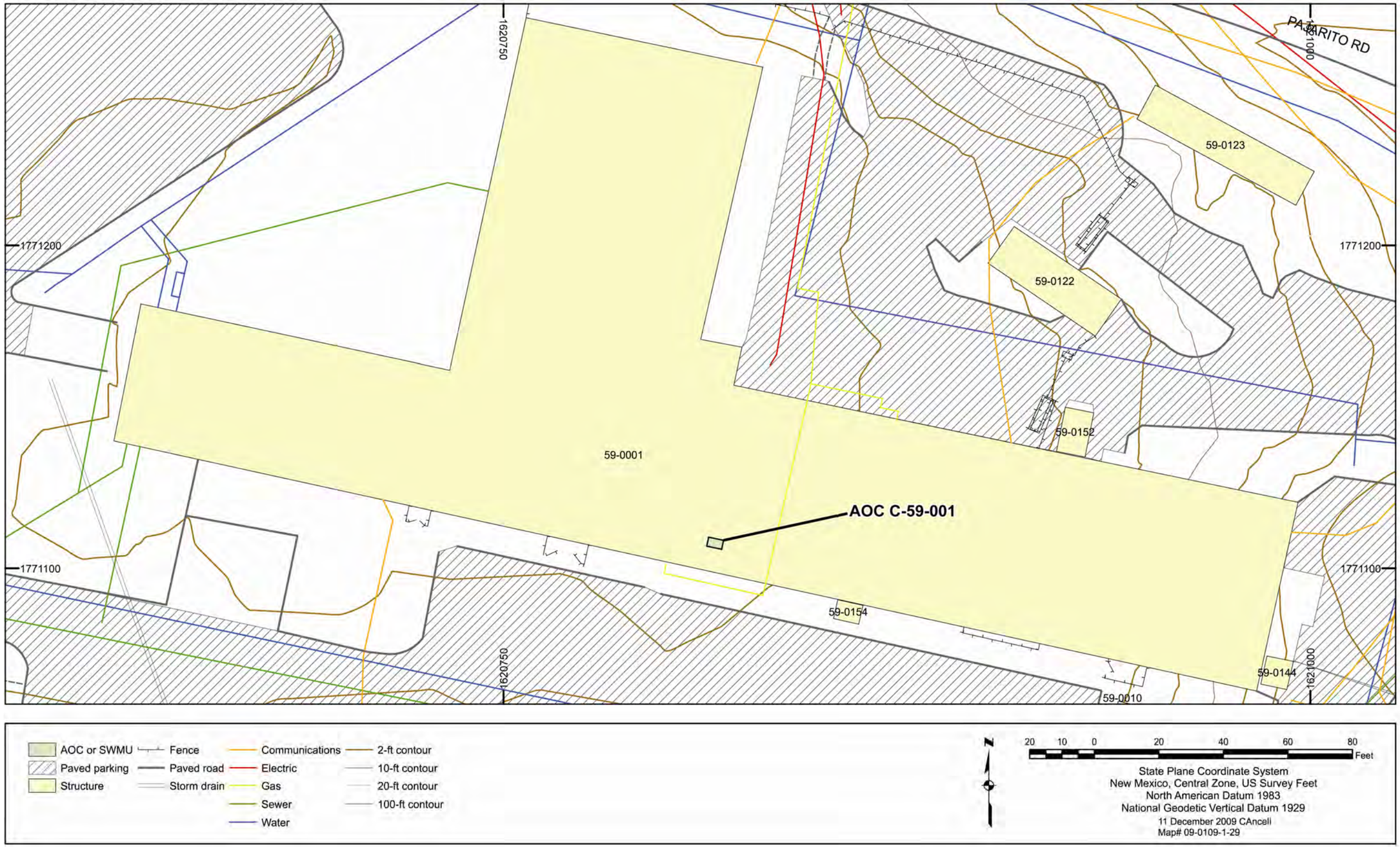


Figure 4.7-3 Site features for AOC C-59-001

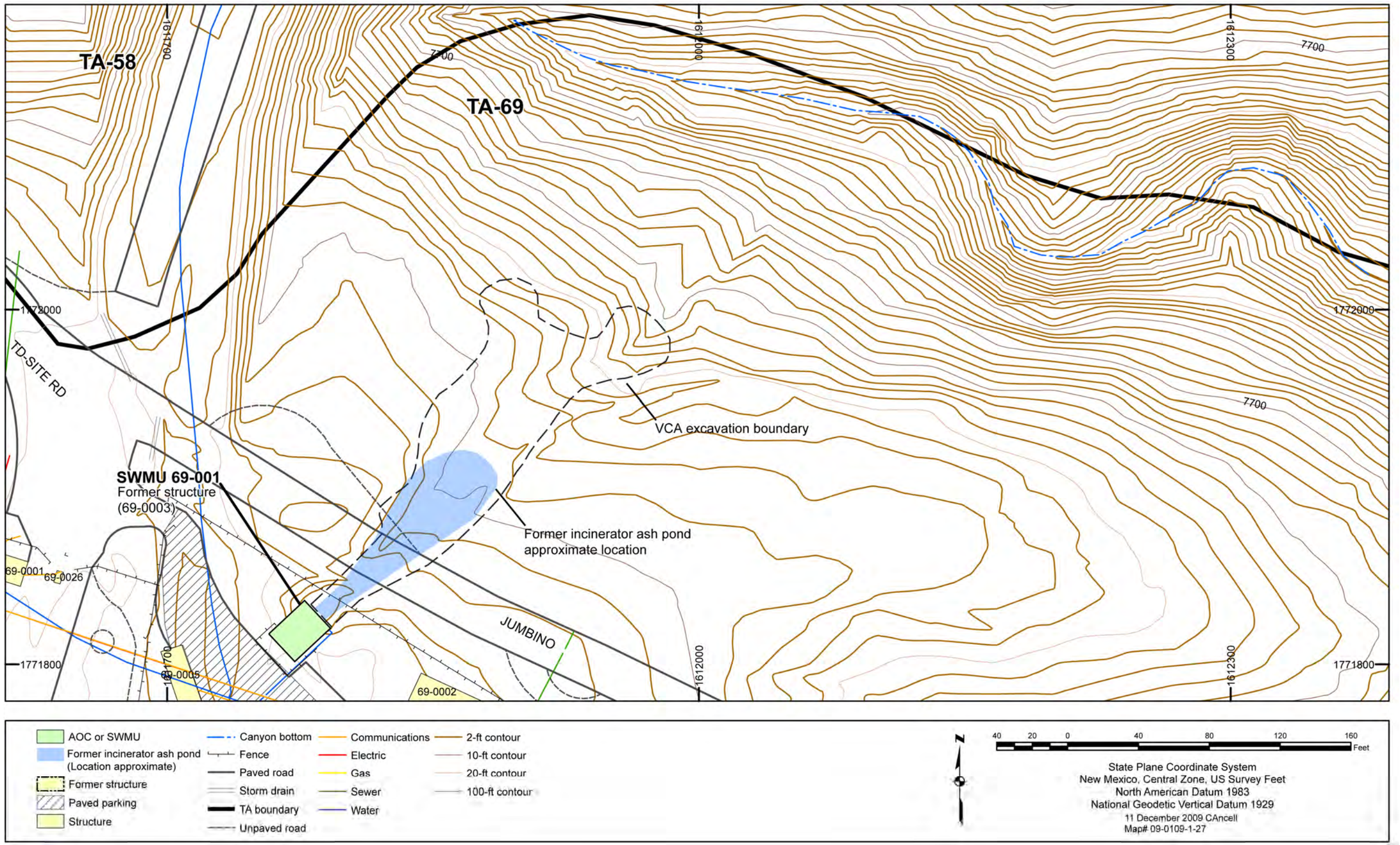


Figure 4.8-1 Site features for SWMU 69-001

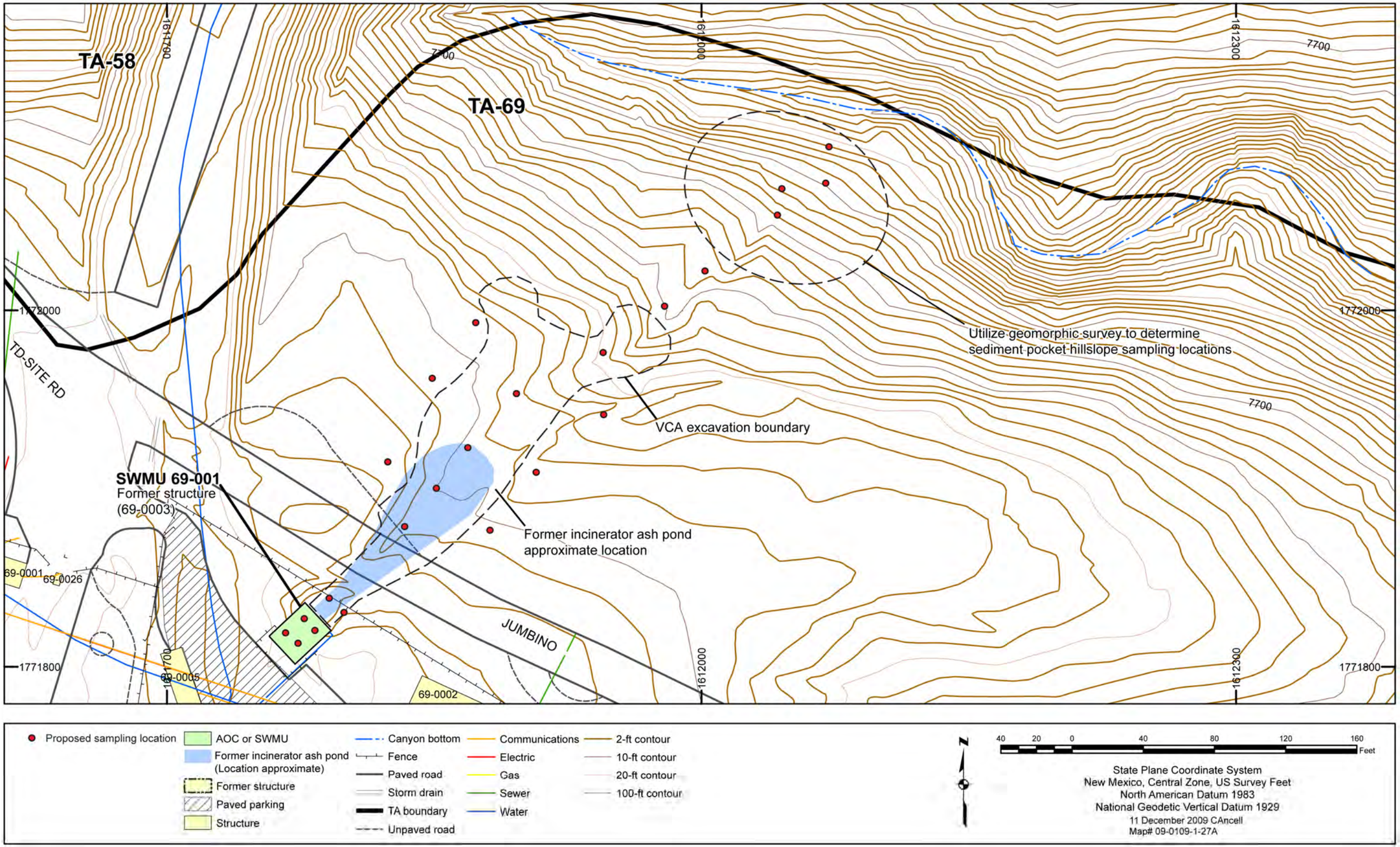


Figure 4.8-2 Proposed sampling locations at SWMU 69-001

Table 1.1-1
Status of SWMUs and AOCs in Twomile Canyon Aggregate Area

Consolidated Unit	Site ID	Brief Description	Site Status	IWP Reference
TA-03				
	SWMU 03-001(a)	Less-than-90-day storage	Removed from the Module VIII of the Laboratory's Hazardous Waste Facility Permit (HWFP), 12/23/98	NMED 1998, 063042
	SWMU 03-001(b)	SAA	Removed from the Module VIII of the Laboratory's HWFP, 12/23/98	NMED 1998, 063042
	SWMU 03-001(c)	Less-than-90-day storage	Removed from the Module VIII of the Laboratory's HWFP, 12/23/98	NMED 1998, 063042
	AOC 03-001(e)	Former storage area	Under Investigation	Section 4.1.1
	AOC 03-001(g)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464
	SWMU 03-001(k)	Former storage area	Under Investigation	Section 4.1.2
	AOC 03-001(l)	Less-than-90-day storage	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-001(s)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-001(t)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-001(u)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-001(w)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464
	SWMU 03-002(d)	Former storage area	Removed from the Module VIII of the Laboratory's HWFP, 05/02/01	NMED 2001, 070010
	SWMU 03-003(a)	Former storage area	Under Investigation	Section 4.1.3
	SWMU 03-003(b)	Former storage area	Under Investigation	Section 4.1.4
	AOC 03-003(h)	Transformers	Under Investigation	Section 4.1.5
	AOC 03-003(j)	Transformers	Under Investigation	Section 4.1.6
	AOC 03-003(k)	Area of potential soil contamination	Under Investigation	Section 4.1.7
	AOC 03-003(l)	Transformers	Under Investigation	Section 4.1.8
	AOC 03-003(p)	Former Storage Area	Under Investigation	Section 4.1.9
	SWMU 03-009(d)	Surface Disposal Site	Removed from Module VIII of the Laboratory's HWFP, 4/22/07	NMED 2007, 095495
	SWMU 03-009(f)	Surface disposal site	Removed from the Module VIII of the Laboratory's HWFP, 12/23/98	NMED 1998, 063042
	SWMU 03-009(g)	Soil fill area	Removed from the Module VIII of the Laboratory's HWFP, 05/02/01	NMED 2001, 070010
	SWMU 03-010(a)	Surface disposal area/drainage	Under Investigation	Section 4.1.1

Table 1.1-1 (continued)

Consolidated Unit	Site ID	Brief Description	Site Status	IWP Reference
	SWMU 03-011	Operational release	NFA Approved, 01/23/08	NMED 2008, 100116
	AOC 03-013(g)	Operational release	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-013(h)	Operational release	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-014(a2)	Floor drains associated with former WWTP	Under Investigation	Section 4.1.10
	SWMU 03-014(t)	Lift station associated with former WWTP	Under Investigation	Section 4.1.11
	AOC 03-014(z)	Former floor drain associated with former WWTP	Under Investigation	Section 4.1.12
	AOC 03-016(a)	Septic system	NFA Approved, 01/21/05	EPA 2005, 088464
	SWMU 03-018	Septic system	Removed from the Module VIII of the Laboratory's HWFP, 12/23/98	NMED 1998, 063042
	SWMU 03-019	Septic system	Removed from the Module VIII of the Laboratory's HWFP, 05/02/01	NMED 2001, 070010
	AOC 03-022	Former containment sump	Under Investigation	Section 4.1.13
	SWMU 03-025(b)	Oil/water separators	Under Investigation	Section 4.1.14
	AOC 03-025(c)	Oil/water separators	Under Investigation	Section 4.1.15
	SWMU 03-026(d)	Sump/lift station	Under Investigation	Section 4.1.16
	SWMU 03-033	Former liquid waste collection system	Under Investigation	Section 4.1.17
	AOC 03-038(e)	Waste lines	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-038(f)	Drainline	Under Investigation	Section 4.1.18
	AOC 03-039(c)	Silver recovery unit	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-040(a)	Storage area	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-042	Former containment area	Under Investigation	Section 4.1.3
	SWMU 03-043(c)	Area of potential soil contamination from former manhole	Under Investigation	Section 4.1.19
	AOC 03-043(i)	Aboveground tank	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-044(b)	Container storage	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-047(j)	Drum storage	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-047(k)	Drum storage	NFA Approved, 01/21/05	EPA 2005, 088464
03-050(a)-00	SWMU 03-050(a)	Area of potential soil contamination from stack emissions	Under Investigation	Section 4.1.20.1
	SWMU 03-050(d)	Area of potential soil contamination from stack emissions	Under Investigation	Section 4.1.20.2

Table 1.1-1 (continued)

Consolidated Unit	Site ID	Brief Description	Site Status	IWP Reference
03-050(a)-00 (cont.)	SWMU 03-050(f)	Area of potential soil contamination from stack emissions	Under Investigation	Section 4.1.20.3
	SWMU 03-050(g)	Area of potential soil contamination from stack emissions	Under Investigation	Section 4.1.20.4
	SWMU 03-050(e)	Filter unit (inactive)	Removed from the Module VIII of the Laboratory's HWFP, 05/02/01	NMED 2001, 070010
	AOC 03-051(a)	Area of potential soil contamination	Under Investigation	Section 4.1.21
	AOC 03-051(b)	Area of potential soil contamination	Under Investigation	Section 4.1.22
	AOC 03-051(d)	Soil contamination (oil from leaking compressor)	NFA Approved, 01/21/05	EPA 2005, 088464
03-052(a)-00	SWMU 03-052(a)	Storm drain	Under Investigation	Section 4.1.23
	SWMU 03-052(e)	Storm drain	Under Investigation	Section 4.1.23
	SWMU 03-054(b)	Outfall	Under Investigation	Section 4.1.23
03-054(a)-00	SWMU 03-054(a)	Former cooling tower outfall	Under Investigation	Section 4.1.24
	SWMU 03-054(d)	Outfall	Under Investigation	Section 4.1.24
	SWMU 03-055(a)	Outfall	Under Investigation	Section 4.1.25
	AOC 03-055(b)	Outfall	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-056(f)	Drum storage	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-056(g)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 03-056(j)	Storage area	NFA Approved, 01/21/05	EPA 2005, 088464
	SWMU 03-056(m)	Drum storage area (inactive)	Removed from the Module VIII of the Laboratory's HWFP, 05/02/01	NMED 2001, 070010
	AOC C-03-003	One-time spill, stained asphalt	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC C-03-008	Storage area / rad contaminated	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC C-03-010	Outfall	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC C-03-019	Underground storage tank	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC C-03-021	Underground storage tank	NFA Approved, 01/21/05	EPA 2005, 088464
TA-06				
	SWMU 06-001(a)	Septic system	Under Investigation	Section 4.2.1
	SWMU 06-001(b)	Septic system	Under Investigation	Section 4.2.2
06-002-00	SWMU 06-002	Septic system	Under Investigation	Section 4.2.3.1
	SWMU 06-003(c)	Firing site	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-005	Area of potential soil contamination	Under Investigation	Section 4.2.3.2

Table 1.1-1 (continued)

Consolidated Unit	Site ID	Brief Description	Site Status	IWP Reference
	AOC C-06-006	Soil contamination from former building 06-0014	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-016	Soil contamination from former building 06-0028	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-020	Soil contamination from former building	NFA Approved, 03/14/00	NMED 2000, 066381
06-003(a)-99	SWMU 06-003(a)	Firing site	Eligible for deferral under Consent Order section IV.A.5.b; Under Investigation	Section 4.2.4.1
	AOC 06-008	Area of potential soil contamination	Under Investigation	Section 4.2.4.2
	AOC C-06-019	Area of potential soil contamination	Under Investigation	Section 4.2.4.3
	SWMU 06-003(b)	Firing site (inactive)	NFA Approved, 01/21/05	EPA 2005, 088464
	SWMU 06-003(d)	Firing Site	Under Investigation	Section 4.2.5
	SWMU 06-003(e)	Firing Site	Under Investigation	Section 4.2.6
	SWMU 06-003(f)	Firing Site	Under Investigation	Section 4.2.7
06-003(g)-00	SWMU 06-003(g)	Firing site and building 06-0010 (inactive)	Removed from the Module VIII of the Laboratory's HWFP, 11/09/01	NMED 2001, 072819
	AOC C-06-003	Building 06-0011, control building for explosive shots	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-007	Building 06-0015, boiler for steam generation	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-008	Building 06-0016, magazine for explosives	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-009	Building 06-0017, magazine	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-010	Building 06-0021, magazines for explosives storage.	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-011	Building 06-0022, magazine	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-012	Building 06-0023, magazine	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-013	Building 06-0024, magazine for explosives storage.	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-014	Building 06-0025, magazine for explosives storage.	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-015	Building 06-0027, magazine for explosives storage.	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-017	Building 06-0029, magazine for explosives storage.	NFA Approved, 03/14/00	NMED 2000, 066381

Table 1.1-1 (continued)

Consolidated Unit	Site ID	Brief Description	Site Status	IWP Reference
06-003(g)-00 (cont.)	AOC C-06-018	Building 06-0030, magazine for explosives storage.	NFA Approved, 03/14/00	NMED 2000, 066381
	AOC C-06-021	Building 06-0026, magazine used for explosives storage.	NFA Approved, 03/14/00	NMED 2000, 066381
	SWMU 06-003(h)	Firing site	Eligible for deferral under Consent Order section IV.A.5.b; Under Investigation	Section 4.2.8
	AOC 06-004	Sump	NFA Approved, 01/21/05	EPA 2005, 088464
	SWMU 06-006	Storage area	Under Investigation	Section 4.2.9
06-007(a)-99	SWMU 06-005	Pit	Under Investigation	Section 4.2.10.1
	SWMU 06-007(a)	MDA F	Under Investigation	Section 4.3.10.2
	SWMU 06-007(b)	Disposal pit	Under Investigation	Section 4.2.10.2
	SWMU 06-007(c)	Disposal pit	Under Investigation	Section 4.2.10.2
	SWMU 06-007(d)	Disposal pit	Under Investigation	Section 4.2.10.2
	SWMU 06-007(e)	Disposal pit	Under Investigation	Section 4.2.10.2
	SWMU 06-007(f)	Surface disposal area	Under Investigation	Section 4.2.11
	SWMU 06-007(g)	Area of potential soil contamination	Under Investigation	Section 4.2.12
	AOC C-06-001	Area of potential soil contamination	Under Investigation	Section 4.2.13
TA-07				
07-001(a)-99	SWMU 07-001(a)	Inactive firing pit	Under Investigation	Section 4.3.1.1
	SWMU 07-001(b)	Inactive firing pit	Under Investigation	Section 4.3.1.2
	SWMU 07-001(c)	Inactive firing site	Eligible for deferral under Consent Order section IV.A.5.b; Under Investigation	Section 4.3.1.3
	SWMU 07-001(d)	Inactive firing site	Eligible for deferral under Consent Order section IV.A.5.b; Under Investigation	Section 4.3.1.4
	SWMU 07-003(c)	Typographical error	Removed from the Module VIII of the Laboratory's HWFP, 12/23/98	NMED 1998, 063042
	SWMU 07-003(d)	Typographical error	Removed from the Module VIII of the Laboratory's HWFP, 12/23/98	NMED 1998, 063042
TA-22				
	AOC 22-003(a)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 22-003(b)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 22-003(c)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 22-003(d)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464

Table 1.1-1 (continued)

Consolidated Unit	Site ID	Brief Description	Site Status	IWP Reference
	AOC 22-003(e)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 22-003(f)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 22-003(g)	SAA	NFA Approved, 01/21/05	EPA 2005, 088464
	SWMU 22-010(a)	Septic system	Under Investigation	Section 4.4.1
	AOC 22-013	Liquid waste treatment/storage	NFA Approved, 01/21/05	EPA 2005, 088464
	SWMU 22-014(a)	Sump system	Under Investigation	Section 4.4.2
	SWMU 22-014(b)	Sump system	Under Investigation	Section 4.4.3
	SWMU 22-015(a)	Seepage pits	Under Investigation	Section 4.4.4
	SWMU 22-015(b)	Sump and outfall	Under Investigation	Section 4.4.5
TA-40				
	SWMU 40-001(a)	Septic system	Removed from the Module VIII of the Laboratory's HWFP, 12/23/98	NMED 1998, 063042
	SWMU 40-001(b)	Septic system	Under Investigation	Section 4.5.1
	AOC 40-002(a)	Container storage area SAA located inside building 40-0023	NFA Approved, 01/21/05	EPA 2005, 088464
	SWMU 40-005	Sump	Under Investigation	Section 4.5.2
	AOC 40-007(e)	Storage area	Under Investigation	Section 4.5.3
TA-50				
	AOC C-50-001	Transformer	Under Investigation	Section 4.6.1
TA-59				
	SWMU 59-001	Decommissioned septic system	NFA Approved, 5/2/01	NMED 2007, 070010
	AOC 59-002	Container storage area	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 59-003	Sump	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 59-004	Outfall	Under Investigation	Section 4.7.1
	AOC C-59-001	Transformer	Under Investigation	Section 4.7.2
TA-64				
	AOC 64-001	Storage area	NFA Approved, 01/21/05	EPA 2005, 088464
TA-69				
	SWMU 69-001	Twomile Incinerator Facility	Under Investigation	Section 4.8.1
	AOC 69-002(a)	Septic system	NFA Approved, 01/21/05	EPA 2005, 088464
	AOC 69-002(b)	Septic system	NFA Approved, 01/21/05	EPA 2005, 088464

Note: Shading denotes approved for NFA or complete with controls.

Table 2.3-1
Industrial SSLs and SALs

Chemical	Industrial SSL[a] (inorganic and organic chemicals) or Industrial SAL[b] (radionuclides)
Inorganic Chemicals (mg/kg)	
Aluminum	1130000
Antimony	454
Arsenic	17.7
Barium	224000
Beryllium	2260
Cadmium	1120
Calcium	na[c]
Chromium	2920[d]
Cobalt	300[e]
Copper	45400
Iron	795000
Lead	800
Manganese	145000
Mercury	49.9[f]
Nickel	22700
Selenium	5680
Silver	5680
Sodium	na
Thallium	74.9
Vanadium	5680
Zinc	341000
Organic Chemicals (mg/kg)	
Acenaphthene	36700
Acenaphthylene	18300[g]
Acetone	851000
Anthracene	183000
Aroclor-1260	8.26
Benzo(a)anthracene	23.4
Benzo(a)pyrene	2.34
Benzo(b)fluoranthene	23.4
Benzo(g,h,i)perylene	18300[h]
Benzo(k)fluoranthene	234
Benzoic acid	2500000[e]
Bis(2-ethylhexyl)phthalate	1370
Butylbenzylphthalate	9100[e]
2-Chloronaphthalene	90800
Chrysene	2340
Di-n-butylphthalate	68400
Di-n-octylphthalate	68400[i]
Dibenz(a,h)anthracene	2.34
Dibenzofuran	1620[j]

Table 2.3-1 (continued)

Chemical	Industrial SSL[a] (inorganic and organic chemicals) or Industrial SAL[b] (radionuclides)
1,2-Dichlorobenzene	14300
1,3-Dichlorobenzene	37.4[j]
Diethylphthalate	547000
2,4-Dimethylphenol	13700
2,4-Dinitrotoluene	103
Ethylbenzene	385
Fluoranthene	24400
Fluorene	24400
Hexachlorobenzene	12.0
Indeno(1,2,3-cd)pyrene	23.4
Methylene chloride	1090
2-Methylnaphthalene	4100[e]
4-Methylphenol	3100[e]
Naphthalene	252
Phenanthrene	20500
Pyrene	18300
RDX	174
Tetryl	2740
Toluene	57900
TPH-DRO	1120[k]
1,1,1-Trichloroethane	77100
Trichloroethene	253
1,2,4-Trichlorobenzene	525
Trichlorofluoromethane	6760
2,4,6-Trinitrotoluene	469
Xylene (total)	3610
Radionuclides (pCi/g)	
Americium-241	180
Cesium-137	23
Sodium-22	6.5
Uranium-234	1500
Uranium-238	430

[a] SSLs from NMED 2009, 106420, unless otherwise noted.

[b] SALs from LANL 2005, 088493.

[c] na = Not available.

[d] SSL is for hexavalent chromium.

[e] SSL is from the EPA Regional Screening Table (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm).

[f] SSL is for elemental mercury.

[g] SSL is for pyrene, which is surrogate for acenaphthylene.

[h] SSL is for pyrene, which is surrogate for benzo(g,h,i)perylene.

[i] SSL is for di-n-butylphthalate, which is surrogate for di-n-octylphthalate.

[j] SSL from NMED 2006, 092513.

[k] SSL from NMED 2006, 094614.

Table 4.0-1
Summary of Proposed Samples and Analyses

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
TA-03																					
	AOC 03-001(e) and SWMU 03-010(a)	Quarterly groundwater sampling of remaining well 03-B-13.	Well 03-B-13	n/a[a]	water	X[b]	—[c]	—	—	X	X	X	—	—	—	—	—	X	—	—	—
	SWMU 03-001(k)	Collect 20 surface asphalt and/or concrete samples from 12 locations where electrical equipment and drums of vacuum oil were stored adjacent to the south side of the building on concrete and asphalt covering the site and from eight locations surrounding the former storage area.	20 locations, 20 samples	Concrete or asphalt	Surface concrete or asphalt	—	—	—	—	—	—	—	—	X	—	—	—	X	—	—	—
		Collect 40 samples from two depths beneath the concrete and/or asphalt from the same 12 locations where electrical equipment and drums of vacuum oil were stored adjacent to the south side of the building and from the same eight locations surrounding the former storage area.	20 locations, 40 samples	0–1, 2–3 beneath concrete or asphalt	Soil beneath concrete or asphalt	X	X	X	—	X	X	—	—	X	—	—	—	X	—	—	—
		Collect 16 samples from two depths from eight locations in the two drainages downgradient of the site. NOTE: Samples from the western drainage will also be used to characterize lateral extent for SWMU 03-055(a).	8 locations, 16 samples	0–1, top 1 ft of unweathered tuff	Soil, tuff, sediment	X	X	X	—	X	X	—	—	X	—	—	—	X	—	—	—
	SWMU 03-003(a) and AOC 03-042	Collect 10 samples from the asphalt and/or concrete and from two depths beneath the asphalt and/or concrete from 10 locations within the former storage area and concrete containment area.	10 locations, 10 samples	Surface concrete or asphalt	Concrete, asphalt	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—
		Collect 20 samples from the asphalt and/or concrete and from two depths beneath the asphalt and/or concrete from 10 locations within the former storage area and concrete containment area	10 locations, 20 samples	0–1, 2–3 beneath concrete or asphalt	Soil beneath concrete or asphalt	X	X	X	—	X	X	—	—	X	—	—	—	—	—	—	—
		Collect 14 samples (beneath any asphalt) from two depths from seven locations around the former storage area.	7 locations, 14 samples	0–1, 2–3 beneath concrete or asphalt	Soil beneath concrete or asphalt	X	X	X	—	X	X	—	—	X	—	—	—	—	—	—	—
	SWMU 03-003(b)	Collect 7 surface base course samples from seven locations within the former storage area.	7 locations, 7 samples	Surface base course	Base course	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—
		Collect 14 samples from two depths beneath base course from the same seven locations within the former storage area.	7 locations, 14 samples	0–1, 2–3 beneath base course	Soil beneath base course	X	X	X	—	X	X	—	—	X	—	—	—	—	—	—	—

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
	SWMU 03-003(b) (cont.)	Collect 10 samples from two depths (beneath any asphalt) from five locations around the former storage area.	5 locations, 10 samples	0–1, 2–3 beneath concrete or asphalt	Soil	X	X	X	—	X	X	—	—	X	—	—	—	—	—	—	—
	AOC 03-003(h)	No sampling currently proposed; sampling delayed until decontamination and decommissioning (D&D) of building 03-0039.	n/a	n/a	n/a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	AOC 03-003(j)	No sampling currently proposed; sampling delayed until D&D of building 03-0040.	n/a	n/a	n/a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	AOC 03-003(k)	Collect 16 samples from two depths beneath the asphalt from four locations around former transformer location and four downgradient locations.	8 locations, 16 samples	0–1, 2–3 beneath asphalt	Soil, tuff	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—
	AOC 03-003(l)	No sampling currently proposed; sampling delayed until D&D of building 03-0016.	n/a	n/a	n/a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	AOC 03-003(p)	Collect 42 samples from two depths from twelve locations within the former storage area (including three previous VCA confirmation sampling locations 03-09000, 03-09001, and 03-09002) and from nine locations around the former storage area.	21 locations, 42 samples	0–1, 2-3 beneath asphalt	Soil, tuff	X	X	—	—	X	X	—	—	X	—	—	—	—	—	—	—
	AOC 03-014(a2)	Collect six samples from two depths beneath the drainline from three locations between building 03-0316 and where the outlet drainline connects to the main sanitary sewer line north of building 03-0316.	3 locations, 6 samples	0–1, 2–3 (beneath drainline)	Soil, tuff	X	X	X	—	X	X	—	—	X[d]	—	—	—	—	—	—	—
	SWMU 03-014(t)	Collect 12 samples from two depths beneath and adjacent to the bottom of the lift station from two locations adjacent to the lift station and four locations along the drainline between the lift station and where it connects to the main sanitary sewer line.	6 locations, 12 samples	0–1, 2–3 (beneath and adjacent to bottom of lift station and drainline)	Soil, tuff	X	X	X	—	X	X	—	—	X[d]	—	—	—	—	—	—	—
	AOC 03-014(z)	No sampling currently proposed; sampling delayed until D&D of building 03-0040.	n/a	n/a	n/a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	AOC 03-022	Collect samples from three depths (0 to 1 ft, 3 to 4 ft, and 5 to 6 ft beneath clean fill or until no soil staining, odor, or elevated PID readings observed) from eight locations within sump footprint.	8 locations, 24 samples	0-1, 3–4, 5–6 (beneath clean fill)	Soil, tuff	X	X	—	—	X	X	—	—	X	X	—	—	—	—	—	—
		Collect 24 samples from three depths from eight locations around the former sump footprint.	8 locations, 24 samples	1–2, 3–4, 5–6	Soil, tuff, sediment	X	X	—	—	X	X	—	—	X	X	—	—	—	—	—	—
		Collect nine samples from three depths from three locations along the former location of the oil transfer line.	3 locations, 9 samples	1–2, 3–4, 5–6	Soil, tuff	X	X	—	—	X	X	—	—	X	X	—	—	—	—	—	—

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
	AOC 03-022 (cont.)	Collect samples from two depths from nine locations in the two drainages downgradient of the site.	9 locations, 18 samples	0-1, top 1 ft of unweathered tuff	Soil, tuff, sediment	X	X	—	—	X	X	—	—	X	X	—	—	—	—	—	—
	SWMU 03-025(b)	No sampling currently proposed; sampling delayed until D&D of building 03-0102.	n/a	n/a	n/a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	AOC 03-025(c)	Collect six samples from two depths beneath the bottom of the sump from three locations around the structure (north, south, and east sides of the sump).	3 locations, 6 samples	0–1, 2–3 (beneath bottom of sump)	Soil	X	X	X	X	X	X	—	—	X[d]	X	X	X	—	X	X	—
	SWMU 03-026(d)	No sampling currently proposed; sampling delayed until D&D of building 03-0016.	n/a	n/a	n/a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	SWMU 03-033	Collect 28 samples from two depths beneath former structures from: • two locations within the steel containment excavation, • two locations within the concrete secondary containment excavation, • three locations around the concrete secondary containment structure, • three locations within the drainline excavation, and • four locations downgradient of these structures.	14 locations, 28 samples	0–1, 3–4 (beneath structures)	Soil	X	X	X	X	X	X	—	—	X[d]	—	—	—	—	—	—	—
	AOC 03-038(f)	Collect six samples from two depths beneath drainline from three locations along the drainline. Use radiological field screening to guide sampling.	3 locations, 6 samples	0–1, 2–3 (beneath drainline)	Soil, tuff	X	X	X	X	X	X	—	—	X[d]	—	X	X	X	X	—	—
	SWMU 03-043(c)	Collect 15 samples from three depths from one location in the center of the former manhole location and four step-out locations around the former manhole location.	5 locations, 15 samples	1–2, 3–4, 6–7	Soil, tuff	X	X	X	X	X	X	—	—	X[d]	—	X	X	X	X	—	—
		Collect six samples from two depths beneath the bottom of the former drainline from three locations along former drainline location. Use radiological field screening to guide sampling.	3 locations, 6 samples	0–1, 2–3 (beneath former drainline)	Soil, tuff	X	X	X	X	X	X	—	—	X[d]	—	X	X	X	X	—	—
03-050(a)-00	SWMU 03-050(a)	Collect 44 samples from two depths (beneath any asphalt or concrete) at twenty-two locations along the fence line around the CMR building (building 03-0029).	22 locations, 44 samples	0–1, 2–3 (beneath asphalt or concrete)	Soil	—	—	—	—	—	—	—	—	X[c]	—	X	X	X	X	X	X
	SWMU 03-050(d)	Collect 22 samples from two depths (beneath any asphalt or concrete) from eleven locations around building 03-0102.	11 locations, 22 samples	0–1, 2–3 (beneath asphalt or concrete)	Soil	—	—	—	—	—	—	—	—	X[d]	—	X	X	X	X	X	X
	SWMU 03-050(f)	Collect 26 samples from two depths (beneath any asphalt or concrete) from thirteen locations around building 03-0040.	13 locations, 26 samples	0–1, 2–3 (beneath asphalt or concrete)	Soil	X[e]	—	—	—	—	—	—	—	X[d]	—	X	X	X	X	X	X

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
	SWMU 03-050(g)	Collect 32 samples from two depths (beneath any asphalt or concrete) from sixteen locations around building 03-0016.	16 locations, 32 samples	0–1, 2-3 (beneath asphalt or concrete)	Soil	—	—	—	—	—	—	—	—	X[d]	—	—	—	X	—	—	—
	AOC 03-051(a)	Collect six samples from the asphalt paving at six locations around the compressor shed.	6 locations, 6 samples	Asphalt	Asphalt	—	—	—	—	—	—	—	—	X	X	—	—	—	—	—	—
		Collect 12 samples from two depths beneath the asphalt paving at six locations around the compressor shed.	6 locations, 12 samples	0–1, 2–3 (beneath asphalt)	Soil	X	X	X	—	X	X	—	—	X	X	—	—	—	—	—	—
	AOC 03-051(b)	Collect 12 samples from two depths beneath concrete paving from six locations at and around the former compressor shed.	6 locations, 12 samples	0–1, 2–3 (beneath concrete)	Soil	—	—	—	—	—	—	—	—	X	X	—	—	—	—	—	—
		Collect eight samples from two depths from four locations downgradient of the former compressor shed location, directly south of the concrete pad and the facility fence line and at locations approximately 40 ft and 80 ft farther east along the fence line.	4 locations, 8 samples	0-1, 2–3	Soil	X	X	X	—	X	X	—	—	X	X	—	—	—	—	—	—
03-052(a)-00	Consolidated Unit 03-052(a)-00	Collect 21 samples from two depths from seven locations within outfall area on mesa top.	7 locations, 21 samples	0–1, 2–3, 4–5	Soil	X	X	X	—	X	X	—	—	X	X	—	—	—	—	—	—
		Collect 16 samples from two depths from eight locations in the drainage downgradient of the outfall area.	8 locations, 16 samples	0–1, top 1 ft of unweathered tuff	Soil, tuff, sediment	X	X	X	—	X	X	—	—	X	X	—	—	—	—	—	—
03-054(a)-00	Consolidated Unit 03-054(a)-00	Collect 10 samples from two depths beneath the drainlines from five locations along the drainlines between building 03-0016 and former buildings 03-0208, 03-0019 and the outfall.	5 locations, 10 samples	0–1, 2–3 (beneath drainlines)	Soil, tuff	X[f]	X	X	—	X	X	—	—	X	—	—	—	X	—	—	—
		Collect 10 samples from two depths from five mesa-top locations at and downgradient of the outfall.	5 locations, 10 samples	0–1, 2–3	Soil, sediment	X[f]	X	X	—	X	X	—	—	X	—	—	—	X	—	—	—
		Collect 10 samples from two depths at five locations in the drainage down gradient of the site.	5 locations, 10 samples	0–1, top 1 ft of unweathered tuff	Soil, tuff, sediment	X[f]	X	X	—	X	X	—	—	X	—	—	—	X	—	—	—
	SWMU 03-055(a)	Collect four samples from two depths beneath the drainline from two locations along the drainline between building 03-0016 and the outfall.	2 locations, 4 samples	0–1, 2–3	Soil, tuff	X	X	X	—	X	X	—	—	X[d]	—	—	—	X	—	—	—
		Collect eight samples from two depths from four locations at and down gradient of the outfall.	4 locations, 8 samples	0–1, top 1 ft of unweathered tuff	Soil, tuff, sediment	X	X	X	—	X	X	—	—	X[d]	—	—	—	X	—	—	—

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
TA-06																					
	SWMU 06-001(a)	Remove septic tank and collect nine samples from three depths beneath inlet and outlet to tank and beneath bottom of tank.	3 locations, 9 samples	0–1, 2–3, 5–6 (below drainlines and tank bottom)	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	—	—	X	—	—
		Collect 14 samples from two depths beneath inlet and outlet drainlines.	7 locations, 14 samples	0–1, 3–4 (below drainlines)	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	—	—	X	—	—
		Collect 18 samples from six locations at three depths at and downgradient of the outfall to define lateral extent.	6 locations, 18 samples	0–1, 2–3, 4–5 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	—	—	X	—	—
	SWMU 06-001(b)	Remove septic tank and collect nine samples from three depths beneath inlet and outlet to tank and beneath bottom of tank.	3 locations, 9 samples	0–1, 2–3, 5–6 (below drainlines and tank bottom)	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	—	—	X	—	—
		Collect six samples from three locations at two depths beneath inlet drainline.	3 locations, 6 samples	0–1, 3–4 (below drainline)	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	—	—	X	—	—
		Collect 12 samples from three depths in the filter trench area below the distribution box, below each perforated drainline, and below outlet drainline.	4 locations, 12 samples	0–1, 2–3, 4–5 (below distribution box and drainlines)	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	—	—	X	—	—
		Collect 18 samples at three depths from six locations at and downgradient of the outfall to define lateral extent. These samples will also define lateral extent for other upstream SWMUs and AOCs.	6 locations, 18 samples	0–1, 2–3, 4–5 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	—	—	X	—	—
06-002-00	SWMU 06-002	Collect nine samples at three depths from three 1995 RFI locations 06-08001, 06-08002, and 06-08003 at and around former septic tank at deeper depths and with expanded analytical suite.	3 locations, 9 samples	0–1, 4–5, 8–9	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect 18 samples at two depths beneath inlet drainlines from former buildings 06-0010 and 06-0020 and beneath outlet drainline.	9 locations, 18 samples	0–1, 3–4 (below drainlines)	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect six samples at three depths from 1998 RFI locations 06-08060 and 06-08061 at and below outfall at deeper depths and with expanded analytical suite.	2 locations, 6 samples	0–1, 4–5, 8–9 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
	SWMU 06-002 (cont.)	Collect six samples at three depths from two locations downgradient of 1998 RFI outfall sampling locations.	2 location, 6 samples	0–1, 4–5, 8–9 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
06-002-00	AOC C-06-005	Perform XRF survey within building footprint to identify areas of elevated lead contamination. Remove lead-contaminated soil and collected confirmation samples.	To be determined	0–1, 2–3 (below excavation)	Soil, tuff	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Collect nine samples at three depths from RFI locations 06-08010, 06-08011, and 06-08012 at deeper depths and with expanded analytical suite to define nature and extent.	3 locations, 9 samples	0–1, 4–5, 8–9	Soil, tuff	X	X	X	X	X	X	X	X	X[d]	—	—	—	—	—	—	—
		Collect 12 samples at three depths from four step-out locations around RFI locations.	4 locations, 12 samples	0–1, 4–5, 8–9	Soil, tuff	X	X	X	X	X	X	X	X	X[d]	—	—	—	—	—	—	—
06-003(a)-99	SWMU 06-003(a)	Sample sediment and water in bowl and filter pit to characterize for removal and disposal requirements.	To be determined	To be determined	Sediment, water	X	—	—	—	X	X	X	—	X	—	X	—	—	X	X	—
		Angle drill beneath pad and collect samples beneath bowl and filter pit.	1 location, 4 samples	Approximately 10 ft below bottom of shaft	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	X	—	X	X	X
		Collect nine samples at three depths from RFI locations 06-04004, 06-04005, and 06-04006 outside concrete bowl at deeper depths.	3 locations, 9 samples	0–1, 2–3, 4–5	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	X	—	X	X	X
		Collect nine samples at three depths from three step-out locations outside concrete bowl.	3 locations, 9 samples	0–1, 2–3, 4–5	Soil, tuff	X	X	X	X	X	X	X	—	X[c]	—	X	X	—	X	X	X
		Collect nine samples at three depths from the outfall from filter pit drainline and two downgradient locations.	3 locations, 9 samples	0–1, 2–3, 4–5 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	X	—	X	X	X
	AOC 06-008	Collect three samples at three depths from one location of former tank.	1 location, 3 samples	0–1, 3–4, 6–7 (below backfill)	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	X	X	X	—	X	X	X
		Collect nine samples at three depths from 3 step-out locations on the north, south and east sides of the tank.	3 locations, 9 samples	4–5, 7–8, 10–11	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	X	X	X	—	X	X	X
	AOC C-06-019	Collect nine samples at three depths from one location in footprint of former structure and two locations adjacent to footprint at 3 depths.	3 locations, 9 samples	0–1, 4–5, 8–9	Soil, tuff	X	X	X	X	X	X	X	X	X[d]	X	X	X	—	X	X	X

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
	AOC C-06-019 (cont.)	Collect three samples at three depths from one step-out location to define lateral extent. Samples from SWMU 06-003(a) and AOC 06-008 will also be used for lateral extent.	1 locations, 3 samples	0–1, 4-5, 8-9	Soil, tuff	X	X	X	X	X	X	X	X	X[d]	X	X	X	—	X	X	X
	SWMU 06-003(d)	Collect 15 samples at three depths from one location within footprint of former building and at four step-out locations.	5 locations, 15 samples	0–1, 3-4, 6-7	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
	SWMU 06-003(e)	Collect 18 samples at three depths from two locations within footprint of former building and at four step-out locations to define nature and extent.	6 locations, 18 samples	0–1, 3–4, 6–7	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
	SWMU 06-003(f)	Collect 21 samples from RFI locations 06-04022, 06-04023, 06-04024, 06-04025, 06-04026, and 06-04027 and one additional downgradient location at deeper depths to define lateral and vertical extent.	7 locations, 21 samples	0–1, 3–4, 6–7	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	—	—	X	—	X
	SWMU 06-003(h)	Collect 21 samples at three depths from three locations within footprint of former firing site and at four step-out locations to define nature and extent. Sample locations within footprint to be based on XRF and HE field-screening results.	7 locations, 21 samples	0–1, 4–5, 8–9	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X
	SWMU 06-006	Collect 24 samples at three depths from eight locations below former storage pad.	8 locations, 24 samples	0–1, 2–3, 4–5 (below pad)	Soil, tuff	X	X	X	X	X	X	X	—	X	—	X	—	—	X	—	—
		Collect eight samples from storage pad material from eight locations to characterize PCB contamination.	8 location, 8 samples	0–0.5	Asphalt, concrete	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—
		Collect 18 samples at three locations from six step-out locations around former storage pad.	6 locations, 18 samples	0–1, 2–3, 4–5	Soil, tuff	X	X	X	X	X	X	X	—	X	—	X	—	—	X	—	—
06-007(a)-99	SWMU 06-005	Collect four samples at two depths from two locations within footprint of backfilled pit.	2 locations, 4 samples	0–1, 3–4 (below backfill)	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X
		Collect 12 samples at three depths from four step-out locations.	4 locations, 12 samples	0–1, 4–5, 9–10	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X
	SWMU 06-007(a)	Perform geophysical surveys to locate pits and excavate test pits to confirm locations. Install boreholes around boundary of disposal pits and sample to define nature and extent.	To be determined [estimated to be 8 locations (4 around each pit), 24 samples (3 from each location)]	0–1, 3–4, 6–7 (below bottom of pit)	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
	SWMU 06-007(b)	Perform geophysical surveys to locate pit and shafts and excavate test pit to confirm location. Install boreholes around boundary of disposal pit and sample to define nature and extent.	To be determined (estimated to be 4 locations, 12 samples)	0–1, 3–4, 6–7 (below bottom of pit)	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X
	SWMU 06-007(c)	Perform geophysical surveys to locate pit and excavate test pit to confirm location. Install one borehole adjacent to disposal pit and sample to define nature and extent.	To be determined (estimated to be 1 location 3 samples)	0–1, 3–4, 6–7 (below bottom of pit)	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X
	SWMU 06-007(d)	Perform geophysical surveys to locate pit and excavate test pit to confirm location. Install one borehole adjacent to disposal pit and sample to define nature and extent.	To be determined (estimated to be 1 location 3 samples)	0–1, 3–4, 6–7 (below bottom of pit)	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X
	SWMU 06-007(e)	Perform geophysical surveys to locate pit and excavate test pit to confirm location. Install one borehole adjacent to disposal pit and sample to define nature and extent.	To be determined (estimated to be 1 location 3 samples)	0–1, 3–4, 6–7 (below bottom of pit)	Soil, tuff	X	X	X	X	—	X	X	—	X[c]	—	X	—	—	X	—	X
	SWMU 06-007(f)	Collect nine samples at three depths from VCA locations 06-09911, 06-09912, and 06-09913 at deeper depth to determine vertical extent.	3 locations, 9 samples	0–1, 2–3, 4–5 into undisturbed soil/tuff	Soil, tuff	X	X	X	X	X	X	X	X	X[d]	—	X	—	—	X	—	X
		Collect 12 samples at three depths from four step-out locations around site.	4 locations, 12 samples	0–1, 3–4, 6–7	Soil, tuff	X	X	X	X	X	X	X	X	X[d]	—	X	—	—	X	—	X
	SWMU 06-007(g)	Collect nine samples at three depths from RFI locations 06-05004, 06-05005, and 06-05006 at deeper depth.	3 locations, 9 samples	0–1, 3–4, 6–7	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	—	—	X	—	X
		Collect nine samples at three depths from four step-out locations around site to define lateral extent.	4 locations, 12 samples	0–1, 3–4, 6–7	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	—	—	X	—	X
	AOC C-06-001	Collect nine samples at three depths from RFI locations 06-08004, 06-08005, and 06-08006 at deeper depth and with expanded analytical suite.	3 locations, 9 samples	0–1, 3–4, 6–7	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	—	—	—	—	—
		Collect six samples at three depths from two step-out locations around site to define lateral extent.	2 locations, 6 samples	0–1, 3–4, 6–7	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	—	—	—	—	—

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
TA-07																					
07-001(a)-99	SWMU 07-001(a)	Conduct UXO survey around site to locate unexploded detonators or scrap. Collect 18 samples at three depths from RFI locations 07-04041, 07-04042, 07-04043, 07-04044, 07-04045, and 07-04046 at deeper depths and with expanded analytical suite to determine nature and vertical extent.	6 locations, 18 samples	0–1, 3–4, 6–7	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X
	SWMU 07-001(b)	Conduct UXO survey around site to locate unexploded detonators or scrap. Collect 18 samples at three depths from RFI locations 07-04047, 07-04048, 07-04049, 07-04050, 07-04051, and 07-04052 at deeper depths and with expanded analytical suite to determine nature and vertical extent.	6 locations, 18 samples	0–1, 3–4, 6–7	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X
	SWMU 07-001(c)	Collect nine samples at three depths from RFI locations 07-04053, 07-04054, and 07-04055 at deeper depths and with expanded analytical suite to determine nature and vertical extent.	3 locations, 9 samples	0–1, 2–3, 4–5	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X
		Collect nine samples at three depths from three locations downgradient of site to determine lateral extent.	3 locations, 9 samples	0–1, 2–3, 4–5 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X
	SWMU 07-001(d)	Collected 18 samples at three depths from RFI locations 07-04062, 07-04063, 07-04064, 07-04065, 07-04066, and 07-04067 at deeper depths and with expanded analytical suite to determine nature and vertical extent.	6 locations, 18 samples	0–1, 3–4, 6–7	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X
		Collect three samples at one downgradient step-out location to determine lateral extent.	1 location, 3 samples	0–1, 3–4, 6–7	Soil, tuff	X	X	X	X	—	X	X	—	X[d]	—	X	—	—	X	—	X
TA-22																					
	SWMU 22-010(a)	Collect 12 samples at two depths from six locations: • one location beneath the drainline where it exits building 22-0034; • one location beneath the drainline at the midpoint between the building and septic tank; • two locations, one beneath the inlet and one beneath the outlet to the septic tank; • one location beneath the septic tank; and • one location beneath manhole riser.	6 locations, 12 samples	0–1, 3–4 below drainlines, septic tank and manhole riser	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
	SWMU 22-010(a) (cont.)	Collect eight samples at two depths from four locations in the drain field area. One location beneath each perforated drainline in the drain field area (three total locations) and one location beneath the point of discharge from the drain field area.	4 locations, 8 samples	0–1, 3–4 below drainfield drainlines	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect 3 samples at three depths from one location at the outfall from the drain field.	1 location, 3 samples	0–1, 2–3, 4–5 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
	SWMU 22-014(a)	Collect 18 samples at two depths from nine locations: • two locations, beneath the drainline one at each point where the drainline exits building 22-0093; • two locations adjacent to the sump; • two locations, one adjacent and below each, the sump inlet and outlet; • two locations beneath the sump drainline between the sump and seepage pit; and, • one location beneath the seepage pit inlet.	9 locations, 18 samples	0–1, 3–4 below drainlines, adjacent and below level of sump	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect five samples from advancing one borehole adjacent and downgradient of the seepage pit.	1 location, 7 samples	10 ft intervals to 30 ft below bottom of pit to a total depth of 70 ft bgs	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect nine samples at three depths from three locations downgradient of the seepage pit.	3 locations, 9 samples	0–1, 2–3, and 4-5 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff, sediment	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect 18 samples at three depths from six locations in the drainage area from 1996 RFI location IDs 40-03056, 40-0357, 40-03058, 40-03059, 40-03060, and 40-03061.	6 locations, 18 samples	0–1, 2–3, 5–6	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
	SWMU 22-014(b)	Collect 12 samples at two depths from six locations: • one location beneath the drainline at building 22-0034; • one location beneath the sump; • two locations, one location beneath each, the sump inlet and outlet; and, • two locations beneath the sump drainline between the sump and outfall.	6 locations, 12 samples	0–1, 3–4 ft below sump and drainlines	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect 18 samples at three depths from six locations: one location at the outfall and five locations downgradient of the outfall to the toe of the hillslope.	6 locations, 18 samples	0–1, 2–3, 4–5 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff, sediment	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect nine samples at three depths from three locations in the drainage downgradient of the outfall.	3 locations, 9 samples	0–1, 2–3 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff, sediment	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
	SWMU 22-015(a)	Collect 14 samples at two depths from seven locations: • two locations, one at each point where the drainline exits building 22-0091 beneath the drainline; • two locations, one at each 90 degree turn in the drainline; • one location at the drainline junction; • one location along the drainline; and, • one location beneath seepage pit inlet.	7 locations, 14 samples	0–1, 3–4 beneath drainlines	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect four samples at two depths from two locations beneath the drainline connecting the seepage pits. One location at the outlet of seepage pit A and one location at the inlet of seepage pit B.	2 locations, 4 samples	0–1, 2–3	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect 18 samples at three depths from six locations downgradient of the seepage pits.	6 locations, 18 samples	0–1, 2–3, 4–5 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff, sediment	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Advance two boreholes, one next to and downgradient of each seepage pit.	2 locations, 11 samples	10 ft intervals to 30 ft below bottom of pit	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
	SWMU 22-015(b)	Collect 10 samples at two depths from five locations: • one location beneath the drainline where it exits building 22-0025; • one location beneath the sump; • two locations, one beneath each, the sump inlet and outlet; and • one location along the drainline at the midpoint between the sump and the outfall.	8 locations, 16 samples	0–1, 3–4 below sump and drainlines	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect three samples at three depths from one location at 1997 RFI sample ID 22-03024.	1 location, 3 samples	0–1, 3–4, 8–9	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect 24 samples at three depths from eight locations downgradient of the outfall to the toe of the slope. Two sample locations will be collected at 1997 RFI sample location ID 22-06066 (at the outfall) and 22-06068 (downgradient of the outfall).	8 locations, 24 samples	0–1, 2–3, 4–5 or from the top 1 ft of unweathered tuff, whichever is shallower.	Soil, tuff, sediment	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
TA-40																					
	SWMU 40-001(b)	Collect 16 samples at two depths from eight locations: • one location where drainline exits building 40-0023; • two locations, one location where each of two drainlines exits building 40-0001; • two locations, one location where each of two drainlines exiting building 40-001 ties into the east-west drainline; • one location at the junction where the drainline from former building 40-0019 joins the drainline from building 40-001; • one location where the drainline exited former building 40-0019; and, • one location east of Twomile Mesa Road.	8 locations, 16 samples	0–1, 3–4 below the drainlines.	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect 12 samples at two depths from six locations: • two locations, one adjacent and below the inlet and outlet of the cleanout; • one location adjacent and below the septic tank; • two locations, one adjacent and below the septic tank inlet and outlet; and, • one location beneath the distribution box.	6 locations, 12 samples	0–1, 3–4 below the cleanout and septic tank drainlines, septic tank, and distribution box.	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
	SWMU 40-001(b) (cont.)	Collect eight samples at two depths from four locations: one at the inlet and outlet of both seepage pits.	4 locations, 8 samples	0–1, 3–4 below drainlines	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Advance two boreholes, one adjacent and downgradient of each seepage pit. Borehole samples will be collected at ten-foot intervals to a depth of 30 ft below the bottom of each seepage pit. Note: Depths of pits is unknown.	2 locations	10 ft intervals to 30 ft below each pit	Soil, tuff, sediment	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect six samples at two depths from three locations, one beneath each perforated drainline in the drain field.	3 locations, 6 samples	0–1, 3–4 below the perforated drainlines	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect 12 samples at three depths from four locations downgradient of the drain field.	4 locations, 12 samples	0–1, 2–3, 4–5 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff, sediment	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
	SWMU 40-005	Collect nine samples from three depths below the drainlines: one location where the drainline exits building 40-0041; and, two locations, one below the sump inlet and one below the sump outlet.	3 locations, 9 samples	0–1, 4–5, 8–9 ft below the drainlines	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect 12 samples at three depths from four RFI locations (sample IDs 40-3048, 40-3049, 40-3050) surrounding the sump.	4 locations, 12 samples	0–1, 4–5, 8–9 bgs	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Sample along drainline. Sampling will define extent in area.	1 location, 2 samples	0–1, 3–4 ft below drainline	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect 12 samples at two depths from six locations in the outfall area and downgradient. One sample location will be at the outfall and five sample locations downgradient to the toe of the slope.	6 locations, 12 samples	0–1, 2–3 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff, sediment	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
	AOC 40-007(e)	Collect eight samples at two depths from four locations, one location on each side of building 40-0041, 8 ft from the building; the sample collected on the east side of the building will be beneath the asphalt.	4 locations, 8 samples	0–1, 2–3	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
TA-50																					
	AOC C-50-001	Collect 16 samples from the asphalt and from two depths beneath the asphalt from eight locations around the transformer pad.	8 locations, 16 samples	0–1, 2–3 (beneath asphalt)	Soil	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—

Table 4.0-1 (continued)

Consolidated Unit	Site	Sampling Justification	Number of Locations and Samples	Depth (ft)	Media	TAL Metals (EPA SW-846:6010B/6020)	Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846:8260B)	SVOCs (EPA SW-846:8270C)	Explosive Compounds (EPA SW-846:8321A_MOD)	Dioxins/Furans (EPA SW-846:8280)	PCBs (EPA SW-846:8082)	TRPH (EPA SW-846 8440)	Isotopic Uranium, (HASL-300)	Isotopic Plutonium (HASL 300)	Tritium	Gamma Spectroscopy (EPA 901.1M)	Americium-241 (HASL-300)	Strontium-90
TA-59																					
	AOC 59-004	Collect 8 samples at two depths from four locations: • Two sample locations, one where the drainline exits building 59-0001 and one where the drainline exits structure 59-0010. • One sample location where the drainline from building 59-0001 makes a 45 degree turn; and, • One sample location west of building 59-0117 along the drainline from structure 59-0010.	4 locations, 8 samples	0–1, 3–4 ft below drainline	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	X	X	X	X	X
		Collect 12 samples at two depths from six locations. One sample location at the outfall and five locations downgradient of the outfall to the toe of the slope. The first sample location downgradient of the outfall will be collected from within the remaining portion of the rock-lined drainage channel.	6 locations, 12 samples	0–1, the top 1-ft of unweathered tuff	Soil, tuff	X	X	X	X	X	X	X	—	X[d]	—	X	X	X	X	X	X
	AOC C-59-001	Delay – no sampling.	n/a	n/a	n/a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TA-69																					
	SWMU 69-001	Collect four concrete chip samples from four locations on concrete slab foundation of former building 69-0003.	4 locations, 4 samples	Surface	Concrete chips	X	X	X	X	X	X	X	—	X[d]	—	—	—	—	—	—	—
		Collect six samples at three depths from two locations between the east side of the concrete foundation of former building 69-0003 and the west side of Jumbino Road.	2 locations, 6 samples	0–1, 3–4, 4–5 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff	X	X	—	—	X	X	—	—	X	—	—	—	—	—	—	—
		Collect 26 samples at two depths from 13 locations on the east side of Jumbino Road. Five sampling locations in the drainage of VCA excavated area; six sample locations, three along east and three along the west side of VCA excavation area; and, two sample locations in the drainage downgradient of the VCA excavation area.	13 locations, 26 samples	0–1, 2–3 or from the top 1 ft of unweathered tuff, whichever is shallower	Soil, tuff, sediment	X	X	—	—	X	X	—	—	X	—	—	—	—	—	—	—
		Collect eight samples from four sediment pockets on canyon slope downgradient of the VCA area to the toe of the slope.	4 locations, 8 samples	0–1, top 1 ft of unweathered tuff	Soil, tuff, sediment	X	X	—	—	X	X	—	—	X	—	—	—	—	—	—	—

[a] n/a = Not applicable.
[b] X = Analysis proposed.
[c] — = Analysis will not be performed.
[d] 20% of samples collected will be analyzed for PCBs.
[e] Samples analyzed for beryllium only.
[f] Samples analyzed for hexavalent chromium.

Table 4.1-1
Summary of Samples Collected and Analyses Requested at TA-03 Sites

Sample ID	Location ID	Depth (ft)	Media	Metals	VOCs	SVOCs	TPH-DRO
Consolidated Unit 03-052(a)-00							
RE03-02-45102	03-02-19564	0.0–0.17	Soil	734S[a]	—[b]	734S	734S
RE03-02-45093	03-02-19564	0.58–0.75	Soil	734S	—	734S	734S
RE03-02-45103	03-02-19565	0.0–0.17	Soil	734S	—	734S	734S
RE03-02-45094	03-02-19565	0.42–0.58	Soil	734S	—	734S	734S
RE03-02-45104	03-02-19566	0.0–0.17	Soil	734S	—	734S	734S
RE03-02-45095	03-02-19566	0.83–1.08	Soil	734S	734S	734S	734S
RE03-02-45105	03-02-19567	0.0–0.17	Soil	734S	—	734S	734S
RE03-02-45096	03-02-19567	1.0–1.17	Soil	734S	—	734S	734S
RE03-02-45106	03-02-19568	0.0–0.17	Soil	734S	—	734S	734S
RE03-02-45097	03-02-19568	0.83–1.0	Soil	734S	—	734S	734S
RE03-02-45107	03-02-19569	0.0–0.17	Soil	734S	—	734S	734S
RE03-02-45098	03-02-19569	0.67–0.83	Soil	734S	734S	734S	734S
RE03-02-45108	03-02-19570	0.0–0.17	Soil	734S	—	734S	734S
RE03-02-45099	03-02-19570	0.17–0.33	Soil	734S	—	734S	734S
RE03-02-45109	03-02-19571	0.0–0.17	Soil	734S	—	734S	734S
RE03-02-45100	03-02-19571	1.5–1.7	Soil	734S	—	734S	734S
RE03-02-45110	03-02-19572	0.0–0.17	Soil	734S	—	734S	734S
RE03-02-45101	03-02-19572	0.67–0.83	Soil	734S	734S	734S	734S

[a] Request numbers.

[b] — = Analysis not requested.

Table 4.1-2
Inorganic Chemicals above BVs at TA-03

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Cobalt
Soil BV[a]				**0.83**	**8.17**	**1.83**	**0.4**	**19.3**	**8.64**
Consolidated Unit 03-052(a)-00									
RE03-02-45102	03-02-19564	0.0–0.17	Soil	—[b]	—	—	—	27.7 (J)	—
RE03-02-45093	03-02-19564	0.58–0.75	Soil	1.2	—	—	0.49	19.6 (J)	—
RE03-02-45103	03-02-19565	0.0–0.17	Soil	0.98	—	—	0.72	—	—
RE03-02-45094	03-02-19565	0.42–0.58	Soil	—	—	—	0.69	—	—
RE03-02-45104	03-02-19566	0.0–0.17	Soil	—	—	—	0.51	23.8 (J)	9.4
RE03-02-45095	03-02-19566	0.83–1.08	Soil	0.88	—	—	—	39.6 (J)	—
RE03-02-45105	03-02-19567	0.0–0.17	Soil	—	—	—	0.5	—	—
RE03-02-45096	03-02-19567	1.0–1.17	Soil	—	—	—	0.73	20.5 (J)	—
RE03-02-45106	03-02-19568	0.0–0.17	Soil	—	—	—	—	—	—
RE03-02-45097	03-02-19568	0.83–1.0	Soil	—	—	—	—	20.2 (J)	—
RE03-02-45107	03-02-19569	0.0–0.17	Soil	—	—	—	0.59	—	—
RE03-02-45098	03-02-19569	0.67–0.83	Soil	—	—	—	—	—	—
RE03-02-45108	03-02-19570	0.0–0.17	Soil	0.92	—	—	1.1	32.3 (J)	—
RE03-02-45099	03-02-19570	0.17–0.33	Soil	1.0	—	—	1.0	28.3 (J)	—
RE03-02-45109	03-02-19571	0.0–0.17	Soil	1.1	8.6	—	1.3	—	—
RE03-02-45100	03-02-19571	1.5–1.7	Soil	1.0	—	—	0.59	34.2 (J)	—
RE03-02-45110	03-02-19572	0.0–0.17	Soil	—	—	—	1.2	29.9 (J)	—
RE03-02-45101	03-02-19572	0.67–0.83	Soil	—	—	3.1 (J)	1.6	60.5 (J)	—

Table 4.1-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Copper	Lead	Mercury	Nickel	Silver	Zinc
Soil BV				**14.7**	**22.3**	**0.1**	**15.4**	**1**	**48.8**
Consolidated Unit 03-052(a)-00									
RE03-02-45102	03-02-19564	0.0–0.17	Soil	120	23.6 (J-)	—	44.2 (J)	—	198
RE03-02-45093	03-02-19564	0.58–0.75	Soil	121	62.3 (J-)	—	—	—	246
RE03-02-45103	03-02-19565	0.0–0.17	Soil	67.1	39.7 (J-)	—	—	—	476
RE03-02-45094	03-02-19565	0.47–0.58	Soil	65.1	57.5 (J-)	—	—	3.6	391
RE03-02-45104	03-02-19566	0.0–0.17	Soil	211	80.8 (J-)	—	17.8 (J)	—	307
RE03-02-45095	03-02-19566	0.83–1.08	Soil	108	99.9 (J-)	—	27.6 (J)	—	125
RE03-02-45105	03-02-19567	0.0–0.17	Soil	27.4	27.2 (J-)	—	—	—	330
RE03-02-45096	03-02-19567	1.0–1.17	Soil	71.1	47.2 (J-)	—	—	—	360
RE03-02-45106	03-02-19568	0.0–0.17	Soil	17.8	22.6 (J-)	—	—	—	138
RE03-02-45097	03-02-19568	0.83–1.0	Soil	197	40.6 (J-)	—	—	—	130
RE03-02-45107	03-02-19569	0.0–0.17	Soil	30.3	52.2 (J-)	—	—	—	218
RE03-02-45098	03-02-19569	0.67–0.83	Soil	—	27.7 (J-)	—	—	—	63.2
RE03-02-45108	03-02-19570	0.0–0.17	Soil	67.4	91.8 (J-)	—	16.4 (J)	1.3	400
RE03-02-45099	03-02-19570	0.17–0.33	Soil	60.4	89.5 (J-)	—	15.8 (J)	1.4	284
RE03-02-45109	03-02-19571	0.0–0.17	Soil	135	52.1 (J-)	—	—	1.1	825
RE03-02-45100	03-02-19571	1.5–1.7	Soil	254	97.9 (J-)	—	—	—	265
RE03-02-45110	03-02-19572	0.0–0.17	Soil	71.4	84.1 (J-)	0.11	—	1.7	431
RE03-02-45101	03-02-19572	0.67–0.83	Soil	106	168 (J-)	0.18	20.7 (J)	1.9	497

Notes: Units are mg/kg. Data qualifiers are defined in Appendix A.

[a] BVs from LANL 1998, 059730.

[b] — = Result was not detected or was below the BV.

Table 4.1-3
Organic Chemicals Detected at TA-03

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Anthracene	Aroclor 1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Chrysene	Di-n-octylphthalate	Dibenz(a,h)anthracene
Consolidated Unit 03-052(a)-00																		
RE03-02-45102	03-02-19564	0.0–0.17	Soil	17	0.72 (J)	17	NA[a]	38	42 (J)	51 (J)	8.3 (J)	40 (J)	—[b]	1.1 (J)	—	46	—	3.9
RE03-02-45093	03-02-19564	0.58–0.75	Soil	49	1.5 (J)	61	NA	110	110	74	29	56	—	—	—	120	—	17
RE03-02-45103	03-02-19565	0.0–0.17	Soil	30	1.4 (J)	37	NA	100	110	110	25 (J)	100	—	2.4 (J)	—	130	10 (J)	15
RE03-02-45094	03-02-19565	0.42–0.58	Soil	45	3 (J)	52	NA	170	190	160	39 (J)	150	0.98 (J)	4.7	—	220	—	21
RE03-02-45104	03-02-19566	0.0–0.17	Soil	79	4.3	81	NA	220	260	240	57 (J)	190	1.3 (J)	—	—	280	—	31
RE03-02-45095	03-02-19566	0.83–1.08	Soil	24	—	31	NA	50	49	52	23	26	—	—	—	57	—	12
RE03-02-45105	03-02-19567	0.0–0.17	Soil	23	1.3 (J)	23	NA	57	65 (J)	66	14 (J)	54	—	—	—	79	7.8 (J)	6
RE03-02-45096	03-02-19567	1.0–1.17	Soil	52	3 (J)	60	NA	190	200	170	41 (J)	140	1.2 (J)	—	5.8	240	—	24
RE03-02-45106	03-02-19568	0.0–0.17	Soil	13	0.88 (J)	15	NA	45	52 (J)	63	11 (J)	50 (J)	—	—	—	56	—	3.2 (J)
RE03-02-45097	03-02-19568	0.83–1.0	Soil	3.5 (J)	—	4.1	NA	12	14 (J)	15 (J)	3.7 (J)	15 (J)	—	—	—	15	—	1.5 (J)
RE03-02-45107	03-02-19569	0.0–0.17	Soil	4.5	—	5.6	NA	14	17	19	2.7 (J)	20	—	—	—	18	—	1.1 (J)
RE03-02-45098	03-02-19569	0.67–0.83	Soil	—	—	—	NA	1.7 (J)	2.1 (J)	2.1 (J)	—	2.3 (J)	—	—	—	2.3 (J)	—	—
RE03-02-45108	03-02-19570	0.0–0.17	Soil	19	1.1 (J)	23	NA	58	70	63	15 (J)	59	—	—	—	79	—	6.4
RE03-02-45099	03-02-19570	0.17–0.33	Soil	6.1	—	8.8	NA	26	30 (J)	31 (J)	7.9 (J)	30 (J)	—	—	—	31	—	4.2
RE03-02-45109	03-02-19571	0.0–0.17	Soil	6.1	—	6.4	NA	18	22	25	5.2	19	—	—	—	24	—	1.9 (J)
RE03-02-45100	03-02-19571	1.5–1.7	Soil	24	—	30	NA	52	55 (J)	61 (J)	14 (J)	47 (J)	—	—	0.97 (J)	61	—	7.9
RE03-02-45110	03-02-19572	0.0–0.17	Soil	10	—	13	NA	35	42	58	6.4	36	—	—	—	48	—	—
RE03-02-45101	03-02-19572	0.67–0.83	Soil	14	—	18	NA	42	49 (J)	64 (J)	10 (J)	48 (J)	—	1.2 (J)	—	53	—	5.8

Table 4.1-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenzofuran	Dimethylphenol[2,4-]	Ethylbenzene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Methylphenol[4-]	Naphthalene	Phenanthrene	Pyrene	TPH-DRD	Trichloroethane[1,1,1-]	Trichloroethene	Xylene (Total)
Consolidated Unit 03-052(a)-00																		
RE03-02-45102	03-02-19564	0.0–0.17	Soil	8.5	—	NA	120	15	12 (J)	6	—	18	110	98	580	NA	NA	NA
RE03-02-45093	03-02-19564	0.58–0.75	Soil	24	1 (J)	NA	300	42	38	17	1.9 (J)	50	300	250	2800	NA	NA	NA
RE03-02-45103	03-02-19565	0.0–0.17	Soil	11	—	NA	250	21	34 (J)	4.5 (J)	—	8.3	190	190	1800	NA	NA	NA
RE03-02-45094	03-02-19565	0.42–0.58	Soil	15	—	NA	430	32	54 (J)	11	—	23	330	390	5600	NA	NA	NA
RE03-02-45104	03-02-19566	0.0–0.17	Soil	24	1.1 (J)	NA	560	49	130	20	1.3 (J)	46	420	470	3500	NA	NA	NA
RE03-02-45095	03-02-19566	0.83–1.08	Soil	13	—	—	150	22	29	7.3	—	21	150	110	2300	0.0048 (J)	0.00077 (J)	—
RE03-02-45105	03-02-19567	0.0–0.17	Soil	10	—	NA	150	19	18 (J)	6.3	—	13	130	130	2000	NA	NA	NA
RE03-02-45096	03-02-19567	1.0–1.17	Soil	17	—	NA	440	35	56 (J)	12	—	24	340	400	2300	NA	NA	NA
RE03-02-45106	03-02-19568	0.0–0.17	Soil	4.5	—	NA	110	9.7	14 (J)	3.1 (J)	—	7.4	79	90	340	NA	NA	NA
RE03-02-45097	03-02-19568	0.83–1.0	Soil	1.1 (J)	—	NA	35	2.4 (J)	4.8 (J)	0.92 (J)	—	2.2 (J)	22	27	460	NA	NA	NA
RE03-02-45107	03-02-19569	0.0–0.17	Soil	1.6 (J)	—	NA	38	3.3 (J)	4 (J)	0.89 (J)	—	2.2 (J)	27	27	—	NA	NA	NA
RE03-02-45098	03-02-19569	0.67–0.83	Soil	—	—	0.00096 (J)	5.2	—	—	—	—	—	2.9 (J)	4	—	—	—	0.002 (J)
RE03-02-45108	03-02-19570	0.0–0.17	Soil	7.5	—	NA	160	15	20 (J)	3.5 (J)	—	7.4	120	120	810	NA	NA	NA
RE03-02-45099	03-02-19570	0.17–0.33	Soil	2.1 (J)	—	NA	62	4.7	11 (J)	1 (J)	—	2.4 (J)	43	60	620	NA	NA	NA
RE03-02-45109	03-02-19571	0.0–0.17	Soil	2.2 (J)	—	NA	46	4.4	7.4	1.5 (J)	—	3.9	34	35	—	NA	NA	NA
RE03-02-45100	03-02-19571	1.5–1.7	Soil	12	—	NA	140	20	19 (J)	7.4	—	23	140	110	1600	NA	NA	NA
RE03-02-45110	03-02-19572	0.0–0.17	Soil	3.8 (J)	—	NA	89	7.6	9.7	2.4 (J)	—	6.2	69	83	740	NA	NA	NA
RE03-02-45101	03-02-19572	0.67–0.83	Soil	5.5	—	—	120	11	14 (J)	2.9 (J)	—	7.6	98	100	2000	—	—	—

Notes: Units are mg/kg. Data qualifiers are defined in Appendix A.

[a] NA = Not analyzed.

[b] — = Result was not detected.

Table 4.2-1
Summary of Samples Collected and Analyses Requested at TA-06

Sample ID	Location ID	Depth (ft)	Media	Metals	VOCs	High Explosives	Gamma Spectroscopy	Isotopic Uranium	Tritium	Strontium-90
SWMU 06-002										
0506-95-1200	06-08001	0.0–0.5	Soil	317[a]	—[b]	315	—	—	316	—
0506-95-1202	06-08001	2.83–3.17	Soil	317	314	315	—	—	—	—
0506-95-1203	06-08002	0.0–0.5	Soil	317	—	315	—	—	—	—
0506-95-1204	06-08002	2.58–3.17	Soil	317	314	315	—	—	—	—
0506-95-1205	06-08003	0.0–0.5	Soil	317	—	315	—	—	—	—
0506-95-1206	06-08003	3.0–3.33	Soil	317	314	315	—	—	—	—
RE06-98-0001	06-08003	5.17–5.67	Soil	4363R	—	4362R[c]	—	—	—	—
RE06-98-0002	06-08003	7.5–8.0	Qbt 3	4363R[d]	—	4362R[c]	—	—	—	—
RE06-98-0003	06-08060	0.0–0.5	Soil	4363R	—	4362R	—	—	—	—
RE06-98-0004	06-08060	4.25–4.5	Soil	4363R	4361R	4362R	—	—	—	—
RE06-98-0006	06-08061	0.0–0.5	Soil	4363R	—	4362R	—	—	—	—
RE06-98-0007	06-08061	4.25–4.5	Soil	4363R	4361R	4362R	—	—	—	—
SWMU 06-003(a)										
0506-97-0001	06-04001	0.0–0.33	Soil	3044R	—	3043R	3045R	3045R	—	3045R
AOC C-06-001										
0506-95-1207	06-08004	0.0–0.5	Soil	317	—	315	—	—	—	—
0506-95-1208	06-08004	2.33–2.5	Soil	317	—	315	—	—	—	—
0506-95-1209	06-08005	0.0–0.5	Soil	317	—	315	—	—	—	—
RE06-98-0032	06-08005	0.0–0.5	Soil	4341R	—	4342R	—	—	—	—
0506-95-1210	06-08005	3.83–4.33	Soil	317	—	315	—	—	—	—
RE06-98-0033	06-08005	4.17–4.83	Soil	4341R	—	—	—	—	—	—

Table 4.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	VOCs	High Explosives	Gamma Spectroscopy	Isotopic Uranium	Tritium	Strontium-90
0506-95-1211	06-08006	0.0–0.5	Soil	317	—	315	—	—	—	—
RE06-98-0035	06-08006	0.0–0.5	Soil	4341R	—	4342R	—	—	—	—
0506-95-1212	06-08006	0.83–1.25	Soil	317	—	315	—	—	—	—
RE06-98-0036	06-08006	2.17–2.83	Soil	4341R	—	—	—	—	—	—
AOC C-06-005										
0506-95-1219	06-08010	0.0–0.5	Soil	317	—	315	—	—	316	—
RE06-98-0017	06-08010	0.0–0.5	Soil	4365R[e]	—	—	—	—	—	—
0506-95-1220	06-08010	3.0–3.33	Soil	317	314	315	—	—	—	—
RE06-98-0018	06-08010	10.08–12.58	Soil	4365R[e]	—	—	—	—	—	—
0506-95-1221	06-08011	0.0–0.5	Soil	317	—	315	—	—	—	—
0506-95-1222	06-08011	3.0–3.33	Soil	317	314	315	—	—	—	—
0506-95-1223	06-08012	0.0–0.5	Soil	317	—	315	—	—	—	—
0506-95-1225	06-08012	2.67–3.17	Soil	317	314	315	—	—	—	—

[a] Request numbers.

[b] — = Analysis not requested.

[c] Sample analyzed for PETN only.

[d] Sample analyzed for antimony only.

[e] Sample analyzed for antimony, cadmium, and silver only.

Table 4.2-2
Inorganic Chemicals Detected above BVs at TA-06

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Sodium	Thallium	Vanadium	Zinc
Soil/Fill BV[a]				**29200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**1**	**915**	**0.73**	**39.6**	**48.8**
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14500**	**11.2**	**482**	**0.1**	**6.58**	**1**	**2770**	**1.1**	**17**	**63.5**
SWMU 06-002																						
0506-95-1200	06-08001	0.0–0.5	Soil	—[b]	—	—	—	1.2	—	—	23.3	—	—	—	4030	—	—	—	—	—	—	—
0506-95-1202	06-08001	2.83–3.17	Soil	—	—	—	—	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0506-95-1203	06-08002	0.0–0.5	Soil	—	—	—	—	0.5 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0506-95-1204	06-08002	2.58–3.17	Soil	—	—	—	—	1.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0506-95-1205	06-08003	0.0–0.5	Soil	—	—	—	—	0.81	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0506-95-1206	06-08003	3.0–3.33	Soil	—	—	511	—	1.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE06-98-0001	06-08003	5.17–5.67	Soil	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	0.8 (J)	—	—
RE06-98-0004	06-08060	4.25–4.5	Soil	—	—	—	—	—	—	—	—	—	—	—	718	—	—	—	—	1.1	—	—
RE06-98-0007	06-08061	4.25–4.5	Soil	—	—	318	—	—	—	—	—	—	—	—	—	—	—	—	—	1.3	—	—
SWMU 06-003(a)																						
0506-97-0001	06-04001	0.0–0.33	Soil	—	28.4 (U)	—	2.27 (U)	2.84 (U)	21400	—	—	43.3	—	44.8	—	0.24 (U)	—	2.84 (U)	1570 (J)	1.14 (U)	40.8	112
AOC C-06-001																						
0506-95-1207	06-08004	0.0–0.5	Soil	—	—	—	—	0.87	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0506-95-1209	06-08005	0.0–0.5	Soil	—	—	—	—	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE06-98-0032	06-08005	0.0–0.5	Soil	NA	—	NA	NA	1.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0506-95-1210	06-08005	3.83–4.33	Soil	—	—	—	—	0.45 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0506-95-1211	06-08006	0.0–0.5	Soil	—	—	—	—	1.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0506-95-1212	06-08006	0.83–1.25	Soil	—	—	—	—	0.66	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AOC C-06-005																						
0506-95-1219	06-08010	0.0–0.5	Soil	—	—	—	—	0.9	—	—	9.2	—	—	23.8 (J+)	—	—	—	—	—	—	—	—
0506-95-1220	06-08010	3.0–3.33	Soil	—	—	—	—	1.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0506-95-1221	06-08011	0.0–0.5	Soil	—	—	349	—	1.1	—	50.8	—	206	—	786 (J+)	—	—	17.8	—	—	—	—	1260
0506-95-1222	06-08011	3.0–3.33	Soil	43000	—	498	—	1.7	—	—	16	—	24400	39.4 (J+)	1080	—	19.6	—	—	—	—	—
0506-95-1223	06-08012	0.0–0.5	Soil	—	—	—	—	1.1	—	20.9	—	16.8	—	84.7 (J+)	—	—	—	—	—	—	—	191
0506-95-1225	06-08012	2.67–3.17	Soil	41800	—	469	—	—	—	—	—	—	—	—	—	—	15.5	—	—	—	—	—

Notes: Units are mg/kg. Data qualifiers are defined in Appendix A.

[a] BVs from LANL 1998, 059730.

[b] — = Result was not detected or was below the BV.

Table 4.2-3
Organic Chemicals Detected at TA-06

Sample ID	Location ID	Depth (ft)	Media	Acetone	RDX	Toluene	Trinitrotoluene[2,4,6-]
SWMU 06-002							
0506-95-1202	06-08001	2.83–3.17	Soil	0.005 (J)	—[a]	0.006 (J)	—
0506-95-1206	06-08003	3.0-3.33	Soil	—	—	0.004 (J)	—
SWMU 06-003(a)							
0506-97-0001	06-04001	0.0–0.33	Soil	NA[b]	0.485	NA	0.498
AOC C-06-005							
0506-95-1220	06-08010	3.0–3.33	Soil	—	—	0.005 (J)	—

Notes: Units are mg/kg. Data qualifiers are defined in Appendix A.

[a] — = Not detected.

[b] NA = Not analyzed.

Table 4.2-4
Radionuclides Detected or Detected above BVs/FVs at TA-06

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Sodium-22	Uranium-234	Uranium-238
Soil BV/FV[a]				**0.013**	**1.65**	**na[b]**	**2.59**	**2.29**
SWMU 06-003(a)								
0506-97-0001	06-04001	0.0–0.33	Soil	0.14	7.33	0.126	3.67	4.22

Note: Units are pCi/g.

[a] BVs/FVs from LANL 1998, 059730.

[b] na = Not available.

Table 4.3-1
Summary of Samples Collected and Analyses Requested at Former TA-07

Sample ID	Location ID	Depth (ft)	Media	SVOCs	High Explosives
SWMU 07-001(a)					
0507-96-0029	07-04041	0.0–0.5	Soil	1906*	1907
0507-96-0030	07-04041	2.75–3.0	Soil	1906	1907
0507-96-0031	07-04042	0.0–0.50	Soil	1906	1907
0507-96-0032	07-04042	2.33–3.0	Soil	1906	1907
0507-96-0033	07-04043	0.0–0.5	Soil	1906	1907
0507-96-0034	07-04043	2.33–3.0	Soil	1906	1907
0507-96-0035	07-04044	0.0–0.5	Soil	1906	1907
0507-96-0036	07-04044	2.5–3.17	Soil	1906	1907
0507-96-0037	07-04045	0.0–0.5	Soil	1906	1907
0507-96-0038	07-04045	2.5–3.17	Soil	1906	1907
0507-96-0039	07-04046	0.0–0.5	Soil	1906	1907
0507-96-0041	07-04046	2.5–3.17	Soil	1906	1907
SWMU 07-001(b)					
0507-96-0042	07-04047	0.0–0.5	Soil	1906	1907
0507-96-0043	07-04047	2.5–3.17	Soil	1906	1907
0507-96-0044	07-04048	0.0–0.5	Soil	1906	1907
0507-96-0045	07-04048	2.5–3.17	Soil	1906	1907
0507-96-0046	07-04049	0.0–0.5	Soil	1906	1907
0507-96-0047	07-04049	2.5–3.17	Soil	1906	1907
0507-96-0048	07-04050	0.0–0.5	Soil	1906	1907
0507-96-0049	07-04050	2.5–3.17	Soil	1906	1907
0507-96-0050	07-04051	0.0–0.5	Soil	1906	1907
0507-96-0051	07-04051	2.58–3.25	Soil	1906	1907
0507-96-0052	07-04052	0.0–0.5	Fill	1906	1907
0507-96-0053	07-04052	2.58–3.25	Fill	1906	1907

* Request number.

Table 4.3-2
Organic Chemicals Detected at Former TA-07

Sample ID	Location ID	Depth (ft)	Media	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzoic Acid	Chloronaphthalene[2-]	Di-n-octylphthalate	Dichlorobenzene[1,2-]	Dichlorobenzene[1,3-]
SWMU 07-001(a)										
0507-96-0033	07-04043	0.0–0.5	Soil	—*	—	0.187 (J)	—	—	—	—
SWMU 07-001(b)										
0507-96-0042	07-04047	0.0–0.5	Soil	0.055 (J)	0.08 (J)	—	0.267 (J)	0.12 (J)	0.32 (J)	0.312 (J)
0507-96-0043	07-04047	2.5–3.17	Soil	—	—	—	—	—	—	—
0507-96-0044	07-04048	0.0–0.5	Soil	—	—	—	—	—	—	—
0507-96-0045	07-04048	2.5–3.17	Soil	—	—	—	—	—	—	—
0507-96-0046	07-04049	0.0–0.5	Soil	—	—	—	—	—	—	—
0507-96-0048	07-04050	0.0–0.5	Soil	—	—	—	—	—	—	—
0507-96-0052	07-04052	0.0–0.5	Fill	—	—	—	—	—	—	—

Table 4.3-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Diethylphthalate	Hexachlorobenzene	Phenanthrene	Pyrene	RDX	Tetryl	Trichlorobenzene[1,2,4-]
SWMU 07-001(a)										
0507-96-0033	07-04043	0.0–0.5	Soil	—	—	—	—	—	—	—
SWMU 07-001(b)										
0507-96-0042	07-04047	0.0–0.5	Soil	—	0.268 (J)	0.14 (J)	0.188 (J)	—	—	0.368 (J)
0507-96-0043	07-04047	2.5–3.17	Soil	—	—	—	—	—	1.5	—
0507-96-0044	07-04048	0.0–0.5	Soil	—	—	—	—	1.0	—	—
0507-96-0045	07-04048	2.5–3.17	Soil	—	—	—	—	1.0	—	—
0507-96-0046	07-04049	0.0–0.5	Soil	—	—	—	—	1.0	—	—
0507-96-0048	07-04050	0.0–0.5	Soil	—	—	—	—	1.0	—	—
0507-96-0052	07-04052	0.0–0.5	Fill	0.041 (J)	—	—	—	1.0	—	—

Notes: Units are mg/kg. Data qualifiers are defined in Appendix A.

* — = Result was not detected.

Table 4.4-1
Summary of Samples Collected and Analyses Requested at TA-22

Sample ID	Location ID	Depth (ft)	Media	Metals	Cyanide	VOCs	SVOCs	High Explosives
SWMU 22-010(a)								
0522-97-0001	22-06061	4.33–5.0	Soil	3050R[a]	—[b]	3049R	3049R	3051R
0522-97-0002	22-06061	7.33–8.0	Soil	3050R	—	3049R	3049R	3051R
0522-97-0003	22-06062	3.0–3.67	Soil	3050R	—	3049R	3049R	3051R
0522-97-0004	22-06062	6.0–6.67	Soil	3050R	—	3049R	3049R	3051R
0522-97-0005	22-06063	4.83–5.5	Soil	3050R	—	3049R	3049R	3051R
0522-97-0006	22-06063	7.0–7.67	Soil	3050R	—	3049R	3049R	3051R
SWMU 22-015(a)								
0522-97-0010	22-06064	27.67–28.5	Soil	3074R	3074R	3073R	—	3075R
0522-97-0011	22-06064	29.0–30.0	Sed	3074R	3074R	3073R	—	3075R
0522-97-0014	22-06065	20.5–21.5	Sed	3074R	3074R	3073R	—	3075R
0522-97-0015	22-06065	23.0–24.0	Sed	3074R	3074R	3073R	—	3075R
SWMU 22-015(b)								
0522-97-0021	22-03024	0.0–0.5	Soil	—	—	3081R	—	3082R
0522-97-0022	22-03024	3.0–3.5	Soil	—	—	3081R	—	3082R
0522-97-0023	22-03024	3.5–4.0	Soil	—	—	3081R	—	3082R
0522-97-0018	22-03027	0.0–0.5	Soil	—	—	3081R	—	3082R
0522-97-0019	22-03027	3.5–4.5	Soil	—	—	3081R	—	3082R
0522-97-0020	22-03027	7.0–7.5	Qbt 4	—	—	3081R	—	3082R
0522-97-0024	22-06066	0.0–0.5	Sed	—	—	3081R	—	3082R
0522-97-0025	22-06066	1.33–2.0	Soil	—	—	3081R	—	3082R
0522-97-0026	22-06067	0.0–0.5	Sed	—	—	3081R	—	3082R
0522-97-0027	22-06067	2.0–2.67	Soil	—	—	3081R	—	3082R
0522-97-0028	22-06068	0.0–0.5	Sed	—	—	3081R	—	3082R
0522-97-0029	22-06068	0.67–1.33	Qbt 4	—	—	3081R	—	3082R

[a] Request numbers.

[b] — = Analysis not requested.

Table 4.4-2
Inorganic Chemicals above BVs at TA-22

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Cobalt	Copper	Manganese	Selenium	Silver
Soil BV[a]				**0.83**	**295**	**0.4**	**8.64**	**14.7**	**671**	**1.52**	**1**
Sediment BV[a]				**0.83**	**127**	**0.4**	**4.73**	**11.2**	**543**	**0.3**	**1**
SWMU 22-010(a)											
0522-97-0001	22-06061	4.33–5.0	Soil	5.8 (U)	—[b]	0.58 (U)	—	—	—	—	—
0522-97-0002	22-06061	7.33–8.0	Soil	6.49 (U)	—	0.649 (U)	—	—	—	—	—
0522-97-0003	22-06062	3.0–3.67	Soil	6 (U)	—	0.6 (U)	—	—	—	—	—
0522-97-0004	22-06062	6.0–6.67	Soil	5.61 (U)	—	0.561 (U)	26.9	—	1320 (J+)	—	—
0522-97-0005	22-06063	4.83–5.5	Soil	6.92 (U)	374	0.692 (U)	12.4	—	1360 (J+)	—	—
0522-97-0006	22-06063	7.0–7.67	Soil	6.51 (U)	—	0.651 (U)	—	—	—	—	—
SWMU 22-015(a)											
0522-97-0010	22-06064	27.67–28.5	Soil	4.9 (U)	—	0.83 (U)	—	122	—	—	—
0522-97-0011	22-06064	29.0–30.0	Sed	4.9 (U)	—	0.83 (U)	—	—	—	0.88 (U)	1.6 (J)
0522-97-0014	22-06065	20.5–21.5	Sed	5 (U)	—	0.91 (J)	—	126	—	0.89 (U)	—
0522-97-0015	22-06065	23.0–24.0	Sed	4.9 (U)	—	0.82 (U)	—	127	—	0.87 (U)	—

Notes: Units are mg/kg. Data qualifiers are defined in Appendix A.

[a] BVs from LANL 1998, 059730.

[b] — = Result was not detected or was below the BV.

Table 4.4-3
Organic Chemicals Detected at TA-22

Sample ID	Location ID	Depth (ft)	Media	Acetone	Di-n-butylphthalate	Dinitrotoluene[2,4-]	Methylene Chloride	Tetryl	Toluene	Trichlorofluoromethane
SWMU 22-010(a)										
0522-97-0001	22-06061	4.33–5.0	Soil	—[a]	—	—	0.003 (J)	—	—	0.003 (J)
0522-97-0002	22-06061	7.33–8.0	Soil	—	—	—	0.003 (J)	—	—	0.002 (J)
0522-97-0003	22-06062	3.0–3.67	Soil	—	0.47	—	0.003 (J)	—	—	0.002 (J)
0522-97-0004	22-06062	6.0–6.67	Soil	—	0.76	—	0.003 (J)	—	—	0.002 (J)
0522-97-0005	22-06063	4.83–5.5	Soil	—	—	—	0.006	—	—	0.008
0522-97-0006	22-06063	7.0–7.67	Soil	—	—	—	0.005	—	—	0.006
SWMU 22-015(a)										
0522-97-0011	22-06064	29.0–30.0	Sed	0.026	NA[b]	—	—	—	—	—
0522-97-0014	22-06065	20.5–21.5	Sed	0.008 (J)	NA	—	—	—	—	—
SWMU 22-015(b)										
0522-97-0023	22-03024	3.5–4.0	Soil	—	NA	—	—	—	0.0068 (J)	—
0522-97-0028	22-06068	0.0–0.5	Sed	—	NA	—	—	0.428	—	—
0522-97-0029	22-06068	0.67–1.33	Qbt 4	—	NA	5.83	—	—	—	—

Notes: Units are mg/kg. Data qualifiers are defined in Appendix A.

[a] — = Not detected.

[b] NA = Not analyzed.

Table 4.5-1
Summary of Samples Collected and Analyses Requested at TA-40

Sample ID	Location ID	Depth (ft)	Media	VOCs	High Explosives
SWMU 40-005					
0540-96-0001	40-03048	0.0–0.5	Soil	1915[a]	1917
0540-96-0002	40-03048	4.58–5.25	Soil	1915	1917
0540-96-0003	40-03048	7.5–8.17	Soil	1915	1917
0540-96-0004	40-03049	0.0–0.5	Soil	1915	1917
0540-96-0005	40-03049	4.67–5.17	Soil	1915	1917
0540-96-0006	40-03049	7.5–8.0	Soil	1915	1917
0540-96-0007	40-03050	0.0–0.5	Soil	1915	1917
0540-96-0008	40-03050	4.67–5.33	Soil	1915	1917
0540-96-0009	40-03050	7.0–7.5	Soil	1915	1917
0540-96-0010	40-03051	0.0–0.5	Soil	1915	1917
0540-96-0011	40-03051	4.67–5.33	Soil	1915	1917
0540-96-0012	40-03051	7.33–8.0	Soil	1915	1917
0540-96-0013	40-03052	0.0–0.5	Soil	1915	1917
0540-96-0014	40-03052	4.5–5.0	Soil	1915	1917
0540-96-0015	40-03052	7.5–8.0	Soil	1915	1917
0540-96-0017	40-03053	0.0–0.5	Soil	—	1917
0540-96-0018	40-03054	0.0–0.5	Soil	—	1917
0540-96-0019	40-03055	0.0–0.5	Soil	—	1917
0540-96-0021	40-03056	0.0–0.5	Sed	1915	1917
0540-96-0022	40-03057	0.0–0.5	Sed	1915	1917
0540-96-0023	40-03058	0.0–0.5	Sed	1915	1917
0540-96-0024	40-03059	0.0–0.5	Sed	1915	1917
0540-96-0025	40-03060	0.0–0.5	Sed	1915	1917
0540-96-0026	40-03061	0.0–0.5	Sed	1915	1917

[a] Request number.

[b] — = analysis not requested.

Table 4.5-2
Organic Chemicals Detected at TA-40

Sample ID	Location ID	Depth (ft)	Media	Acetone	Methylene Chloride
SWMU 40-005					
0540-96-0001	40-03048	0.0–0.5	Soil	0.006 (J-)	—*
0540-96-0002	40-03048	4.58–5.25	Soil	0.014 (J+)	—
0540-96-0003	40-03048	7.5–8.17	Soil	0.006 (J)	—
0540-96-0004	40-03049	0.0–0.5	Soil	0.01 (J)	—
0540-96-0005	40-03049	4.67–5.17	Soil	0.004 (J)	—
0540-96-0006	40-03049	7.5–8.0	Soil	0.004 (J-)	—
0540-96-0007	40-03050	0.0–0.5	Soil	0.021 (J)	0.004 (J)
0540-96-0008	40-03050	4.67–5.33	Soil	0.055	—

Notes: Units are mg/kg. Data qualifiers are defined in Appendix A.

* — = Not detected.

Table 5.0-1
Summary of Investigation Methods

Method	Summary
Locating Utilities	Excavation/Soil Disturbance Permits will be obtained from the Industrial Hygiene and Safety–Operational Support Division. Underground utilities will be located, and the excavation permits secured before the readiness and planning review and before any field activities at the Twomile Canyon Aggregate Area are undertaken.
Spade-and-Scoop Collection of Soil Samples	This method will be used to collect surface (i.e., 0–1 ft) soil or fill samples. A hole will be dug to the desired depth, as prescribed in the work plan, and a discrete grab sample collected. The sample will be homogenized in a decontaminated stainless-steel bowl before it is transferred to the appropriate sample containers.
Hand Auger Collection of Soil Samples	This method will typically be used for sampling soil or sediment at depths of less than 10–15 ft but may in some cases be used for collecting samples of weathered or nonwelded tuff. The method involves hand-turning a stainless-steel bucket auger (typically 3–4 in. inside diameter [I.D.]), creating a vertical hole which can be advanced to the desired sample depth. When the desired depth is reached, the auger is decontaminated before advancing the hole through the sample depth. The sample material is transferred from the auger bucket to a stainless-steel sampling bowl before filling the various required sample containers.
Split-Spoon Core-Barrel Sampling	The split-spoon core barrel is a cylindrical barrel split lengthwise so that the two halves can be separated to expose the core sample. The stainless-steel core barrel (3-in.-inner-diameter and 5 ft long) is pushed directly into the subsurface media with a hollow-stem auger drilling rig. A continuous length of core is extracted with the core barrel. Once it is extracted, the section of core will be screened for radioactivity and organic vapors, photographed, and described in a lithologic log. If it is located within a targeted sample interval, a portion of the core will be collected for fixed laboratory analysis.

Table 5.0-1 (continued)

Method	Summary
Field Logging, Handling, and Documentation of Borehole Materials	Upon reaching the surface, core barrels will be immediately opened for field-screening, logging, and sampling. Logging of borehole materials includes run number, core recovery in feet, depth interval (in 5-ft increments), field-screening results, lithological and structural description, and a photograph. Once the core material is logged, selected samples will be taken from discrete intervals of the core. All borehole material not sampled will be managed as IDW.
Borehole Abandonment	Shallow boreholes, with a total depth of 20 ft or less, will be abandoned by filling the borehole with bentonite chips and then hydrating the chips in 1- to 2-ft lifts. The borehole will be visually inspected while the bentonite chips are being added to ensure bridging does not occur. Boreholes greater than 20 ft in depth will be pressure-grouted from the bottom of the borehole to the surface using the tremie pipe method. Acceptable grout materials include cement or bentonite grout, neat cement, or concrete. The use of backfill materials such as bentonite and grout will be documented in a field logbook with regard to volume (calculated and actual), intervals of placement, and additives used to enhance backfilling. All borehole abandonment information will be presented in the investigation report.
Geophysical Surveys	Geophysical surveys will be performed at selected sites to identify anomalies that would indicate the location of former waste disposal sites. Geophysical methods employed will include terrain conductivity (EM-31 or equivalent), high-sensitivity metal detection (EM-61 or equivalent), and GPR. The area to be surveyed will be gridded as specified in the work plan and data will be digitally recorded. Geodetic coordinates will be recorded at 1-second intervals using an integrated GPS.
Headspace Vapor Screening	All soil and tuff samples will be field screened for VOCs by placing a portion of the sample in a glass jar. The jar will be sealed with foil and gently shaken and allowed to equilibrate for approximately 5 min. The sample will then be screened by inserting a PID probe equipped with an 11.7-eV lamp into the container. The results will be recorded in units of ppm.
XRF Screening	Soil samples will be screened in the field using XRF to delineate areas of inorganic chemical contamination. The XRF used will have a diction limit equal to approximately 10 to 20% of the soil screening level for major site contaminants. Samples will be collected and analyzed in accordance with the XRF manufacturer's instructions, including analysis of standards and other QA/QC samples.
HE Field Screening	EnSys™ RDX and TNT test kits will be used to field screen soil samples quantitatively for RDX, TNT, and related compounds. Soil samples will be extracted with solvent and the extract will be analyzed colorimetrically to determine the concentration of explosive in the sample.
UXO Surveys	Visual UXO surveys will be performed by trained UXO technicians to identify unexploded detonators or associated debris. Surveys will be accomplished by walking survey lines with several trained personnel positioned approximately arms-length apart. Hand-held metal detectors may be used to identify metallic debris in areas overgrown with brush that cannot be visually inspected.
Handling, Packaging, and Shipping of Samples	Samples will be sealed and labeled before being packed in ice. Sample and transport containers will be examined to ensure they are free of external contamination. Samples will be packaged to minimize the possibility of breakage during transport. After environmental samples are collected, packaged, and preserved, they will be transported to the SMO. A split of each sample will be sent to an SMO-approved radiation-screening laboratory under chain of custody (COC). Once radiation-screening results are received, the SMO will send the corresponding analytical samples to fixed laboratories for full analysis.

Table 5.0-1 (continued)

Method	Summary
Containers and Preservation of Samples	Specific requirements/processes for sample containers, preservation techniques, and holding times are based on EPA guidance for environmental sampling, preservation, and QA. Specific requirements for each sample will be printed in the sample collection logs (SCLs) provided by the SMO (size and type of container, preservatives, etc.). All samples will be preserved by placing them in insulated containers with ice to maintain a temperature of 4°C.
Sample Control and Field Documentation	The collection, screening, and transport of samples will be documented on standard forms generated by the SMO. These forms include SCLs, COC forms, and sample container labels. Collection logs will be completed at the time the samples are collected and signed by the sampler and a reviewer who verifies that the logs are complete and accurate. Corresponding labels will be initialed and applied to each sample container, and custody seals will be placed around container lids or openings. The COC forms will be completed and assigned to verify that the samples are not left unattended.
Coordinating and Evaluating Geodetic Surveys	Geodetic surveys will focus on obtaining survey data of acceptable quality to use during project investigations. Geodetic surveys will be conducted with a Trimble 5700 DGPS. The survey data will conform to Laboratory Information Architecture project standards IA-CB02, "GIS Horizontal Spatial Reference System," and IA-D802, "Geospatial Positioning Accuracy Standard for A/E/C/ and Facility Management." All coordinates will be expressed as State Plane Coordinate System, North American Datum 83, New Mexico Central Zone, U.S. survey ft. All elevation data will be reported relative to the National Geodetic Vertical Datum of 1983.
Management, Characterization, and Storage of IDW	The IDW will be managed, characterized, and stored in accordance with an approved Waste characterization strategy form that documents site history, field activities, and the characterization approach for each waste stream managed. Waste characterization will comply with on-site or off-site waste acceptance criteria, as appropriate. All stored IDW will be marked with appropriate signs and labels. Each waste generated container will be individually labeled with waste classification, item ID, and radioactivity (if applicable) immediately following containerization. All waste will be segregated by classification and compatibility to prevent cross-contamination.
Field Quality Control Samples	Field QC samples will be collected as follows. Field duplicate samples and equipment blanks will be collected at a frequency of 10%. Field duplicates and equipment blanks will be collected at the same time as a regular sample and submitted for the same analyses. Trip blanks will be collected whenever samples were collected for VOC analysis. Trip blanks will be collected at a frequency of one sample per day when VOC samples are collected. Trip-blank containers will consist of certified clean sand that are opened and kept with the other sample containers during the sampling process.
Field Decontamination of Equipment	Dry decontamination will be the preferred method at the Twomile Canyon Aggregate Area to minimize generating liquid waste. Dry decontamination will include using a wire brush or other tool to remove soil or other material adhering to the sampling equipment, followed by applying a commercial cleaning agent (i.e., Fantastik) and paper wipes.

Table 6.2-1
Twomile Canyon Aggregate Area Sites with Stormwater Monitoring

Site	MSGP SMAs	IP SMAs
SWMU 03-001(k)	—*	2M-SMA-1.8
SWMU 03-003(a)	—	2M-SMA-1.9
AOC 03-003(k)	—	2M-SMA-2.2
SWMU 03-010(a)	2M-SMA-1	2M-SMA-1
SWMU 03-050(d)	—	2M-SMA-2
SWMU 03-054(b)	2M-SMA-2	2M-SMA-2
SWMU 03-055(a)	2M-SMA-1.7	2M-SMA-1.7
SWMU 06-001(a)	—	2M-SMA-1.42
SWMU 06-001(b)	—	2M-SMA-1.44
SWMU 06-003(h)	—	2M-SMA-1.67
SWMU 06-006	—	2M-SMA-1.45
SWMU 06-007(g)	2M-SMA-1.6	—
SWMU 07-001(a)	—	2M-SMA-3
SWMU 07-001(b)	2M-SMA-3	2M-SMA-3
SWMU 07-001(c)	2M-SMA-3	2M-SMA-3
SWMU 07-001(d)	2M-SMA-3	2M-SMA-3
SWMU 22-014(a)	—	2M-SMA-1.43
SWMU 22-014(b)	2M-SMA-1.5	2M-SMA-1.5
SWMU 22-015(a)	—	2M-SMA-1.43
SWMU 40-005	—	2M-SMA-1.65

* — = Site not included in SMA.

Appendix A

Acronyms and Abbreviations,
Metric Conversion Table, and Data Qualifier Definitions

A-1.0 ACRONYMS AND ABBREVIATIONS

AK	acceptable knowledge
AOC	area of concern
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
BH	borehole
BTEX	benzene, toluene, ethylbenzene, and xylene
BV	background value
CEARP	Comprehensive Environmental Assessment and Response Program
CFR	Code of Federal Regulations
CMR	Chemical and Metallurgical Research (building)
COPC	chemical of potential concern
DCA	dichloroethane
DCE	dichloroethene
DDE	dichlorophenyltrichloroethylene
DOE	Department of Energy (U.S.)
DRO	diesel range organic
EM	electromagnetic
EP	Environmental Programs Directorate
EPA	Environmental Protection Agency (U.S.)
FFCA	Federal Facility Compliance Act
FV	fallout value
GPR	ground-penetrating radar
GPS	global-positioning system
HE	high explosives
HEPA	high-efficiency particulate air
HIR	historical investigation report
HSWA	Hazardous and Solid Waste Amendments
HWFP	Hazardous Waste Facility Permit
IDW	investigation-derived waste
IP	individual permit
LANL	Los Alamos National Laboratory
LLW	low level waste
MDA	material disposal area

MLLW	mixed low-level waste
MSGP	Multi-Sector General Permit
NFA	no further action
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NOI	notice of intent
NPDES	National Pollutant Discharge Elimination System
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PBX	plastic-bonded explosive
PCB	polychlorinated biphenyl
PETN	pentaerythritol tetranitrate
PID	photoionization detector
PPE	personal protective equipment
ppm	part per million
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RFI	RCRA facility investigation
RLW	radioactive liquid waste
RLWTF	Radioactive Liquid Waste Treatment Facility
SAA	satellite accumulation area
SAL	screening action level
SCL	sample collection log
SDPPP	Site Drainage Pollution Prevention Program
SMA	site-monitoring areas
SOP	standard operating procedure
SSL	soil screening level
SVOC	semivolatile organic compound
SWMU	solid waste management unit
SWSC	Sanitary Wastewater Systems Consolidated Plant
TA	technical area
TAL	target analyte list
TCA	trichloroethane

TCE	trichloroethene
TNT	2,4,6-trinitrotoluene
TRPH	total recoverable petroleum hydrocarbons
UXO	unexploded ordnance
VCA	voluntary corrective action
VOC	volatile organic compound
WAC	waste acceptance criteria
WCSF	waste characterization strategy form
WWTP	wastewater treatment plant
XRF	x-ray fluorescence

A-2.0 METRIC CONVERSION TABLE

Multiply SI (Metric) Unit	by	To Obtain U.S. Customary Unit
kilometers (km)	0.622	miles (mi)
kilometers (km)	3281	feet (ft)
meters (m)	3.281	feet (ft)
meters (m)	39.37	inches (in.)
centimeters (cm)	0.03281	feet (ft)
centimeters (cm)	0.394	inches (in.)
millimeters (mm)	0.0394	inches (in.)
micrometers or microns (µm)	0.0000394	inches (in.)
square kilometers (km^2)	0.3861	square miles (mi^2)
hectares (ha)	2.5	acres
square meters (m^2)	10.764	square feet (ft^2)
cubic meters (m^3)	35.31	cubic feet (ft^3)
kilograms (kg)	2.2046	pounds (lb)
grams (g)	0.0353	ounces (oz)
grams per cubic centimeter (g/cm^3)	62.422	pounds per cubic foot (lb/ft^3)
milligrams per kilogram (mg/kg)	1	parts per million (ppm)
micrograms per gram (µg/g)	1	parts per million (ppm)
liters (L)	0.26	gallons (gal.)
milligrams per liter (mg/L)	1	parts per million (ppm)
degrees Celsius (°C)	9/5 + 32	degrees Fahrenheit (°F)

A-3.0 DATA QUALIFIER DEFINITIONS

Data Qualifier	Definition
U	The analyte was analyzed for but not detected.
J	The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.
J+	The analyte was positively identified, and the result is likely to be biased high.
J-	The analyte was positively identified, and the result is likely to be biased low.
UJ	The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.
R	The data are rejected as a result of major problems with quality assurance/quality control (QA/QC) parameters.

Appendix B

Management Plan for Investigation-Derived Waste

B-1.0 INTRODUCTION

This appendix describes how investigation-derived waste (IDW) generated during the Twomile Canyon Aggregate Area investigation will be managed by Los Alamos National Laboratory (the Laboratory). IDW may include, but is not limited to, drill cuttings, excavated media, excavated man-made debris, contact waste, decontamination fluids, and all other waste that has potentially come into contact with contamination.

B-2.0 IDW

All IDW generated during investigation activities will be managed in accordance with the current version of Standard Operating Procedure (SOP) 5238, Characterization and Management of Environmental Program Waste. This SOP incorporates the requirements of applicable U.S. Environmental Protection Agency (EPA) and New Mexico Environment Department (NMED) regulations, U.S. Department of Energy (DOE) orders, and Laboratory requirements.

The most recent version of the Laboratory's Hazardous Waste Minimization Report will be implemented during the investigation to minimize waste generation. The Hazardous Waste Minimization Report is updated annually as a requirement of Module VIII of the Laboratory's Hazardous Waste Facility Permit.

A waste characterization strategy form (WCSF) will be prepared and approved per requirements of SOP-5238, Characterization and Management of Environmental Program Waste. The WCSF will provide detailed information on IDW characterization methods, management, containerization, and potential volumes. IDW characterization is completed through review of investigation data and/or documentation or by direct sampling. Waste characterization may include a review of historical information and process knowledge to identify whether listed hazardous waste may be present (i.e., due diligence reviews). If low levels of listed hazardous waste are identified, a "contained in" determination may be submitted for approval to NMED. Moderate amounts of material may potentially be excavated during the remediation of portions of Solid Waste Management Units (SWMUs) 06-001(a), 06-001(b), 22-010(a), 22-014(a), 22-014(b), 22-015(a), 22-015(b), and 40-001(b). To facilitate the staging and segregation of these materials, the Laboratory may submit area of contamination designation requests for these sites to NMED for approval. The need for area of contamination designations for these sites will be evaluated based on the results of preliminary field-screening activities and waste characterization results from samples collected at each site before excavation activities begin. The request will specify the boundaries of the proposed areas of contamination and describe the activities to be conducted within the boundaries.

Wastes will be containerized and placed in clearly marked and appropriately constructed waste accumulation areas. If IDW is generated within the boundary of an area of contamination, it will be managed as nonhazardous within those boundaries in designated, properly constructed waste management areas. If hazardous, the IDW will be managed in accordance with hazardous waste requirements once it is removed from the area of contamination. If IDW is generated outside area of contamination boundaries, the initial management of the waste will rely on the data from previous investigations and/or process knowledge. If new analytical data changes the expected waste category, the waste will be managed in accumulation areas appropriate to the final waste determination. Waste accumulation area postings, regulated storage duration, and inspection requirements will be based on the type of IDW and its classification. Container and storage requirements will be detailed in the WCSF and approved before the waste is generated. Table B-2.0-1 summarizes how waste is expected to be managed. The waste streams anticipated to be generated during work plan implementation are described below.

B-2.1 Drill Cuttings

This waste stream consists of soil and rock chips generated by the drilling of boreholes with the intent to sample. Drill cuttings include excess core sample not submitted for analysis and any returned samples sent for analysis. Drill cuttings will be containerized in 20 yd^3 rolloff containers, 55-gal. drums, B-12 containers, or other appropriate containers at the point of generation.

Cuttings will be land applied if they meet the criteria in the NMED-approved Notice of Intent (NOI) Decision Tree for Land Application of Investigation Derived Waste Solids from Construction of Wells and Boreholes. This waste stream will be characterized based either on direct sampling of the waste or on the results from core samples collected during drilling. If directly sampled, the following analyses will be performed: volatile organic compounds (VOCs); semivolatile organic compounds (SVOCs); cyanide, nitrate, explosive compounds and perchlorate (if screening and/or process knowledge indicates the presence of explosives); radionuclides as identified for each site in the work plan; total metals; and, if needed, toxicity characteristic metals. If process knowledge, odors, or staining indicates the cuttings may be contaminated with petroleum products, the materials will also be analyzed for total petroleum hydrocarbons (TPH) and polychlorinated biphenyls (PCBs). Other constituents may be analyzed as necessary to meet the waste acceptance criteria (WAC) for a receiving facility. The Laboratory expects most cuttings will be land applied or disposed of as a low-level waste (LLW); however, the waste may also be classified as hazardous, mixed low-level waste (MLLW), or PCB waste. All wastes will be treated/disposed of at an authorized on-site or off-site facility appropriate for the waste classification.

B-2.2 Excavated Environmental Media

Layback and overburden spoils (including environmental media mixed with buried debris) will consist of soil and rock removed from within or next to (e.g., from benching to stabilize a trench) areas within the SWMUs that are to be excavated. This material will be field screened for high explosives (HE), radioactivity and/or VOCs during the excavation process. If contamination is not detected during screening, the spoils will be stored either in rolloff bins other suitable containers, or on the ground surface with appropriate best management practices. If field screening indicates the potential for contamination, the layback and overburden spoils will be placed in rolloff bins or other suitable containers. The spoils will remain within the area of contamination boundary of the SWMU from which they were excavated, awaiting analytical results. Incremental samples of the spoils will be collected as the spoils are excavated or the media may be sampled in piles or containers. A minimum of one sample will be collected for every 100 yd^3. The samples will be analyzed for VOCs; target analyte list (TAL) metals; nitrate, cyanide, explosive compounds, and perchlorate if screening and/or process knowledge indicates the presence of explosives; radionuclides, as identified for each site in the work plan; and toxicity characteristic metals, as needed. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility. If odors or staining is present, the spoils may be contaminated with petroleum products; if so, the materials will also be analyzed for TPH and PCBs. If the spoils are determined to be suitable for reuse (i.e., meets residential cleanup standards as determined using NMED's and DOE's soil screening guidance), the Laboratory may use the soil to backfill the bottom of the excavations. If the spoils are not suitable for reuse, they will be treated/disposed of at an authorized facility appropriate for the waste regulatory classification. Based on existing data, the Laboratory expects the spoils that cannot be reused to be designated as industrial waste or LLW; however, the waste may also be classified as hazardous, MLLW, or PCB waste. All wastes will be treated/disposed of at an authorized on-site or off-site facility appropriate for the waste classification.

B-2.3 Excavated and/or Removed Man-made Debris

Excavated man-made debris will be generated from the removal of three septic tanks, two sumps, and the surface infrastructure associated with inactive seepage pits at three sites. The debris will be segregated as it is excavated and/or removed, to the extent practical, based on factors such as the type and size of debris, the type of alternative treatment technology that would be used to treat the debris, field screening, process knowledge, and/or staining or odors. Where practicable, this waste stream will be characterized by direct sampling of the waste (e.g., concrete). Direct samples will be analyzed for VOCs, SVOCs, explosive compounds, and perchlorate (if field screening or process knowledge indicates the presence of explosives), radionuclides (as identified for each site in the work plan), total metals, and, if needed, toxicity characteristic metals. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility or if the work plan or visual observations indicate other contaminants may be present (e.g., PCBs or asbestos). For debris that is difficult to characterize; acceptable knowledge (AK) will be used whenever possible, supplemented by sampling as needed. Sampling methods will often have to be identified on a case-by-case basis by qualified sampling personnel, and these sampling decisions will be documented in the field activity notebook.

Waste minimization will be implemented, where practicable, through segregation of waste materials. Nonhazardous and non-radioactive materials will be recycled, if practicable.

The types of debris expected to be excavated from each SWMU are identified in sections.B-2.3.1 through B-2.3.3.

B-2.3.1 Excavated Waste from SWMUs 06-001(a) and 06-001(b)

This waste stream will consist of debris from two abandoned concrete septic tanks (e.g., piping, metal, concrete reinforced with steel rebar and wood) and possibly contaminated soil. The septic tanks [SWMUs 06-001(a), and 06-001(b)] were abandoned in place, and sludge was found to be present in both tanks during the 1994 Phase I Resource Conservation and Recovery Act facility investigation (RFIs). Any waste remaining in the tanks will be sampled and analyzed before it is removed. The waste will then be containerized (e.g., in 55-gal. drums) and managed in accordance with applicable Laboratory waste management requirements based on the waste characterization results. The interiors of both tanks will be pressure-washed and chip-sampled for waste characterization purposes before the tanks are removed; wastes generated from steam cleaning are discussed in section B-2.5. Other components will be characterized based on the chip or sludge samples. To the extent practicable, soil will be brushed off or otherwise removed from the debris. Soil at locations with elevated HE, VOCs, and/or metals based on field screening within the septic tank excavations will be excavated.

The excavated debris will be placed in containers (e.g., rolloff bins) at the site and will be managed in accordance with applicable Laboratory waste management requirements based on the waste characterization results. Any soil generated will be managed as described in section B-2.2. The Laboratory expects most of this waste to be designated as industrial waste or hazardous waste. All wastes will be treated/disposed of at an authorized on-site or off-site facility appropriate for the waste classification.

B-2.3.2 Excavated Waste from SWMU 22-010(a)

This waste stream will consist of debris from one abandoned septic tank (e.g., piping, metal, concrete reinforced with steel rebar and wood) and possibly contaminated soil. The septic tank [SWMU 22-010(a)] was abandoned in place, and sludge was found to be present in the tank during the 1994 Phase I RFI.

Any waste remaining in the tank will be sampled and analyzed before it is removed. The waste will be containerized (e.g., in 55-gal. drums) and managed in accordance with applicable Laboratory waste management requirements based on the waste characterization results. The interior of the tank will be pressure-washed and chip-sampled for waste characterization purposes before the tank is removed; wastes generated from steam cleaning are discussed in section B-2.5. Components that cannot be chip-sampled will be characterized using the concrete or sludge sampling. To the extent practicable, soil will be brushed off or otherwise removed from the debris. Soil at locations with elevated HE, VOCs, radioactivity, and/or metals based on field screening within the septic tank excavation will be excavated.

The excavated materials will be placed in containers (e.g., rolloff bins) at the site. The debris will be managed in accordance with applicable Laboratory waste management requirements based on the waste characterization results. Any soil generated will be managed as described in section B-2.2. The Laboratory expects most of this waste to be designated as industrial waste, LLW, or hazardous waste; however, the waste may also be classified as MLLW. All wastes will be treated/disposed of at an authorized on-site or off-site facility appropriate for the waste classification.

B-2.3.3 Removed Debris from SWMUs 22-014(a) and 22-015(a)

This waste stream will consist of the surface infrastructure (including the metal manhole covers, metal and/or concrete subsurface vault, metal filter basket, and associated metal vent piping) associated with inactive seepage pits at SWMUs 22-014(a) and 22-015(b). The removed infrastructure components will be placed in containers (e.g., rolloff bins) at the site and managed in accordance with applicable Laboratory waste management requirements based on the waste characterization results. This debris will be field-screened for HE, VOCs, and radioactivity and swipe samples will be collected as necessary. Since most of this waste can be decontaminated, the Laboratory expects most of this waste to be designated as industrial waste that could be recycled. All wastes will be treated/disposed of at an authorized on-site or off-site facility appropriate for the waste classification.

B-2.3.4 Excavated Waste from SWMUs 22-014(b) and 22-015(b)

This waste stream will consist of debris from two abandoned sumps (e.g., piping, metal, and concrete reinforced with steel rebar) and possibly contaminated soil. The sumps [SWMUs 22-014(b) and 22-015(a)] were abandoned in place and found to be empty during the 1994 Phase I RFIs; however, any waste remaining in the tanks will be sampled and analyzed before it is removed. The waste will then be containerized (e.g., in 55-gal. drums) and managed in accordance with applicable Laboratory waste management requirements based on the waste characterization results. The interior of both sumps will be pressure-washed and chip-sampled for waste characterization purposes before the sumps are removed; wastes generated from steam cleaning are discussed in section B-2.5. The other components will be characterized based on the chip or sludge samples. To the extent practicable, soil will be brushed off or otherwise removed from the debris. Soil at locations with elevated HE, VOCs, radioactivity, and/or metals based on field screening within the sump excavations will be excavated.

The excavated materials will be placed in containers (e.g., rolloff bins) at the sites. The debris will be managed in accordance with applicable Laboratory waste management requirements based on the waste characterization results. Any soil generated will be managed as described in section B-2.2. The Laboratory expects most of this waste to be designated as industrial waste or hazardous waste; however, the waste may also be classified as MLLW. All wastes will be treated/disposed of at an authorized on-site or off-site facility appropriate for the waste classification.

B-2.3.5 Excavated Waste from SWMU 40-001(b)

This waste stream will consist of debris from a distribution box and surface infrastructure (including the manhole cover, subsurface vault, filter basket and associated vent piping) associated with an inactive seepage pit and possibly contaminated soil. The distribution box and seepage pit surface infrastructure [SWMU 40-001(b)] were abandoned in place and found to be empty during the 1994 Phase I RFI; however, any waste remaining in the distribution box will be sampled and analyzed before it is removed. The waste will then be containerized (e.g., in 55-gal. drums) and managed in accordance with applicable Laboratory waste management requirements based on the waste characterization results. The interior of the distribution box will be pressure-washed and chip-sampled for waste characterization purposes before it is removed; wastes generated from steam cleaning are discussed in section B-2.5. The other components will be characterized based on the results of the chip or sludge samples. To the extent practicable, soil will be brushed off or otherwise removed from the debris. Soil at locations with elevated HE, VOCs, radioactivity, and/or metals based on field screening within the sump excavations will be excavated.

The excavated debris will be placed in containers (e.g., rolloff bins) at the site and managed in accordance with applicable Laboratory waste management requirements based on the waste characterization results. Any soil generated will be managed as described in Section B-2.2. The Laboratory expects most of this waste to be designated as industrial waste or hazardous waste; however, the waste may also be classified as MLLW. All wastes will be treated/disposed of at an authorized on-site or off-site facility appropriate for the waste classification.

B-2.4 Contact Waste

The contact waste stream consists of potentially contaminated materials that “contacted” waste during sampling and excavation. This waste stream consists primarily of, but is not limited, to personal protective equipment (PPE) such as gloves; decontamination wastes such as paper wipes; and disposable sampling supplies. Characterization of this waste stream will use AK of the waste materials; the methods of generation, the extent of contamination, and analysis of the material contacted (e.g., drill cuttings and soil). The waste will be containerized (e.g., in 55-gal. drums) and managed in accordance with applicable Laboratory waste management requirements based on the waste characterization results. The Laboratory expects most of the contact waste to be designated industrial waste or LLW; however, the waste may also be classified as hazardous, MLLW, or PCB waste. All wastes will be treated/disposed of at an authorized on-site or off-site facility appropriate for the waste classification.

B-2.5 Decontamination Fluids

This waste stream will consist of liquid wastes from decontamination activities [i.e., decontamination solutions and rinse waters including water generated from the high pressure washing of the interior of the septic tanks at SWMUs 06-001(a), 06-001(b), and 22-010(a); the interior of the sumps at SWMUs 22-014(b) and 22-015(b); the interior of the distribution box at SWMU 40-001(b); and waste generated from the decontamination of surface infrastructure components associated with inactive seepage pits at SWMUs 22-014(a) and 22-015(b)]. Consistent with waste minimization practices, the Laboratory uses dry equipment decontamination methods to the extent possible. If dry decontamination cannot be performed, liquid decontamination wastes will be collected in containers at the point of generation. The fluids from decontaminating drilling or sampling equipment will be characterized through AK of the waste materials, the levels of contamination measured in the environmental media (e.g., the results of the associated drill cuttings), and, if necessary, direct sampling of the containerized waste. The fluids from decontaminating the septic tanks at SWMUs 06-001(a), 06-001(b), and 22-010(a) will be directly sampled. If directly

sampled, the following analyses will be performed: VOCs, SVOCs, radionuclides (as identified for each site in the work plan), total metals, and, if needed, toxicity characteristic metals and other analytes required by the receiving facility (i.e., total suspended solids, MICROTOX, chemical oxygen demand, oil and grease, pH, nitrates). The Laboratory expects most of these wastes to be nonhazardous liquid waste or radioactive liquid waste that will be sent to one of the Laboratory's wastewater treatment facilities where the WAC allows the waste to be received.

B-2.6 Unexploded and Spent Detonators

This waste stream is associated with the unexploded ordnance (UXO) surveys that will be conducted at SWMUs 07-001(a) and 07-001(b) where excess detonators were formerly disposed of by open detonation. Unexploded detonators will be detonated on-site in a permitted treatment facility or transported to an off-site permitted treatment facility for destruction. Spent detonators and associated metallic debris will be certified as nondetonable by a qualified UXO quality/safety officer or supervisor before they are transported off-site. This debris will be characterized by AK and swipe sampling for radionuclides. The Laboratory expects such debris to be designated industrial waste or LLW. All wastes will be treated/disposed of at an authorized on-site or off-site facility appropriate for the waste classification.

Table B-2.0-1
Summary of Estimated IDW Generation and Management

Waste Stream	Expected Waste Type	Expected Disposition
Drill Cuttings	Industrial Hazardous PCB LLW MLLW	Land application or treatment/disposal at an authorized on-site or off-site facility
Excavated Environmental Media	Industrial Hazardous PCB LLW MLLW	Reused as fill at the excavation location or treated/disposed of at an authorized on- or off- facility
Excavated and/or Removed Man-made Debris	Industrial Hazardous PCB LLW MLLW	Treatment or disposal at an authorized on-site or off-site facility, recycled, or reused
Contact Waste	Industrial Hazardous PCB LLW MLLW	Disposal at an approved on- or off-site facility
Decontamination Fluids	Industrial LLW	Treatment at an on-site wastewater treatment facility
Unexploded and Spent Detonators	Industrial LLW	Treatment at an on-site or off-site permitted hazardous waste treatment facility

Plate 1 SWMUs and AOCs in Twomile Canyon Aggregate Area

Monitoring well
AOC or SWMU
Canyon reach
Former structure
Structure
Twomile aggregate area
Fence
Paved road
Storm drain
TA boundary
20-ft contour
100-ft contour

520 260 0 520 1,040 1,560 2,080 Feet

State Plane Coordinate System
New Mexico, Central Zone, US Survey Feet
North American Datum 1983
National Geodetic Vertical Datum 1929
05 January 2010 CAncell
Mapit 09-0109-1-53

Disclaimer: This map was created for work processes associated with the LANL Environmental Programs Directorate, Corrective Actions Projects (EP-CAPS). All other uses for this map should be confirmed with EP-CAP personnel.

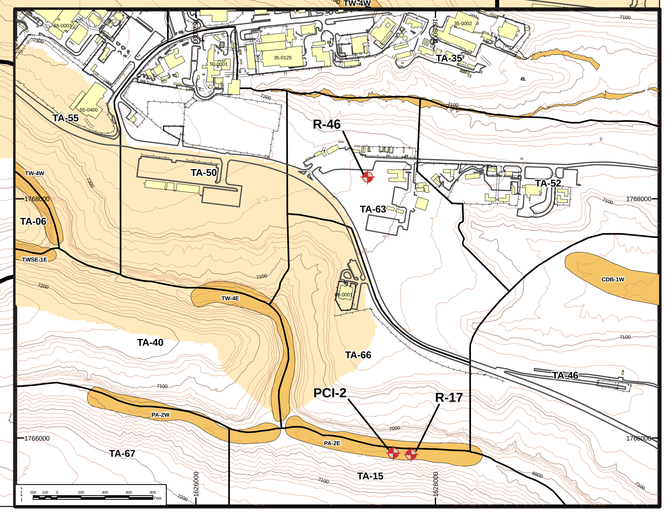
Santa Fe National Forest

TA-43
Los Alamos Canyon
TA-03
TA-62
TA-61
TA-58
Sandia Canyon
TA-60
TA-59
Mortandad Canyon
TA-69
TA-48
TA-06
Twomile Canyon
TA-64
TA-35
TA-55
TA-08
TA-22
TA-50
TA-40
TA-09
Pajarito Canyon
TA-14
TA-16

W JEMEZ RD
E JEMEZ RD
JUANITO RD
TWOMILE MESA RD
TOWER RD
PAJARITO RD

LA-BKG
LA-0
LA-1
LA-1FW
DIAMOND DR
S-1
S-2
M-1W
M-1E
E-1W
E-1
TWSW-1W
TWSW-1C
TWSW-1E
TW-3W
TW-3E
TW-4W
TW-4E
TWSE-1W
TWSE-1E
TW-1E
TW-1W
TW-1C
TW-2W
TW-2E
PA-1W
PA-1C
PA-1E
PA-2W
PA-2E
PAS-1E
PAS-2W
PAS-2E
AW-1
AEN-1
AES-1
TH-1W
CDB-1W

SWMU 69-001
AOC 03-001(e)
AOC 03-003(p)
SWMU 03-010(a)
03-B-13
SWMU 03-050(f)
SWMU 03-043(c)
AOC 03-042
AOC 03-014(2)
SWMU 03-033
SWMU 03-003(a)
SWMU 03-003(b)
AOC 03-003(h)
SWMU 03-052(a)
SWMU 03-050(a)
AOC 03-003(j)
AOC 03-051(a)
SWMU 03-052(e)
AOC 03-025(c)
SWMU 03-025(b)
AOC 03-014(a2)
AOC 03-051(b)
AOC 03-003(k)
SWMU 03-050(d)
SWMU 03-014(f)
SWMU 03-054(a,d)
SWMU 03-026(d)
AOC 03-003(l)
SWMU 03-050(g)
AOC 03-022
AOC 03-038(f)
SWMU 03-055(a)
SWMU 03-054(b)
SWMU 03-001(k)
AOC 59-004
AOC C-59-001
SWMU 06-001(a)
SWMU 06-003(d)
SWMU 06-007(f)
SWMU 06-001(b)
SWMU 06-003(e)
SWMU 06-007(g)
SWMU 06-003(f)
SWMU 06-005
SWMU 06-007(a)
AOC C-06-001
SWMU 06-006
AOC C-06-020
AOC C-06-005
SWMU 06-003(h)
SWMU 06-002
AOC C-06-006
AOC C-06-019
SWMU 06-003(c)
AOC C-06-016
AOC 06-008
SWMU 06-007(b)
SWMU 06-007(c)
SWMU 06-007(d)
SWMU 06-007(e)
SWMU 06-003(a)
SWMU 07-001(a)
SWMU 07-001(b)
SWMU 07-001(d)
SWMU 07-001(c)
AOC C-50-001
SWMU 22-014(a)
SWMU 22-010(a)
SWMU 22-015(a)
SWMU 22-014(b)
SWMU 22-015(b)
SWMU 40-005
AOC 40-007(e)
SWMU 40-001(b)
R-18



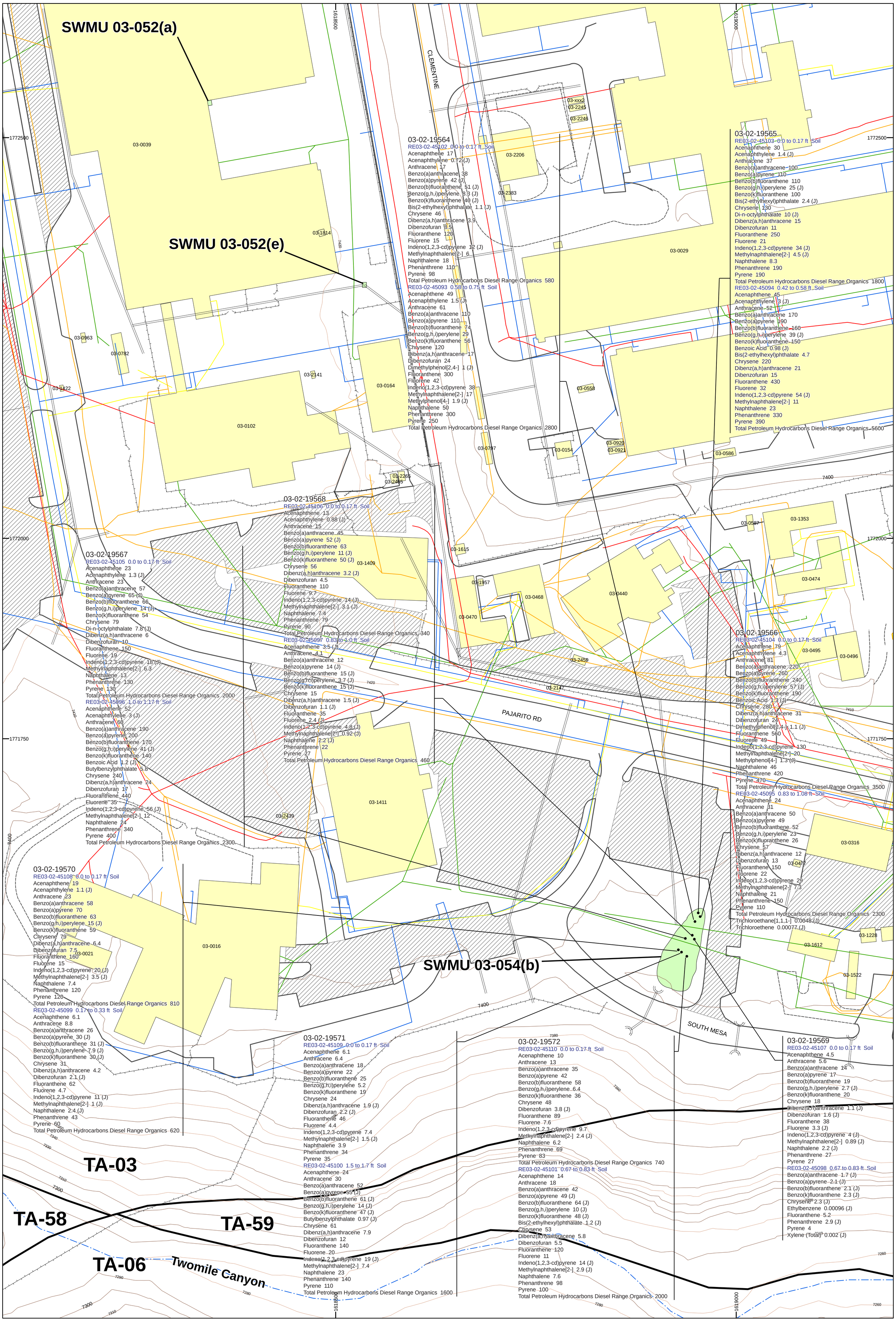


Plate 2 Organic chemicals detected at Consolidated Unit 03-052(a)-00